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PUBLIC SERVICE
COMMISSION

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

In the Matter of:

**BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN**

)
) **Case No.**
) **2014-00166**

**Response to the Office of the Attorney General's
Initial Request for Information
dated August 20, 2014**

FILED: September 10, 2014

ORIGINAL

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
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1 **Item 1) Big Rivers' 2014 Integrated Resource Plan, prepared on Big Rivers'**
2 **behalf by GDS Associates, Inc., and filed with the Commission on May 15, 2014 ["IRP**
3 **Filing"], at page 21 states that, "Due to recent, favorable conditions in the wholesale**
4 **power market, Big Rivers has made forward power sales from Wilson that have**
5 **enabled Big Rivers to postpone the idling of the Wilson Station until February 2015 and**
6 **possibly beyond." Please provide a list of all forward power sales detailing quantity,**
7 **purchaser, term, and start and stop dates.**

8

9 **Response)**

Dates		Amount	Period	Buyer
Begin	End	MW	Hours	
2/1/14	3/31/14	200	7x24	█
4/1/14	4/30/14	200	On-Peak*	█
7/1/14	8/31/14	50	On-Peak*	█
7/1/14	12/31/14	200	On-Peak*	██████████
1/1/15	2/28/15	200	On-Peak*	██████████
1/1/15	12/31/15	200	On-Peak*	██████████
6/1/15	6/30/15	100	On-Peak*	██████████
7/1/15	7/31/15	125	On-Peak*	██████████
8/1/15	8/31/15	125	On-Peak*	██████████
9/1/15	9/30/15	100	On-Peak*	██████████

* On-Peak hours are Monday - Friday from 6 AM to 10 PM (5x16)

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- 1 In addition to the power sales provided above, Big Rivers has sold capacity to bilateral
2 counterparties, as well as in the MISO Capacity Auction.

Dates		Amount	Buyer
Begin	End	MW	
6/1/2014	5/31/2015	100	████████
6/1/2014	5/31/2015	298	██████
████████	████████	███	████████
████████	████████	███	███
████████	████████	███	████████

3

4 **Witness)** Lindsay N. Barron

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- 1 **Item 2) With regard to the costs that will be associated with restarting the three**
2 **Coleman units:**
- 3 **a) Provide a description of each type of restart or startup costs expected to be**
4 **incurred by Big Rivers and the year these costs will be incurred, including:**
- 5 **i) a detailed breakdown of each type of restart or startup costs;**
6 **ii) the year these costs will be incurred; and**
7 **iii) whether these costs will be capital costs or expenses.**
- 8 **b) Provide a description of all anticipated environmental upgrades that will be**
9 **required prior to restarting these units, including:**
- 10 **i) a detailed breakdown of all costs related to any such environmental**
11 **upgrades; and**
12 **ii) the year these costs will be incurred.**
- 13 **c) Provide a description of each type of major maintenance activity that has**
14 **been deferred that will be completed prior to restarting these units,**
15 **including:**
- 16 **i) a detailed breakdown of all costs related to all such major**
17 **maintenance activities; and**
18 **ii) the year these costs will be incurred.**

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- 1 **d) Provide a description of all necessary permits that will be required prior to**
2 **restarting these units, including:**
- 3 **i) a detailed breakdown of all costs related to achieving these permits;**
4 **and**
- 5 **ii) the year these costs will be incurred.**
- 6 **e) Provide a discussion whether the restart of Coleman could or might trigger**
7 **an EPA New Source Review.**

8

9 **Response)**

- 10 a) Please see Big Rivers' confidential response to AG 2-9 in CN 2013-00199.
- 11 b) The environmental upgrades that will be required will depend on the regulations in
12 effect at the time Coleman is returned to service. Please see Big Rivers' response to
13 AG 1-18c for the environmental upgrades that would be required to return Coleman
14 to service in 2016 or 2017 based on current regulations.
- 15 c) Please see Big Rivers' confidential response to AG 2-9 in CN 2013-00199.
- 16 d) Please see Big Rivers' confidential response to AG 2-9 in CN 2013-00199.

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- 1 e) Big Rivers does not believe restarting Coleman will trigger an EPA New Source
2 Review if the restart occurs within a few years of idling and no pollution control
3 equipment which could increase PSD emissions is installed.

4

5 **Witness)** Duane E. Braunecker and Eric M. Robeson

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1 **Item 3)** Please provide the latest estimated date for Wilson's idling, together with
2 any projected dates for its re-start.

3

4 **Response)** Please see Big Rivers' response to PSC1-29 in this case.

5

6 **Witness)** Lindsay N. Barron

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1 **Item 4) With regard to the costs that will be associated with restarting Wilson,**
2 **please provide responses to the questions set forth in question number 2, subparts (a) -**
3 **(e), above, as pertains specifically to Wilson.**

4 **a) Provide a description of each type of restart or startup costs expected to be**
5 **incurred by Big Rivers and the year these costs will be incurred, including:**

6 **i) a detailed breakdown of each type of restart or startup costs;**

7 **ii) the year these costs will be incurred; and**

8 **iii) whether these costs will be capital costs or expenses.**

9 **b) Provide a description of all anticipated environmental upgrades that will be**
10 **required prior to restarting these units, including:**

11 **i) a detailed breakdown of all costs related to any such environmental**
12 **upgrades; and**

13 **ii) the year these costs will be incurred.**

14 **c) Provide a description of each type of major maintenance activity that has**
15 **been deferred that will be completed prior to restarting these units,**
16 **including:**

17 **i) a detailed breakdown of all costs related to all such major**
18 **maintenance activities; and**

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- 1 ii) the year these costs will be incurred.
- 2 d) Provide a description of all necessary permits that will be required prior to
- 3 restarting these units, including:
- 4 i) a detailed breakdown of all costs related to achieving these permits;
- 5 and
- 6 ii) the year these costs will be incurred.
- 7 e) Provide a discussion whether the restart of Wilson could or might trigger an
- 8 EPA New Source Review.

9

10 **Response)**

- 11 a) Wilson has not been idled. Please see Big Rivers' response to PSC 1-29 in this case
- 12 where Big Rivers anticipates Wilson Station will be economic to operate for many
- 13 years to come. Therefore, there will be no restarting of Wilson Station required.
- 14 b) Please see response to part (a) above.
- 15 c) Please see response to part (a) above.
- 16 d) Please see response to part (a) above.
- 17 e) Please see response to part (a) above.

18

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1 **Witness)** Duane E. Braunecker and Eric M. Robeson

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1 **Item 5)** Please provide the revenue requirements for Coleman and Wilson for the
2 period 2014 through 2027, in the same format as was supplied in response to KIUC 1-21
3 and 1-22 in Case No. 2013-00199. Provide this information in electronic format
4 with data and formulae in all cells and rows intact and fully accessible

5

6 **Response)** The most recent information available that has been approved for 2014
7 through 2027 was provided in response to KIUC 2-15, in Case No. 2013-00199.

8

9 **Witness)** Jeffrey R. Williams

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1 **Item 6)** **Please provide Big Rivers' most recent long-term financial forecast**
2 **model, in electronic format with data and formulae in all cells and rows intact and fully**
3 **accessible. If there are any other workpapers, memos, reports, emails etc.**
4 **concerning how the data in those files were developed, please provide that**
5 **information electronically, with all formulae intact.**

6

7 **Response)** The current Big Rivers forecast runs through 2017 and is named *Financial*
8 *Forecast (2015-2017) 7-21-2014.xlsx*. This file, along with supporting (linked) electronic
9 files, is provided under the folder AG-1-6 on the confidential electronic media accompanying
10 this response.

11

12 **Witness)** Christopher A. Warren

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1 **Item 7) Please provide Big Rivers' most recent production cost model, in**
2 **electronic format with data and formulae in all cells and rows intact and fully**
3 **accessible. If there are any other workpapers, memos, reports, emails etc. concerning**
4 **how the data in those files were developed, please provide that information**
5 **electronically, with all formula intact.**

6

7 **Response) Please see the attachments in the folder AG 1-7 on the confidential electronic**
8 **media accompanying these responses.**

9

10 **Witness) Duane E. Braunecker**

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1 **Item 8) Please provide a list of any and all contracts for the supply of**
2 **power from Big Rivers (whether directly or through its member, Kenergy) to Century**
3 **Aluminum of Kentucky General Partnership, and Century Aluminum Sebree LLC, at**
4 **the Hawesville and Sebree smelters.**

5 **a. If there have been any changes to those contracts since the time**
6 **they were introduced into the public record in Case Nos. 2013-00221 and 2013-00413,**
7 **please provide copies of any and all such changes.**

8
9 **Response)** Big Rivers does not supply power to either Century entity, directly or through
10 Kenergy. As the Market Participant for Kenergy, Big Rivers purchases power in the
11 wholesale power market for Kenergy for delivery to Century.

12 The latest versions of the contracts described above of which Big Rivers is
13 aware, and to which one or both of Big Rivers and Kenergy are parties, are listed below. To
14 Big Rivers' knowledge, none of these contracts has been amended.

15 *Century Hawesville – Case No. 2013-00221*

16 Primary Transaction Documents

17 1. Electric Service Agreement, dated as of the Effective Date, by and between Century
18 Kentucky and Kenergy

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1

2 2. Arrangement and Procurement Agreement, dated as of the Effective Date, by and
3 between Kenergy and Big Rivers

4 3. Direct Agreement, dated as of the Effective Date, by and between Big Rivers and
5 Century Kentucky

6 4. Guarantee, dated as of the Effective Date, by and among Century Parent, Kenergy
7 and Big Rivers

8 5. Tax Indemnity Agreement, dated as of the Effective Date, by and among Kenergy,
9 Century Parent and Century Kentucky

10 6. Security and Lock Box Agreement, dated as of the Effective Date, by and among Big
11 Rivers, Kenergy, Century Kentucky and Depository Bank

12 Alternate Electric Service Arrangements

13 7. Alternate Service Agreement, dated the Effective Date, by and between Kenergy and
14 Century Kentucky

15 8. Letter Agreement, dated the Effective Date, by and between Big Rivers and Kenergy,
16 relating to wholesale electric service to Kenergy for the Alternate Service Agreement

17 Load Curtailment, Capacitor and Protective Relay Documents

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1 9. Capacitor Agreement, dated as of August 12, 2013, by and among Big Rivers,
2 Kenergy and Century Kentucky

3 10. Protective Relays Agreement, dated as of August 12, 2013, by and among Big Rivers,
4 Kenergy and Century Kentucky

5 11. Capacitor Additions and Protective Relays Guarantee, dated as of August 12, 2013,
6 by and among Big Rivers, Kenergy and century Parent

7 12. Load Curtailment Agreement by and among Big Rivers Electric Corporation,
8 Kenergy Corp. and Century Aluminum of Kentucky General Partnership, dated as of
9 January 21, 2014

10 Credit Support for Electric Service

11 13. Irrevocable Standby Letter of Credit, dated August 16, 2013, applied for by Century
12 Kentucky and issued by Wells Fargo Bank, N.A. for the benefit of Kenergy and/or
13 Big Rivers

14 *Century Sebree – Case No. 2013-00413*

15 Primary Transaction Documents

16 1. Electric Service Agreement, dated as of the Effective Date, by and between Century
17 Sebree and Kenergy

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- 1 2. Arrangement and Procurement Agreement, dated as of the Effective Date, by and
2 between Kenergy and Big Rivers
- 3 3. Direct Agreement, dated as of the Effective Date, by and between Big Rivers and
4 Century Sebree
- 5 4. Guarantee, dated as of the Effective Date, by and among Century Parent, Kenergy
6 and Big Rivers
- 7 5. Tax Indemnity Agreement, dated as of the Effective Date, by and among Kenergy,
8 Century Parent and Century Sebree
- 9 6. Security and Lock Box Agreement, dated as of the Effective Date, by and among Big
10 Rivers, Kenergy, Century Sebree and Depository Bank

11 Alternate Electric Service Arrangements

- 12 7. Alternate Service Agreement, dated the Effective Date, by and between Kenergy and
13 Century Sebree
- 14 8. Letter Agreement, dated the Effective Date, by and between Big Rivers and Kenergy,
15 relating to wholesale electric service to Kenergy for the Alternate Service Agreement
- 16
- 17

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1 Load Curtailment and Protective Relay Documents

2 9. Load Curtailment Agreement, dated as of the Effective Date, by and among Big
3 Rivers, Kenergy and Century Sebree

4 10. Protective Relays Agreement, dated as of the Effective Date, by and among Big
5 Rivers, Kenergy and Century Sebree

6 Credit Support for Electric Service

7 11. Irrevocable Standby Letter of Credit, issued the effective date, applied for by Century
8 Sebree and issued by Wells Fargo Bank, N.A. for the benefit of Kenergy and/or Big
9 Rivers

10

11 **Witness)** Lindsay N. Barron

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1 **Item 9) Please provide copies of any written documents, memoranda, power point**
2 **slides, excel spreadsheets and emails pertaining in any manner to any and all**
3 **presentations Century Aluminum may have made to Big Rivers' Board of Directors**
4 **since January 1, 2014.**

5

6 **Response) None.**

7

8 **Witness) Lindsay N. Barron**

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1 **Item 10)** Please provide any analyses or studies, including sensitivity analyses,
2 which Big Rivers, or any consultant or contractor on its behalf, may have conducted
3 regarding whether market prices by 2019 will or might increase to levels that would
4 justify returning any and/or all idled units to operational status.

5 a) Please provide any updates to the analyses and studies that Big Rivers provided
6 in response to PSC 2-14 in Case. No. 2013-00199, together with any new such
7 analyses.

8
9 **Response)** a) Big Rivers has not updated the analysis that would justify returning idled
10 units to operational status by 2019 as outlined in Big Rivers' response to PSC 2-14 in Case
11 No. 2013-00199. Big Rivers is evaluating the pending environmental regulations and the
12 decision to return idled units to service involves, among other things, forecasting power
13 market and capacity prices, determining environmental implications and costs, considering
14 the amount of replacement load, and evaluating the lay-up cost, the future operating cost and
15 the cost of returning the idled unit(s) back to service.

16

17 **Witness)** Duane E. Braunecker

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1 **Item 11)** **Please provide the latest load forecast (and associated documentation and**
2 **workpapers) performed by outside consultants for Big Rivers, and identify any and all**
3 **such outside consultants. Please provide this information in Excel spreadsheets with**
4 **data and formulae in all cells and rows intact and fully accessible.**

5

6 **Response)** The latest load forecast is included in the IRP as Appendix A. GDS
7 Associates assisted Big Rivers in the development of the forecast. Forecast spreadsheet files
8 with data and formulae in all cells and rows intact are provided in the folder AG 1-11 on the
9 confidential electronic media accompanying these responses.

10

11 **Witness)** Marlene S. Parsley

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1 **Item 12)** Please provide an update regarding Big Rivers' efforts to sell or lease one
2 **or more of its generating plants, including price offers.**

3

4 **Response)** Big Rivers continues to offer the sale or lease of Coleman and Wilson Station
5 to interested counterparties. The price offers are unchanged from the values discussed in
6 Case No. 2013-00199.

7

8 **Witness)** Lindsay N. Barron

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1 **Item 13)** Please provide copies of any and all responses Big Rivers has made to
2 requests for proposals for long-term power contracts, other than those provided in Case
3 No. 2014-00134. For the Attorney General's purposes, electronic copies will suffice.

4
5 **Response)** Big Rivers objects to this request on the grounds that it is overly broad and
6 unduly burdensome. Notwithstanding that objection, but without waiving it, Big Rivers
7 responds as follows. Big Rivers continues to respond to RFPs as received. Big Rivers has
8 responded to more than 10 RFPs since January 2014 and has spent a significant amount of
9 time working with numerous entities who have not formally expressed a need for power.

10 Big Rivers mitigation efforts are proving successful as is evidenced by the sales
11 contracts highlighted in the response to AG1-1. The operation of Wilson Station through
12 2015 has already added significant value to Big Rivers Members, both through increased
13 margins for the organization and direct savings that flow to Members through the Fuel
14 Adjustment Clause on a near real-time basis. That value will continue throughout 2014 and
15 2015. The continued operation of Wilson Station also benefited the local economy through
16 continued employment for the area at both Wilson Station, as well as, local coal mines and
17 reagent providers. The economic impact of Wilson's operation is significant and benefits
18 many in Western Kentucky.

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1 **Item 14)** **Please provide the annual average account balances and depreciation**
2 **expense for Coleman and Wilson Stations for each year from 2013 through 2020.**

3

4 **Response)** Please see the attachment to this response for the average plant balances and
5 annual depreciation amounts for Coleman and Wilson for each year from 2013 through 2017.
6 Please note that the amounts presented for 2013 represent actuals, and the amounts presented
7 for 2014-2017 represent budgeted amounts based on Big Rivers' 2014 Budget and 2015-
8 2017 Financial Plan as approved by Big Rivers' Board of Directors on December 20, 2013.

9 Beginning September 2013, Coleman depreciation is not recorded as an expense in
10 Big Rivers' financial statements and instead is recorded to a regulatory asset account based
11 on the Commission's Order dated October 29, 2013 in Case No. 2012-00535. Beginning
12 February 2014, Wilson depreciation is not recorded as an expense on Big Rivers' financial
13 statements and instead is recorded to a regulatory asset account based on the Commission's
14 Order dated April 25, 2014 in Case No. 2013-00199.

15 The information requested for years 2018 through 2020 is not available as of the date
16 this response was prepared.

17

18 **Witness)** Nicholas R. Castlen

Big Rivers Electric Corporation

**Average Gross Annual Plant Balances and Depreciation Expense (Coleman and Wilson)
2013 Actuals and 2014-2017 Budget**

Coleman:

Average Annual Account Balances:

	<u>2013</u>		<u>2014</u>		<u>2015</u>		<u>2016</u>		<u>2017</u>
3102	\$ 1,124,665	\$	1,124,665	\$	1,124,665	\$	1,124,665	\$	1,124,665
3112	19,731,174		19,786,790		19,786,790		19,786,790		19,786,790
3122	81,898,572		83,075,424		83,216,622		83,216,622		83,216,622
312C	122,800,032		123,057,165		123,057,165		123,057,165		123,057,165
312M	-		-		-		-		-
312W	412,629		412,629		412,629		412,629		412,629
3142	33,411,897		33,731,069		33,731,069		33,731,069		33,731,069
3152	9,314,774		9,435,027		9,435,027		9,435,027		9,435,027
3162	1,286,980		1,319,017		1,319,017		1,319,017		1,319,017
Total	\$ 269,980,723	\$	271,941,786	\$	272,082,984	\$	272,082,984	\$	272,082,984

Annual Depreciation Expense⁽¹⁾:

\$ 5,564,449	\$	5,956,322	\$	5,961,135	\$	5,961,741	\$	5,962,317
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Big Rivers Electric Corporation

**Average Gross Annual Plant Balances and Depreciation Expense (Coleman and Wilson)
2013 Actuals and 2014-2017 Budget**

Wilson:

Average Annual Account Balances:

	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>
3104 \$	2,218,858 \$	2,218,858 \$	2,218,858 \$	2,218,858 \$	2,218,858
3114	73,632,825	73,660,583	73,660,583	73,660,583	73,660,583
3124	404,675,067	405,900,361	405,900,361	405,900,361	405,900,361
312E	262,905,028	262,987,021	262,987,021	262,987,021	262,987,021
312P	6,615,946	6,615,946	6,615,946	6,615,946	6,615,946
312Y	-	-	-	-	-
3144	129,092,523	129,222,885	129,222,885	129,222,885	129,222,885
3154	35,285,583	35,338,975	35,338,975	35,338,975	35,338,975
3164	1,338,215	1,347,362	1,347,362	1,347,362	1,347,362
Total \$	915,764,045 \$	917,291,991 \$	917,291,991 \$	917,291,991 \$	917,291,991

Annual Depreciation Expense⁽²⁾:

\$	19,193,370 \$	19,953,828 \$	19,955,254 \$	19,955,809 \$	19,956,346
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⁽¹⁾ Beginning September 2013, Coleman depreciation is not recorded as an expense in Big Rivers' financial statements and instead is recorded to a regulatory asset account based on the Commission's Order dated October 29, 2013 in Case No. 2012-00535. The amounts shown above include the depreciation expense recorded to the regulatory asset account.

⁽²⁾ Beginning February 2014, Wilson depreciation is not recorded as an expense in Big Rivers' financial statements and instead is recorded to a regulatory asset account based on the Commission's Order dated April 25, 2014 in Case No. 2013-00199. The amounts shown above include the depreciation recorded to the regulatory asset account.

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1 **Item 15) Section 6.2 of the IRP filing states that “the existing transmission system**
2 **is sufficient to support the export of all Big Rivers’ generation power greater than the**
3 **amount required to serve native load.” Please provide the following:**

- 4 **a. A copy of the analysis or study performed to reach this conclusion.**
- 5 **b. A list of Big Rivers’ generating plants assumed to be available in this study or**
6 **analysis.**
- 7 **c. Explain if the above statement is still correct if Coleman is idled indefinitely.**

8

9 **Response)**

- 10 a. A July 6, 2011 MISO study titled “First Contingency Incremental Transfer Capability
11 Study for Big Rivers Electric Corporation” indicated facility overloads are not
12 expected until transfers reach 1210 MWs into MISO and 1263 MWs into TVA. A
13 redacted public version of the described study is attached.
- 14 b. The study cited in the response to part a. assumed all generation owned and/or
15 operated by Big Rivers was available. This includes:
16 Kenneth C. Coleman Station units 1, 2, and 3
17 Robert D. Green Station units 1 and 2
18 Henderson Municipal Power & Light Station Two units 1 and 2

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- 1 Robert A. Reid Station unit 1 and gas turbine
2 D.B Wilson Station unit 1
3 c. The statement is still correct with the Coleman Station idled. The existing
4 transmission system remains capable of supporting the export of all Big Rivers'
5 generation in excess of the amount required to serve native load.

6

7 **Witness)** Christopher S. Bradley



Contains Critical Energy Infrastructure Information - Do Not Release

First Contingency Incremental Transfer Capability Study for Big Rivers Electric Corporation [BREC]

July 6, 2011

By
David A. Mendonsa, P.E.



First Contingency Incremental Transfer Capability Study for Big Rivers Electric Corporation [BREC]

A First Contingency Incremental Transfer Capability (FCITC) Study was conducted for Big Rivers Electric Corporation to assess transfer capability five years from now, in year 2016. FCITC measures the maximum increase in power transfer that can take place between a **source system** and a **sink system** without violating thermal ratings of transmission lines or transformers. The MISO MTEP11, 2016 Summer Peak model with a security constraint economic dispatch, served as the case for these studies. Four FCITC transfers were studied, including:

- 1) Southern Indiana to BREC
- 2) BREC to Southern Indiana
- 3) TVA to BREC
- 4) BREC to TVA

The FCITC results for the four transfers are provided. The first contingency causing thermal violations, the associated overloaded transmission system element and the definition of the transfers are also provided.

1) Southern Indiana to BREC Transfer

A high transfer from Southern Indiana to BREC was analyzed. The observed transfer capability of 1568 MWs is limited by [REDACTED]

[REDACTED] The results of this transfer study are summarized below in Table 1. Loss of [REDACTED]

[REDACTED] will initiate implementation of operating guide [REDACTED]. The provisions of this operating guide to mitigate [REDACTED]

[REDACTED]
[REDACTED]

This operating guide may also restrict the Southern Indiana to BREC transfer capability to 1568 MWs.

BREC Transfer Capability Study

Transfer	Southern Indiana to BREC
FCITC	1568 MWs
Limiting Element	
TDF (%) on the Limiting Element	8.25%
FCITC Flow on the Limiting Element	129.4 MWs
Base Flow on the Limiting Element	46.7 MWs
Limiting Flow on the Limiting Element	176 MWs
Rating of the Limiting Element	176 MWs
Contingency Description	

Table 1. – Southern Indiana to BREC Transfer

The definition of the Southern Indiana to BREC transfer is provided below:

Source of Transfer: SIndiana_Export; Scaling up of generation, including offline generation, in Area 207 – HE, Area 208 – Duke Energy Indiana, Area 212 – Duke Energy Ohio and Kentucky and Area 216 – IP&L

Sink of Transfer: BREC_Import; Scaling down of BREC generation

2) BREC to Southern Indiana Transfer

A high transfer from BREC to Southern Indiana was analyzed. The observed transfer capability of 1210 MWs is limited by [REDACTED] due to Category A “Base Case” thermal overload at this transfer level. The results of this transfer study are summarized below in Table 2. The second FCITC limitation is 1768 MWs. The [REDACTED] is the limiting element due to Category A “Base Case” thermal overload at the 1768 MW transfer level.

BREC Transfer Capability Study

Transfer	BREC to Southern Indiana
FCITC	1210 MW
Limiting Element	
TDF (%) on the Limiting Element	20.37%
FCITC Flow on the Limiting Element	246.4 MW
Base Flow on the Limiting Element	88.6 MW
Limiting Flow on the Limiting Element	335 MW
Rating of the Limiting Element	335 MW
Contingency Description	Base Case

Table 2. – BREC to Southern Indiana Transfer

The definition of the BREC to Southern Indiana transfer is provided below:

Source of Transfer: BREC_Export; Scaling up of generation in Area 314 – BREC

Sink of Transfer: Indiana_Import; Scaling down of generation, including offline generation, in Area 207 – HE, Area 208 – Duke energy Indiana, Area 210 SIGE, Area 212 – Duke Energy Ohio & Kentucky, Area 216 – IP&L and Area 217 - NIPS

3) TVA to BREC Transfer

A high transfer from TVA to BREC was analyzed. The observed transfer capability of 1870 MWs is limited by [REDACTED] with the Category B contingency loss of [REDACTED]. The results of this transfer study are summarized below in Table 3. As the transfer from TVA is increasing and the BREC generation is diminishing, the majority of the increasing transfer will flow from TVA. However, as transfer flow from TVA is increasing, load on the [REDACTED] [REDACTED]. At the above transfer level of 1870 MWs, a Category B contingency loss of [REDACTED] will result in the thermal overloading of [REDACTED].

BREC Transfer Capability Study

Loss of [REDACTED] will initiate implementation of operating guide [REDACTED]. The provisions of this operating guide to mitigate potential low voltage and thermal overloads [REDACTED] [REDACTED]. This operating guide may also restrict the TVA to BREC transfer capability to 1870 MWs.

Transfer	TVA to BREC
FCITC	1870 MW
Limiting Element	[REDACTED]
TDF (%) on the Limiting Element	6.92%
FCITC Flow on the Limiting Element	129.3 MW
Base Flow on the Limiting Element	46.7 MW
Limiting Flow on the Limiting Element	176 MW
Rating of the Limiting Element	176 MW
Contingency Description	[REDACTED]

Table 3. – TVA to BREC Transfer

The definition of the TVA to BREC transfer is provided below:

Source of Transfer: TVA_Export; Scaling up of specific generating units in Area 347 – TVA

Sink of Transfer: BREC_Import; Scaling down of BREC generation

4) BREC to TVA Transfer

A high transfer from BREC to TVA was analyzed. The observed transfer capability of 1263 MWs is limited by [REDACTED] due to Category A “Base Case” thermal overload at this transfer level. The results of this transfer study are summarized below in Table 4. The second FCITC limitation is 1752 MW. The [REDACTED]

BREC Transfer Capability Study

████████████████████ is the limiting element due to Category A “Base Case” thermal overload at the 1752 MW transfer level

Transfer	BREC to TVA
FCITC	1263 MW
Limiting Element	████████████████████
TDF (%) on the Limiting Element	19.52%
FCITC Flow on the Limiting Element	246.4 MW
Base Flow on the Limiting Element	88.6 MW
Limiting Flow on the Limiting Element	335 MW
Rating of the Limiting Element	335 MW
Contingency Description	Base Case

Table 4. – BREC to TVA Transfer

The definition of the BREC to TVA transfer is provided below:

Source of Transfer: BREC_Export; Scaling up of generation in Area 314 – BREC

Sink of Transfer: TVA_Import; Scaling down of generation in Area 347 – TVA

CONCLUSIONS:

BREC import of power from either Southern Indiana generation or TVA is limited by ██████████ ██████████ with the Category B contingency loss of ██████████. Loss of service of ██████████ will require operating guide ██████████ to be implemented to mitigate potential low voltage and thermal overloads in ██████████ ██████████. The operating guide may limit BREC import of power.

Export of power from BREC to either Southern Indiana or TVA is limited by the ██████████ ██████████. The re-dispatch of area generation, particularly at ██████████, may reduce potential emergency loading on this line and allow additional power to be exported.

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1 **Item 16)** Please fully describe the 25 MW growth in native load due to new
2 **customer additions discussed on page 22, section 3.0.**

3

4 **Response)** Please see Big Rivers' response to SC 1-10 in Case No. 2013-00199.

5

6 **Witness)** Lindsay N. Barron

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1 **Item 17)** Please provide in electronic Excel spreadsheet format, with data and
2 formulae in all cells and rows intact and fully accessible, the spreadsheet(s) used to
3 develop the following tables: 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.11,
4 4.12, 4.14, 4.16, 4.17, 4.18, 4.19, 4.20, 4.21, 4.22, 5.1, 5.2, 5.3, 5.15, 5.16, 5.17, 5.18, 9.1,
5 9.4, 9.6, 9.8, 10.1, 10.2, and 11.1.

6

7 **Response)** The electronic versions for all tables presented in the IRP are provided in
8 electronic Excel spreadsheet format, with data and formulae in all cells and rows intact, in
9 the folder AG 1-17 on the confidential electronic media accompanying these responses.
10 Supporting files are provided in the folder AG 1-17 WK.

11

12 **Witness)** Marlene S. Parsley

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1 **Item 18) On page 37, section 4.2 of the IRP the following statement is made: "Big**
2 **Rivers currently projects that market prices will return to a level that may justify**
3 **returning the idled plant to operational status in 2016 or 2017 as demonstrated in**
4 **the base case of this IRP;" Please provide the following related to this**
5 **statement:**

- 6 a) **Explain how the base case demonstrates market prices will return to such a**
7 **level in 2016 and 2017.**
- 8 b) **Please list in detail all deferred maintenance activities and associated costs**
9 **necessary to return Coleman to service.**
- 10 c) **Please provide a detailed list of all environmental upgrades and the projected**
11 **costs of each upgrade required to return Coleman to service in 2016 or 2017.**
- 12 d) **Please provide a detailed list of all costs associated with returning Coleman**
13 **to service.**
- 14 e) **Please explain where the costs referenced in subpart (d), above, are**
15 **addressed in the base case study provided in section H.**

16
17 **Response)**

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- 1 a) Section 4.2.4 of the IRP is an explanation of Replacement Load, and relays a
2 projection that market prices will return to a level that *may* justify returning the idled
3 plant to operational status in 2016 or 2017 [emphasis added]. Market price
4 projections include revenues from capacity and energy. In the base case, average
5 economy sales revenue raises from ██████/MWh in 2015 to ██████ by 2018. In
6 addition, capacity revenues are expected to rise from ██████ projected in 2015 to
7 ██████/KW-Year by 2018. We note that these projections were created prior to
8 MISO's Planning Resource Auction for 2014/15, where the Zone 6 Auction Clearing
9 Price was higher than expected (\$16.75/MW-Day, or \$6.11/KW-Year).
- 10 b) Please see Big Rivers' confidential response to AG 2-9 in CN 2013-00199.
- 11 c) The only environmental upgrade required to return Coleman to service in 2016 or
12 2017 is MATS equipment for the three Coleman units. The estimated cost of these
13 projects in the 2012 ECP was \$28.44 million.
- 14 d) Please see Big Rivers' confidential response to AG 2-9 in CN 2013-00199.
- 15 e) The base case study provided in section H is a Strategist run which by design includes
16 fixed costs only if new capacity is needed. The anticipated growth in \$/MWH
17 economy sales, plus the revenues from any capacity sales must cover the "all in"
18 fixed and variable costs of the existing equipment plus any required environmental

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1 additions and startup costs. Big Rivers will make the decision of when to return
2 idled plants to service when more certainty is gained regarding future market prices
3 and environmental requirements. See response to subsection a), above, for
4 quantifications of market expectations.

5

6 **Witness)** Marlene S. Parsley, Duane E. Braunecker and Eric Robeson

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1 **Item 19)** **Table 4.14 lists the projected rural retail electricity price through 2018.**

2 **Please provide the following:**

3 **a. Electronic copies of all workpapers, spreadsheets, etc. used to derive these**
4 **price projections.**

5 **b. Please explain why retail electric prices stay the same from 2016 through**
6 **2018 in this forecast even though replacement load sales increase throughout this time**
7 **period.**

8 **c. Please provide escalation and inflation rates assumed for each year in the**
9 **forecast period to derive real prices.**

10

11 **Response)** a. The file named *Table 4 14.xlsx* and the supporting files are provided under
12 the folder **AG 1-19** on the confidential electronic media accompanying this response.

13 b. Real prices stay the same from 2016 through 2018 (and also through 2028)
14 to reflect the assumption that price of electricity will increase at the rate of inflation
15 following the expected increases through 2016. Changes in price may exceed or fall below
16 the rate of inflation in specific years; however, it is assumed that average over the long term
17 will be equal to inflation.

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1 c. The escalation and inflation rates assumed each year in the forecast period
2 are provided in the attachment.

3

4 **Witness)** Christopher A. Warren, Marlene S. Parsley

Mnemonic:	FPDPGDP.US	
Description:	NIPA: Chain-Type Price Index - GDP, (Index 2005=100, SA)	
Source:	U.S. Bureau of Economic Analysis (BEA); Moody's Analytics (ECCA) Forecast	
Native Frequency:	QUARTERLY	
Geography:	United States	
Mar-1947		13.48
Apr-1947		13.54
May-1947		13.61
Jun-1947		13.67
Jul-1947		13.74
Aug-1947		13.83
Sep-1947		13.93
Oct-1947		14.04
Nov-1947		14.13
Dec-1947		14.19
Jan-1948		14.24
Feb-1948		14.28
Mar-1948		14.31
Apr-1948		14.35
May-1948		14.42
Jun-1948		14.53
Jul-1948		14.63
Aug-1948		14.71
Sep-1948		14.73
Oct-1948		14.71
Nov-1948		14.68
Dec-1948		14.67
Jan-1949		14.66
Feb-1949		14.65
Mar-1949		14.63
Apr-1949		14.60
May-1949		14.56
Jun-1949		14.50
Jul-1949		14.45
Aug-1949		14.42
Sep-1949		14.42
Oct-1949		14.43
Nov-1949		14.43
Dec-1949		14.42
Jan-1950		14.40
Feb-1950		14.37
Mar-1950		14.35
Apr-1950		14.36
May-1950		14.42
Jun-1950		14.52
Jul-1950		14.64
Aug-1950		14.74
Sep-1950		14.80
Oct-1950		14.85
Nov-1950		14.95
Dec-1950		15.13
Jan-1951		15.36

Feb-1951	15.53
Mar-1951	15.60
Apr-1951	15.60
May-1951	15.58
Jun-1951	15.56
Jul-1951	15.58
Aug-1951	15.62
Sep-1951	15.70
Oct-1951	15.79
Nov-1951	15.85
Dec-1951	15.87
Jan-1952	15.86
Feb-1952	15.84
Mar-1952	15.85
Apr-1952	15.88
May-1952	15.92
Jun-1952	15.96
Jul-1952	16.00
Aug-1952	16.04
Sep-1952	16.07
Oct-1952	16.09
Nov-1952	16.10
Dec-1952	16.10
Jan-1953	16.10
Feb-1953	16.11
Mar-1953	16.12
Apr-1953	16.13
May-1953	16.15
Jun-1953	16.16
Jul-1953	16.18
Aug-1953	16.20
Sep-1953	16.22
Oct-1953	16.23
Nov-1953	16.25
Dec-1953	16.28
Jan-1954	16.30
Feb-1954	16.33
Mar-1954	16.34
Apr-1954	16.35
May-1954	16.35
Jun-1954	16.35
Jul-1954	16.34
Aug-1954	16.34
Sep-1954	16.34
Oct-1954	16.34
Nov-1954	16.35
Dec-1954	16.37
Jan-1955	16.40
Feb-1955	16.42
Mar-1955	16.45
Apr-1955	16.47
May-1955	16.51

Jun-1955	16.55
Jul-1955	16.59
Aug-1955	16.63
Sep-1955	16.67
Oct-1955	16.70
Nov-1955	16.74
Dec-1955	16.79
Jan-1956	16.85
Feb-1956	16.91
Mar-1956	16.96
Apr-1956	17.00
May-1956	17.06
Jun-1956	17.13
Jul-1956	17.21
Aug-1956	17.27
Sep-1956	17.30
Oct-1956	17.32
Nov-1956	17.35
Dec-1956	17.42
Jan-1957	17.50
Feb-1957	17.57
Mar-1957	17.62
Apr-1957	17.65
May-1957	17.68
Jun-1957	17.73
Jul-1957	17.78
Aug-1957	17.83
Sep-1957	17.86
Oct-1957	17.88
Nov-1957	17.91
Dec-1957	17.96
Jan-1958	18.03
Feb-1958	18.08
Mar-1958	18.11
Apr-1958	18.13
May-1958	18.15
Jun-1958	18.17
Jul-1958	18.19
Aug-1958	18.20
Sep-1958	18.20
Oct-1958	18.20
Nov-1958	18.21
Dec-1958	18.23
Jan-1959	18.26
Feb-1959	18.29
Mar-1959	18.30
Apr-1959	18.31
May-1959	18.32
Jun-1959	18.34
Jul-1959	18.36
Aug-1959	18.38
Sep-1959	18.41

Oct-1959	18.44
Nov-1959	18.46
Dec-1959	18.48
Jan-1960	18.48
Feb-1960	18.50
Mar-1960	18.52
Apr-1960	18.55
May-1960	18.58
Jun-1960	18.61
Jul-1960	18.63
Aug-1960	18.66
Sep-1960	18.69
Oct-1960	18.72
Nov-1960	18.75
Dec-1960	18.76
Jan-1961	18.76
Feb-1961	18.76
Mar-1961	18.77
Apr-1961	18.78
May-1961	18.80
Jun-1961	18.82
Jul-1961	18.84
Aug-1961	18.85
Sep-1961	18.86
Oct-1961	18.87
Nov-1961	18.89
Dec-1961	18.93
Jan-1962	18.98
Feb-1962	19.01
Mar-1962	19.04
Apr-1962	19.05
May-1962	19.06
Jun-1962	19.07
Jul-1962	19.09
Aug-1962	19.11
Sep-1962	19.13
Oct-1962	19.15
Nov-1962	19.18
Dec-1962	19.20
Jan-1963	19.22
Feb-1963	19.23
Mar-1963	19.24
Apr-1963	19.25
May-1963	19.25
Jun-1963	19.25
Jul-1963	19.26
Aug-1963	19.28
Sep-1963	19.32
Oct-1963	19.36
Nov-1963	19.40
Dec-1963	19.43
Jan-1964	19.45

Feb-1964	19.47
Mar-1964	19.49
Apr-1964	19.51
May-1964	19.53
Jun-1964	19.56
Jul-1964	19.60
Aug-1964	19.63
Sep-1964	19.66
Oct-1964	19.69
Nov-1964	19.72
Dec-1964	19.75
Jan-1965	19.78
Feb-1965	19.80
Mar-1965	19.83
Apr-1965	19.87
May-1965	19.89
Jun-1965	19.92
Jul-1965	19.95
Aug-1965	19.98
Sep-1965	20.02
Oct-1965	20.06
Nov-1965	20.11
Dec-1965	20.14
Jan-1966	20.18
Feb-1966	20.22
Mar-1966	20.28
Apr-1966	20.35
May-1966	20.42
Jun-1966	20.48
Jul-1966	20.54
Aug-1966	20.61
Sep-1966	20.67
Oct-1966	20.74
Nov-1966	20.80
Dec-1966	20.83
Jan-1967	20.86
Feb-1967	20.89
Mar-1967	20.92
Apr-1967	20.97
May-1967	21.02
Jun-1967	21.08
Jul-1967	21.14
Aug-1967	21.21
Sep-1967	21.29
Oct-1967	21.37
Nov-1967	21.45
Dec-1967	21.52
Jan-1968	21.60
Feb-1968	21.67
Mar-1968	21.76
Apr-1968	21.85
May-1968	21.92

Jun-1968	21.98
Jul-1968	22.04
Aug-1968	22.12
Sep-1968	22.23
Oct-1968	22.34
Nov-1968	22.45
Dec-1968	22.52
Jan-1969	22.59
Feb-1969	22.66
Mar-1969	22.74
Apr-1969	22.85
May-1969	22.97
Jun-1969	23.08
Jul-1969	23.20
Aug-1969	23.30
Sep-1969	23.40
Oct-1969	23.50
Nov-1969	23.59
Dec-1969	23.69
Jan-1970	23.80
Feb-1970	23.91
Mar-1970	24.04
Apr-1970	24.17
May-1970	24.27
Jun-1970	24.34
Jul-1970	24.39
Aug-1970	24.44
Sep-1970	24.53
Oct-1970	24.64
Nov-1970	24.76
Dec-1970	24.89
Jan-1971	25.02
Feb-1971	25.14
Mar-1971	25.25
Apr-1971	25.37
May-1971	25.47
Jun-1971	25.58
Jul-1971	25.67
Aug-1971	25.74
Sep-1971	25.78
Oct-1971	25.82
Nov-1971	25.91
Dec-1971	26.06
Jan-1972	26.24
Feb-1972	26.38
Mar-1972	26.45
Apr-1972	26.47
May-1972	26.50
Jun-1972	26.56
Jul-1972	26.65
Aug-1972	26.75
Sep-1972	26.86

Oct-1972	26.96
Nov-1972	27.06
Dec-1972	27.17
Jan-1973	27.29
Feb-1973	27.41
Mar-1973	27.55
Apr-1973	27.70
May-1973	27.87
Jun-1973	28.05
Jul-1973	28.24
Aug-1973	28.42
Sep-1973	28.57
Oct-1973	28.72
Nov-1973	28.88
Dec-1973	29.08
Jan-1974	29.29
Feb-1974	29.49
Mar-1974	29.69
Apr-1974	29.89
May-1974	30.13
Jun-1974	30.42
Jul-1974	30.75
Aug-1974	31.10
Sep-1974	31.43
Oct-1974	31.75
Nov-1974	32.06
Dec-1974	32.34
Jan-1975	32.60
Feb-1975	32.80
Mar-1975	32.96
Apr-1975	33.10
May-1975	33.25
Jun-1975	33.44
Jul-1975	33.66
Aug-1975	33.89
Sep-1975	34.11
Oct-1975	34.32
Nov-1975	34.50
Dec-1975	34.64
Jan-1976	34.76
Feb-1976	34.87
Mar-1976	34.98
Apr-1976	35.10
May-1976	35.23
Jun-1976	35.37
Jul-1976	35.53
Aug-1976	35.71
Sep-1976	35.90
Oct-1976	36.11
Nov-1976	36.32
Dec-1976	36.53
Jan-1977	36.73

Feb-1977	36.93
Mar-1977	37.13
Apr-1977	37.34
May-1977	37.53
Jun-1977	37.70
Jul-1977	37.86
Aug-1977	38.03
Sep-1977	38.24
Oct-1977	38.47
Nov-1977	38.69
Dec-1977	38.89
Jan-1978	39.10
Feb-1978	39.31
Mar-1978	39.56
Apr-1978	39.84
May-1978	40.09
Jun-1978	40.32
Jul-1978	40.53
Aug-1978	40.77
Sep-1978	41.04
Oct-1978	41.34
Nov-1978	41.62
Dec-1978	41.86
Jan-1979	42.09
Feb-1979	42.35
Mar-1979	42.67
Apr-1979	43.05
May-1979	43.42
Jun-1979	43.74
Jul-1979	44.02
Aug-1979	44.30
Sep-1979	44.58
Oct-1979	44.87
Nov-1979	45.17
Dec-1979	45.49
Jan-1980	45.83
Feb-1980	46.16
Mar-1980	46.51
Apr-1980	46.86
May-1980	47.20
Jun-1980	47.53
Jul-1980	47.88
Aug-1980	48.26
Sep-1980	48.69
Oct-1980	49.15
Nov-1980	49.63
Dec-1980	50.11
Jan-1981	50.58
Feb-1981	50.96
Mar-1981	51.28
Apr-1981	51.56
May-1981	51.84

Jun-1981	52.14
Jul-1981	52.47
Aug-1981	52.81
Sep-1981	53.13
Oct-1981	53.44
Nov-1981	53.73
Dec-1981	54.00
Jan-1982	54.26
Feb-1982	54.48
Mar-1982	54.69
Apr-1982	54.91
May-1982	55.14
Jun-1982	55.41
Jul-1982	55.68
Aug-1982	55.93
Sep-1982	56.15
Oct-1982	56.33
Nov-1982	56.51
Dec-1982	56.69
Jan-1983	56.86
Feb-1983	57.00
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Nov-1989	70.29
Dec-1989	70.55
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Feb-1990	71.18
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Aug-1990	72.68
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Oct-1990	73.03
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Jul-1991	74.95
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Sep-1991	75.30
Oct-1991	75.43
Nov-1991	75.55
Dec-1991	75.68
Jan-1992	75.83
Feb-1992	75.98
Mar-1992	76.14
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May-1992	76.45
Jun-1992	76.56
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Aug-1992	76.77
Sep-1992	76.90
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Sep-1993	78.60
Oct-1993	78.74
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Jan-1994	79.19
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Apr-1994	79.56
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Jun-1994	79.84
Jul-1994	80.00
Aug-1994	80.16
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Oct-1994	80.42
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Jul-1995	81.64
Aug-1995	81.76
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Oct-1995	82.02
Nov-1995	82.18
Dec-1995	82.34
Jan-1996	82.50
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Mar-1996	82.74
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May-1996	82.92
Jun-1996	83.05
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Oct-1996	83.60
Nov-1996	83.72
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Nov-2015	124.32
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May-2016	125.49
Jun-2016	125.68
Jul-2016	125.87
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Sep-2016	126.25
Oct-2016	126.43
Nov-2016	126.61
Dec-2016	126.80
Jan-2017	127.01
Feb-2017	127.20
Mar-2017	127.39
Apr-2017	127.59
May-2017	127.80
Jun-2017	128.01
Jul-2017	128.22
Aug-2017	128.44
Sep-2017	128.67
Oct-2017	128.89
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Jun-2018	130.60
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Mar-2022	140.18
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May-2022	140.62
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Sep-2022	141.54
Oct-2022	141.77
Nov-2022	142.00
Dec-2022	142.23
Jan-2023	142.46
Feb-2023	142.68
Mar-2023	142.90
Apr-2023	143.13
May-2023	143.37
Jun-2023	143.60
Jul-2023	143.84
Aug-2023	144.08
Sep-2023	144.31
Oct-2023	144.55
Nov-2023	144.79
Dec-2023	145.02
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Apr-2024	145.95
May-2024	146.18
Jun-2024	146.42
Jul-2024	146.66
Aug-2024	146.90
Sep-2024	147.14

Oct-2024	147.38
Nov-2024	147.62
Dec-2024	147.86
Jan-2025	148.10
Feb-2025	148.33
Mar-2025	148.56
Apr-2025	148.80
May-2025	149.03
Jun-2025	149.27
Jul-2025	149.51
Aug-2025	149.75
Sep-2025	149.99
Oct-2025	150.23
Nov-2025	150.47
Dec-2025	150.71
Jan-2026	150.96
Feb-2026	151.19
Mar-2026	151.42
Apr-2026	151.65
May-2026	151.89
Jun-2026	152.12
Jul-2026	152.36
Aug-2026	152.60
Sep-2026	152.84
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Nov-2026	153.32
Dec-2026	153.57
Jan-2027	153.82
Feb-2027	154.05
Mar-2027	154.28
Apr-2027	154.51
May-2027	154.74
Jun-2027	154.98
Jul-2027	155.22
Aug-2027	155.46
Sep-2027	155.71
Oct-2027	155.96
Nov-2027	156.20
Dec-2027	156.45
Jan-2028	156.69
Feb-2028	156.92
Mar-2028	157.15
Apr-2028	157.38
May-2028	157.61
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Jul-2028	158.08
Aug-2028	158.32
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Oct-2028	158.78
Nov-2028	159.02
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Jan-2029	159.53

Feb-2029	159.76
Mar-2029	159.99
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May-2029	160.44
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Sep-2029	161.40
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Nov-2029	161.89
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Sep-2031	167.15
Oct-2031	167.39
Nov-2031	167.64
Dec-2031	167.89
Jan-2032	168.14
Feb-2032	168.37
Mar-2032	168.60
Apr-2032	168.83
May-2032	169.06
Jun-2032	169.30
Jul-2032	169.54
Aug-2032	169.79
Sep-2032	170.03
Oct-2032	170.27
Nov-2032	170.52
Dec-2032	170.78
Jan-2033	171.03
Feb-2033	171.27
Mar-2033	171.50
Apr-2033	171.72
May-2033	171.95

Jun-2033	172.19
Jul-2033	172.44
Aug-2033	172.70
Sep-2033	172.94
Oct-2033	173.19
Nov-2033	173.44
Dec-2033	173.70
Jan-2034	173.96
Feb-2034	174.20
Mar-2034	174.43
Apr-2034	174.66
May-2034	174.89
Jun-2034	175.12
Jul-2034	175.37
Aug-2034	175.61
Sep-2034	175.86
Oct-2034	176.11
Nov-2034	176.37
Dec-2034	176.65
Jan-2035	176.92
Feb-2035	177.18
Mar-2035	177.42
Apr-2035	177.65
May-2035	177.88
Jun-2035	178.12
Jul-2035	178.37
Aug-2035	178.63
Sep-2035	178.89
Oct-2035	179.16
Nov-2035	179.42
Dec-2035	179.68
Jan-2036	179.93
Feb-2036	180.17
Mar-2036	180.41
Apr-2036	180.64
May-2036	180.88
Jun-2036	181.12
Jul-2036	181.37
Aug-2036	181.64
Sep-2036	181.90
Oct-2036	182.18
Nov-2036	182.45
Dec-2036	182.72
Jan-2037	182.99
Feb-2037	183.23
Mar-2037	183.46
Apr-2037	183.70
May-2037	183.94
Jun-2037	184.18
Jul-2037	184.44
Aug-2037	184.71
Sep-2037	184.98

Oct-2037	185.25
Nov-2037	185.53
Dec-2037	185.82
Jan-2038	186.10
Feb-2038	186.36
Mar-2038	186.61
Apr-2038	186.86
May-2038	187.11
Jun-2038	187.37
Jul-2038	187.64
Aug-2038	187.92
Sep-2038	188.21
Oct-2038	188.51
Nov-2038	188.81
Dec-2038	189.11
Jan-2039	189.41
Feb-2039	189.70
Mar-2039	189.96
Apr-2039	190.23
May-2039	190.50
Jun-2039	190.77
Jul-2039	191.05
Aug-2039	191.36
Sep-2039	191.66
Oct-2039	191.98
Nov-2039	192.30
Dec-2039	192.62
Jan-2040	192.94
Feb-2040	193.24
Mar-2040	193.51
Apr-2040	193.79
May-2040	194.06
Jun-2040	194.35
Jul-2040	194.65
Aug-2040	194.97
Sep-2040	195.29
Oct-2040	195.61
Nov-2040	195.95
Dec-2040	196.29
Jan-2041	196.64
Feb-2041	196.95
Mar-2041	197.26
Apr-2041	197.56
May-2041	197.86
Jun-2041	198.17
Jul-2041	198.49
Aug-2041	198.84
Sep-2041	199.19
Oct-2041	199.56
Nov-2041	199.93
Dec-2041	200.31
Jan-2042	200.69

Feb-2042	201.03
Mar-2042	201.35
Apr-2042	201.67
May-2042	201.99
Jun-2042	202.33
Jul-2042	202.68
Aug-2042	203.06
Sep-2042	203.44
Oct-2042	203.83
Nov-2042	204.23
Dec-2042	204.62

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to the Office of the Attorney General's
Initial Request for Information
Dated August 20, 2014

September 10, 2014

1 **Item 20)** **Page 57, section 4.7 of the IRP describes a decrease in native system sales**
2 **by 2028 related to a \$30 per metric ton CO2 policy. Is this entire decrease related to**
3 **price increases? Please explain**

4

5 **Response)** The load forecast scenario representing the impact of the \$30 per metric ton
6 CO2 policy reflects changes in consumption due entirely to changes in price resulting from
7 implementation of the policy.

8

9 The carbon tax scenarios are based on information published by EIA in their report entitled
10 *Further Sensitivity Analysis of Hypothetical Policies to Limit Energy-Related Carbon*
11 *Dioxide Emissions, Supplement to the Annual Energy Outlook 2013*, July 2013, and by
12 Synapse in their report entitled *2013 Carbon Dioxide Price Forecast*, Synapse Energy
13 Economics, Inc., November 1, 2013. These reports are provided as attachments. The
14 spreadsheet created to develop the scenario is located in the folder AG1-20 on the electronic
15 media included with these responses.

16

17 **Witness)** John W. Hutts



Independent Statistics & Analysis

**U.S. Energy Information
Administration**

Further Sensitivity Analysis of Hypothetical Policies to Limit Energy-Related Carbon Dioxide Emissions

Supplement to the Annual Energy Outlook 2013

July 2013

This report was prepared by the U.S. Energy Information Administration (EIA), the statistical and analytical agency within the U.S. Department of Energy. By law, EIA's data, analyses, and forecasts are independent of approval by any other officer or employee of the United States Government. The views in this report therefore should not be construed as representing those of the U. S. Department of Energy or other Federal agencies.

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Executive Summary

The *Annual Energy Outlook 2013 (AEO2013)* included several alternative cases in which hypothetical carbon dioxide (CO₂) emission fees were imposed on fossil fuel consumers on an economy-wide basis. The fees start at \$10, \$15, and \$25 per metric ton of CO₂ in 2014 and rise at 5 percent per year thereafter. The *AEO2013* cases illustrate the impact of policies that might place an implicit or explicit value on CO₂ emissions from fuel combustion.

Feedback from EIA customers suggested an interest in additional sensitivity runs that explore variations of such policies, including cases in which a value is placed only on CO₂ emissions from electric power facilities rather than on an economy-wide basis, and cases with alternative treatment of the potential revenues associated with the fees. This analysis examines the impacts of fees placed only on the emissions from electric power facilities starting at \$10, \$20 and \$30 per metric ton of CO₂ in 2014 and rising 5 percent or 7.5 percent per year thereafter. It also examines the impacts of returning the potential revenues associated with the fees to consumers versus using it for deficit reduction or returning it to businesses. And finally, two cap-and-trade policies with a 50 percent electricity sector emission reduction target are compared to the fee cases. The important questions examined include:

- How sensitive are the electricity generation mix and electricity prices to variations in the level and growth of values placed on CO₂ emissions from that sector?
- How does the response to an economy-wide CO₂ fee compare to one imposed on the electricity sector alone?
- How do cases with CO₂ fees on the electric sector compare to ones in which a cap on emissions is imposed through a tradable allowance program?
- How would the cost and CO₂ fees of such a policy be influenced by the flexibility of an alternative to submit emissions offsets for up to 20 percent of the emission allowance?

Key findings:

- The electricity sector is very responsive to the imposition of CO₂ fees. Across the four fee trajectories examined, electricity sector CO₂ emissions are between 28 and 60 percent below the 2005 level in 2025 and 35 and 89 percent below the 2005 level in 2040.
- The emissions reductions are achieved through large reductions in coal use offset by increases in natural gas (particularly early on), nuclear and renewable fuel use, as well as by reductions in overall electricity use.
 - With a CO₂ fee starting at \$10 per metric ton in 2014 and rising 5 percent per year, coal generation is 24 percent below the Reference case level in 2025 and 37 percent below it in 2040, when it accounts for 23 percent of overall electricity generation. In all of the other CO₂ fee cases, coal generation falls to 10 percent to 29 percent of total generation by 2025 and, except for one case, less than 10 percent of total generation by 2040.
 - Natural gas-fired generation surges in the early years after a fee is imposed, but tends to return towards or below Reference case levels between 2030 and 2040. In 2025, natural gas-fired generation ranges from 10 percent to 39 percent above the Reference case level in the four CO₂ fee cases. However, by 2040 this range falls to between 14 percent below the Reference case level and 5 percent above the Reference case level.

- Renewable and nuclear generation becomes particularly important over time as large numbers of new plants are brought on line as coal plants retire. In 2025, renewable generation in the CO₂ fee cases is between 21 percent and 46 percent above the Reference case level. By 2040 the increase ranges from 41 percent to 71 percent above the Reference case level. Relative to the Reference case, nuclear generation is between 0 percent and 12 percent higher in 2025 and 20 to 105 percent higher in 2040 the CO₂ fee cases.
- The change in the generation mix and emission fees in the CO₂ fee cases leads to higher electricity prices. In 2025 electricity prices are 12 percent to 34 percent higher than in the Reference case, while in 2040 they are 14 percent to 28 percent higher. There are significant differences in Reference case electricity prices and electricity price impacts across regions.
- The imposition of an economy-wide CO₂ fee rather than an electricity sector CO₂ fee results in only slightly larger emissions reductions, but provides significantly greater fee revenues and has a larger economic impact. In two \$20 fee cases that differ only in their coverage, the reduction in total energy-related CO₂ emissions differs by a little over a 1-percentage-point by 2040.
- The results in cap and trade cases targeting a 50 percent electricity sector emissions reduction by 2040 are most similar to fee cases with a starting level of \$10 in 2014. However, allowance prices in the cap and trade cases are zero until after 2020 even though utilities make plant retirement decisions that reduce emissions prior to that date in anticipation of higher future allowance prices.
- The imposition of CO₂ fees or allowance costs slows economic growth, but estimated economic impacts are sensitive to decisions on how to apply the revenue that is provided.
 - When the CO₂ fees are first imposed there is a shock to the economy that reduces the level of gross domestic product (GDP) relative to the Reference case by between 0.3 percent to 1.2 percent in 2020, which is generally the peak impact year. In real 2005 chain weighted dollar terms, projected GDP, which is \$16,863 billion in the Reference case, ranges from \$16,664 billion to \$16,807 billion in 2020 in the CO₂ fee cases. By 2040, the reduction in the level of GDP relative to the Reference case ranges from 0.2 to 0.4 percent in the electricity sector CO₂ fee cases. Projected 2040 GDP, which is \$27,282 billion in the Reference case, ranges from \$27,171 billion to \$27,236 billion in the electricity sector CO₂ fee cases.
 - The same impacts can also be considered in terms of changes in the annual average projected rate of economic growth over the 2014 to 2040 period. In the CO₂ fee cases, the annual average rate of economic growth, which is 2.54 percent in the reference case, is reduced by between 0.0023 to 0.0124 percentage points.
 - Returning the fee related revenue through business tax adjustments tends to reduce the impact of the policy compared with the two other alternatives considered: consumer rebates or deficit reduction. When the fee-related revenue is returned through business tax rebates, total GDP nearly returns to the Reference case level by 2040.

Introduction

The *Annual Energy Outlook 2013 (AEO2013)* included several alternative cases in which hypothetical carbon dioxide (CO₂) emission fees were imposed on fossil fuel consumers on an economy-wide basis. The fees start at \$10, \$15, and \$25 per metric ton of CO₂ in 2014 and rise at 5 percent per year thereafter. The *AEO2013* cases illustrate the impact of policies that might place an implicit or explicit value on CO₂ emissions from fuel combustion.

Feedback from EIA customers suggested an interest in additional sensitivity runs that explore variations of such policies, including cases in which a value is placed only on CO₂ emissions from electric power facilities rather than on an economy-wide basis. This report presents results of a set of additional CO₂ policy cases and compares them to a reference case that reflects the American Taxpayer Relief Act of 2012 (ATRA) enacted at the start of 2013. That law, among other things, extended several provisions for tax credits to the energy sector.

The cases included in this report are presented in Table 1. The cases are designed to answer several questions:

- How sensitive is the electricity sector to variations in the level and growth of values placed on CO₂ emissions from that sector? Three cases are included with per-metric ton fees starting at \$10, \$20, and \$30 (2011 dollars) in 2014 growing at 5 percent per year in real (inflation-adjusted) terms, and another case with per-metric ton fees starting at \$10 in 2014 and growing at 7.5 percent per year.
- How does the response to an economy-wide CO₂ fee compare to one imposed on the electricity sector alone? How do emissions reductions compare in the two cases and what is the relative impact on the economy? A case with a \$20 per metric ton fee growing at 5 percent a year imposed economy-wide is compared to a case with the same fees imposed on the electricity sector only.
- How do cases with CO₂ fees on the electric sector compare to ones in which a cap on emissions is imposed through a tradable allowance program? A market-based cap on emissions effectively imposes an incremental, opportunity cost on emitting CO₂ through a requirement to submit allowances for emissions. These marginal cost incentives are largely equivalent to those imposed through a CO₂ fee on emissions, such that either approach could be used to provide the same emissions reductions with roughly the same effects over time. In particular, what CO₂ fees, or equivalent allowances prices, would be required each year to gradually cut annual CO₂ emissions in the electricity sector by half the 2012 level by 2040? The 50-percent electricity cap-and-trade case illustrates this scenario.
- How would the cost and CO₂ fees of such a policy be influenced by the flexibility of an alternative to submit emissions offsets for up to 20 percent of the emission allowance requirement? An electricity cap-and-trade case with offsets illustrates that variation to the cap-and-trade scenario.
- How does the use of revenues from carbon fees affect economic impacts? How would the economic impacts change if carbon fees were used to reduce the deficit rather than returning

the fee revenue to consumers through tax rebates? How would the impacts change if carbon fee revenue was rebated to reduce corporate taxes on a revenue neutral basis?

The cases presented in this report were prepared using the National Energy Modeling System, generally as configured for *AEO2013*; however, as indicated above, an updated Reference case was prepared with assumptions modified to reflect ATRA. The sensitivity cases listed in Table 1 differ from the updated Reference case only by the settings indicated.

Table 1. List of carbon dioxide policy cases

Case Name	CO ₂ Fees		Cap and Trade	Fee/Allowance Revenue Treatment			Offsets
	Start (\$)	Real Rate of Increase	2040 Reduction from 2012	Deficit Reduction	Consumer Rebate	Corporate Rebate	
Reference	-	-	-	-	-	-	-
Electricity Sector Only Fee Cases							
\$10 fee at 5%	\$10	5.0%			X		No
\$10 fee at 7.5%	\$10	7.5%			X		No
\$20 fee	\$20	5.0%			X		No
\$20 fee w/deficit reduction	\$20	5.0%		X			No
\$20 fee with business rebate	\$20	5.0%				X	No
\$30 fee	\$30	5.0%			X		No
Electricity Sector Cap and Trade Cases							
Cap and Trade without Offsets	NA	NA	50%		X		No
Cap and Trade with Offsets	NA	NA	50%		X		Yes
Economy-Wide Fee Cases							
\$20 fee economy-wide	\$20	5.0%			X		No
\$20 fee economy-wide w/deficit reduction	\$20	5.0%		X			No

Findings

A CO₂ fee provides an economic incentive to reduce emissions through its effects on energy-related investment decisions, choice of fuels, and other market responses. Generally, the higher the fee and faster its rate of growth over time, the greater the emission reduction response. CO₂ fees impose an incremental cost of using fuels that is proportional to the carbon content of the fuel, so that a given fee has greater incremental impact on coal than natural gas.

When the fees are applied across the economy, the effect on delivered (fee-inclusive) energy prices is directly reflected in all uses of fossil fuels. When applied only in the electricity sector, the higher delivered cost of fossil fuels to power producers results in higher electricity prices. Responses in the power sector also change the overall demand for each of the fossil fuels, which can affect the prices paid by consumers who use these fuels directly.

A summary of results for selected cases that demonstrate the range of CO₂ reductions and economic impacts examined is provided in Tables 2 and 3. Full results for the case are available on EIA's web site through the Interactive Table Viewer. (<http://www.eia.gov/oiaf/aeo/tablebrowser/>).

Table 2. Summary of selected case results, 2011 and 2025

	2011		2025						
	Reference		\$10 fee @ 5%/year Electric	\$10 fee @ 7.5%/year Electric	\$20 fee @ 5%/year Electric	\$20 fee @ 5%/year Economy	\$30 fee @ 5%/year Electric	Cap&Trade No offsets Electric	Cap&Trade with offsets Electric
CO₂ Fee or Allowance Price (2011 dollars per metric ton)	--	--	17.10	22.16	34.21	34.21	51.31	15.50	9.25
Emissions, offsets, and cap compliance (million metric tons CO ₂ equivalent)									
Electricity sector CO ₂ emissions	2166	2141	1750	1450	1276	1283	959	1602	1773
Offsets, if applicable	--	--	--	--	--	--	--	--	173
Electricity sector CO ₂ emissions less offsets	2166	2141	1750	1450	1276	1283	959	1602	1600
Emissions cap, if applicable	--	--	--	--	--	--	--	1598	1598
Total energy-related CO₂ emissions	5471	5481	5066	4764	4580	4524	4246	4926	5091
Potential revenue from fees or allowances (billion 2011 dollars)	--	--	29.9	32.1	43.6	43.9	49.2	24.8	14.8
Delivered energy prices, including CO₂ fee (2011 dollars per unit indicated)									
Electricity (cents per kilowatthour)	9.91	9.43	10.60	10.96	11.73	11.63	12.63	10.60	10.21
Coal, electric power sector (per million Btu)	2.38	2.69	4.20	4.58	5.61	5.63	7.05	4.06	3.53
Natural gas (per million Btu)									
Electricity sector	4.87	5.63	6.99	7.51	8.64	8.50	9.74	6.86	6.45
Residential	11.05	12.92	13.37	13.60	14.07	15.83	14.22	13.28	13.22
Motor gasoline, transportation (per gallon)	3.45	3.49	3.50	3.50	3.51	3.81	3.50	3.49	3.50
Diesel transportation (per gallon)	3.58	3.97	3.97	3.96	3.96	4.29	3.95	3.96	3.97
Energy consumption (quadrillion Btu)									
Liquid fuels and other petroleum	37.02	36.87	36.60	36.43	36.30	35.92	36.11	36.56	36.65
Natural gas	24.91	27.15	27.59	28.46	28.73	28.27	29.45	28.67	28.34
Coal	19.66	19.22	14.78	11.24	9.23	9.18	5.62	12.75	14.61
Purchased electricity	12.71	14.14	13.59	13.42	13.10	13.16	12.71	13.66	13.80
Electricity Generation									
Petroleum	28	18	17	15	14	14	13	16	16
Natural gas	1000	1233	1355	1515	1591	1582	1711	1521	1451
Coal	1730	1715	1302	963	771	769	419	1108	1288
Nuclear power	790	912	912	914	935	936	1024	915	912
Renewable/Other	544	716	865	1002	1014	1014	1038	908	833
Total	4093	4595	4451	4409	4325	4316	4205	4467	4500
Gross domestic product									
Billion 2011 dollars	13299	18989	18941	18924	18899	18863	18867	18935	18953
Percentage change from reference	--	--	-0.25	-0.34	-0.47	-0.67	-0.64	-0.29	-0.19

Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, co2elfee10.d030613a, co2elfee1075.d030613a, co2elfee20.d030613a, co2fee20.d030613a, co2elfee30.d030613a, capel50pct.d030613a, and capel50off.d030613a.

Table 3. Summary of results, 2011 and 2040

	2011		2040						
	Reference		\$10 fee @ 5%/year Electric	\$10 fee @ 7.5%/year Electric	\$20 fee @ 5%/year Electric	\$20 fee @ 5%/year Economy	\$30 fee @ 5%/year Electric	Cap&Trade No offsets Electric	Cap&Trade with offsets Electric
CO₂ Fee or Allowance Price (2011 dollars per metric ton)	--	--	35.56	65.56	71.11	71.11	106.67	55.29	49.93
Emissions, offsets, and cap compliance (million metric tons CO ₂ equivalent)									
Electricity sector CO ₂ emissions	2166	2308	1566	799	516	585	276	1032	1285
Offsets, if applicable	--	--	--	--	--	--	--	--	257
Electricity sector CO ₂ emissions less offsets	2166	0	1566	799	516	585	276	1032	1028
Emissions cap, if applicable	--	--	--	--	--	--	--	1030	1030
Total energy-related CO₂ emissions	5471	5680	4923	4173	3893	3814	3659	4417	4635
Potential revenue from fees or allowances (billion 2011 dollars)	--	--	55.7	52.4	36.7	41.6	29.4	57.1	51.3
Delivered energy prices, including CO₂ fee (2011 dollars per unit indicated)									
Electricity (cents per kilowatthour)	9.91	10.71	12.24	13.31	13.59	13.48	13.74	12.97	12.81
Coal, electric power sector (per million Btu)	2.38	3.20	6.33	8.63	8.89	8.98	12.30	7.83	7.52
Natural gas (per million Btu)									
Electricity sector	4.87	8.51	10.15	11.98	12.43	12.14	13.59	10.98	10.98
Residential	11.05	16.71	16.69	16.87	17.18	20.76	16.61	16.38	16.61
Motor gasoline, transport (per gallon)	3.45	4.32	4.32	4.33	4.34	4.96	4.32	4.32	4.33
Diesel (per gallon)	3.58	4.94	4.96	4.94	4.94	5.68	4.93	4.93	4.94
Energy consumption (quadrillion Btu)									
Liquid fuels and other									
petroleum	37.02	36.03	35.72	35.51	35.53	34.69	35.66	35.61	35.59
Natural gas	24.91	29.75	28.88	29.64	28.86	28.17	27.67	30.22	30.20
Coal	19.66	20.31	13.10	5.43	3.03	3.30	2.08	7.46	9.55
Purchased electricity	12.71	15.76	14.86	14.39	14.14	14.40	13.90	14.50	14.75
Electricity Generation									
Petroleum	28	18	17	13	12	12	12	14	15
Natural gas	1000	1563	1510	1646	1549	1550	1341	1708	1707
Coal	1730	1827	1151	402	157	192	66	602	814
Nuclear power	790	911	1091	1431	1764	1736	1868	1303	1168
Renewable/Other	544	900	1255	1401	1364	1335	1520	1306	1257
Total	4093	5220	5023	4893	4846	4825	4806	4932	4961
Gross domestic product									
Billion 2011 dollars	13299	27282	27229	27171	27183	27134	27236	27197	27172
Percentage change from reference	--	--	-0.19	-0.41	-0.36	-0.54	-0.17	-0.31	-0.40

Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, co2elfee10.d030613a, co2elfee1075.d030613a, co2elfee20.d030613a, co2fee20.d030613a, co2elfee30.d030613a, capel50pct.d030613a, and capel50off.d030613a.

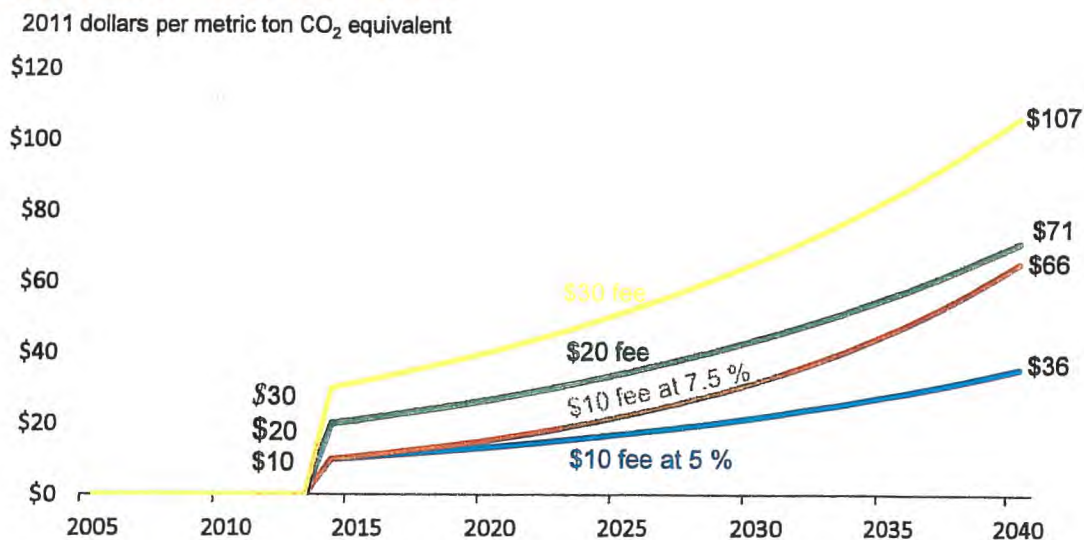
CO₂ fees

The CO₂ fees considered in the fee cases developed in this report start at \$10, \$20 and \$30 per metric ton of CO₂ in 2014 and grow at either 5 or 7.5 percent per year over time (Figure 1). By 2040 they range between \$36 and \$107 per metric ton of CO₂. The allowance prices in the cap-and-trade cases are generally much lower, particularly in the near term, than the fees in the four fee cases (Figure 2). In both of the cap-and-trade cases the emissions target is set to 50 percent below the 2012 level by 2040. The target is assumed to decline linearly from the emission level in 2012 to the final target in 2040. Both cap-and-trade cases assume no banking of allowances, but one allows offsets to be used for up to 20 percent of their covered emissions as a compliance option, while the other does not. The assumed offsets reflect a potential program to allow non-covered entities to register either reductions in non-CO₂ greenhouse gases or increases in carbon sequestration through changes in forestry and agriculture practices. While the supply of offsets is uncertain, they have the potential to lower compliance costs significantly. In the cap-and-trade case with offsets, the estimated allowance price in 2033 is less than half the price in the cap-and-trade without offsets case.

In all cases, covered entities are assumed to be aware of future allowance prices and CO₂ fees, so investment decisions take current-year and future-year CO₂ fee or allowance values into account. This foresight assumption leads to an interesting outcome, particularly in the cap-and-trade cases. In those cases, simulated allowances prices in the first few years were driven to zero based on forward-looking investment behavior by coal plant owners. In anticipation of future allowance prices that would eventually make many of their coal plants uneconomical, they retire some of their coal plants earlier to avoid the interim costs of upgrading them to meet environmental regulations that take effect in 2016.¹ These coal plant retirements cause emissions over the 2014 to 2020 period to fall below the assumed caps even though allowance prices do not rise above \$1 per metric ton CO₂ until after 2020.

¹ Section 112 of the Clean Air Act Toxic Standards (MATS). Compliance with MATS is expected to require all coal plants to add emission control equipment, such as flue gas desulfurization and dry sorbent injection by 2016, or to be retired.

Figure 1. Alternative CO₂ fees examined




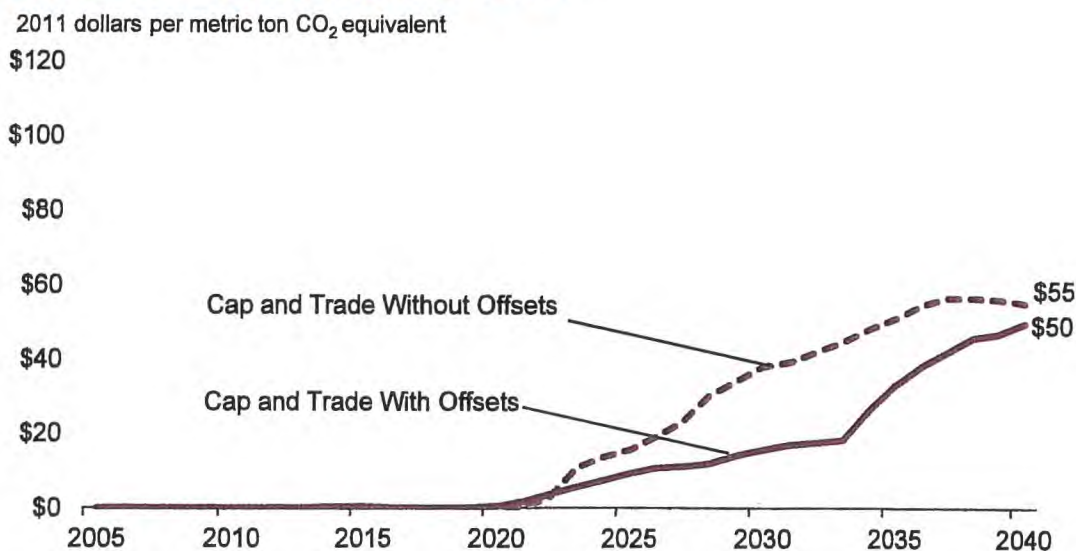

Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, co2elfee10.d030613a, co2elfee1075.d030613a, co2elfee20.d030613a, and co2elfee30.d030613a. 

Figure 2. Allowance prices in cap-and-trade cases

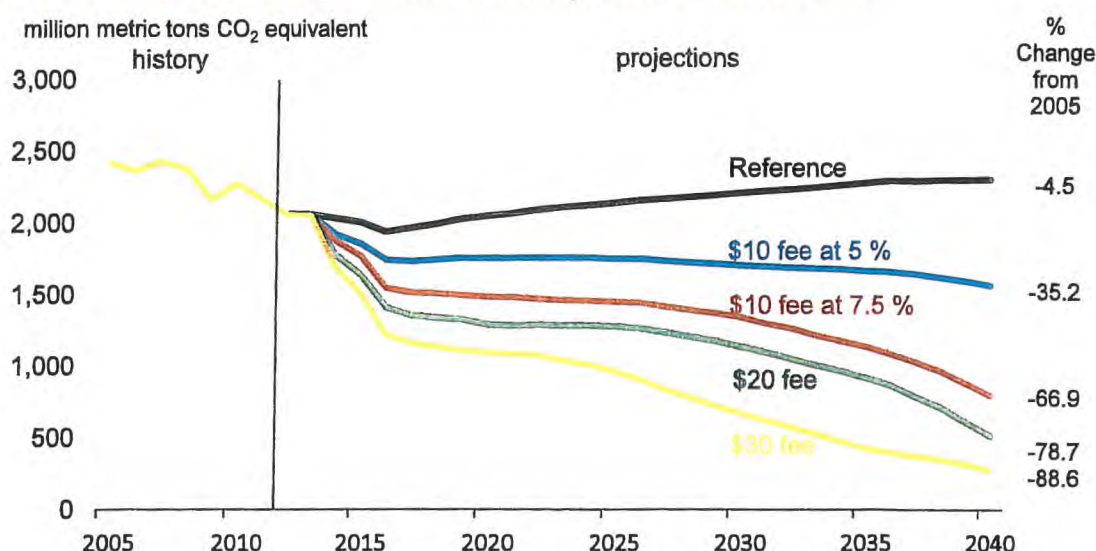


Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, capel50pct.d030613a and capel50off.d030613a. 

CO₂ emissions

The electricity sector exhibits a strong response to CO₂ fees by altering investment and operating decisions to reduce emissions, while electricity consumers react to higher prices by cutting their demand for electricity. Emissions decline rapidly in the first three years after introduction of the carbon fees, 2014-2016, as power companies initially react to the emissions fees by retiring coal plants rather than investing in them to bring them into compliance with upcoming environmental regulations (Figure 3). This leads to an increase in natural gas use. Emissions reductions continue after 2016, but at a slower pace. The magnitude of the CO₂ emissions response is strongly related to the CO₂ fee levels assumed, particularly in the early years, but reductions from the Reference case occur throughout the projection. By 2040, energy-related CO₂ emissions in the electricity sector are less than half the 2005 level in three of the four CO₂ fee cases. The \$30 fee case induces an emission reduction in the electricity sector of 89 percent from 2005 levels by 2040.

Figure 3. Energy-related CO₂ emissions in electricity sector in CO₂ fee cases

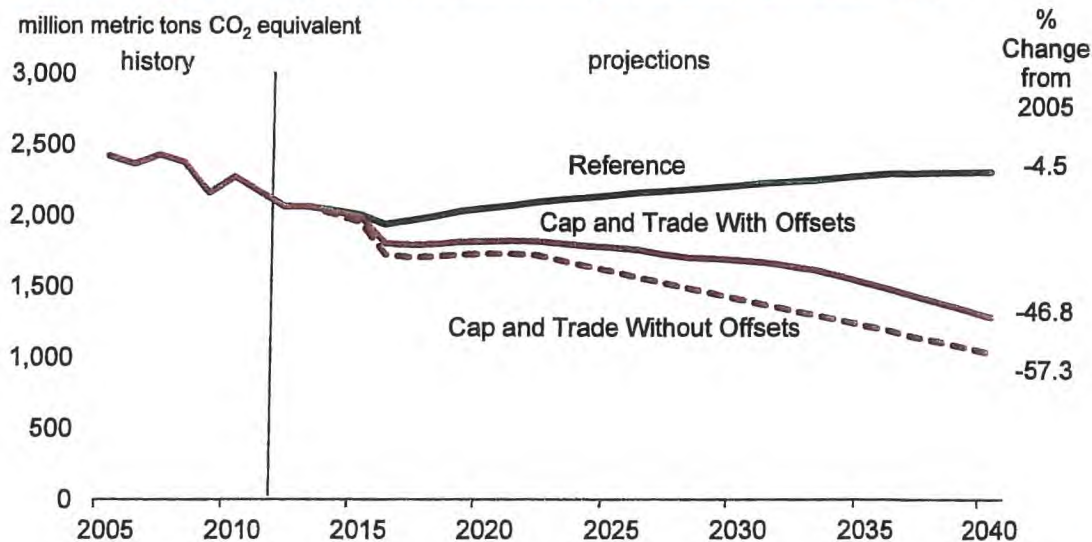


Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, co2elfee10.d030613a, co2elfee1075.d030613a, co2elfee20.d030613a, and co2elfee30.d030613a.



In the two cap-and-trade cases, the emission target in 2040 was assumed to be half the 2012 level, or about 57 percent below the 2005 level (Figure 4). Some over-compliance or excess emissions reductions occur in the first five years. Again, the anticipation of future allowance prices drives some retirement and investment decisions, leading to greater emissions reductions than required in the early years of the projections. The difference in CO₂ emissions shown between the two cap-and-trade cases reflects the quantity of offsets used in the case with offsets. The effect on CO₂-equivalent greenhouse gas emissions in the two cases would be essentially the same, but reductions in the offsets case include non-CO₂ emissions reductions in non-covered sectors, as well as increases in carbon sequestration in agriculture and forestry. No energy-related CO₂ offsets were simulated from the non-covered sectors, as might be

Figure 4. Energy-related CO₂ emissions in electricity sector in cap-and-trade cases



Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, capel50pct.d030613a and capel50off.d030613a.



allowed under an electricity-only cap-and-trade offset policy. Comparing the emissions reductions in the cap-and-trade cases to those in the fee cases shows that the two \$10 fee cases produce emissions reductions most similar to the 50 percent reduction target called for in the cap-and-trade cases.

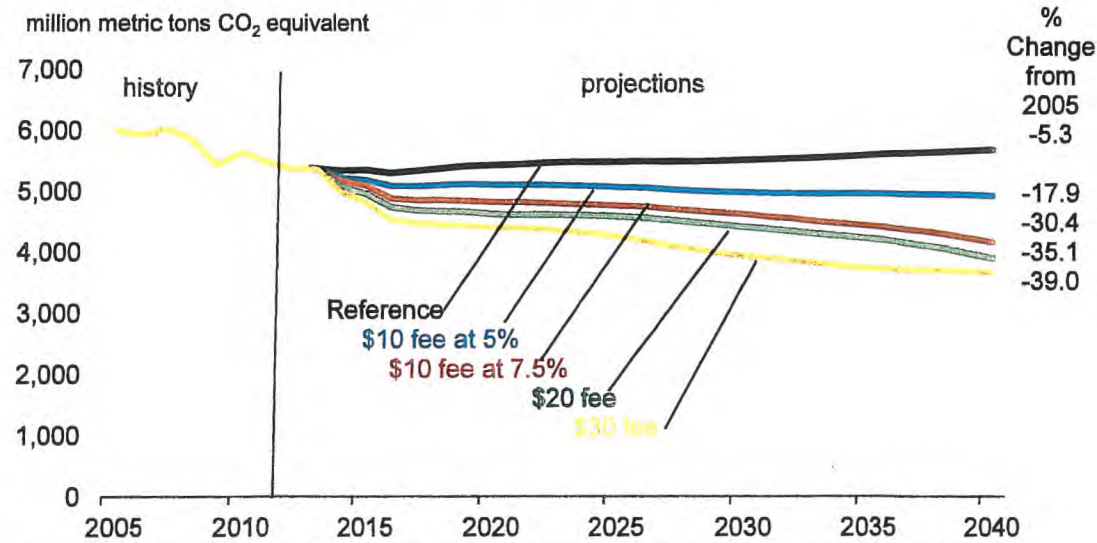
The change in total U.S. energy-related CO₂ emissions in 2040 relative to 2005 emissions ranges from 18 percent to 39 percent across the fee cases (Figure 5), lower than the 35 percent to 89 percent reductions seen in the power sector alone. This difference reflects the fact that in 2011, the electricity sector accounted for about 40 percent of total U.S. energy-related CO₂ emissions.

One interesting finding in this analysis is shown in Figure 6, comparing energy-related CO₂ emissions in two \$20 fee cases that differ only in their coverage. In one case, only the electricity sector is covered, while in the other, all energy-related CO₂ emissions throughout the economy are covered. The total CO₂ emissions in the economy-wide coverage case are only slightly lower than in the electricity sector coverage case, and in both cases, the emissions reductions are almost entirely attributable to electricity sector actions. By 2040, there is only a little over a 1-percentage-point difference in the total emissions reduction from the 2005 level.

Many factors including changing fuel prices and slowing energy demand growth contribute to the relatively small emissions reductions seen in the fee cases outside of the electricity sector. Recent changes in energy regulations may be a particularly important factor. For example, the Reference case incorporates the recently-extended fuel economy and tailpipe emission standards for light-duty vehicles. The rulings mandate increasingly stringent improvements in CO₂ emissions and fuel economy between 2017 and 2025. As a result, the Reference case projects a 16-percent reduction in CO₂ emissions from all light-duty vehicles between 2011 and 2025. Since these standards lead to technology

adoption for fuel economy in excess of what might otherwise occur, increases in gasoline prices from a CO₂ fee have limited incremental effect on consumer or manufacturer decisions to adopt fuel-saving technology. In addition, any increases in driving costs from CO₂ fees on gasoline would be tempered by the high fuel economy of the vehicle fleet already in place to meet the fuel economy standards.

Figure 5. Total energy-related CO₂ emissions in CO₂ fee cases




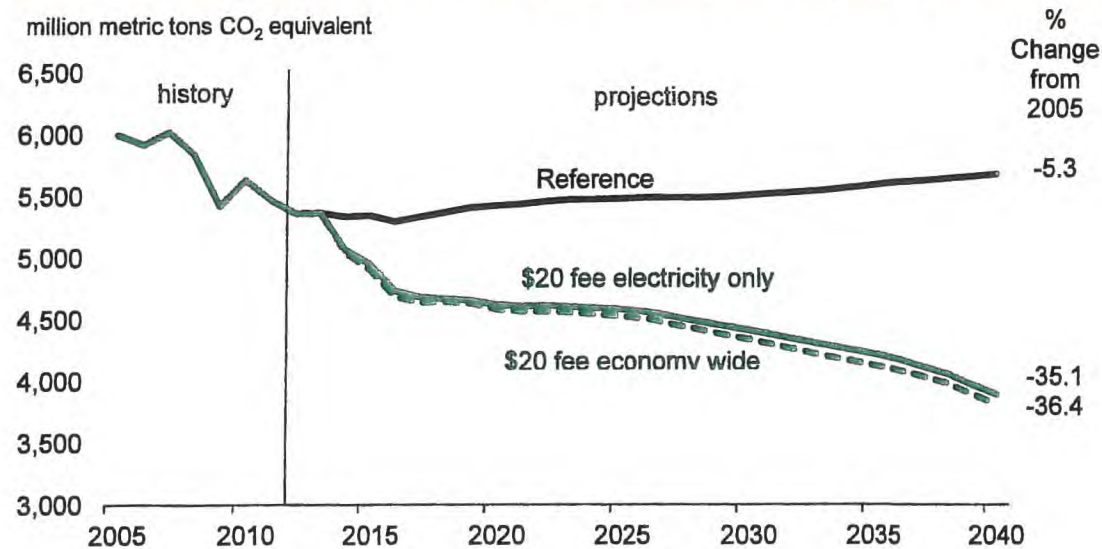

Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, co2elfee10.d030613a, co2elfee1075.d030613a, co2elfee20.d030613a, and co2elfee30.d030613a. 

Figure 6. Total energy-related CO₂ emissions in CO₂ fee cases, electricity only vs. economy wide

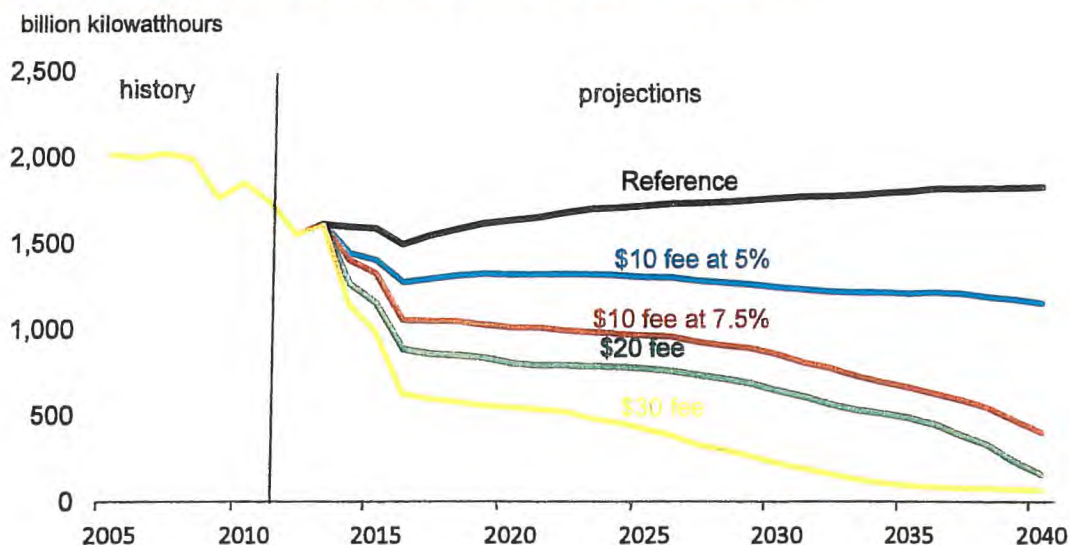



Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, co2elfee20.d030613a, and co2fee20.d030613a. 

Generation by fuel

The imposition of CO₂ fees or allowance prices on the power sector has significant impacts on the mix of fuels used to generate electricity. The fees raise the cost of using fossil fuels, making it more economical to use less carbon intensive fuels or technologies that capture and store the CO₂. Among the fuels used to generate electricity, coal is most impacted by the imposition of a CO₂ fee (Figure 7), particularly when the fee starts above \$10 per metric ton of CO₂ or rises more rapidly than 5 percent per year. When the CO₂ fee starts at \$10 per metric ton and rises 5 percent per year, coal generation falls below the Reference case levels, but it continues to account for a significant share of overall electricity generation. In this case, coal generation is 24 percent below the Reference case level in 2025 and 37 percent below it in 2040, when it accounts for 23 percent of overall electricity generation. In all of the other CO₂ fee cases, coal generation falls to 10 percent to 29 percent of total generation by 2025 and, except for one case, less than 10 percent of total generation by 2040. In the case where the CO₂ fee starts at \$10 per metric ton and rises 5 percent per year, just over one-third (36 percent) of existing coal capacity is retired by 2040 while in the other fee cases more than 75 percent of current coal capacity is retired by then.

Figure 7. Coal generation in alternative electricity sector CO₂ fee cases

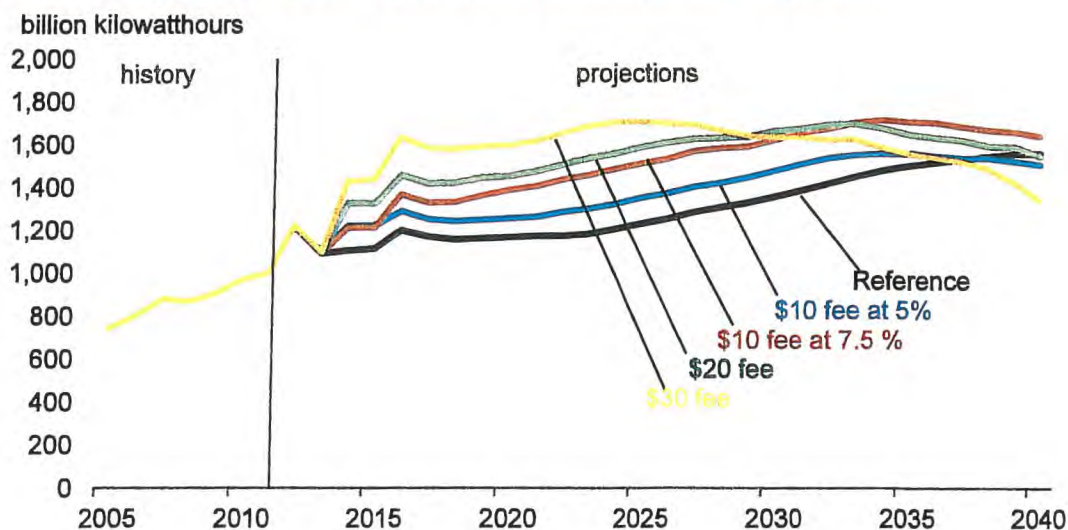


Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, co2elfee10.d030613a, co2elfee1075.d030613a, co2elfee20.d030613a, and co2elfee30.d030613a. 

The implications for natural-fired generation differ significantly from those for coal (Figure 8). When the CO₂ fee is first imposed, power plant owners retire a large amount of existing coal capacity rather than make investments to bring it into compliance with upcoming environmental regulations. Since companies know that the CO₂ fees will rise over time, they take this into account in their environmental retrofit investment decisions and, in many cases, choose not to go forward with them. This leads to a sharp increase in natural gas-fired generation to replace the power formerly supplied by existing coal plants. Over time, however, as the CO₂ fees continue to increase, non-emitting sources like new renewable and nuclear plants become increasingly attractive. As these new zero-CO₂ emitting plants are

brought on line, the generation contribution from natural gas-fired plants falls towards or below Reference case levels, particularly in the higher fee cases. In 2025, natural gas-fired generation ranges from 10 percent to 39 percent above the Reference case level in the CO₂ fee cases. However, by 2040 this range falls to between 14 percent below the Reference case level and 5 percent above the Reference case level in the CO₂ fee cases. A portion of the natural gas generation in the later years in the CO₂ fee cases, particularly in the \$30 fee case, comes from new natural gas plants with carbon capture and storage equipment.

Figure 8. Natural gas generation in alternative electricity sector CO₂ fee cases



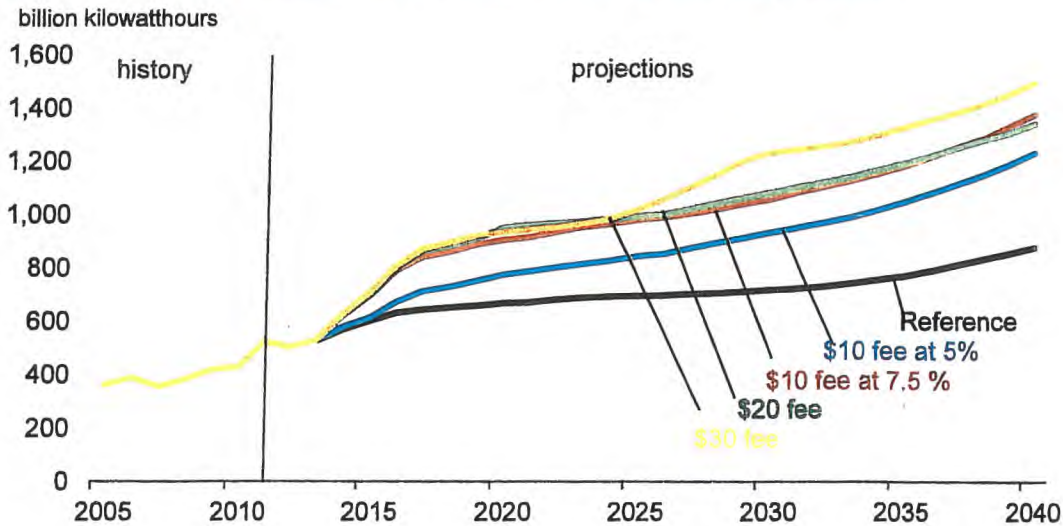
Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, co2elfee10.d030613a, co2elfee1075.d030613a, co2elfee20.d030613a, and co2elfee30.d030613a.




Similar to natural gas, renewable generation shows strong growth in the early years when the CO₂ fees are first imposed (Figure 9). However, unlike natural gas, the increase above Reference case levels continues to grow over time as new renewable capacity is added. In 2025, renewable generation in the CO₂ fee cases is between 21 percent and 46 percent above the Reference case level. By 2040 the increase ranges from 40 percent to 71 percent above the Reference case level. The share of total generation accounted for by renewables ranges from 25 percent to 31 percent in 2040 in the CO₂ fee cases, much higher than the 17 percent share achieved in the Reference case. Among the specific renewable sources, wind, solar, biomass and geothermal all contribute to the increase in renewable generation in the CO₂ fee cases, but their relative contribution varies from case to case, particularly for biomass. Biomass can be burned in dedicated plants and co-fired along with other fuels like coal. In the \$10 CO₂ fee cases, it becomes attractive to reduce coal use through increased co-firing of biomass and this leads to a large overall increase in biomass generation. In the higher CO₂ fee cases, however, most coal capacity is eventually retired, reducing the opportunity for co-firing. Large increases in wind and solar capacity occur in the CO₂ fee cases. In the Reference case, wind capacity increases from 46 gigawatts in 2011 to 101 gigawatts in 2040. In the CO₂ fee cases, wind capacity ranges from 154 to 220 gigawatts in 2040. The pattern is similar for solar. In the Reference case, solar capacity increases from 5

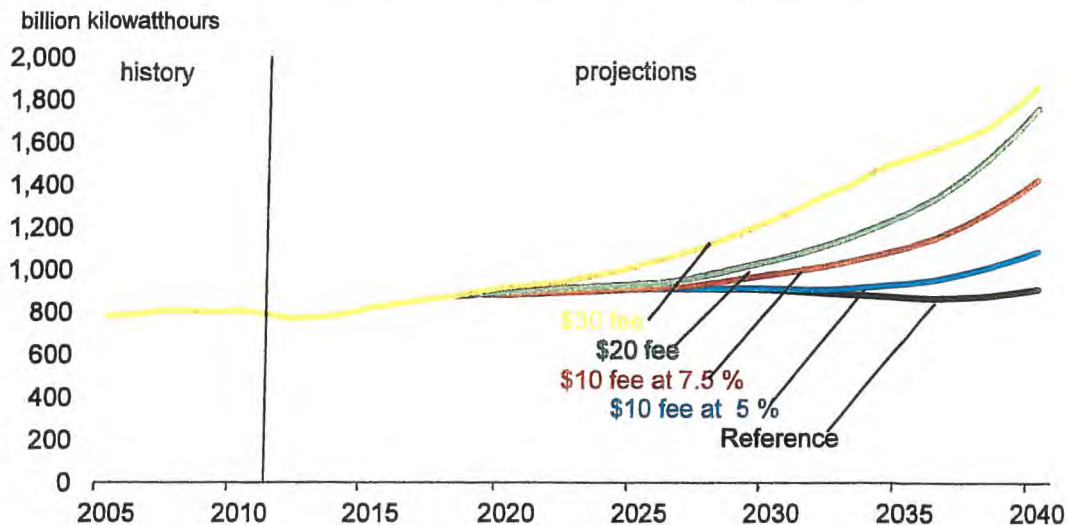
gigawatts in 2011 to 44 gigawatts in 2040, but in the CO₂ fee cases, capacity ranges from 60 to 152 gigawatts in 2040.

Figure 9. Renewable generation in alternative electricity sector CO₂ fee cases



Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, co2elfee10.d030613a, co2elfee1075.d030613a, co2elfee20.d030613a, and co2elfee30.d030613a. 

Nuclear generation, like renewable generation, increases in all of the CO₂ fee cases, but its growth occurs later, mostly after 2025 and 2030 (Figure 10). The development timeline for new nuclear capacity is generally longer than for other capacity types. Relative to the Reference case, nuclear generation ranges from unchanged to 12 percent higher in 2025 in the CO₂ fee cases. By 2040, the increase in nuclear generation relative to the Reference case grows to from 20 percent to 105 percent higher in the CO₂ fee cases. While not entirely unprecedented, the rate of nuclear expansion seen in the \$20 and \$30 fee cases rivals or exceeds the rate of expansion seen between 1970 and 1990 in the United States, and it may be challenging to repeat that rate of growth again. For example, in the \$30 fee case, 135 gigawatts of new nuclear capacity are added between 2015 and 2040, substantially exceeding the 90-plus gigawatts of nuclear capacity that was added between 1970 and 1995.

Figure 10. Nuclear generation in alternative electricity sector CO₂ fee cases

Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, eia co2elfee10.d030613a, co2elfee1075.d030613a, co2elfee20.d030613a, and co2elfee30.d030613a.

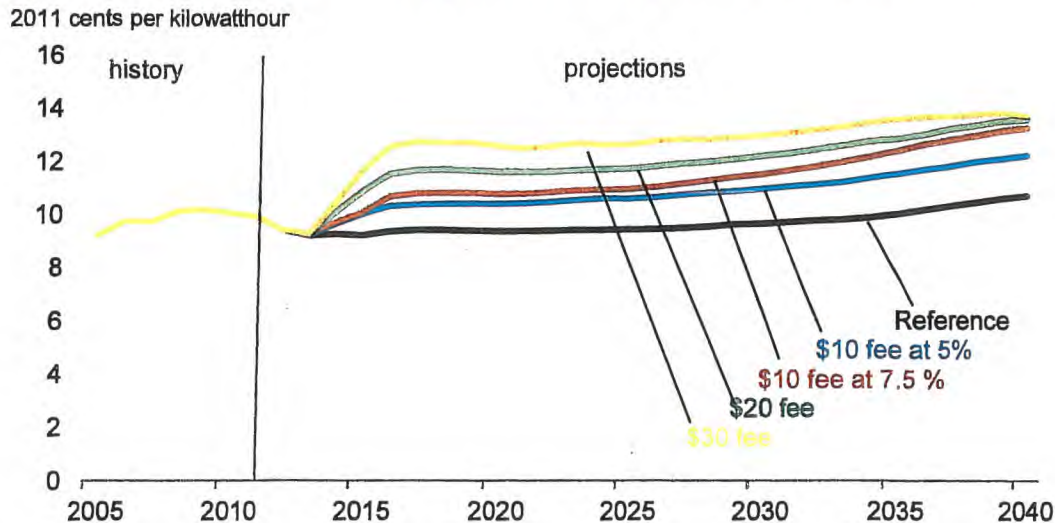
Electricity prices


The imposition of CO₂ fees leads to higher fossil fuel and electricity prices, and slower economic growth, but the impacts vary significantly with the level of the fees imposed, the uses of the fee revenue and the coverage of the program. Across the CO₂ fee cases, electricity prices are 12 percent to 34 percent higher than in the Reference case in 2025 and 14 percent to 28 percent higher in 2040 (Figure 11). The percentage changes and the electricity prices shown in Figure 11 are average delivered prices to all consumers, including homes, commercial buildings, and industrial facilities.

The CO₂ fees raise the cost of using fossil fuels to generate electricity. For example, in 2025, the cost of coal to power plants without carbon capture and storage equipment is \$2.69 per million Btu in the Reference case, but it is \$3.70 in the \$10 fee case, \$4.85 in the \$20 fee case and \$6.01 in the \$30 fee case. The cost of using coal increases even further by 2040, ranging from \$6.33 to \$12.30 per million Btu in the CO₂ fee cases versus \$3.20 in the Reference case. The impacts on natural gas prices are smaller than those for coal because of its lower carbon content, but they are still significant. The cost of using natural gas for power generation in 2040 ranges from \$9.94 to \$13.31 per million Btu in the CO₂ fee cases versus \$8.33 in the Reference case.

While CO₂ fees raise electricity prices through their impact on generation costs, they do not affect electricity distribution costs, which typically constitute a larger share of the electricity price for residential consumers than for industrial consumers, who typically pay lower overall prices. Therefore, in each of the CO₂ fee cases, the percentage increase in residential electricity prices tends to be significantly smaller than the percentage increase in industrial electricity prices.

Figure 11. National average electricity prices in electricity-sector-only CO₂ fee cases



Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, co2elfee10.d030613a, co2elfee1075.d030613a, co2elfee20.d030613a, and co2elfee30.d030613a. 

Current electricity prices, as well as projected electricity prices in the Reference case and the change in electricity prices in the CO₂ fee and cap-and-trade cases considered in the paper, vary significantly across U.S. regions. Table 4 shows actual 2011 regional prices and projected reference and alternative case prices in 2025. Table 5 displays the same for 2011 and 2040 in the CO₂ fee cases, while Figure 16 displays the regions.

Table 4. Regional electricity prices, 2011 actual and 2025 in alternative cases

2011 cents per kilowatthour

	2011	2025							
		Reference	\$10 fee @ 5%/year Electric	\$10 fee @ 7.5%/year Electric	\$20 fee @ 5%/year Electric	\$20 fee @ 5%/year Economy	\$30 fee @ 5%/year Electric	Cap&Trade No offsets Electric	Cap&Trade with offsets Electric
1 Texas	9.2	9.0	10.7	11.3	12.0	11.8	13.1	11.0	10.4
2 Florida	10.6	9.9	10.9	11.5	12.6	12.6	13.6	11.0	10.5
3 Eastern Wisconsin	9.5	9.0	10.2	10.8	11.4	11.4	12.6	10.2	9.9
4 Northern Plains	8.1	7.9	9.1	9.3	9.9	10.0	10.9	9.0	8.8
5 New England	14.5	12.8	14.7	13.8	15.1	14.8	15.8	13.6	13.6
6 New York City/Westchester	20.0	18.5	18.8	18.9	21.1	19.8	21.9	19.0	18.1
7 Long Island	18.8	15.8	17.8	18.3	17.3	19.3	18.6	17.8	17.2
8 Upstate New York	11.5	12.4	13.6	13.6	14.4	14.3	15.4	13.2	13.1
9 Mid-Atlantic	12.3	10.5	12.2	12.4	13.3	13.0	14.7	11.9	11.7
10 Lower Michigan	10.6	9.7	11.1	11.5	12.5	12.1	12.9	11.1	10.5
11 Great Lakes	8.9	9.8	11.0	11.8	12.6	12.6	13.4	11.2	10.7
12 Mississippi Delta	7.5	9.0	9.8	10.4	11.2	11.1	11.8	10.1	9.7
13 Mississippi Basin	8.1	8.2	9.8	11.2	12.2	11.5	12.6	10.5	9.6
14 Alabama / Georgia	9.6	8.7	9.7	9.9	10.8	10.7	11.6	9.5	9.2
15 Tennessee Valley	8.4	6.8	7.8	8.1	8.7	8.8	10.7	7.7	7.3
16 Virginia / Carolina	8.8	8.9	9.6	9.8	10.4	10.4	11.1	9.6	9.3
17 Central Plains	9.0	9.2	10.6	11.2	11.7	11.7	12.8	10.7	10.2
18 Southern Plains	7.6	7.8	9.5	9.8	10.7	10.6	11.6	9.3	9.0
19 Arizona / New Mexico	9.7	10.3	11.5	11.8	12.2	12.2	12.9	11.5	11.0
20 California	13.1	12.7	13.3	13.6	14.0	13.9	14.6	13.4	13.1
21 Northwest	7.2	7.0	7.6	7.8	8.4	8.4	8.7	7.8	7.6
22 Rocky Mountain	9.2	9.0	10.2	10.5	11.1	11.1	12.5	10.1	9.6

Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, co2elfee10.d030613a, co2elfee1075.d030613a, co2elfee20.d030613a, co2fee20.d030613a, co2elfee30.d030613a, capel50pct.d030613a, and capel50off.d030613a.

Table 5. Regional electricity prices, 2011 actual and 2040 in alternative cases

2011 cents per kilowatthour

	2011	2040							
		Reference	\$10 fee @ 5%/year Electric	\$10 fee @ 7.5%/year Electric	\$20 fee @ 5%/year Electric	\$20 fee @ 5%/year Economy	\$30 fee @ 5%/year Electric	Cap&Trade No offsets Electric	Cap&Trade with offsets Electric
1 Texas	9.2	12.1	13.2	14.5	15.1	14.7	15.6	14.2	13.8
2 Florida	10.6	11.7	13.5	14.4	14.5	14.4	14.6	14.2	14.1
3 Eastern Wisconsin	9.5	9.3	11.4	13.3	13.3	13.4	13.6	12.7	12.3
4 Northern Plains	8.1	8.3	10.1	10.9	11.3	11.3	11.2	10.6	10.6
5 New England	14.5	15.1	16.1	16.6	17.6	17.2	17.3	16.2	16.7
6 New York City/ Westchester	20.0	20.7	21.6	22.8	23.7	23.4	24.2	22.6	22.7
7 Long Island	18.8	18.9	20.1	21.6	22.6	22.3	22.2	20.8	20.8
8 Upstate New York	11.5	14.7	16.0	16.8	17.3	17.0	17.8	16.3	16.3
9 Mid Atlantic	12.3	12.3	13.5	14.4	15.2	15.1	15.6	14.0	14.0
10 Lower Michigan	10.6	10.3	12.4	13.1	13.2	13.3	12.5	13.3	13.2
11 Great Lakes	8.9	10.9	12.5	14.1	14.3	14.2	14.7	13.4	13.1
12 Mississippi Delta	7.5	10.0	11.6	12.7	13.0	13.0	13.4	12.4	12.1
13 Mississippi Basin	8.1	9.2	11.2	13.1	13.5	13.5	13.2	12.7	12.2
14 Alabama / Georgia	9.6	9.2	11.1	12.9	13.1	12.9	13.0	12.2	11.9
15 Tennessee Valley	8.4	7.1	9.2	10.9	10.8	10.7	10.7	10.5	10.0
16 Virginia / Carolina	8.8	9.3	10.8	11.5	11.6	11.6	11.8	11.4	11.2
17 Central Plains	9.0	9.4	11.1	12.0	12.5	12.2	12.9	11.8	11.6
18 Southern Plains	7.6	9.5	11.4	12.1	12.4	12.3	12.8	12.0	12.0
19 Arizona / New Mexico	9.7	12.3	14.1	14.4	14.3	14.2	14.5	14.4	14.5
20 California	13.1	13.8	14.6	15.4	15.5	15.4	15.7	15.1	14.9
21 Northwest	7.2	8.1	9.3	9.6	10.0	10.0	9.8	9.5	9.4
22 Rocky Mountain	9.2	10.8	12.6	14.0	14.0	13.9	14.4	13.7	13.4

Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, co2elfee10.d030613a, co2elfee1075.d030613a, co2elfee20.d030613a, co2fee20.d030613a, co2elfee30.d030613a, capel50pct.d030613a, and capel50off.d030613a.

Economic Impacts

The higher consumer electricity prices (and higher consumer fossil fuel prices when the coverage extends beyond the electricity sector) in the CO₂ fee cases tend to slow economic growth. Figures 12 and 13 display the economic impacts in alternative ways. Figure 12 shows total U.S. gross domestic product (GDP) in the Reference case and the four CO₂ fee cases. As shown, the impacts are hard to discern, the thickness of the lines in the figure obscure them.

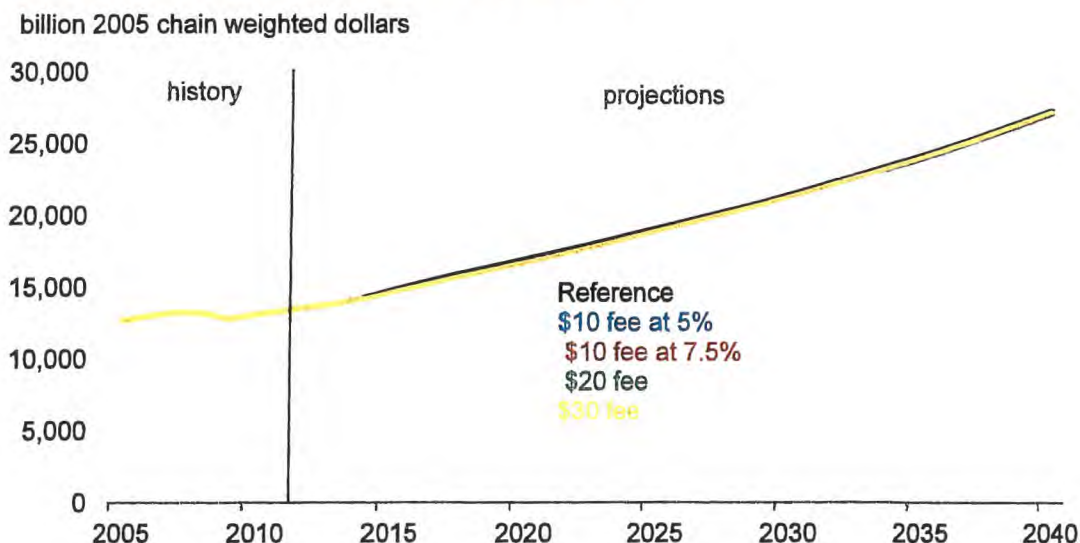
Figure 13 displays the same information in a different way, showing the percentage change in GDP in the CO₂ fee cases relative to GDP in the Reference case. Initially as the CO₂ fees are first imposed there is a shock to the economy leading to a reduction in GDP of 0.3 percent to 1.2 percent in 2020, which is

generally the peak impact year. In real 2005 chain-weighted dollar terms, projected GDP, which is \$16,863 billion in the Reference case, ranges from \$16,664 billion to \$16,807 billion in 2020 in the CO₂ fee cases. Over time, the impacts fall as the economy adjusts, the power sector converts to lower emitting sources and consumers spend the revenue associated with the fees that is rebated to them. By 2040, the reduction in GDP relative to the Reference case in the CO₂ fee cases ranges from 0.2 to 0.4 percent. Projected 2040 GDP, which is \$27,282 billion in the Reference case, ranges from \$27,171 billion to \$27,236 billion in the electricity sector CO₂ fee cases. Figure 14 shows the same information for the cap-and-trade cases and illustrates that their economic impacts are similar to those in the two \$10 fee cases.

The impacts in the alternative cases can also be considered in terms of changes in the annual average projected rate of economic growth over the 2011 to 2040 period. In the CO₂ fee cases, the annual average rate of economic growth, which is 2.51 percent in the reference case, is reduced by between 0.006 to 0.014 percentage points.

In all of the fee cases, industrial and employment impacts tend to follow GDP changes, with energy-intensive industries experiencing higher percentage changes from Reference case levels compared to all of manufacturing and overall industry as well.

Figure 12. GDP in electricity-sector-only CO₂ fee cases




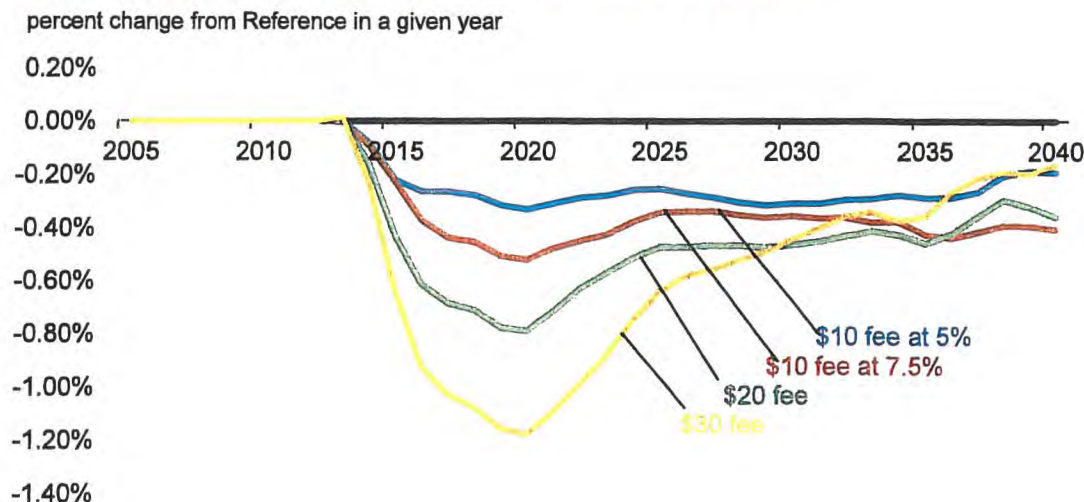
Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a,  co2elfee10.d030613a, co2elfee1075.d030613a, co2elfee20.d030613a, and co2elfee30.d030613a.

Figure 13. Change in GDP in alternative electricity sector CO₂ fee cases




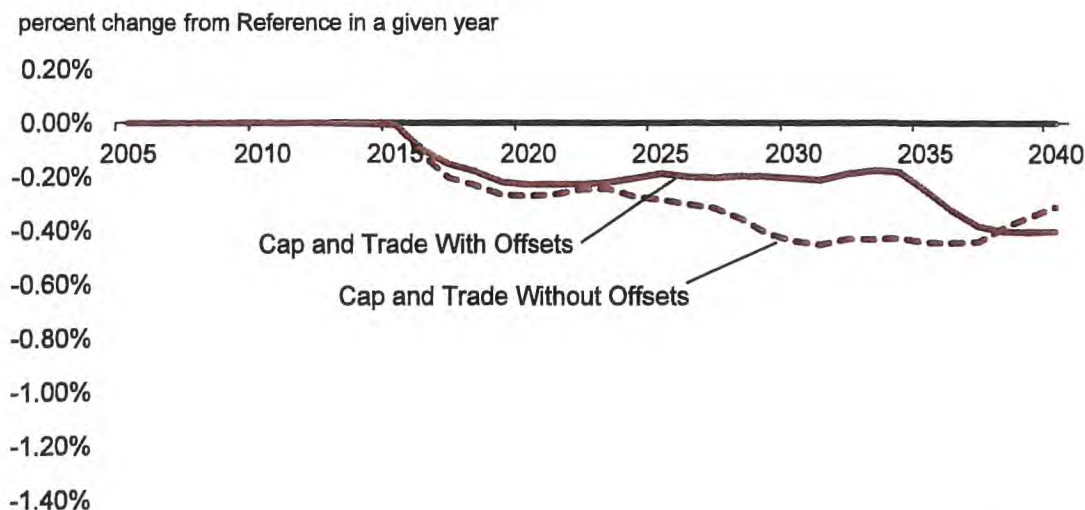

Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, co2elfee10.d030613a, co2elfee1075.d030613a, co2elfee20.d030613a, and co2elfee30.d030613a. 

Figure 14. Change in GDP in cap-and-trade cases

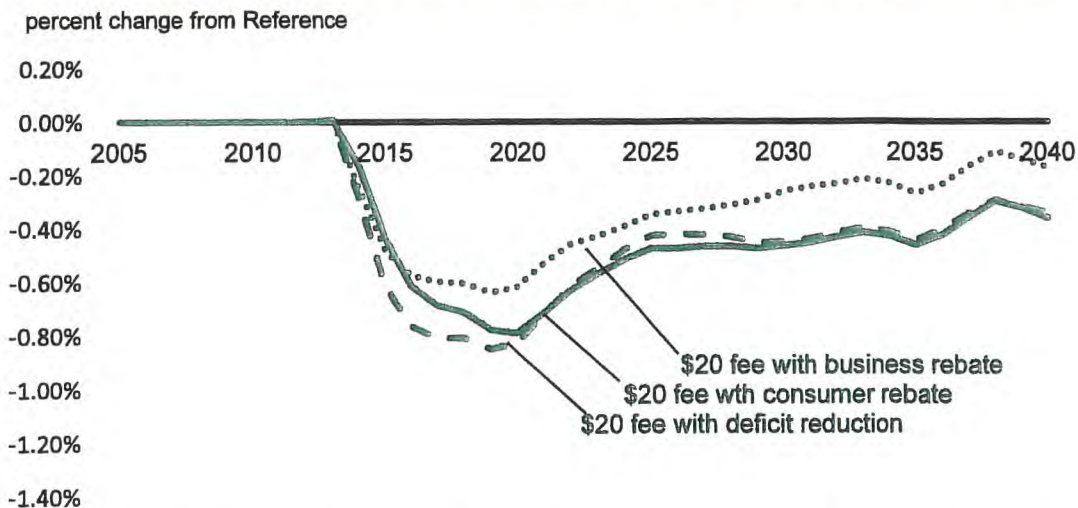


Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, capel50pct.d030613a, and capel50off.d030613a. 

While the fee level is important in estimating the potential economic impact of the program, other important factors include how the revenue associated with the CO₂ fees is used and the coverage of the program. In most of the cases discussed in this report it is assumed that all the fee revenue is rebated to consumers. Other options include using the fee revenue to reduce the deficit or returning it to businesses through lower business taxes.

In general, using the fee revenue for deficit reduction rather than rebating it to consumers, leads to a larger adverse impact on the GDP in the near term. This occurs because personal consumption, a major portion of GDP, is much lower when the fee revenue is not returned. Conversely, when the fee revenue is returned to businesses, the economy tends to be better off because businesses increase their investments that lead to greater productivity and economic growth. As shown, when the revenue is returned through business tax rebates, total GDP nearly returns to the Reference case level by 2040. However, personal consumption remains lower when the revenue is returned to businesses rather than consumers.

Figure 15. Change in GDP in electricity sector CO₂ \$20 fee cases with different revenue use




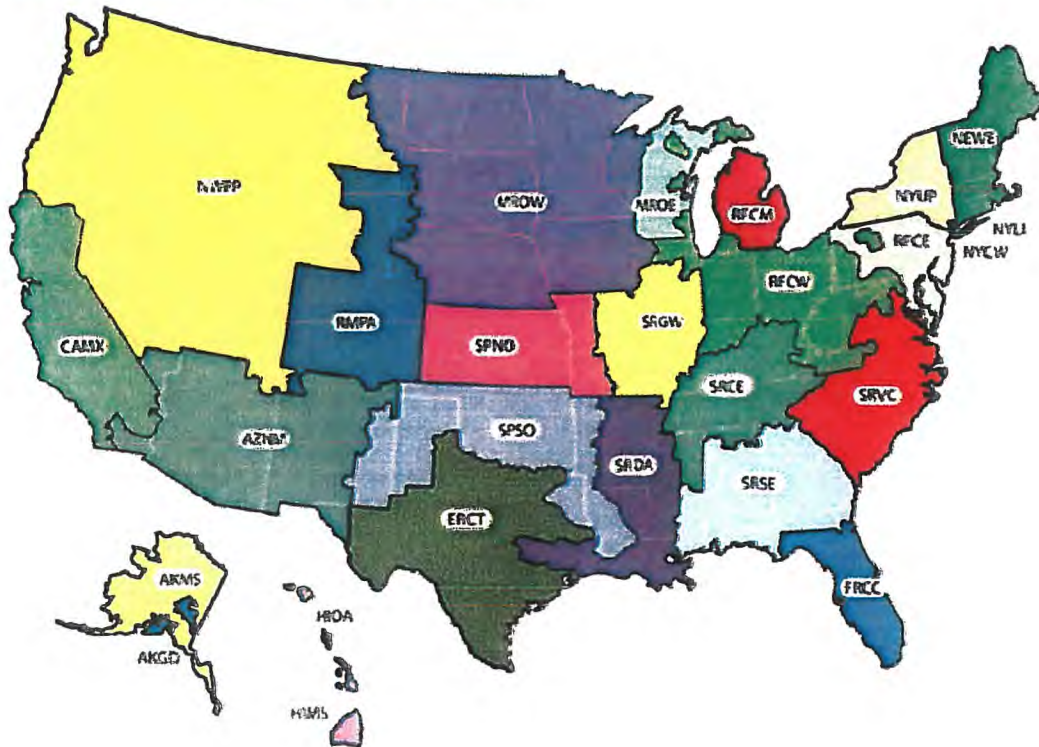
Sources: U.S. Energy Information Administration, National Energy Modeling System runs: aeo2013hr8.d021213a, co2elfee20.d030613a, co2elfeedr.d030613a and co2elfeebr.d031113a. 

Figure 16. Regional boundaries and definitions



Number	Abbreviation	NERC Sub Region Name	Geographic Name*
1	ERCT	Texas Regional Entity	Texas
2	FRCC	Florida Reliability Coordinating Council	Florida
3	MRDE	Midwest Reliability Council – East	Eastern Wisconsin
4	MROW	Midwest Reliability Council – West	Northern Plains
5	NEWE	Northeast Power Coordinating Council/ Northeast	New England
6	NYCW	Northeast Power Coordinating Council/ New York City Westchester	New York City
7	NYLI	Northeast Power Coordinating Council/ Long Island	Long Island
8	NYUP	Northeast Power Coordinating Council/ Upstate New York	Upstate New York
9	RFCM	Reliability First Corporation – East	Mid Atlantic
10	RFCM	Reliability First Corporation – Michigan	Lower Michigan
11	RFCW	Reliability First Corporation – West	Great Lakes
12	SRDA	Southeast Reliability Corporation - Delta	Mississippi Delta
13	SRGW	SERC – Gateway	Mississippi Basin
14	SRSE	SERC – Southeast	Southeast
15	SRCE	SERC – Central	Tennessee Valley
16	SRVC	SERC – Virginia Carolina	Virginia Carolina
17	SPNO	Southwest Power Pool North	Central Plains
18	SPSO	Southwest Power Pool South	Southern Plains
19	AZNM	Western Electricity Coordinating Council – Arizona New Mexico	Southwest
20	CAMX	WECC – California	California
21	NWPP	WECC – Northwest Power Pool Area	Northwest
22	RMPA	WECC – Rocky Mountain	Rocky Mountain

* Names are intended to be approximately descriptive of location. Exact regional boundaries do not necessarily correspond to state borders or to other regional naming conventions

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2013 Carbon Dioxide Price Forecast

November 1, 2013

(Minor corrections February 2014)

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1. EXECUTIVE SUMMARY

Prudent planning requires electric utilities and other stakeholders in carbon-intensive industries to use a reasonable estimate of the future price of carbon dioxide (CO₂) emissions when evaluating resource investment decisions with multi-decade lifetimes. However, forecasting a CO₂ price can be difficult. While several bills have been introduced in Congress, the federal government has yet to legislate a policy to reduce greenhouse gas emissions in the United States.

Although this lack of a defined policy that sets a price on carbon poses a challenge in CO₂ price forecasting, an assumption that there will be no CO₂ price in the long run is not, in our view, reasonable. The scientific basis for attributing climatic changes to human-driven greenhouse gas emissions is irrefutable, as are the type and scale of damages expected to both infrastructure and ecosystems. The need for a comprehensive U.S. effort to reduce greenhouse gas emissions is clear. Any policy requiring or leading to greenhouse gas emission reductions will result in higher costs to the electricity resources that emit CO₂.

The Synapse 2013 CO₂ price forecast is designed to provide a reasonable range of price estimates for use in utility Integrated Resource Planning (IRP) and other electricity resource planning analyses. The current forecast updates Synapse's 2012 CO₂ price forecast, published in October 2012.¹ Our 2013 forecast incorporates new data that have become available since 2012, in order to provide useful CO₂ price estimates for utility resource planning purposes.

1.1. Key Assumptions

Synapse's 2013 CO₂ price forecast reflects our expert judgment that near-term regulatory measures to reduce greenhouse gas emissions, coupled with longer-term cap-and-trade or carbon tax legislation passed by Congress, will result in significant pressure to decarbonize the electric power sector. The key assumptions of our forecast include:

- A federal program establishing a price for greenhouse gases is the probable eventual outcome, as it allows for a least-cost path to emissions reduction.
- Initial climate-focused policy actions are more likely to take a regulatory approach, e.g. Section 111(d) of the Clean Air Act. In the longer-term, federal legislation setting a price on emissions through a cap-and-trade policy or a carbon tax will likely be prompted by one or more of the following factors:
 - New technological opportunities that lower the cost of carbon mitigation;

¹ Wilson et al., "2012 Carbon Dioxide Price Forecast," October 2012. <http://www.synapse-energy.com/Downloads/SynapseReport.2012-10.0.2012-CO2-Forecast.A0035.pdf>.

- A patchwork of state policies that achieve state emission targets for 2020, spurring industry demands for federal action;
- A series of executive actions taken by the President that spur demand for Congressional action;
- A Supreme Court decision that permits nuisance lawsuits, making it possible for states to sue companies within their boundaries that own high-carbon-emitting resources, and creating a financial incentive for energy companies to act; and
- Mounting public outcry in response to increasingly compelling evidence of human-driven climate change.

Given the growing interest in reducing greenhouse gas emissions by states and municipalities throughout the nation, a lack of timely, substantive federal action will result in the enactment of diverse state and local policies. Heterogeneous—and potentially incompatible—sub-national climate policies would present a challenge to any company seeking to invest in CO₂ emitting power plants, both existing and new. Historically, there has been a pattern of states and regions leading with energy and environmental initiatives that have in time been superseded at the national level. It seems likely that this will be the dynamic going forward: a combination of state and regional actions, together with federal regulations, that are eventually eclipsed by a comprehensive federal carbon price.

We expect that federal regulatory measures together with regional and state policies will lead to the existence of a cost associated with greenhouse gas reductions in the near term. Prudent utility planning requires that utilities take this cost into account when engaging in resource planning, even before a federal carbon price is enacted.

1.2. Study Approach

To develop the 2013 CO₂ price forecast, Synapse reviewed several key developments that have occurred over the past year. These include:

- Proposed federal regulatory measures to limit CO₂ emissions from new power plants and administrative initiatives to advance regulation for existing units;
- Updates to the U.S. carbon price used to assess the climate benefit of federal rulemakings;
- Revisions to the Northeast's Regional Greenhouse Gas Initiative (RGGI) CO₂ policy and the first allowance auctions under California's AB 32 Cap-and-Trade program;
- The results of a multi-year Energy Modeling Forum (EMF) research effort on the costs of U.S. emissions abatement from nine integrated assessment modeling teams; and
- Carbon price forecasts from the most recent IRP efforts of 28 utilities.

1.3. Synapse's 2013 CO₂ Price Forecast

Based on analyses of the sources described in sections 3 through 9, and relying on our own expert judgment, Synapse developed Low, Mid, and High case forecasts for CO₂ prices from 2013 to 2040. Figure ES-1 (below) shows the range covered by the Synapse forecasts. These projections assume that state and regional policies will combine with federal regulatory measures to put economic pressure on carbon-emitting resources in the next several years such that the costs of operating a high-carbon-emitting plant increase—followed later by a broader federal, market-based policy. In states other than the RGGI region² and California, we assume a zero carbon price for the next several years; by 2020, we expect that federal regulatory measures will begin to put economic pressure on carbon-emitting power plants throughout the United States. All annual carbon prices are reported in 2012 dollars per short ton of CO₂.³

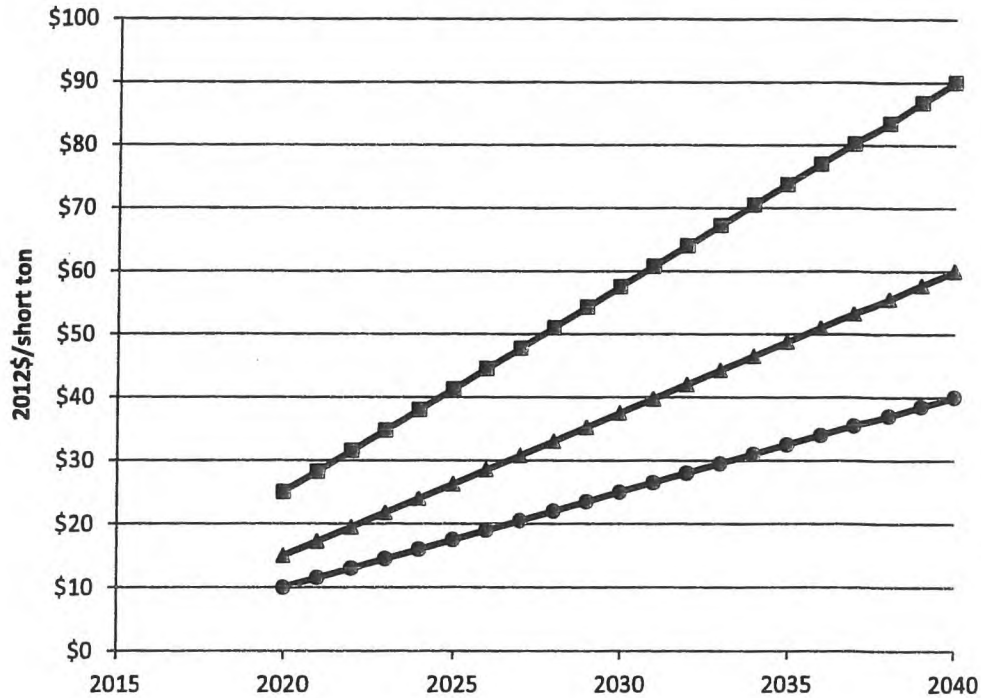
Each of the forecasts shown in Figure ES-1 represents a different level of political will for reducing carbon emissions, as described below.

- The **Low case** forecasts a carbon price that begins in 2020 at \$10 per ton, and increases to \$40 per ton in 2040, representing a \$22 per ton levelized price over the period 2020-2040. This forecast represents a scenario in which federal policies—either regulatory or legislative—exist but are not very stringent.
- The **Mid case** forecasts a carbon price that begins in 2020 at \$15 per ton, and increases to \$60 per ton in 2040, representing a \$34 per ton levelized price over the period 2020-2040. This forecast represents a scenario in which federal policies are implemented with significant but reasonably achievable goals.
- The **High case** forecasts a carbon price that begins in 2020 at \$25 per ton, and increases to approximately \$90 per ton in 2040, representing a \$52 per ton levelized price over the period 2020-2040. This forecast is consistent with the occurrence of one or more factors that have the effect of raising carbon prices. These factors include somewhat more aggressive emissions reduction targets; greater restrictions on the use of offsets; restricted availability or high cost of technological alternatives such as nuclear, biomass, and carbon capture and sequestration; more aggressive international actions (thereby resulting in fewer inexpensive international offsets available for purchase by U.S. emitters); or higher baseline emissions.

² Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.

³ Results from public modeling analyses were converted to 2012 dollars using price deflators taken from the U.S. Bureau of Economic Analysis, and are available at: <http://www.bea.gov/national/nipaweb/SelectTable.asp>. Consistent with U.S. Energy Information Administration and U.S. Environmental Protection Agency modeling analyses, a 5 percent real discount rate was used in all levelization calculations.

ES-1: Synapse 2013 CO₂ Price Trajectories



2. STRUCTURE OF THIS REPORT

This report presents Synapse's 2013 Low, Mid and High CO₂ price forecasts, along with the evidence assembled to inform these forecasts:

- Section 3 discusses broader concepts of CO₂ pricing.
- Sections 4 through 8 discuss existing state and federal legislation, potential future legislation, recent cap-and-trade results from the research community, and a range of current CO₂ price forecasts from utilities.
- Section 9 presents Synapse's 2013 Low, Mid, and High CO₂ price forecast, along with a comparison to recent utility forecasts.

Unless otherwise indicated, all prices are in 2012 dollars and CO₂ emissions are given in short tons.

3. WHAT IS A CARBON PRICE?

There are several co-existing meanings for the term “carbon price” or “CO₂ price”: each of these meanings is appropriate in its own context. Here we give a brief introduction to five common types of carbon prices, along with a quick guide to which of the carbon price estimates reviewed in this report are based on which of these meanings. (Note that the definition of an additional term—the “price of carbon”—is ambiguous because it can at times mean several of the following.)

Carbon allowances (sometimes called credits or certificates, and best known for their use in policies called “cap and trade”): Allowances are certificates that give their holder the right to emit a unit of a particular pollutant. A fixed number of carbon allowances are issued by a government, some sold and, perhaps, some given away.⁴ Subsequent trade of allowances in a secondary market is common to this policy design. The price that firms must pay to obtain allowances increases their cost of doing business, thereby giving an advantage to firms with cleaner, greener operations, and creating an incentive to lower emissions whenever it can be done for less than the price of allowances. The number of allowances—the “cap” in the cap-and-trade system—reflects the required society-wide emission reduction target. A greater reduction target results in a lower cap and a higher price for allowances. In the field of economics, pricing emissions is called “internalizing an externality”: The external (not borne by the polluting enterprise) cost of pollution damages is assigned a market price (thus making it internal to the enterprise).

In this report: The Northeast’s RGGI and California’s Cap-and-Trade Program are both carbon allowance trading systems. In addition, the Kerry-Lieberman, Waxman-Markey, and Cantwell-Collins bills all proposed policy measures that included carbon allowance trading.

Carbon tax: A carbon tax also internalizes the externality of carbon pollution, but instead of selling or giving away rights to pollute (the allowance approach), a carbon tax creates an obligation for firms to pay a fee for each unit of carbon that they emit. In theory, if the value of damages were known with certainty, a tax could internalize the damages more accurately, by setting the tax rate equal to the damages; in practice, the valuation of damages is typically uncertain. In contrast to the government issuance of allowances, with a carbon tax there is no fixed amount of possible emissions (no “cap”). A cap-and-trade system specifies the amount of emission reduction, allowing variation in the price; a tax specifies the price on emissions, allowing variation in the resulting reductions. In both cases there is an incentive to reduce emissions whenever it can be done for less than the prevailing price. In both cases there is the option to continue emitting pollution, at the cost of either buying allowances or paying the tax. While some advocates have claimed that a tax is administratively simpler and reduces bureaucratic, regulatory, and compliance costs, a general aversion to new taxes has meant that no carbon tax proposals have received substantial support in recent policy debate.

⁴ Whether or not allowances are initially given away for free or sold, they represent an opportunity cost of emissions to the holder.

Effective price of carbon (sometimes called the notional, hypothetical, or voluntary price): Carbon allowances and carbon taxes internalize the climate change externality by making polluters pay. However, many other types of climate policies work not by making polluting more expensive per se, but instead by requiring firms to use one technology instead of another, or to maintain particular emission limitations in order to avoid legal repercussions. Non-market-based emission control regulatory policies are called “command and control.” For any such non-market policy there is an “effective” price: a market price that—if instituted as an allowance or tax—would result in the identical emission reduction as the non-market policy. An effective price may be used internally within a firm, government agency, or other entity to represent the effects of command and control policies for the purpose of improved decision making. Renewable Portfolio Standards, energy efficiency measures, and other policies designed to mitigate CO₂ emissions impose an effective price on carbon.

In this report: Utility carbon price forecasts are effective prices used for state-required IRPs and internal planning purposes. The U.S. Environmental Protection Agency’s (EPA’s) proposed carbon pollution standard for new sources of electric generation is a non-market-based policy that would represent an effective price.

Marginal abatement cost of carbon: An abatement cost refers to an estimate of the expected cost of reducing emissions of a particular pollutant. Estimation of a marginal abatement cost requires the construction of a “supply curve”: all of the possible solutions to controlling emissions (these may be technologies or policies) are lined up in order of their cost per unit of pollution reduction. Then, starting from the least expensive option, one tallies up the pollution reduction from various solutions until the desired total reduction is almost achieved, and then asks: what would it cost to reduce emissions by one more unit to achieve the target? The answer is the “marginal” cost of that level of pollution reduction; a greater reduction target would have a higher marginal cost. The marginal abatement cost of carbon is not a market price used to internalize an externality. Rather, it is a method for estimating the price that, if it were applied as a market price, would have the effect of achieving a given emission reduction target. In a well-functioning cap-and-trade system, the allowance price would tend towards the marginal abatement cost of carbon.

In this report: We do not analyze any marginal abatement costs in this report—see the *2012 Synapse Carbon Dioxide Price Forecast* for further information. McKinsey & Company has been a consistent producer of this type of analysis, an example being their 2010 report *Impact of the Financial Crisis on Carbon Economics: Version 2.1 of the Global Greenhouse Gas Abatement Cost Curve*.

Social cost of carbon: Whereas the marginal abatement cost estimates the price of stopping pollution, the social cost of carbon estimates the cost, per unit of emissions, of allowing pollution to continue. The social cost of carbon is the societal cost of current and future damages related to climate change from the emission of one additional unit of pollutant. Estimating the uncertain costs of uncertain future damages from uncertain future climatic events is, of course, a tricky business. If enough information were available, a marginal abatement cost for each level of future emissions (the supply of emission reductions) could be compared to a social cost of carbon for each level of future emissions (the demand for emission reductions) to determine an “optimal” level of pollution (such that the next higher unit of

emission reduction would cost more to achieve than its value in reduced damages). More commonly, the social cost of carbon is used as part of the calculation of benefits of emission-reducing measures.

In this report: The U.S. federal government's internal carbon price for use in policy making is estimated as the social cost of carbon.

4. FEDERAL CLIMATE ACTION IS INCREASINGLY LIKELY

In the near term, comprehensive federal climate legislation appears unlikely to come out of a divided Congress. The Executive Branch, however, is moving forward with regulatory actions to limit greenhouse gas emissions. Following a directive issued by President Obama, EPA released revised CO₂ performance standards for new power plants on September 20, 2013.⁵ In June 2013, President Obama also instructed EPA to use its Clean Air Act authority to propose CO₂ standards for existing power plants by June 2014 and to finalize these standards by June 2015.⁶ While this report is focused on electric sector CO₂ policies, similar regulatory measures have been proposed for the transportation, buildings, and industrial sectors; policies enacted in other sectors include vehicle efficiency standards set to rise to 54.5 miles per gallon by 2025 for new cars and light-duty trucks, and new energy efficiency standards for federal buildings set to reduce energy consumption by nearly 20 percent.^{7,8}

We continue to expect that a federal cap-and-trade program for greenhouse gases is the most likely policy outcome in the long term, because it permits reductions to come from sources that can mitigate emissions at the lower cost. While state and regional policies combined with federal regulatory actions appear to be more likely than a federal cap-and-trade policy in the near term, according to a WRI analysis these local measures are unlikely to be able to meet long-term goals of reducing total greenhouse gas emissions to 83 percent below 2005 levels by 2050, even in the most aggressive of scenarios.⁹

⁵ EPA. "2013 Proposed Carbon Pollution Standard for New Power Plants." Available at: <http://www2.epa.gov/carbon-pollution-standards/2013-proposed-carbon-pollution-standard-new-power-plants>.

⁶ Memorandum from President Obama to Administrator of the Environmental Protection Agency, Power Sector Carbon Pollution Standards (June 25, 2013). Available at: <http://www.whitehouse.gov/the-press-office/2013/06/25/presidential-memorandum-power-sector-carbon-pollution-standards>.

⁷ Vlasic, Bill. "US Sets Higher Fuel Efficiency Standards." *The New York Times*. August 28th, 2012. Available at: <http://www.nytimes.com/2012/08/29/business/energy-environment/obama-unveils-tighter-fuel-efficiency-standards.html>.

⁸ "Energy Efficiency Design Standards for New Federal Commercial and Multi-Family High-Rise Residential Buildings." A Rule by the Department of Energy. July 9th, 2013. Available at: <https://www.federalregister.gov/articles/2013/07/09/2013-16297/energy-efficiency-design-standards-for-new-federal-commercial-and-multi-family-high-rise-residential#h-9>.

⁹ See WRI's analysis of these scenarios in the 2013 report "Can the U.S. Get There From Here?: Using Existing Federal Laws and State Action to Reduce Greenhouse Gas Emissions." Available at: <http://www.wri.org/publication/can-us-get-there-from-here>.

4.1. Regulatory Measures for Reducing Greenhouse Gas Emissions

Clean Air Act

As a result of the 2007 Supreme Court finding in *Massachusetts v. EPA*, greenhouse gas emissions were determined to be subject to the Clean Air Act and (in a later ruling) to contribute to air pollution anticipated to endanger public health and welfare. In 2009, EPA issued an “endangerment finding,” obligating the agency to regulate emissions of greenhouse gases from stationary sources such as power plants.¹⁰ EPA released draft New Source Performance Standards (NSPS) in April 2012 and revised NSPS standards on September 20, 2013. The revised standards limit CO₂ emissions from new fossil-fuel power plants to 1,000-1,100 pounds of CO₂ per MWh (lbs/MWh)—a level achievable by a new natural gas combined-cycle plant. The exact limit of CO₂ emissions within that range depend on the type of plant and period over which the emission rate would be averaged.¹¹

Under Section 111(d) of the Clean Air Act, the EPA is required to propose standards for existing power plants by June 2014, but there remains substantial uncertainty over what form these regulations will take. Unit-specific emission rates standards, such as the NSPS for greenhouse gases, are only one of several plausible options. Unit-specific standards could apply to power plants based on categories by fuel type and technology type, each with its own maximum emission rate. Units that are not in compliance could undertake upgrades to improve efficiency; however, these kinds of upgrades can be expensive, can only achieve small, one-time changes to emission rates, and could trigger New Source Review/Prevention of Significant Deterioration (NSR/PSD) provisions, increasing the cost further.^{12,13}

Other regulatory design options for existing plants under 111(d) include maintaining a state-wide average maximum emission rate, and market-based (e.g. cap-and-trade) approaches. More flexible mechanisms like these could lower the cost of compliance, but could also result in additional legal challenges as compared to a simpler but more rigid system of unit-specific regulation.¹⁴ An Edison Electric Institute white paper on potential regulation of existing sources notes that “because of concerns about legal challenges to the guidelines, EPA may be reluctant to incorporate a wide range of

¹⁰ EPA. “Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act.” Available at: <http://www.epa.gov/climatechange/endangerment/>.

¹¹ EPA. “Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units.” Available at: <http://www2.epa.gov/sites/production/files/2013-09/documents/20130920proposal.pdf>.

¹² EEI. “Existing Source GHG NSPS White Paper,” Page 5. Available at: <http://online.wsj.com/public/resources/documents/carbon04232013.pdf>.

¹³ Tarr J., Monast J., Profeta T. “Regulating Carbon Dioxide under Section 111(d) of the Clean Air Act.” The Nicholas Institute. January 2013. Available at: http://nicholasinstitute.duke.edu/sites/default/files/publications/ni_r_13-01.pdf.

¹⁴ Fine, Steven and MacCracken, Chris. “President Obama’s Climate Action Plan: What It Could Mean to the Power Sector.” ICF International. August 2013. Available at: <http://www.icfi.com/insights/white-papers/2013/president-obama-climate-action-plan>.

compliance flexibility mechanisms in the guidelines, but may be more receptive to such mechanisms if proposed by the states in compliance plans.”¹⁵

End-use energy efficiency may be an important part of a comprehensive compliance strategy in a regulation that averages emission rates across states. States may be able to achieve emissions reductions at a lower cost through the structures of their existing energy efficiency resource standards.

Methods for demonstrating compliance with 111(d) may be similar to existing regulations: in a process similar to Section 110 of the Clean Air Act, under which EPA sets National Ambient Air Quality Standards (NAAQS), states will be required to submit State Implementation Plans (SIPs) that specify how they intend to comply with 111(d). EPA can then decide whether a proposed SIP meets the terms of the regulation; in the absence of an acceptable SIP, EPA can impose a Federal Implementation Plan (FIP). Under the schedule outlined by President Obama in his Climate Action Plan, regulations for existing sources under 111(d) will be finalized by June 2015, and states would be required to submit SIPs to the EPA by June 2016.

Performance standards for new and existing sources will affect decisions made by utilities regarding operation, expansion, and retirements. Enforcement of the Clean Air Act creates an opportunity cost of greenhouse gas abatement: prudent utilities will take Clean Air Act compliance into consideration in their planning, either explicitly as a maximum allowable emissions rate, or implicitly as an effective carbon price. An NRDC analysis of the impacts of 111(d) implementation estimated compliance costs under this policy at \$7.53 per ton of CO₂ avoided.¹⁶

Other regulatory measures put economic pressure on carbon-intensive power plants

A suite of current and proposed EPA regulations require pollution-intensive power plants to install environmental controls for compliance. The cost of complying with environmental regulations reduces the profitability of the worst polluters, sometime rendering them uneconomic. These policies demonstrate momentum towards appropriately regulating or pricing environmentally harmful activities in the electric sector. To the extent that plants with high emissions of other pollutants also have high carbon emissions, these policies would tend to *lower* the future CO₂ price necessary to achieve a given reduction; as more pollution-intensive plants retire in response to other EPA regulations, the necessary carbon price is reduced. Specific regulatory measures include:

- *National Ambient Air Quality Standards (NAAQS)* set maximum air quality limitations that must be met at all locations across the nation. EPA has established NAAQS for six pollutants: sulfur dioxide (SO₂), nitrogen dioxides (NO₂), carbon monoxide (CO), ozone, particulate matter—measured as particulate matter less than or equal to 10

¹⁵ Edison Electric Institute. “Existing Source GHG NSPS White Paper,” Page 2. Available at: <http://online.wsj.com/public/resources/documents/carbon04232013.pdf>.

¹⁶ Natural Resources Defense Council. “Closing the Power Plant Carbon Pollution Loophole: Smart Ways the Clean Air Act Can Clean Up America’s Biggest Climate Polluters,” March 2013. Available at: <http://www.nrdc.org/air/pollution-standards/files/pollution-standards-report.pdf>.

micrometers in diameter (PM10) and particulate matter less than or equal to 2.5 micrometers in diameter (PM2.5)—and lead.

- *The Cross State Air Pollution Rule (CSAPR)*, finalized in 2011, establishes the obligations of each affected state to reduce emissions of NO_x and SO₂ that significantly contribute to another state's PM2.5 and ozone non-attainment problems. CSAPR was vacated by the U.S. Court of Appeals for the District of Columbia on August 21, 2012. In June 2013, the U.S. Supreme Court announced that it would review CSAPR. Even if EPA fails to salvage CSAPR through the courts, the Agency must still promulgate a replacement rule to implement Clean Air Act requirements to address the transport of air pollution across state boundaries. In the meantime, the court left the requirements of the 2005 Clean Air Interstate Rule in place.
- *Mercury and Air Toxics Standards (MATS)*: The final MATS rule, approved in December 2011, sets stack emissions limits for mercury, other metal toxins, organic and inorganic hazardous air pollutants, and acid gasses. Compliance with MATS is required by 2015, with a potential extension to 2016. Many utilities have already committed to capital improvements at their coal plants to comply with the standard.
- *Coal Combustion Residuals (CCR) Disposal Rule*: On June 21, 2010, EPA proposed to regulate CCR for the first time either as a Subtitle C hazardous waste or Subtitle D solid waste under the Resource Conservation and Recovery Act. Under a Subtitle C designation, the EPA would regulate siting, liners, run-on and run-off controls, groundwater monitoring, fugitive dust controls, and any corrective actions required. In addition, the EPA would implement minimum requirements for dam safety at impoundments. Under a solid waste Subtitle D designation, the EPA would require minimum siting and construction standards for new coal ash ponds, compel existing unlined impoundments to install liners, and require standards for long-term stability and closure care.
- *Steam Electric Effluent Limitation Guidelines (ELGs)*: On June 7, 2013, EPA released eight regulatory options for new, proposed steam-electric ELGs to reduce or eliminate the release of toxins into U.S. waterways. A final rule is required by May 22, 2014.¹⁷ New requirements will be implemented in 2014 to 2019 through the five-year National Pollutant Discharge Elimination System permit cycle.¹⁸

Other regulations which may raise costs for carbon-intensive resources include Regional Haze rules and cooling water rules under the Clean Water Act.

¹⁷ See U.S. Environmental Protection Agency website. Accessed February 21, 2013. Available at: <http://water.epa.gov/scitech/wastetech/guide/steam-electric/amendment.cfm>.

¹⁸ See U.S. Environmental Protection Agency. Steam Electric ELG Rulemaking. UMRA and Federalism Implications: Consultation Meeting. October 11, 2011. <http://water.epa.gov/scitech/wastetech/guide/upload/Steam-Electric-ELG-Rulemaking-UMRA-and-Federalism-Implications-Consultation-Meeting-Presentation.pdf>.

4.2. Proposed Cap-and-Trade Legislation

Over the past decade, there have been several Congressional proposals to legislate cap-and-trade programs, with the goal of reducing greenhouse gas emissions by up to 83 percent below recent levels by 2050 through a federal cap. Such programs would allow trading of allowances to promote least-cost reductions in greenhouse gas emissions.

Comprehensive climate legislation was passed by the House in the 111th Congress: the American Clean Energy and Security Act of 2009, also known as Waxman-Markey or H.R. 2454. However, the Senate did not vote on either of the two climate bills before it in that session (Kerry-Lieberman APA 2010 and Cantwell-Collins S. 2877). Waxman-Markey was a cap-and-trade program that would have required a 17 percent reduction in emissions from 2005 levels by 2020, and an 83 percent reduction by 2050.¹⁹ Further analysis of these proposals is provided in Synapse's 2012 Carbon Dioxide Price Forecast.

Congressional interest in climate policy has been ongoing. In March 2012, Senator Bingaman introduced the Clean Energy Standard Act of 2012 (S. 2146), which would have required larger utilities to meet a percentage of their sales with electric generation from sources that produce less greenhouse gas emissions than a conventional coal-fired power plant. Credits generated by these clean technologies would have been tradable with a market price. In February 2013, Senators Sanders and Boxer introduced new comprehensive climate change legislation, the Climate Protection Act of 2013. This bill proposed a carbon fee of \$20 per ton of CO₂ or CO₂ equivalent content of methane, rising at 5.6 percent per year over a ten-year period. The bill has not yet been brought to a vote.

We expect that federal cap-and-trade legislation will eventually be enacted but that it is unlikely to happen in the near term. In contrast, federal carbon regulations are in effect or under development today, and the economic pressure—or opportunity cost—that they create may be represented as an effective price of greenhouse gas emissions. Regulatory measures may be successful in achieving near-term targets of 17 percent below 2005 levels by 2020, but according to a WRI analysis are unlikely to meet long-term goals of reducing total greenhouse gas emissions to approximately 80 percent below 2005 levels by 2050, even in the most aggressive of scenarios.²⁰ A broader approach will be increasingly attractive in order to meet these goals at lower costs, and our judgment indicates this is most likely to take the form of a federal cap-and-trade system.

¹⁹ U.S. Energy Information Administration (EIA); Energy Market and Economic Impacts of the American Power Act of 2010 (July 2010). Available at <http://www.eia.gov/oiaf/servicerpt/kgi/index.html>. EIA; Energy Market and Economic Impacts of H.R. 2454, the American Clean Energy and Security Act of 2009 (August 2009). Available at <http://www.eia.doe.gov/oiaf/servicerpt/hr2454/index.html>.

²⁰ See WRI's analysis of these scenarios in their 2013 report "Can the U.S. Get There From Here?: Using Existing Federal Laws and State Action to Reduce Greenhouse Gas Emissions." Available at: <http://www.wri.org/publication/can-us-get-there-from-here>.

5. STATE AND REGIONAL CLIMATE POLICIES

Since the October 2012 release of our 2012 CO₂ price forecasts, there have been significant updates to the two existing regional and state cap-and-trade programs, the Northeast's RGGI and California's Cap-and-Trade Program under AB32. In addition, a total of 20 states plus the District of Columbia have set greenhouse gas emissions targets as low as 80 percent below 1990 levels by 2050.²¹

Recent Revisions to RGGI

RGGI is a cap-and-trade greenhouse gas program for power plants in the northeastern United States. Current participant states are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Pennsylvania, Québec, New Brunswick, and Ontario are official "observers" in the RGGI process. RGGI recently marked five years of successful CO₂ allowance auctions, with Auction 21 resulting in a clearing price of \$2.67 per ton.²² RGGI is designed to reduce electricity sector CO₂ emissions to at least 45 percent below 2005 levels by 2020.²³

When RGGI was established in 2007, the expectation was that the CO₂ emissions allowance auction would generate revenues for consumer benefit programs such as energy efficiency, renewable energy, and clean energy technologies. While RGGI has provided significant revenues for consumer benefit, its allowance prices have generally remained near the statutory minimum price. External influences, including changes to fuel prices, caused a shift from coal and oil to lower-carbon natural gas generation. Compared to those external factors, the effect of the original RGGI cap requirements were relatively minor in meeting the goals of reducing CO₂ emissions in the power sector.²⁴

In 2012 and 2013, the RGGI states evaluated a number of plans for tighter emissions caps with the goal of raising allowance prices. In February of 2013, participating states agreed to lower the CO₂ cap from 165 million to 91 million short tons in 2014, to be reduced by 2.5 percent each year from 2015 to 2020. RGGI analysis indicates that with these lower caps, allowance prices will rise to \$4.16 per short ton in 2014, increasing to \$10.40 per ton in 2020.²⁴

California's Cap-and Trade-Program under AB32

With the goal of reducing the state's emissions to 1990 levels by 2020, California's Global Warming Solutions Act (AB32) has created the world's second largest carbon market, after the European Union's

²¹ "Greenhouse Gas Emissions Targets." Center for Climate and Energy Solutions. Accessed September 13, 2013. Available at: <http://www.c2es.org/us-states-regions/policy-maps/emissions-targets>.

²² RGGI Auction 21 results available at: http://www.rggi.org/market/co2_auctions/results/Auction-21

²³ RGGI. "RGGI States Propose Lowering Regional CO₂ Emission Cap 45%, Implementing a More Flexible Cost-Control Mechanism." February 2013. Available at: http://www.rggi.org/docs/PressReleases/PR130207_ModelRule.pdf.

²⁴ Environment Northeast. "RGGI at One Year: An Evaluation of the Design and Implementation of the Regional Greenhouse Gas Initiative." February 2010. Available at: http://www.env-ne.org/public/resources/pdf/ENE_2009_RGGI_Evaluation_20100223_FINAL.pdf.

Emissions Trading System. The first compliance period for California's Cap-and-Trade Program began on January 1, 2013 and covers electricity generators, CO₂ suppliers, large industrial sources, and petroleum and natural gas facilities emitting at least 27,600 tons of CO₂e per year.^{25,26} On August 16, 2013, the California Air Resources Board held its fourth quarterly allowance auction, resulting in a clearing price of \$11.11 per ton.²⁷ This first phase of the program includes electricity generators and large industrials. Phase II, beginning in 2015, will also include transportation fuels and smaller industrial sources.

6. ASSESSMENT OF CARBON PRICE FOR FEDERAL RULEMAKING

In 2010, the U.S. federal government began including a carbon cost in regulatory rulemakings to account for the climate damages resulting from each additional ton of greenhouse gas emissions;²⁸ updated values were released in 2013.²⁹ The 2013 Economic Report of the President acknowledges that these values will continue to be updated as scientific understanding improves.³⁰

An Interagency Working Group on the Social Cost of Carbon—composed of members of the Department of Agriculture, Department of Commerce, Department of Energy, Environmental Protection Agency, and Department of Transportation, among others—was tasked with the development of a consistent value for the social benefits of climate change abatement. Four values were developed (see Section 3 for more explanation of the “social cost of carbon” methodology). These values—\$11, \$36, \$55, and \$101 per ton of CO₂ in 2013, rising over time—represent average (most likely) damages at three discount rates, along with one estimate at the 95th percentile of the assumed distribution of climate impacts.^{31,32,33,34} While

²⁵ “CO₂e” refers to CO₂-equivalent, the combination of CO₂ and an equivalent value for other greenhouse gases.

²⁶ CARB 2013a. “California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms to Allow for the Use of Compliance Instruments by Linked Jurisdictions.” July 2013. Available at: <http://www.arb.ca.gov/cc/capandtrade/ctlinkqc.pdf>. Legislated value is 25,000 metric tons, converted here to short tons.

²⁷ CARB 2013b. “CARB Quarterly Auction 4, August 2013: Summary Results Report.” August 21, 2013. Available at: <http://www.arb.ca.gov/cc/capandtrade/auction/august-2013/results.pdf>.

²⁸ Interagency Working Group on the Social Cost of Carbon, U. S. G. (2010). Appendix 15a. Social cost of carbon for regulatory impact analysis under Executive Order 12866. In Final Rule Technical Support Document (TSD): Energy Efficiency Program for Commercial and Industrial Equipment: Small Electric Motors. U.S. Department of Energy. URL <http://go.usa.gov/3fh>.

²⁹ Interagency Working Group on the Social Cost of Carbon (2013) Technical Support Document – Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis – Under Executive Order 12866. Available at: http://www.whitehouse.gov/sites/default/files/omb/inforeg/social_cost_of_carbon_for_ria_2013_update.pdf.

³⁰ 2013 Economic Report of the President (2013). Chapter 6. March 2013. Available at: http://www.whitehouse.gov/sites/default/files/docs/erp2013/ERP2013_Chapter_6.pdf.

³¹ These values represent recently revised costs for the SCC. Originally, these values were \$5, \$21, \$35, and \$65 per metric tonne for the year 2010 in 2007 dollars.

³² In a 2012 paper, Ackerman and Stanton modified the Interagency Working Group's assumptions regarding uncertainty in the sensitivity of temperature change to emissions, the expected level of damages at low and high greenhouse gas concentrations, and the assumed discount rate, and found values for the social cost of carbon ranging from the Working Group's level up to more than an order of magnitude greater. Similarly, Laurie Johnson and Chris Hope modified discount rates and methodologies and found results up to twelve times larger than the Working Group's central estimate.

subject to significant uncertainty, this multi-agency effort represents an initial attempt at incorporating the benefits associated with CO₂ abatement into federal policy.

As of May 2012, these estimates had been used in at least 20 federal government rulemakings, for policies including fuel economy standards, industrial equipment efficiency, lighting standards, and air quality rules.^{35,36} In the first rule in which the revised 2013 values were used—improving energy efficiency in microwave ovens—the net present value of benefits over a 30-year timeframe increased by \$400 million as a result of the increase in effective carbon price.³⁷ While a carbon price for federal rulemaking assessments is a fundamentally different kind of cost metric than the others discussed in this report, it nonetheless represents a dollar value for greenhouse gas emissions currently in use by the U.S. federal government.

7. RECENT CO₂ PRICE FORECASTS FROM THE RESEARCH COMMUNITY

The Energy Modeling Forum (EMF), a working group of government and private modeling teams, has been convening to explore energy system issues since the late 1970s. The group recently completed its EMF 24 analysis with the objective of evaluating what CO₂ price trajectories are consistent with proposed emission reduction targets under different technology scenarios. This analysis also incorporated several complementary policies in a cap-and-trade proposal, including: transportation emissions reduction through vehicle gas mileage standards; renewable portfolio standards in the electric sector; and mandates that all new coal facilities employ carbon capture and storage (CCS) technology—a

³³ Frank Ackerman and Elizabeth A. Stanton (2012). "Climate Risks and Carbon Prices: Revising the Social Cost of Carbon." *Economics: The Open-Access, Open-Assessment E-Journal*, Vol. 6, 2012-10. <http://dx.doi.org/10.5018/economics-ejournal.ja.2012-10>.

³⁴ Laurie T. Johnson, Chris Hope. "The social cost of carbon in U.S. regulatory impact analyses: an introduction and critique." *Journal of Environmental Studies and Sciences*, 2012; DOI: 10.1007/s13412-012-0087-7.

³⁵ Robert E. Kopp and Bryan K. Mignone (2012). "The U.S. Government's Social Cost of Carbon Estimates after Their First Two Years: Pathways for Improvement." *Economics: The Open-Access, Open-Assessment E-Journal*, Vol. 6, 2012-15. <http://dx.doi.org/10.5018/economics-ejournal.ja.2012-15>.

³⁶ See, for example, "Rulemaking for Microwave Ovens Energy Conservation Standard: Technical Support Document." May 2013. Available at: http://www1.eere.energy.gov/buildings/appliance_standards/rulemaking.aspx/ruleid/37

³⁷ Brad Blumer (2013). "The social cost of carbon is on the rise." *The Washington Post*, June 6th, 2013. Available at: http://articles.washingtonpost.com/2013-06-06/business/39789409_1_carbon-dioxide-emissions-obama-administration.

policy similar to EPA's proposed NSPS for coal plants. Nine modeling teams participated in this study.^{38,39}

Results from the EMF 24 exercise show a range of CO₂ price trajectories depending on availability of new technologies, policy type, model baseline trajectories, and other more structural characteristics of the models. One question asked by this study that is of particular relevance to users of the Synapse CO₂ price forecast is: which economic sectors would emissions reductions come from in an economically efficient approach to emissions mitigation? Consistent with earlier EMF analyses, the electric sector was found to be the largest contributor to CO₂ emissions reductions across all models.

Under a cap-and-trade scenario designed to reduce energy system emissions 50 percent below 2005 levels by 2050, most of the EMF 24 models reduced electric sector emissions by 75 percent by 2050. Under an 80 percent emissions reduction scenario, most of the additional emissions reductions came from other sectors. Although CO₂ prices are higher under the 80 percent scenario, most electricity customers are not paying these prices, as the electricity sector is largely decarbonized before 2050.

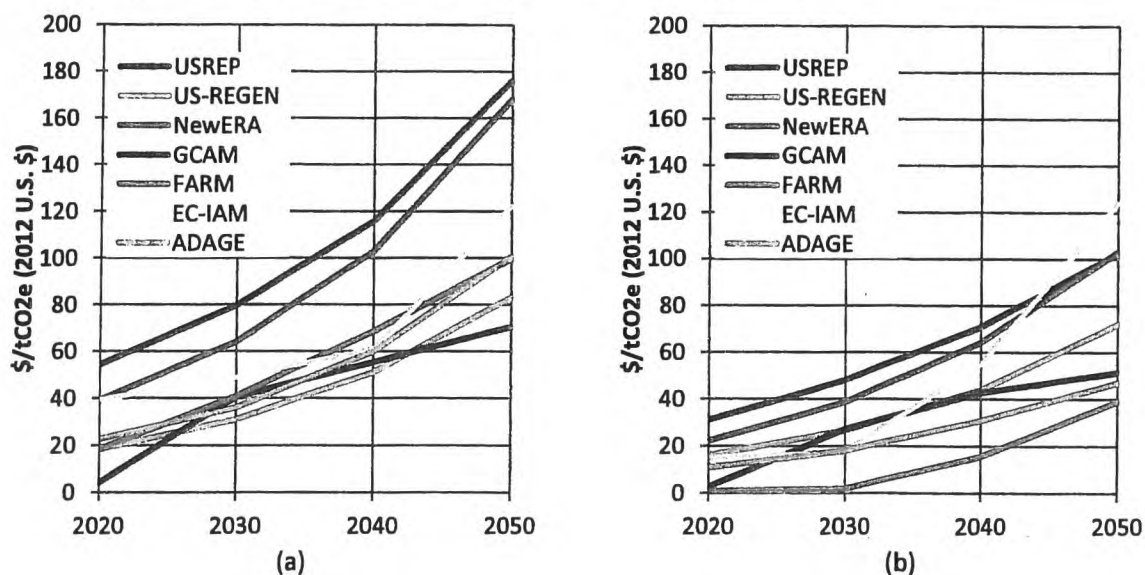
CO₂ prices estimated by the EMF 24 models show substantial variation. While it is difficult to distinguish the roles of model structure and model assumptions in this variation, the results present a reasonable range across which prices may fall. Under the most optimistic technology assumptions, with low-cost renewables, high levels of energy efficiency, and availability of new nuclear and CCS, CO₂ prices in 2020 fell between \$10 per tCO₂ and \$40 per tCO₂. In contrast, prices fell between \$20 per tCO₂ to \$80 per tCO₂ under the most pessimistic assumptions. Complementary policies, such as renewable portfolio standards or fuel economy standards, reduce carbon prices, as indicated in Figure 1.

Universally, the models show that substantial emissions reductions are not achievable in the absence of a policy. Even in the most optimistic technology scenario, the most aggressive emissions reductions from any model in the absence of a policy was 0.19 percent per year, resulting in emissions 7 percent below 2005 levels in 2050.

³⁸ Clarke, L.C., A.A. Fawcett, J.P. Weyant, V. Chaturvedi, J. MacFarland, Y. Zhou, "Technology and U.S. Emissions Reductions Goals: Results of the EMF 24 Modeling Exercise," (forthcoming). *The Energy Journal*.

³⁹ Fawcett, A.A., L.C. Clarke, S. Rausch, J.P. Weyant. "Overview of EMF 24 Policy Scenarios," (forthcoming). *The Energy Journal*.

Figure 1: Allowance prices from EMF study under (a) 50 percent cap-and-trade policy and with (b) the addition of several complementary policies (optimistic CCS/nuclear technology assumptions)^{35,36}



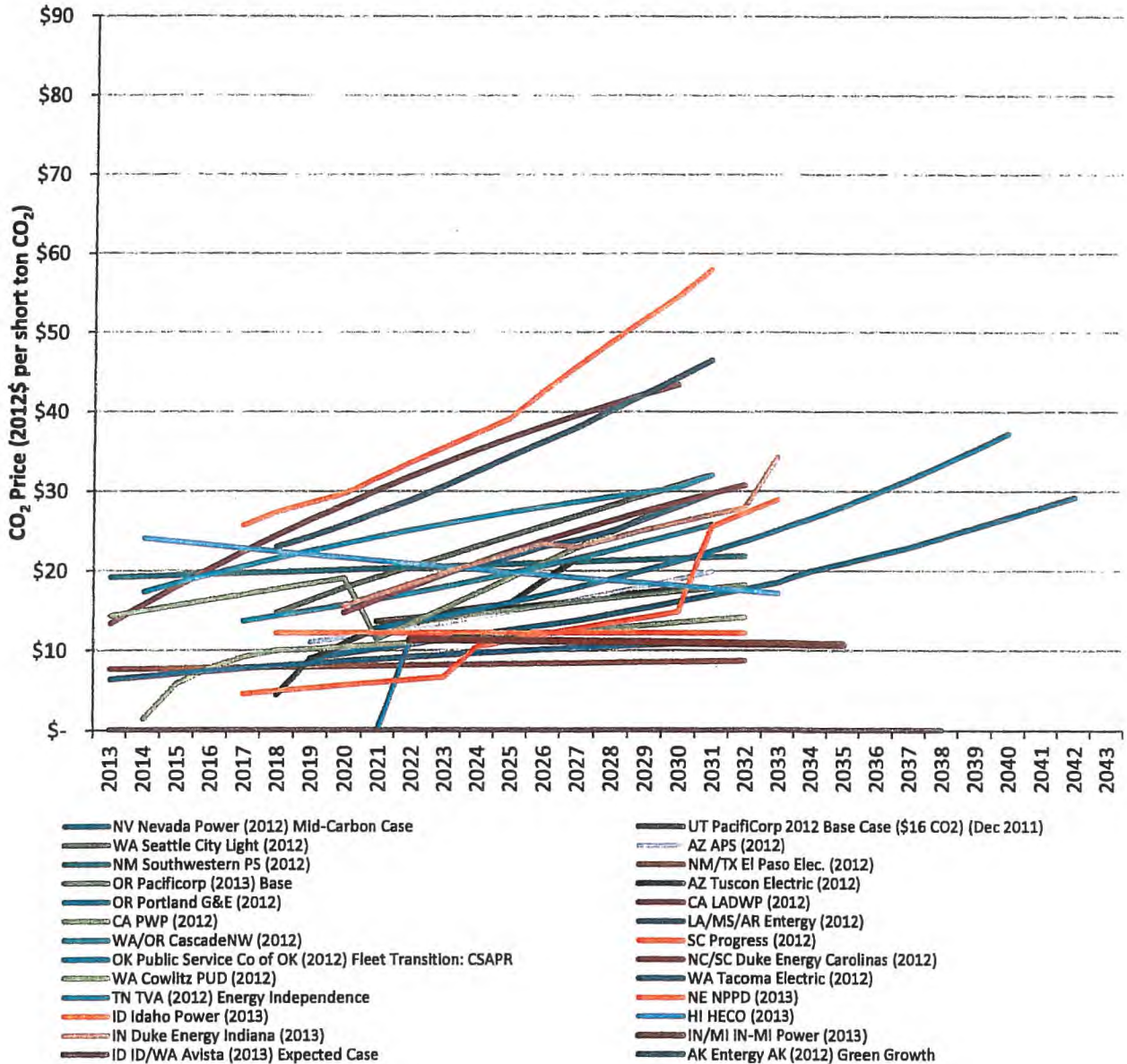
8. CO₂ PRICE FORECASTS IN UTILITY IRPs

A growing number of electric utilities include projections of the costs that will be associated with greenhouse gas emissions in their resource planning procedures. Figure 2 summarizes the reference case values (often described as their “mid” or “central” values) of publicly available forecasts used by utilities in resource planning over the past two years.⁴⁰

Despite ongoing obstacles to a federally legislated CO₂ price and challenges in Congress to addressing climate or energy policy in a meaningful way, many utilities are including an effective price for carbon in their planning. The majority of utility reference case carbon price forecasts start in the 2015-2020 timeframe, and rise gradually (in real terms) throughout the study period.

⁴⁰ Where a utility has released multiple IRP or IRP updates in the past two years, we have included only the most recent value. The IRPs shown here represent those publicly available by internet as of the October 2013.

Figure 2: Utility Reference Case Forecasts from 2012 and 2013



9. OVERVIEW OF THE EVIDENCE FOR A FUTURE CO₂ PRICE

Our CO₂ price forecasts are developed based on the data sources and information presented above and reflect a reasonable range of expectations regarding future efforts to limit greenhouse gas emissions.

The following items have guided the development of the Synapse forecasts:

- **Regulatory measures limiting CO₂ emissions from power plants will be implemented in the near term.** The EPA is required to propose emissions standards for existing power plants under Section 111(d) of the Clean Air Act by June 2014. Standards for new power plants were proposed on September 20, 2013. These actions represent an effective price that will affect utility planning and operational decisions.
- **State and regional action limiting CO₂ is ongoing and growing more stringent.** In the Northeast, the RGGI CO₂ cap has been tightened, resulting in higher CO₂ prices for electric generators in the region. California's Cap-and-Trade Program, which represents an even larger carbon market than RGGI, has held many successful allowance auctions, and has been successfully defended against numerous legal challenges.
- **A price for CO₂ is already being factored into federal rulemakings.** The federal government has demonstrated a commitment to considering the benefits of CO₂ abatement in rulemakings such as fuel economy and appliance standards.
- **Ongoing analysis of emissions caps suggests a wide range of possible prices.** Important factors include the stringency of any future climate policy, the existence of complementary policies, technology availability, and how quickly old capital stock can be phased out in favor of new technologies.
- **Electric suppliers continue to account for the opportunity cost of CO₂ abatement in their resource planning.** Prudent planning requires utilities to consider adequately the potential for future policies. The range of carbon prices reported in section 8 indicates that many utilities believe that by 2020 there will likely be significant economic pressure towards low-carbon electric generation.

10. SYNAPSE 2013 CO₂ PRICE FORECAST

Based on analyses of the sources described in sections 3 through 8 (above), and relying on our own expert judgment, Synapse has developed Low, Mid, and High case forecasts for CO₂ prices from 2013 to 2040. Figure 3 and Table 1 show the Synapse forecasts over this period.

Figure 3: Synapse 2013 CO₂ Price Trajectories

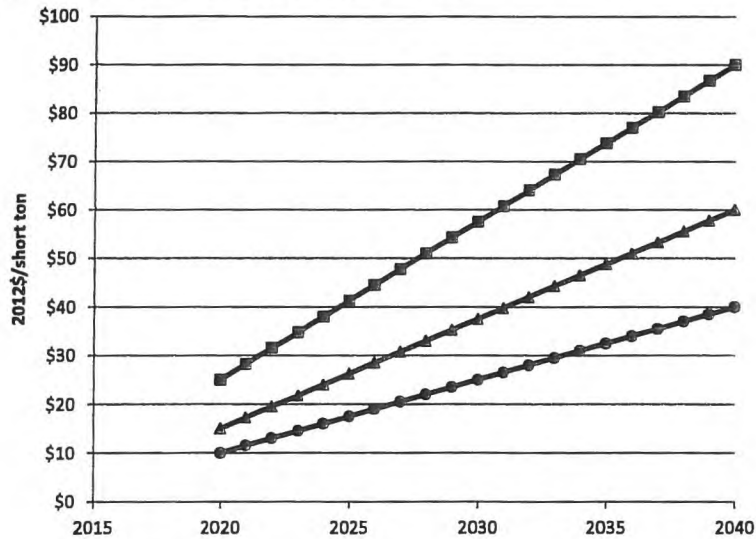


Table 1: Synapse 2013 CO₂ Allowance Price Projections (2012 dollars per ton CO₂)

Year	Low Case	Mid Case	High Case
2020	\$10.00	\$15.00	\$25.00
2021	\$11.50	\$17.25	\$28.25
2022	\$13.00	\$19.50	\$31.50
2023	\$14.50	\$21.75	\$34.75
2024	\$16.00	\$24.00	\$38.00
2025	\$17.50	\$26.25	\$41.25
2026	\$19.00	\$28.50	\$44.50
2027	\$20.50	\$30.75	\$47.75
2028	\$22.00	\$33.00	\$51.00
2029	\$23.50	\$35.25	\$54.25
2030	\$25.00	\$37.50	\$57.50
2031	\$26.50	\$39.75	\$60.75
2032	\$28.00	\$42.00	\$64.00
2033	\$29.50	\$44.25	\$67.25
2034	\$31.00	\$46.50	\$70.50
2035	\$32.50	\$48.75	\$73.75
2036	\$34.00	\$51.00	\$77.00
2037	\$35.50	\$53.25	\$80.25
2038	\$37.00	\$55.50	\$83.50
2039	\$38.50	\$57.75	\$86.75
2040	\$40.00	\$60.00	\$90.00
Levelized 2020-2040	\$22.36	\$33.54	\$51.79

In these forecasts, state and regional policies, together with federal regulatory measures, place economic pressure on CO₂ emitting resources in the next several years, such that it is relatively more expensive to operate a high-carbon-emitting power plant. These pressures are followed later by a broader federal policy, such as cap and trade. In any state other than the RGGI region and California, we assume a zero carbon price through 2019; beginning in 2020, we expect that federal regulatory measures will put economic pressure on carbon-emitting power plants throughout the United States. All annual allowance prices and levelized values are reported in 2012 dollars per short ton of carbon dioxide.

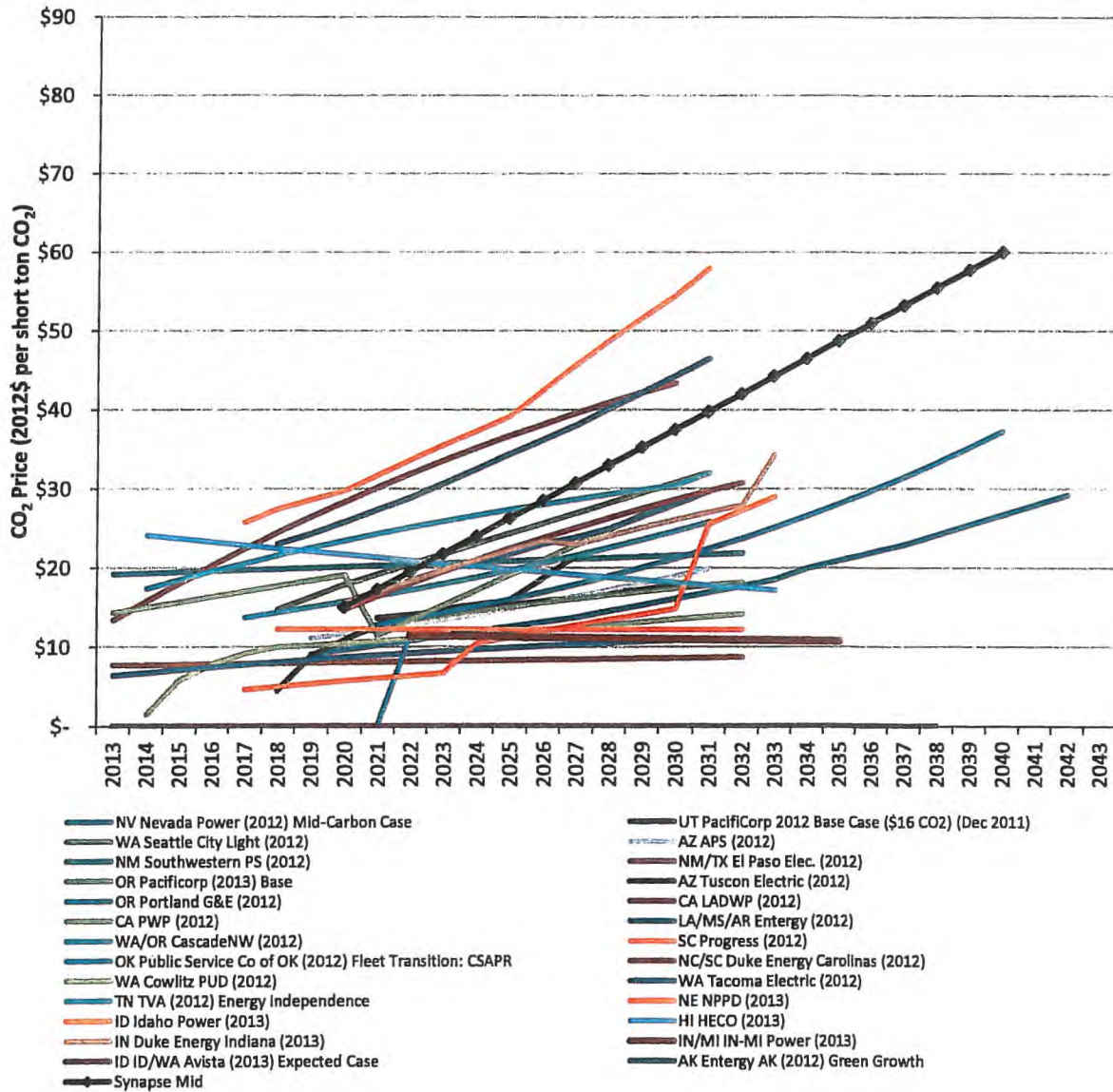
- The **Low case** forecasts a carbon price that begins in 2020 at \$10 per ton, and increases to \$40 per ton in 2040, representing a \$22 per ton levelized price over the period 2020-2040. This forecast represents a scenario in which federal policies—either regulatory or legislative—exist but are not very stringent.
- The **Mid case** forecasts a carbon price that begins in 2020 at \$15 per ton, and increases to \$60 per ton in 2040, representing a \$34 per ton levelized price over the period 2020-2040. This forecast represents a scenario in which federal policies are implemented with significant but reasonably achievable goals.
- The **High case** forecasts a carbon price that begins in 2020 at \$25 per ton, and increases to approximately \$90 per ton in 2040, representing a \$52 per ton levelized price over the period 2020-2040. This forecast is consistent with the occurrence of one or more factors that have the effect of raising carbon prices. These factors include somewhat more aggressive emissions reduction targets; greater restrictions on the use of offsets; restricted availability or high cost of technology alternatives such as nuclear, biomass and carbon capture and sequestration; more

aggressive international actions (thereby resulting in fewer inexpensive international offsets available for purchase by U.S. emitters); or higher baseline emissions.

These price trajectories are designed for planning purposes, so that a reasonable range of emissions costs can be used to investigate the likely costs of alternative resource plans. We expect an actual CO₂ price to fall somewhere between the low and high estimates throughout the forecast period.

In Figure 4, the Synapse Mid forecast is shown in comparison to the reference case utility forecasts presented earlier. See Appendix A for comparisons to utilities' Low and High case forecasts.

Figure 4: Synapse Mid Forecast Compared to Recent Utility Mid Case Forecasts



In Figure 5, the Synapse forecasts are compared to the carbon price used in federal rulemaking. While

the federal price starts out higher in 2020, the Synapse Mid forecast approaches this value at the end of the projected period. In Figure 6, the Synapse forecasts for 2020 are compared to several of the sources identified in this report: the carbon price used in federal rulemakings, EMF 24 study results, and recent utility forecasts. The high and low ends of these sources span a wide range, but the central values show less variation.

Figure 5: Synapse Forecast Compared to Carbon Price Used in Federal Rulemakings

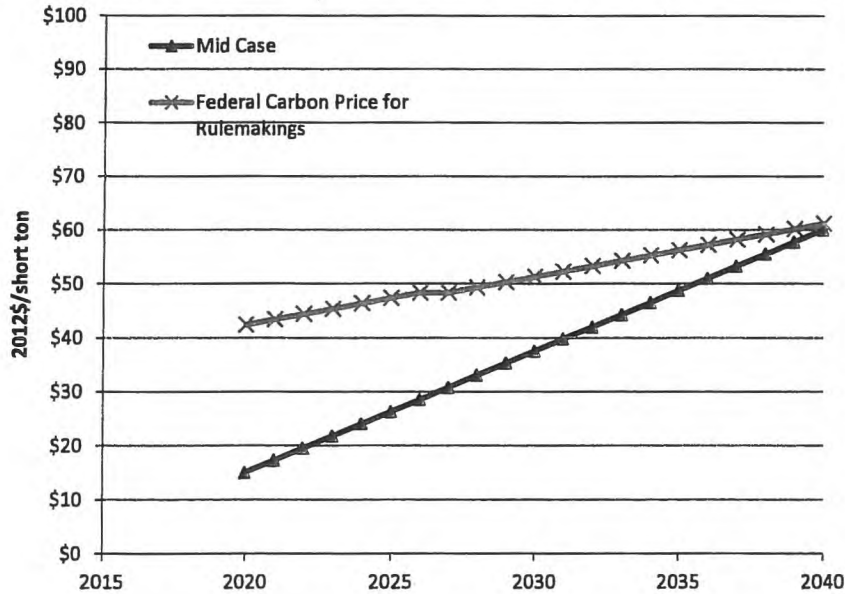
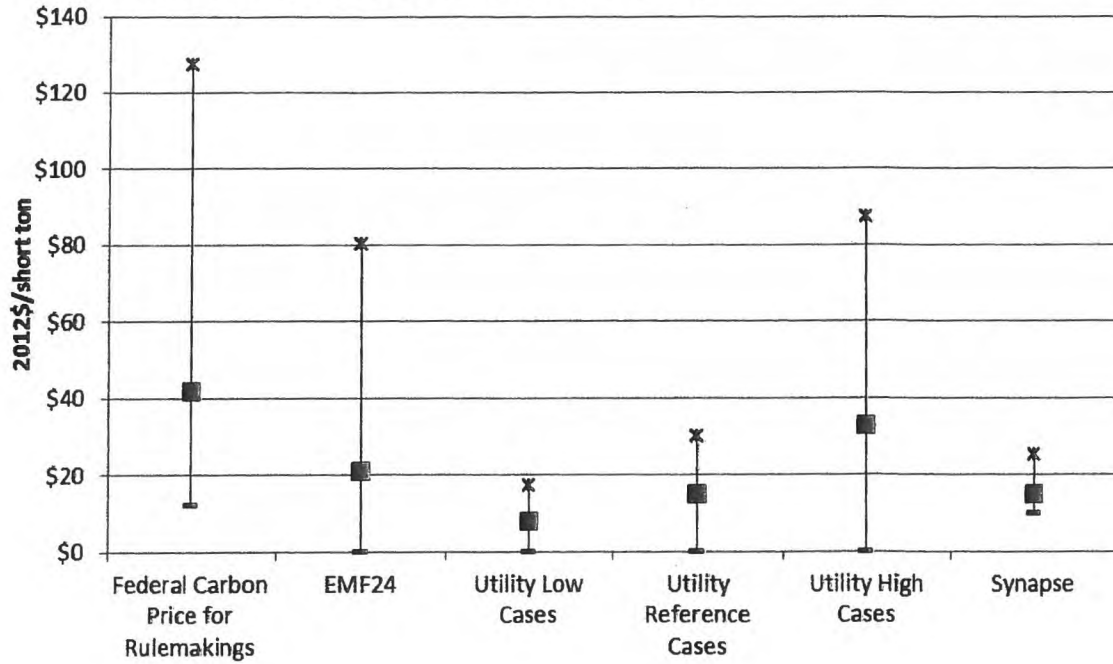


Figure 6: Synapse CO₂ Forecasts for 2020 Compared to Other Sources



APPENDIX A: SYNAPSE FORECAST COMPARED TO UTILITY FORECASTS

Figure 7: Synapse CO₂ Price Forecast Compared to Recent Utility Low-case Forecasts

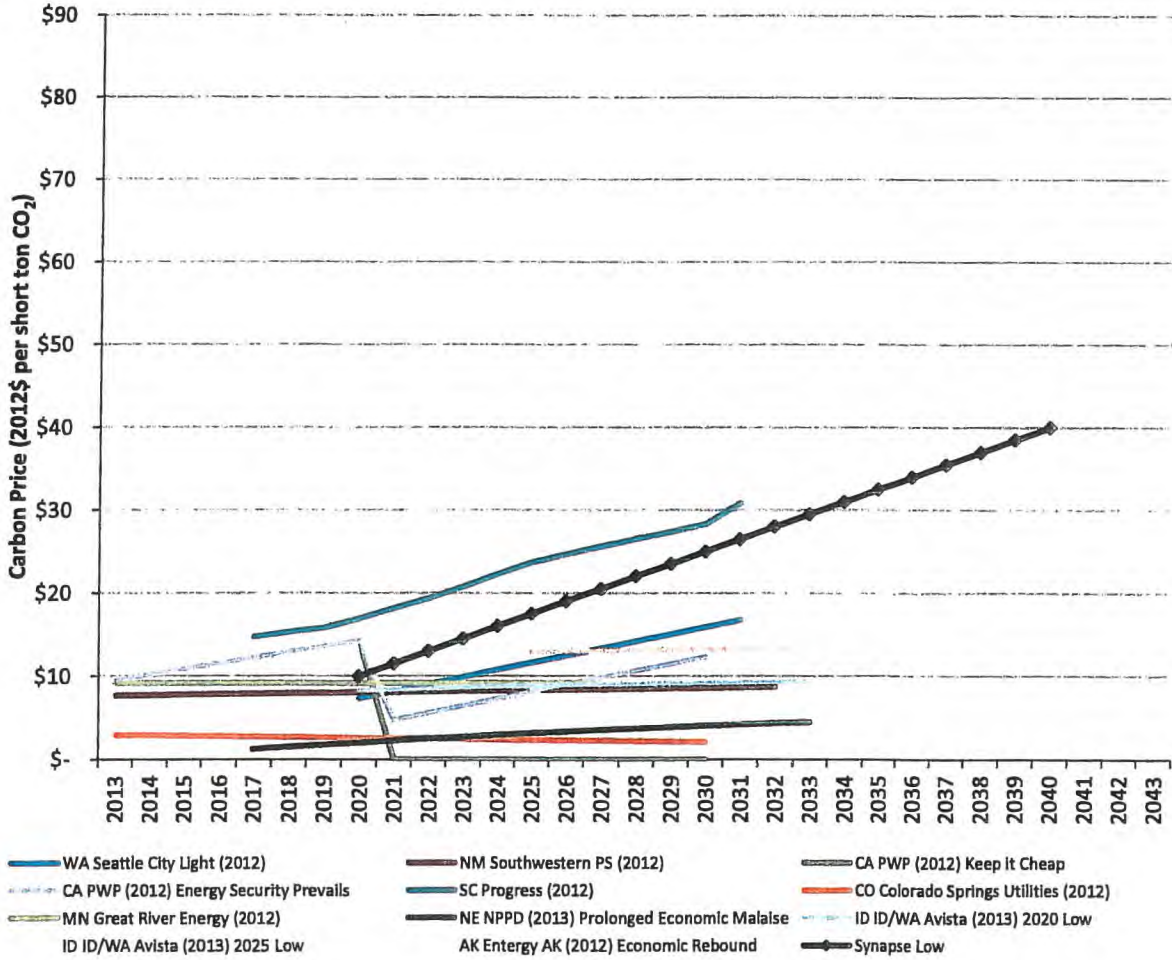
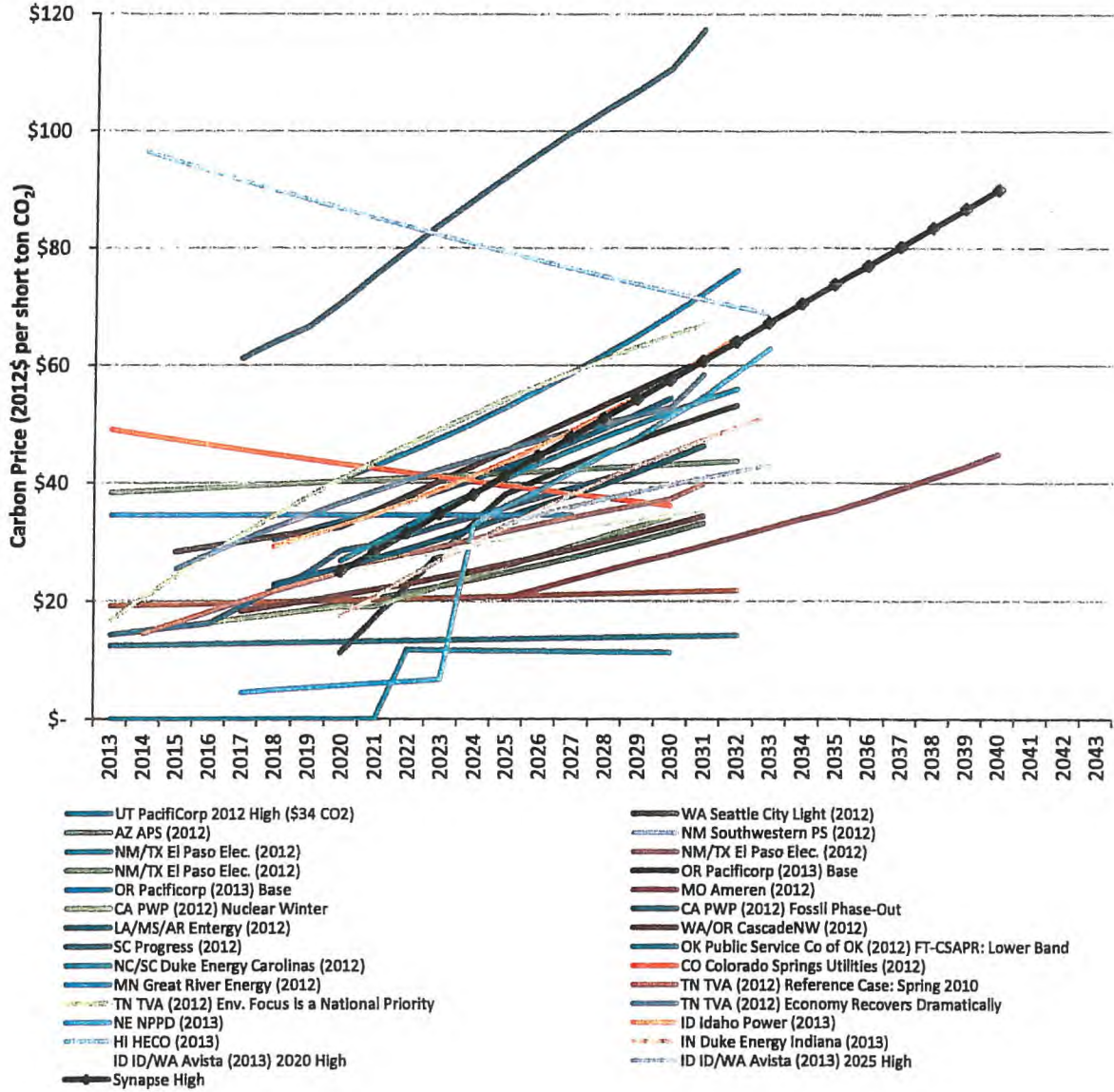


Figure 8: Synapse CO₂ Price Forecast Compared to Recent Utility High-case Forecasts



BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to the Office of the Attorney General's
Initial Request for Information
Dated August 20, 2014

September 10, 2014

1 **Item 21)** **Please provide the estimated (or actual) total cost for each of the**
2 **transmission projects listed in Table 6.1.**

3

4 **Response)** The requested confidential cost information follows:

5

6 Olivet Church Rd. 69 kV line addition: [REDACTED]

7 Reid – Daviess Co. 161 kV reconductor: [REDACTED]

8 Coleman – Coleman EHV 161 kV line 1 and line 2 reconductor: [REDACTED]

9 Coleman – Newtonville 161 kV line reconductor: [REDACTED]

10 Armstrong Dock 69 kV Service: [REDACTED]

11 Equality 69 kV Service: [REDACTED]

12 Falls of Rough – McDaniels 69 kV line addition: [REDACTED]

13 Cannelton 69 kV Service: [REDACTED]

14 Lewis Creek 69 kV Service: [REDACTED]

15 Wilson 161 kV terminal for new tap line: [REDACTED]

16 Wilson 161/69 kV transformer addition: [REDACTED]

17 Wilson – Centertown 69 kV line: [REDACTED]

18 Meade – Garrett 69 kV line reconductor: [REDACTED]

BIG RIVERS ELECTRIC CORPORATION
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September 10, 2014

- 1 Garrett – Flaherty 69 kV line project: [REDACTED]
- 2 Riveredge 69 kV Transmission Service: [REDACTED]
- 3 Maxon 69 kV Service: [REDACTED]
- 4 Elk Creek 69 kV Transmission Service: [REDACTED]
- 5 Wilson – KU Matanzas 161 kV line: [REDACTED]
- 6
- 7 **Witness)** Christopher S. Bradley

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to the Office of the Attorney General's
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Dated August 20, 2014

September 10, 2014

1 **Item 22) Please provide the estimated total cost for each of the transmission**
2 **projects listed in Table 6.2.**

3

4 **Response) The requested estimated confidential cost information follows:**

5

6 Paradise 161 kV reconductor from new tap point: [REDACTED]

7 Buttermilk 69 kV Service: [REDACTED]

8 Cumberland – Caldwell Springs 69 kV line: [REDACTED]

9 Hancock County 69 kV mobile capacitor bank: [REDACTED]

10 White Oak 161/69 kV substation metering: [REDACTED]

11 Irvington Substation switching & metering: [REDACTED]

12 Meade County 161/69 kV transformer replacements (2): [REDACTED]

13 West Owensboro 69 kV reconductor: [REDACTED]

14 KU Matanzas – New Hardinsburg/Paradise 161 kV tap line: [REDACTED]

15 Wilson – Sacramento 69 kV line addition: [REDACTED]

16 Thruston Junction – East Owensboro 69 kV reconductor: [REDACTED]

17 Rome Junction – Philpot Tap 69 kV reconductor: [REDACTED]

18 HMP&L Sub 4 161/69 kV transformer addition [REDACTED]

BIG RIVERS ELECTRIC CORPORATION
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OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to the Office of the Attorney General's
Initial Request for Information
Dated August 20, 2014

September 10, 2014

1

2 **Witness)** Christopher S. Bradley

BIG RIVERS ELECTRIC CORPORATION
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1 **Item 23) Referencing Table 9.2, please provide the following:**

2 **a. All source material used to prepare Table 9.2.**

3 **b. Explanation of why the typical size of units was 50 MW for**
4 **Nuclear, Coal, Combined Cycle, Combustion Turbine, and Biomass units.**

5 **c. Is it assumed that partial ownership of nominally sized units of**
6 **these types would be available?**

7
8 **Response) a.** Please see the three attachments to this response. Most information in
9 Table 9.2 was developed from information in these sources. Some values in these sources
10 were adjusted slightly based on internal discussions.

11 **b.** Consistent sizing was used for these types of units to allow the model
12 to select resources without a bias against larger units. This facilitates unit selection based
13 more on type of resource (defined by capital cost/kW and operating costs and
14 characteristics), rather than size and the associated total capital cost of a “whole” unit of any
15 of these types.

16 **c.** It is assumed that needs could be served through partial ownership of,
17 or through unit purchases of, capacity associated with each type of resource.

18

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September 10, 2014

1 **Witness)** Marlene S. Parsley

Unit	SCPC Coal	HCPP Sensitivity	7EA 1 x 1 CC	1x7EA	Additional 7EA	7FA
Capacity Rating (MW) - Summer	50.0	50.0	135.0	75.0	75.0	160.0
Capacity Rating (MW) - Winter			145.0	84.0	84.0	180.0
Capacity Rating (MW) - Shoulder			140.0	80.0	80.0	170.0
Equiv, Forced Outage Rate		5.2%	4.5%	2.9%	2.9%	2.9%
Planned Maintenance	(2)	(4)	(1)	(1)	(1)	(1)
Fuel Rate (\$/MWh)	19.17	53.88	60.27	84.87	84.87	
Summer						
Avg Heat Rate (mmbtu/MWh) - 100%	9.41	7.60	8.50	11.97	11.97	10.35
Avg Heat Rate (mmbtu/MWh) - 75%			7.90	12.54	12.54	10.84
Avg Heat Rate (mmbtu/MWh) - 50%			8.30	14.24	14.24	12.31
Winter						
Avg Heat Rate (mmbtu/MWh) - 100%			8.30	10.97	10.97	9.49
Avg Heat Rate (mmbtu/MWh) - 75%			7.70	11.39	11.39	9.85
Avg Heat Rate (mmbtu/MWh) - 50%			8.10	13.72	13.72	11.86
Shoulder						
Avg Heat Rate (mmbtu/MWh) - 100%			8.40	11.63	11.63	10.06
Avg Heat Rate (mmbtu/MWh) - 75%			7.80	12.25	12.25	10.59
Avg Heat Rate (mmbtu/MWh) - 50%			8.20	13.88	13.88	12.00
VOM (\$/MWh)	3.25	3.75	3.50	3.00	3.00	3.00
FOM (\$/kw-mo)	3.04	0.64	2.00	1.33	0.30	1.00
Fuel Price (\$/mmbtu)		7.09	7.09	7.09	7.09	7.09

Unit	SCPC Coal	HCPP Sensitivity	7EA 1 x 1 CC	1x7EA	Additional 7EA	7FA
Emissions (lb/MWh)						
NOx	0.47	0.38	0.43	1.08	1.08	0.93
CO2	1930	0	978	1377	1377	1190
SO2	0.75	0.00	0.00	0.00	0.00	0.00
Hg	0.000011	0.00	0.00	0.00	0.00	0.00
Emissions Cost (\$/lb)						
NOx - Seasonal	\$0.35	\$1.35	\$0.35	\$0.35	\$0.35	\$0.35
NOx - Annual	\$1.35	\$0.00	\$1.35	\$1.35	\$1.35	\$1.35
CO2	\$0.00	\$0.28	\$0.00	\$0.00	\$0.00	\$0.00
SO2	\$0.28	\$15,000	\$0.28	\$0.28	\$0.28	\$0.28
Hg	\$15,000					
Emissions Cost Sensitivity (+50%) (\$/lb)						
NOx - Seasonal	\$0.53	\$2.03	\$0.53	\$0.53	\$0.53	\$0.53
NOx - Annual	\$2.03	\$0.00	\$2.03	\$2.03	\$2.03	\$2.03
SO2	\$0.41	\$22,500.00	\$0.41	\$0.41	\$0.41	\$0.41
Hg	\$22,500.00					
CO2 Cost Sensitivities (\$/lb)						
Sensitivity 1	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01
Sensitivity 2	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02
Capital Cost (\$/kW) 2008\$						
Escalation @6% annually for two years	1.1236	0	1.1236	1.1236	1.1236	1.1236
Capital Cost (\$/kW) 2010\$	\$3,184	\$575	\$1,645	\$926	\$694	\$718
Capital Cost Sensitivity (+20%)						
	\$3,821	\$690	\$1,974	\$1,111	\$833	\$861
Coops Borrowing Rate						
	5.88%	5.88%	5.88%	5.88%	5.88%	5.88%

Unit	SCPC Coal	HCPP Sensitivity	7EA 1 x 1 CC	1x7EA	Additional 7EA	7FA
Borrowing Rate Sensitivity (+20%)	7.06%	7.06%	7.06%	7.06%	7.06%	7.06%
Life of Unit	40	30	30	30	30	30
Source Year:	2010	2010	2010	2010	2010	

- Notes: (1) Two weeks each spring.
(2) 8-week outage one year after COD. Otherwise, 4 weeks spring, one week fall. Major outage interval of 7 years
(3) Use \$.015/lb (\$30/ton) for CO2 sensitivity cases.
(4) Two weeks each spring.

New Resources

Unit	Additional Set		Additional Set		Additional Unit	
	FT8 TwinPak	FT8 TwinPak	2 x RR Trent	2 x RR Trent	LMS 100	LMS 100
Capacity Rating (MW) - Summer	55.1	55.1	90.0	90.0	96.0	96.0
Capacity Rating (MW) - Winter	62.7	62.7	102.4	102.4	100.3	100.3
Capacity Rating (MW) - Shoulder	58.3	58.3	95.2	95.2	99.5	99.5
Equiv, Forced Outage Rate	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%
Planned Maintenance	(1)	(1)	(1)	(1)	(1)	(1)
Fuel Rate (\$/MWh)	75.72	75.72	70.19	70.19	66.58	66.58
Summer						
Avg Heat Rate (mmbtu/MWh) - 100%	10.68	10.68	9.90	9.90	9.39	9.39
Avg Heat Rate (mmbtu/MWh) - 75%	10.72	10.72	9.94	9.94	9.60	9.60
Avg Heat Rate (mmbtu/MWh) - 50%	11.87	11.87	11.00	11.00	11.16	11.16
Winter						
Avg Heat Rate (mmbtu/MWh) - 100%	10.41	10.41	9.65	9.65	9.19	9.19
Avg Heat Rate (mmbtu/MWh) - 75%	10.94	10.94	10.14	10.14	9.95	9.95
Avg Heat Rate (mmbtu/MWh) - 50%	13.47	13.47	12.49	12.49	11.17	11.17
Shoulder						
Avg Heat Rate (mmbtu/MWh) - 100%	10.52	10.52	9.75	9.75	9.21	9.21
Avg Heat Rate (mmbtu/MWh) - 75%	10.94	10.94	10.14	10.14	9.69	9.69
Avg Heat Rate (mmbtu/MWh) - 50%	12.06	12.06	11.18	11.18	11.05	11.05
VOM (\$/MWh)	3.30	3.30	3.30	3.30	3.00	3.00
FOM (\$/kw-mo)	1.00	0.10	1.00	0.10	0.67	0.10
Fuel Price (\$/mmbtu)	7.09	7.09	7.09	7.09	7.09	7.09

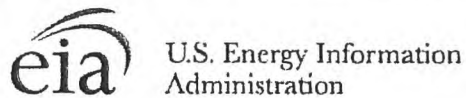
Unit	New Resources					
	FT8 TwinPak	Additional Set FT8 TwinPak	2 x RR Trent	Additional Set 2 x RR Trent	LMS 100	Additional Unit LMS 100
Emissions (lb/MWh)						
NOx	1.07	0.96	0.89	0.89	0.85	0.85
CO2	1228	1228	1139	1139	1080	1080
SO2	0.00	0.00	0.00	0.00	0.00	0.00
Hg	0.00	0.00	0.00	0.00	0.00	0.00
Emissions Cost (\$/lb)						
NOx - Seasonal	\$0.35	\$0.35	\$0.35	\$0.35	\$0.35	\$0.35
NOx - Annual	\$1.35	\$1.35	\$1.35	\$1.35	\$1.35	\$1.35
CO2	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
SO2	\$0.28	\$0.28	\$0.28	\$0.28	\$0.28	\$0.28
Hg						
Emissions Cost Sensitivity (+50%) (\$/lb)						
NOx - Seasonal	\$0.53	\$0.53	\$0.53	\$0.53	\$0.53	\$0.53
NOx - Annual	\$2.03	\$2.03	\$2.03	\$2.03	\$2.03	\$2.03
SO2	\$0.41	\$0.41	\$0.41	\$0.41	\$0.41	\$0.41
Hg						
CO2 Cost Sensitivities (\$/lb)						
Sensitivity 1	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01
Sensitivity 2	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02	\$0.02
Capital Cost (\$/kW) 2008\$						
Escalation @6% annually for two years	1.1236	1.1236	1.1236	1.1236	1.1236	1.1236
Capital Cost (\$/kW) 2010\$	\$1,129	\$903	\$1,123	\$898	\$1,056	\$845
Capital Cost Sensitivity (+20%)						
	\$1,355	\$1,084	\$1,348	\$1,078	\$1,267	\$1,014
Coops Borrowing Rate						
	5.88%	5.88%	5.88%	5.88%	5.88%	5.88%

Unit	New Resources					
	FT8 TwinPak	Additional Set FT8 TwinPak	2 x RR Trent	Additional Set 2 x RR Trent	LMS 100	Additional Unit LMS 100
Borrowing Rate Sensitivity (+20%)	7.06%	7.06%	7.06%	7.06%	7.06%	7.06%
Life of Unit	30	30	30	30	30	30
Source Year:	2010	2010	2010	2010	2010	2010

Unit	Additional Set	
	2 x LM6000	2 x LM6000
Capacity Rating (MW) - Summer	74.4	74.4
Capacity Rating (MW) - Winter	99.4	99.4
Capacity Rating (MW) - Shoulder	88.2	88.2
Equiv, Forced Outage Rate	2.9%	2.9%
Planned Maintenance	(1)	(1)
Fuel Rate (\$/MWh)	70.94	70.94
Summer		
Avg Heat Rate (mmbtu/MWh) - 100%	10.01	10.01
Avg Heat Rate (mmbtu/MWh) - 75%	10.23	10.23
Avg Heat Rate (mmbtu/MWh) - 50%	11.90	11.90
Winter		
Avg Heat Rate (mmbtu/MWh) - 100%	9.39	9.39
Avg Heat Rate (mmbtu/MWh) - 75%	10.17	10.17
Avg Heat Rate (mmbtu/MWh) - 50%	11.41	11.41
Shoulder		
Avg Heat Rate (mmbtu/MWh) - 100%	9.84	9.84
Avg Heat Rate (mmbtu/MWh) - 75%	10.35	10.35
Avg Heat Rate (mmbtu/MWh) - 50%	11.81	11.81
VOM (\$/MWh)	3.00	3.00
FOM (\$/kw-mo)	1.00	0.10
Fuel Price (\$/mmbtu)	7.09	7.09

Unit	2 x LM6000	Additional Set 2 x LM6000
Emissions (lb/MWh)		
NOx	0.91	0.91
CO2	1151	1151
SO2	0.00	0.00
Hg	0.00	0.00
Emissions Cost (\$/lb)		
NOx - Seasonal	\$0.35	\$0.35
NOx - Annual	\$1.35	\$1.35
CO2	\$0.00	\$0.00
SO2	\$0.28	\$0.28
Hg		
Emissions Cost Sensitivity (+50%) (\$/l		
NOx - Seasonal	\$0.53	\$0.53
NOx - Annual	\$2.03	\$2.03
SO2	\$0.41	\$0.41
Hg		
CO2 Cost Sensitivities (\$/lb)		
Sensitivity 1	\$0.01	\$0.01
Sensitivity 2	\$0.02	\$0.02
Capital Cost (\$/kW) 2008\$		
Escalation @6% annually for two years	1.1236	1.1236
Capital Cost (\$/kW) 2010\$	\$1,129	\$903
Capital Cost Sensitivity (+20%)		
	\$1,355	\$1,084
Coops Borrowing Rate		
	5.88%	5.88%

Unit	2 x LM6000	Additional Set 2 x LM6000
Borrowing Rate Sensitivity (+20%)	7.06%	7.06%
Life of Unit	30	30
Source Year:	2010	2010



Capital Cost For Electricity Plants

Updated Capital Cost Estimates for Utility Scale Electricity Generating Plants

Release Date: April 12, 2013

Introduction

The current and future projected cost and performance characteristics of new electric generating capacity are a critical input into the development of energy projections and analyses. The construction and operating costs, along with the performance characteristics of new generating plants, play an important role in determining the mix of capacity additions that will serve future demand for electricity. These parameters also help to determine how new capacity competes against existing capacity, and the response of the electric generators to the imposition of environmental controls on conventional pollutants or any limitations on greenhouse gas emissions.

In 2010, EIA commissioned an external consultant to develop up-to-date cost and performance estimates for utility-scale electric generating plants for *AEO 2011*.¹ This information allowed EIA to compare the costs of different power plant technologies on a standardized basis and was a key input enhancement to the National Energy Model System (NEMS). For the *AEO 2013* development, EIA commissioned the same consultant group to update the cost and performance estimates for each of the technologies evaluated in the original 2010 study. This paper summarizes the results of the findings and discusses how EIA uses the updated information to analyze the development of new capacity in the electric power sector.

Developing updated estimates: key design considerations

The focus of the 2013 update was to gather current information on the "overnight" construction costs, operating costs, and performance characteristics for a wide range of generating technologies.² The estimates were developed through costing exercises, using a common methodology across technologies. Comparing cost estimates developed on a similar basis using the same methodology is of particular importance to ensure modeling consistency.

Each technology is represented by a generic facility of a specific size and configuration, in a location that does not have unusual constraints or infrastructure requirements. Where possible, costs estimates were based on information derived from actual or planned projects known to the consultant. When this information was not available, the project costs were estimated using costing models that account for the current labor and materials rates necessary to complete the construction of a generic facility as well as consistent assumptions for the contractual relationship between the project owner and the construction contractor.

The specific overnight costs for each type of facility were broken down to include:

- **Civil and structural costs:** allowance for site preparation, drainage, the installation of underground utilities, structural steel supply, and construction of buildings on the site
- **Mechanical equipment supply and installation:** major equipment, including but not limited to, boilers, flue gas desulfurization scrubbers, cooling towers, steam turbine generators, condensers, photovoltaic modules, combustion turbines, and other auxiliary equipment

- **Electrical and instrumentation and control:** electrical transformers, switchgear, motor control centers, switchyards, distributed control systems, and other electrical commodities
- **Project indirect costs:** engineering, distributable labor and materials, craft labor overtime and incentives, scaffolding costs, construction management start up and commissioning, and fees for contingency³
- **Owners costs:** development costs, preliminary feasibility and engineering studies, environmental studies and permitting, legal fees, insurance costs, property taxes during construction, and the electrical interconnection costs, including a tie-in to a nearby electrical transmission system

Non-fuel operations and maintenance (O&M) costs associated with each of the power plant technologies were evaluated as well. The O&M costs that do not vary significantly with a plant's electricity generation are classified as fixed, while the costs incurred to generate electricity are classified as variable. The heat rates⁴ were also evaluated for the appropriate technologies.

It should be noted that all estimates provided in this report are broad in scope. A more in-depth cost assessment would require a more detailed level of engineering and design work, tailored to a specific site.

Findings

Table 1 summarizes updated cost estimates for generic utility-scale generating plants, including seven powered by coal, six by natural gas, three by solar energy, two each by wind, hydroelectric, biomass, and geothermal power, and one each by uranium and municipal solid waste. EIA does not model all of these generating plant types, but included them in the study in order to present consistent cost and performance information for a broad range of generating technologies. Additionally, while EIA does model new geothermal and hydroelectric capacity, site specific cost estimates from alternate sources are used in the NEMS model. The specific technologies represented in the NEMS model for *AEO2013* that use the cost data from this report are identified in the last column of Table 1.

Table 2 compares the updated overnight cost estimates to those developed for the 2010 report. To facilitate comparisons, the costs are expressed in 2012 dollars.⁵ Notable changes include:

- **Integrated Gasification Combined Cycle (IGCC) Coal Plants with and without carbon capture and storage (CCS):** The updated overnight capital cost estimates for single unit IGCC plants with and without CCS both rose by approximately 19 percent. This change can be primarily attributed to more recent information from current IGCC projects in various stages of the development process.⁶
- **Conventional Natural Gas Combined Cycle (NGCC):** The updated overnight capital cost for conventional NGCC plants declined by 10 percent relative to the cost in the 2010 study. In addition, the assumed capacity of these units rose from 540 MW in the 2010 study to 620 MW.
- **Onshore Wind:** Overnight costs for onshore wind decreased by approximately 13 percent relative to the 2010 study, primarily due to lower wind turbine prices.
- **Solar Photovoltaic:** The overnight capital costs for solar photovoltaic technologies decreased by 22 percent for 150 MW photovoltaic units from the costs presented in the 2010 study. The size of the smaller photovoltaic units evaluated was increased from 7 MW in the 2010 study to 20 MW in the 2013 study. Although it is not entirely consistent to compare these two systems, there was a significant decline in costs on a \$/kW basis from the 7 MW system to the 20 MW system. The overall decreases in costs can be attributed to a decline in the component costs and construction cost savings for the balance of plant.

As previously noted, costs are developed using a consistent methodology that includes a broad project scope and includes indirect and owners costs. The cost figures will not necessarily match those derived in other studies that employ different approaches to cost estimation.

It should also be noted that when modeling geothermal and hydroelectric power resources, EIA uses site-specific sources for the technology cost estimates, and not the estimates provided by the consultant, due to the site specific nature of those resource supply models.

EIA's analysis of technology choice in the electric power sector

EIA's modeling employs a net present value (NPV) capital budgeting methodology to evaluate different investment options for new power plants. Estimates of the overnight capital cost, fixed and variable operations and maintenance costs, and plant heat rates for generic generating technologies serve as a starting point for developing the total cost of new generating capacity. However, other parameters also play a key role in determining the total capital costs. Because several of these factors are dynamic, the realized overall capital cost for given technologies can vary based on a variety of circumstances. Five of the most notable parameters are:

- **Financing:** EIA determines the cost of capital required to build new power plants by calculating a weighted average cost of capital using a mix of macro-economic parameters determined through EIA's modeling and an assumed capital structure for the electric power industry.
- **Lead Time:** The amount of time needed to build a given type of power plant varies by technology. Projects with longer lead times increase financing costs. Each year of construction represents a year of additional interest charges before the plant is placed in service and starts generating revenue.
- **Inflation of material and construction costs:** The projected relationship between the rate of inflation for the overall economy and key drivers of plant costs, such as materials and construction, are important elements impacting overall plant costs. A projected economy-wide inflation rate that exceeds the projected inflation rate for materials and construction costs results in a projected decline in real (inflation-adjusted) capital costs and vice versa.
- **Resource Supply:** Technologies such as wind, geothermal, or hydroelectric must be sited in suitable locations to take advantage of the particular resource. In order to capture the site specific costs associated with these technologies, EIA develops upward sloping supply curves for each of these technologies. These curves assume that the lowest-cost, most-favorable resources will be developed first, and that costs associated with the technology will increase as only higher-cost, less-favorable sites are left to be developed.
- **Learning by doing:** The overnight capital costs developed for the report serve as an input to EIA's long term modeling and represent the cost of construction for a project that could begin as early as 2013. However, these costs are assumed to decrease over time in real terms as equipment manufacturers, power plant owners, and construction firms gain more experience with certain technologies. The rate at which these costs decline is often referred to as the learning rate.

EIA determines learning rates at the power plant component level, not for the power plant technology itself because some technologies share the same component types. It is assumed that the knowledge and experience gained through the manufacture and installation of a given component in one type of power plant can be carried over to the same component in another type of plant. As an example, the experience gained through the construction of combined cycle natural gas plants can be leveraged to influence the overall cost of building an IGCC unit, which in part, includes the components of a combined cycle natural gas plant. Other technologies, such as nuclear power and pulverized coal (PC) plants without CCS, do not share component systems, and their learning rates are determined solely as a function of the amount of capacity built over time.

Technologies and their components are represented in the NEMS model at various stages of maturity. EIA classifies technologies into three such stages: mature, evolutionary, and revolutionary. The technology classification determines the rate of cost reduction that can be achieved through the learning function. Generally, overnight costs for technologies and associated components decline at a specified rate based on a doubling of new capacity. The cost decline is fastest for revolutionary technologies and slower for evolutionary and mature technologies.⁷

The capacity additions used to influence learning are primarily developed from NEMS results. However, external capacity additions from international projects are also included for some technologies, to account for additional learning from such projects. For power plant technologies with multiple components, the capacity additions are weighted by the contribution of each component to the overall plant construction cost.⁸

Table 3 classifies the status of each technology and component as modeled in *AEO2013*.

The NEMS model also assumes that efficiency for all fossil-fueled plants improves as a result of learning by doing. The power plant heat rates provided by the consultant are intended to represent the characteristics of a plant that starts construction in 2013, referred to as "first-of-a-kind." NEMS assumes that the heat rate for all fossil fueled technologies declines over time to a level referred to as an "nth-of-a-kind" heat rate.⁹ The magnitude of heat rate improvement depends on the current state of the technology, with revolutionary technologies seeing a more significant decline in heat rate than mature technologies. Heat rate improvements are independent to capacity expansion. Fixed and variable O&M are not assumed to achieve learning-related savings.

Impact of location on power plant capital costs

The estimates provided in this report are representative of a generic facility located in a region without any special issues that would alter its cost. However, the cost of building power plants in different regions of the United States can vary significantly. The report includes location-based cost adjustment tables for each technology in 64 metropolitan areas. These adjustments were made to reflect the impact of remote location costs, costs associated with seismic design that may vary by region, and labor wage and productivity differences by region. In order to reflect these costs in EIA's modeling, these adjustments were aggregated to represent the 22 Electricity Market Module regions. EIA also assumes that the development of certain technologies is not feasible in given regions for geographic, logistical, or regulatory reasons. The regional cost adjustments and development restrictions are summarized in Table 4.

Summary

The estimates provided by the consultant for this report are key inputs for EIA electric market projections, but they are not the sole driver of electric generation capacity expansion decisions. The evolution of the electricity mix in each of the 22 regions to be modeled in *AEO2013* is sensitive to many factors, including the projected evolution of capital costs over the modeling horizon, projected fuel costs, whether wholesale power markets are regulated or competitive, the existing generation mix, additional costs associated with environmental control requirements, and future electricity demand.

Users interested in additional details regarding these updated cost estimates should review the consultant study prepared by SAIC Energy Environment and Infrastructure in Appendix B.

see full report report

Footnotes

¹ U.S. Energy Information Administration, Updated Capital Cost Estimates for Electricity Generation Plants November 2010.

² The term "overnight" refers to the cost of the project as if no interest were incurred during its construction.

³ Fees for contingency include contractor overhead costs, fees, profit, and construction.

⁴ Heat Rate is a measure of generating station thermal efficiency commonly stated as Btu per kilowatthour.

⁵ U.S. Energy Information Administration, Annual Energy Outlook 2013, Table 20, GDP chain-type price index.

⁶ The increase in cost for IGCC with CCS resulted in EIA revising its technology assumption for new coal plants with CCS in EIA's projections. EIA's National Energy Modeling System (NEMS) includes one option for coal with CCS, and in *AEO2012* new coal plants with CCS were assumed to have the characteristics consistent with those of an IGCC unit with CCS. However, due to the difference in costs between advanced pulverized coal (PC) with CCS and IGCC with CCS presented in the 2013 update, the assumed characteristics of a coal plant with CCS in NEMS were assumed to be consistent with those of an advanced PC plant with CCS for the *AEO2013*.

⁷ U.S. Energy Information Administration, AEO 2012 Electricity Market Module Assumptions Document, Table 8.3.

⁸ U.S. Energy Information Administration, AEO 2012 Electricity Market Assumptions Document, Table 8.4.

⁹ U.S. Energy Information Administration, AEO 2013 Cost and Performance Characteristics of New Central Station Electricity Generating Technologies, Table 8.2.

AEO2014 Early Release

Technology	Online Year1	Size (MW)	Lead time (years)	Base	Project Contingency Factor2	Technolo	Total	Variable O&M (2012 \$/MWh)	Fixed O&M (2012 \$/kWh)	Heatrate ⁶ in 2013 (Btu/kWh)	nth-of-a-kind Heatrate (Btu/kWh)
				Cost in 2013 (\$/kW)		gical Optimis m Factor3	Cost in 2013 (\$/kW)				
Scrubbed Coal New Integrated Coal-Gasification Comb Cycle (IGCC) IGCC with carbon sequestration	2017	1300		4 2,734	1.07	1.00	2,925	4.47	31.18	8,800	8,740
Conv Gas/Oil Comb Cycle Adv Gas/Oil Comb Cycle (CC) Adv CC with carbon sequestration	2017	1200		4 3,525	1.07	1.00	3,771	7.22	51.39	8,700	7,450
Conv Gas/Oil Comb Cycle	2016	620		3 871	1.05	1.00	915	3.60	13.17	7,050	6,800
Adv Gas/Oil Comb Cycle (CC)	2016	400		3 945	1.08	1.00	1,021	3.27	15.37	6,430	6,333
Adv CC with carbon sequestration	2017	340		3 1,856	1.08	1.04	2,084	6.78	31.79	7,525	7,493
Conv Comb Turbine ⁸	2015	85		2 924	1.05	1.00	971	15.45	7.34	10,817	10,450
Adv Comb Turbine	2015	210		2 641	1.05	1.00	673	10.37	7.04	9,750	8,550
Fuel Cells	2016	10		3 6,099	1.05	1.10	7,044	42.99	0.00	9,500	6,960
Adv Nuclear	2019	2234		6 4,763	1.10	1.05	5,501	2.14	93.28	10,464	10,464
Distributed Generation - Base	2016		2	3 1,414	1.05	1.00	1,485	7.76	17.45	9,027	8,900
Distributed Generation - Peak	2015		1	2 1,698	1.05	1.00	1,783	7.76	17.45	10,029	9,880
Biomass	2017	50		4 3,590	1.07	1.02	3,919	5.26	105.64	13,500	13,500
Geothermal ^{7,9}	2016	50		4 2,375	1.05	1.00	2,494	0.00	112.92	9,716	9,716
Municipal Solid Waste	2014	50		3 7,751	1.07	1.00	8,294	8.75	392.81	18,000	18,000
Conventional Hydropower ⁹	2017	500		4 2,213	1.10	1.00	2,435	2.65	14.83	9,716	9,716
Wind	2014	100		3 2,061	1.07	1.00	2,205	0.00	39.55	9,716	9,716
Wind Offshore	2017	400		4 4,503	1.10	1.25	6,192	0.00	74.00	9,716	9,716
Solar Thermal ⁷	2016	100		3 4,715	1.07	1.00	5,045	0.00	67.26	9,716	9,716
Photovoltaic ^{7,10}	2015	150		2 3,394	1.05	1.00	3,564	0.00	24.69	9,716	9,716

particularly important where previous experience has shown that unforeseeable events which will increase costs are likely to occur”

3 - The technological optimism factor is applied to the first four units of a new, unproven design, it reflects the demonstrated tendency to underestimate actual costs for a first-of- a-kind unit.

4 - Overnight capital cost including contingency factors, excluding regional multipliers and learning effects. Interest charges are also excluded. These represent costs of new

DRAFT

(Final version will be included in the Electricity Market Module Assumptions Document)

Table 8.2 Cost and Performance Characteristics of New Central Station Electricity Generating Technologies

1 - Online year represents the first year that a new unit could be completed, given an order date of 2013. For wind, geothermal and landfill gas, the online year was moved earlier

to acknowledge both market activity already occurring as well as the incentive for certain types of projects to develop at an accelerated rate in order to qualify for the Production Tax Credit.

2 - A contingency allowance is defined by the American Association of Cost Engineers as the “specific provision for unforeseeable elements of costs within a defined project scope;

built in the Northwest Power Pool region, where most of the proposed sites are located.

10 - Costs and capacities are expressed in terms of net AC power available to the grid for the installed capacity.

Sources: For the AEO2014 cycle, EIA continues to use the previously developed cost estimates for utility-scale electric generating plants, updated by external consultants for AEO2013. This report can be found at <http://www.eia.gov/forecasts/capitalcost/>. The costs were assumed to be consistent with plants that would be ordered in 2012, and learning from capacity built in 2012 has been applied in the initial costs above. Site specific costs for geothermal were provided by the National Energy Renewable Laboratory, "Updated U.S. Geothermal Supply Curve", February 2010.

projects initiated in 2013.

5 - O&M = Operations and maintenance.

6 - For hydro, wind, solar and geothermal technologies, the heatrate shown represents the average heatrate for conventional thermal generation as of 2012. This is used for

purposes of calculating primary energy consumption displaced for these resources, and does not imply an estimate of their actual energy conversion efficiency.

7 - Capital costs are shown before investment tax credits are applied.

8 - Combustion turbine units can be built by the model prior to 2015 if necessary to meet a given region's reserve margin.

9 - Because geothermal and hydro cost and performance characteristics are specific for each site, the table entries represent the cost of the least expensive plant that could be

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to the Office of the Attorney General's
Initial Request for Information
Dated August 20, 2014

September 10, 2014

1 **Item 24)** Please provide all Appendix H electronic information in Excel
2 spreadsheet format, with data and formulae in all cells and rows intact and fully
3 accessible.

4
5 **Response)** Appendix H Strategist Model Outputs are originally in text files. See folder
6 App H on the confidential CD filed with Big Rivers' IRP.

7
8 **Witness)** Marlene S. Parsley

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

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Initial Request for Information
Dated August 20, 2014

September 10, 2014

1 **Item 25)** Please explain fully why climatic data in Table 2.1, page 10, of Appendix
2 **A, provided by the National Oceanic and Atmospheric Administration (NOAA) is**
3 **confidential.**

4

5 **Response)** The Public Service Commission denied Big Rivers' request for confidential
6 treatment of Table 2.1 of Appendix A.

7

8 **Witness)** Marlene S. Parsley

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
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September 10, 2014

1 **Item 26)** Please provide the data elements described in Table 3.1, page 12, of
2 **Appendix A.**

3
4 **Response)** Please see the attachments to this response. In addition, please refer to the
5 folder AG 1-26 on the electronic media accompanying these responses.

6 **Class of Data and Corresponding Files**

7	1. System Data:	Monthly System Data Attachment 9
8	2. Price Index:	GDP Deflator_020613 Attachment 4
9	3. Economic and Demographic:	JPEC_020613 Attachment 6
10		Kenergy_020613 Attachment 7
11		MCRECC_020613 Attachment 8
12	4. End-Use Data:	AEOTAB_4_Feb2008 Attachment 2
13		EIA Annual Energy Outlook Residential
14		Attachment 3
15		Heating_Fuel-1990-2009 Attachment 5
16		ACS_11_5YR_B25040 Attachment 1
17		BR End Use 2007 Tables-JPE Attachment 11

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1 BR End Use 2007 Tables-Kenergy Attachment
2 12
3 BR End Use 2007 Tables-MCRECC
4 Attachment 13
5
6 5. Meteorological: Weather History Attachment 10
7
8 **Witness)** John W. Hutts

Table 4. Residential Sector Key Indicators and Consumption
(quadrillion Btu, unless otherwise noted)

	2005	2006	2007	2008	2009	2010	2011
Key Indicators							
Households (millions)							
Single-Family	79.65	80.81	81.53	81.95	82.58	83.48	84.55
Multifamily	24.49	24.81	25.09	25.31	25.57	25.86	26.17
Mobile Homes	6.94	6.89	6.82	6.75	6.70	6.67	6.65
Total	111.09	112.51	113.44	114.01	114.85	116.00	117.37
Average House Square Footage	1802	1815	1826	1836	1847	1858	1871
Energy Intensity (million Btu per household)							
Delivered Energy Consumption	103.7	95.8	101.0	102.3	102.1	100.5	100.2
Total Energy Consumption	194.8	185.0	191.5	192.9	193.4	191.8	191.1
(thousand Btu per square foot)							
Delivered Energy Consumption	57.5	52.8	55.3	55.7	55.3	54.1	53.6
Total Energy Consumption	108.1	101.9	104.8	105.0	104.7	103.2	102.1
Delivered Energy Consumption by Fuel							
Electricity							
Space Heating	0.31	0.27	0.30	0.33	0.31	0.30	0.31
Space Cooling	0.82	0.75	0.78	0.74	0.78	0.79	0.80
Water Heating	0.38	0.38	0.38	0.38	0.38	0.38	0.39

	2005	2006	2007	2008	2009	2010	2011
Refrigeration	0.39	0.39	0.38	0.38	0.37	0.37	0.36
Cooking	0.10	0.10	0.10	0.11	0.11	0.11	0.11
Clothes Dryers	0.25	0.25	0.25	0.25	0.25	0.25	0.26
Freezers	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Lighting	0.73	0.74	0.74	0.73	0.72	0.72	0.72
Clothes Washers 1/	0.03	0.04	0.03	0.03	0.03	0.03	0.03
Dishwashers 1/	0.10	0.10	0.09	0.09	0.09	0.09	0.09
Color Televisions and Set-Top Boxes	0.30	0.33	0.35	0.37	0.38	0.39	0.40
Personal Computers	0.07	0.07	0.07	0.08	0.09	0.10	0.10
Furnace Fans	0.06	0.05	0.06	0.07	0.06	0.06	0.06
Other Uses 2/	1.01	1.05	1.11	1.15	1.20	1.26	1.29
Delivered Energy	4.64	4.61	4.75	4.79	4.87	4.95	5.00
Natural Gas							
Space Heating	3.59	3.13	3.50	3.60	3.66	3.57	3.61
Space Cooling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Heating	1.09	1.08	1.08	1.08	1.08	1.08	1.09
Cooking	0.22	0.22	0.22	0.22	0.22	0.22	0.23
Clothes Dryers	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Delivered Energy	4.97	4.50	4.87	4.98	5.04	4.95	5.00
Distillate Fuel Oil							
Space Heating	0.75	0.60	0.69	0.70	0.68	0.66	0.66
Water Heating	0.11	0.10	0.10	0.10	0.10	0.09	0.09
Delivered Energy	0.85	0.70	0.79	0.80	0.78	0.75	0.76
Liquefied Petroleum Gases							
Space Heating	0.26	0.23	0.25	0.26	0.25	0.24	0.24
Water Heating	0.06	0.06	0.05	0.05	0.05	0.05	0.05
Cooking	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Other Uses 3/	0.15	0.15	0.15	0.15	0.16	0.16	0.16
Delivered Energy	0.50	0.47	0.49	0.50	0.49	0.48	0.48

	2005	2006	2007	2008	2009	2010	2011
Marketed Renewables (wood) 4/	0.45	0.41	0.46	0.49	0.46	0.44	0.43
Other Fuels 5/	0.10	0.08	0.09	0.10	0.10	0.09	0.09
Delivered Energy Consumption by End Use							
Space Heating	5.46	4.72	5.30	5.49	5.46	5.30	5.34
Space Cooling	0.82	0.75	0.78	0.74	0.78	0.79	0.80
Water Heating	1.64	1.62	1.61	1.61	1.61	1.61	1.62
Refrigeration	0.39	0.39	0.38	0.38	0.37	0.37	0.36
Cooking	0.35	0.35	0.36	0.36	0.36	0.36	0.37
Clothes Dryers	0.32	0.33	0.33	0.33	0.33	0.33	0.33
Freezers	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Lighting	0.73	0.74	0.74	0.73	0.72	0.72	0.72
Clothes Washers	0.03	0.04	0.03	0.03	0.03	0.03	0.03
Dishwashers	0.10	0.10	0.09	0.09	0.09	0.09	0.09
Color Televisions and Set-Top Boxes	0.30	0.33	0.35	0.37	0.38	0.39	0.40
Personal Computers	0.07	0.07	0.07	0.08	0.09	0.10	0.10
Furnace Fans	0.06	0.05	0.06	0.07	0.06	0.06	0.06
Other Uses 6/	1.16	1.21	1.26	1.30	1.36	1.42	1.45
Delivered Energy	11.52	10.77	11.45	11.67	11.73	11.66	11.76
Electricity Related Losses	10.12	10.04	10.27	10.32	10.48	10.59	10.66
Total Energy Consumption by End Use							
Space Heating	6.14	5.31	5.95	6.19	6.13	5.95	5.99
Space Cooling	2.61	2.39	2.48	2.33	2.46	2.48	2.51
Water Heating	2.47	2.44	2.43	2.43	2.43	2.43	2.44
Refrigeration	1.26	1.24	1.21	1.19	1.17	1.15	1.14
Cooking	0.57	0.58	0.58	0.59	0.59	0.60	0.60
Clothes Dryers	0.88	0.88	0.88	0.87	0.87	0.87	0.88
Freezers	0.27	0.26	0.26	0.26	0.25	0.25	0.25
Lighting	2.31	2.35	2.33	2.31	2.27	2.26	2.26
Clothes Washers	0.11	0.11	0.11	0.11	0.11	0.10	0.10
Dishwashers	0.31	0.30	0.30	0.30	0.29	0.29	0.29

	2005	2006	2007	2008	2009	2010	2011
Color Televisions and Set-Top Boxes	0.95	1.05	1.11	1.18	1.21	1.23	1.24
Personal Computers	0.21	0.21	0.22	0.25	0.28	0.30	0.32
Furnace Fans	0.19	0.17	0.19	0.21	0.20	0.20	0.20
Other Uses 6/	3.37	3.50	3.66	3.78	3.94	4.13	4.19
Total	21.64	20.82	21.72	21.99	22.21	22.25	22.42
Nonmarketed Renewables 7/							
Geothermal Heat Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solar Hot Water Heating	0.01	0.01	0.01	0.02	0.02	0.02	0.02
Solar Photovoltaic	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.01	0.02	0.02	0.02	0.02	0.02	0.02

1/ Does not include water heating portion of load.

2/ Includes small electric devices, heating elements, and motors not listed above.

3/ Includes such appliances as outdoor grills and mosquito traps.

4/ Includes wood used for primary and secondary heating in wood stoves or fireplaces as reported in the Residential Energy Consumption Survey.

5/ Includes kerosene and coal.

6/ Includes all other uses listed above.

7/ Represents primary energy displaced.

Btu = British thermal unit.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2005 and 2006 are model results and may vary from actual data.

Source: 2005 and 2006 based on: Energy Information Administration (EIA), Annual Energy Review 2006, DOE/EIA-0384(2006) (V.1.0), AEO2008 National Energy Modeling System run aeo2008.d030208f.

Table 4. Residential Sector Key Indicators a
(quadrillion Btu, unless otherwise

	2012	2013	2014	2015	2016	2017	2018
Key Indicators							
Households (millions)							
Single-Family	85.60	86.63	87.65	88.66	89.67	90.64	91.59
Multifamily	26.48	26.79	27.10	27.42	27.75	28.07	28.40
Mobile Homes	6.64	6.63	6.63	6.65	6.67	6.69	6.70
Total	118.72	120.06	121.38	122.73	124.09	125.40	126.68
Average House Square Footage	1882	1894	1905	1916	1926	1937	1946
Energy Intensity							
(million Btu per household)							
Delivered Energy Consumption	100.1	98.4	97.8	97.3	97.2	96.5	96.0
Total Energy Consumption	190.8	186.4	184.9	183.8	183.4	182.4	181.9
(thousand Btu per square foot)							
Delivered Energy Consumption	53.2	52.0	51.3	50.8	50.4	49.8	49.3
Total Energy Consumption	101.4	98.4	97.1	95.9	95.2	94.2	93.5
Delivered Energy Consumption by Fuel							
Electricity							
Space Heating	0.31	0.31	0.31	0.32	0.32	0.32	0.32
Space Cooling	0.81	0.82	0.84	0.85	0.86	0.87	0.88
Water Heating	0.39	0.40	0.40	0.40	0.41	0.41	0.42

	2012	2013	2014	2015	2016	2017	2018
Refrigeration	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Cooking	0.11	0.11	0.11	0.12	0.12	0.12	0.12
Clothes Dryers	0.26	0.26	0.26	0.26	0.27	0.27	0.27
Freezers	0.08	0.08	0.08	0.08	0.09	0.09	0.09
Lighting	0.73	0.59	0.56	0.55	0.54	0.54	0.54
Clothes Washers 1/	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Dishwashers 1/	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Color Televisions and Set-Top Boxes	0.40	0.40	0.40	0.40	0.41	0.41	0.42
Personal Computers	0.10	0.11	0.11	0.11	0.11	0.11	0.11
Furnace Fans	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Other Uses 2/	1.31	1.33	1.35	1.37	1.40	1.42	1.44
Delivered Energy	5.07	4.97	4.99	5.02	5.08	5.12	5.17
Natural Gas							
Space Heating	3.65	3.68	3.71	3.73	3.77	3.78	3.79
Space Cooling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Heating	1.10	1.10	1.11	1.12	1.13	1.13	1.14
Cooking	0.23	0.23	0.23	0.24	0.24	0.24	0.24
Clothes Dryers	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Delivered Energy	5.06	5.08	5.12	5.16	5.21	5.23	5.25
Distillate Fuel Oil							
Space Heating	0.67	0.67	0.66	0.66	0.67	0.66	0.66
Water Heating	0.09	0.09	0.09	0.09	0.09	0.09	0.08
Delivered Energy	0.76	0.76	0.75	0.75	0.75	0.75	0.74
Liquefied Petroleum Gases							
Space Heating	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Water Heating	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Cooking	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Other Uses 3/	0.17	0.17	0.18	0.18	0.19	0.19	0.20
Delivered Energy	0.49	0.49	0.50	0.50	0.50	0.51	0.51

	2012	2013	2014	2015	2016	2017	2018
Marketed Renewables (wood) 4/	0.43	0.43	0.42	0.42	0.41	0.41	0.41
Other Fuels 5/	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Delivered Energy Consumption by End Use							
Space Heating	5.39	5.41	5.43	5.46	5.50	5.50	5.50
Space Cooling	0.81	0.82	0.84	0.85	0.86	0.87	0.88
Water Heating	1.63	1.63	1.64	1.66	1.67	1.68	1.68
Refrigeration	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Cooking	0.37	0.38	0.38	0.38	0.39	0.39	0.40
Clothes Dryers	0.33	0.34	0.34	0.34	0.34	0.34	0.35
Freezers	0.08	0.08	0.08	0.08	0.09	0.09	0.09
Lighting	0.73	0.59	0.56	0.55	0.54	0.54	0.54
Clothes Washers	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Dishwashers	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Color Televisions and Set-Top Boxes	0.40	0.40	0.40	0.40	0.41	0.41	0.42
Personal Computers	0.10	0.11	0.11	0.11	0.11	0.11	0.11
Furnace Fans	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Other Uses 6/	1.48	1.50	1.53	1.56	1.59	1.61	1.64
Delivered Energy	11.89	11.82	11.87	11.95	12.06	12.10	12.17
Electricity Related Losses	10.77	10.56	10.57	10.61	10.70	10.77	10.88
Total Energy Consumption by End Use							
Space Heating	6.05	6.07	6.10	6.13	6.17	6.17	6.18
Space Cooling	2.54	2.57	2.61	2.64	2.67	2.71	2.75
Water Heating	2.46	2.48	2.49	2.51	2.53	2.54	2.56
Refrigeration	1.14	1.13	1.13	1.12	1.13	1.12	1.13
Cooking	0.61	0.62	0.62	0.63	0.64	0.65	0.65
Clothes Dryers	0.89	0.89	0.89	0.90	0.90	0.90	0.91
Freezers	0.26	0.26	0.26	0.26	0.27	0.27	0.27
Lighting	2.27	1.85	1.76	1.71	1.69	1.68	1.68
Clothes Washers	0.10	0.10	0.10	0.09	0.09	0.09	0.09
Dishwashers	0.29	0.29	0.29	0.29	0.29	0.29	0.29

	2012	2013	2014	2015	2016	2017	2018
Color Televisions and Set-Top Boxes	1.25	1.25	1.25	1.26	1.27	1.28	1.29
Personal Computers	0.33	0.33	0.34	0.34	0.34	0.35	0.36
Furnace Fans	0.21	0.21	0.21	0.21	0.22	0.22	0.22
Other Uses 6/	4.27	4.33	4.40	4.46	4.54	4.60	4.67
Total	22.65	22.37	22.45	22.56	22.76	22.87	23.05
Nonmarketed Renewables 7/							
Geothermal Heat Pumps	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Solar Hot Water Heating	0.02	0.02	0.02	0.02	0.03	0.03	0.03
Solar Photovoltaic	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.03	0.03	0.03	0.03	0.03	0.04	0.04

1/ Does not include water heating portion of I

2/ Includes small electric devices, heating ele

3/ Includes such appliances as outdoor grills

4/ Includes wood used for primary and secormption Survey 2001.

5/ Includes kerosene and coal.

6/ Includes all other uses listed above.

7/ Represents primary energy displaced.

Btu = British thermal unit.

-- = Not applicable.

Note: Totals may not equal sum of componediffer slightly from official EIA data reports.

Source: 2005 and 2006 based on: Energy I/washington, DC, June 2007). Projections:

EIA, AEO2008 National Energy Modeling Syst

Table 4. Residential Sector Key Indicators a
 (quadrillion Btu, unless otherwise

	2019	2020	2021	2022	2023	2024	2025
Key Indicators							
Households (millions)							
Single-Family	92.50	93.38	94.23	95.07	95.87	96.68	97.49
Multifamily	28.72	29.05	29.37	29.70	30.02	30.35	30.69
Mobile Homes	6.72	6.73	6.74	6.75	6.76	6.77	6.78
Total	127.93	129.15	130.35	131.52	132.66	133.80	134.96
Average House Square Footage	1956	1965	1974	1983	1992	2000	2008
Energy Intensity							
(million Btu per household)							
Delivered Energy Consumption	95.6	95.3	94.7	94.3	94.0	93.8	93.2
Total Energy Consumption	181.5	181.1	180.0	179.6	179.3	179.5	179.0
(thousand Btu per square foot)							
Delivered Energy Consumption	48.9	48.5	47.9	47.6	47.2	46.9	46.4
Total Energy Consumption	92.8	92.1	91.2	90.6	90.0	89.8	89.1
Delivered Energy Consumption by Fuel							
Electricity							
Space Heating	0.32	0.32	0.32	0.33	0.33	0.33	0.33
Space Cooling	0.90	0.91	0.92	0.93	0.95	0.96	0.97
Water Heating	0.42	0.42	0.42	0.43	0.43	0.43	0.43

	2019	2020	2021	2022	2023	2024	2025
Refrigeration	0.36	0.37	0.37	0.37	0.37	0.37	0.38
Cooking	0.12	0.12	0.13	0.13	0.13	0.13	0.13
Clothes Dryers	0.27	0.27	0.27	0.27	0.28	0.28	0.28
Freezers	0.09	0.09	0.09	0.09	0.10	0.10	0.10
Lighting	0.53	0.51	0.49	0.48	0.48	0.48	0.47
Clothes Washers 1/	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Dishwashers 1/	0.09	0.10	0.10	0.10	0.10	0.10	0.10
Color Televisions and Set-Top Boxes	0.42	0.43	0.43	0.44	0.46	0.47	0.48
Personal Computers	0.12	0.12	0.13	0.13	0.13	0.14	0.14
Furnace Fans	0.07	0.07	0.07	0.07	0.08	0.08	0.08
Other Uses 2/	1.46	1.49	1.51	1.53	1.56	1.59	1.61
Delivered Energy	5.21	5.25	5.29	5.34	5.40	5.47	5.53
Natural Gas							
Space Heating	3.80	3.83	3.84	3.85	3.86	3.88	3.87
Space Cooling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Heating	1.14	1.15	1.15	1.15	1.15	1.15	1.14
Cooking	0.24	0.25	0.25	0.25	0.25	0.25	0.26
Clothes Dryers	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Delivered Energy	5.27	5.30	5.32	5.33	5.34	5.36	5.35
Distillate Fuel Oil							
Space Heating	0.65	0.65	0.64	0.63	0.63	0.62	0.62
Water Heating	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Delivered Energy	0.73	0.73	0.72	0.71	0.71	0.70	0.69
Liquefied Petroleum Gases							
Space Heating	0.24	0.24	0.23	0.23	0.23	0.23	0.23
Water Heating	0.05	0.05	0.05	0.05	0.05	0.05	0.04
Cooking	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Other Uses 3/	0.20	0.20	0.21	0.21	0.22	0.22	0.22
Delivered Energy	0.51	0.52	0.52	0.53	0.53	0.53	0.54

	2019	2020	2021	2022	2023	2024	2025
Marketed Renewables (wood) 4/	0.41	0.40	0.40	0.40	0.40	0.39	0.39
Other Fuels 5/	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Delivered Energy Consumption by End Use							
Space Heating	5.51	5.53	5.53	5.54	5.54	5.55	5.53
Space Cooling	0.90	0.91	0.92	0.93	0.95	0.96	0.97
Water Heating	1.69	1.70	1.70	1.70	1.70	1.70	1.69
Refrigeration	0.36	0.37	0.37	0.37	0.37	0.37	0.38
Cooking	0.40	0.41	0.41	0.41	0.42	0.42	0.42
Clothes Dryers	0.35	0.35	0.35	0.35	0.36	0.36	0.36
Freezers	0.09	0.09	0.09	0.09	0.10	0.10	0.10
Lighting	0.53	0.51	0.49	0.48	0.48	0.48	0.47
Clothes Washers	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Dishwashers	0.09	0.10	0.10	0.10	0.10	0.10	0.10
Color Televisions and Set-Top Boxes	0.42	0.43	0.43	0.44	0.46	0.47	0.48
Personal Computers	0.12	0.12	0.13	0.13	0.13	0.14	0.14
Furnace Fans	0.07	0.07	0.07	0.07	0.08	0.08	0.08
Other Uses 6/	1.66	1.69	1.72	1.75	1.77	1.81	1.83
Delivered Energy	12.23	12.30	12.34	12.40	12.46	12.56	12.58
Electricity Related Losses	10.99	11.08	11.13	11.22	11.33	11.47	11.57
Total Energy Consumption by End Use							
Space Heating	6.18	6.21	6.21	6.22	6.22	6.24	6.22
Space Cooling	2.79	2.83	2.86	2.89	2.93	2.97	3.01
Water Heating	2.58	2.59	2.59	2.60	2.60	2.60	2.59
Refrigeration	1.13	1.14	1.14	1.15	1.15	1.16	1.16
Cooking	0.66	0.67	0.67	0.68	0.69	0.69	0.70
Clothes Dryers	0.91	0.92	0.92	0.93	0.93	0.94	0.95
Freezers	0.28	0.29	0.29	0.29	0.30	0.31	0.31
Lighting	1.66	1.58	1.53	1.50	1.48	1.48	1.47
Clothes Washers	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Dishwashers	0.29	0.30	0.30	0.30	0.30	0.31	0.31

	2019	2020	2021	2022	2023	2024	2025
Color Televisions and Set-Top Boxes	1.31	1.33	1.34	1.38	1.42	1.46	1.49
Personal Computers	0.37	0.38	0.39	0.40	0.41	0.42	0.43
Furnace Fans	0.22	0.23	0.23	0.23	0.23	0.24	0.24
Other Uses 6/	4.75	4.84	4.90	4.97	5.04	5.13	5.19
Total	23.21	23.39	23.46	23.62	23.79	24.02	24.15
Nonmarketed Renewables 7/							
Geothermal Heat Pumps	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Solar Hot Water Heating	0.03	0.03	0.03	0.03	0.04	0.04	0.04
Solar Photovoltaic	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.04	0.04	0.04	0.05	0.05	0.05	0.05

1/ Does not include water heating portion of I

2/ Includes small electric devices, heating ele

3/ Includes such appliances as outdoor grills

4/ Includes wood used for primary and secon

5/ Includes kerosene and coal.

6/ Includes all other uses listed above.

7/ Represents primary energy displaced.

Btu = British thermal unit.

-- = Not applicable.

Note: Totals may not equal sum of compone

Source: 2005 and 2006 based on: Energy I
EIA, AEO2008 National Energy Modeling Syst

Table 4. Residential Sector Key Indicators a
(quadrillion Btu, unless otherwise

	2026	2027	2028	2029	2030	2006-2030
Key Indicators						
Households (millions)						
Single-Family	98.31	99.09	99.83	100.55	101.28	0.9%
Multifamily	31.03	31.37	31.72	32.08	32.44	1.1%
Mobile Homes	6.80	6.82	6.83	6.85	6.86	0.0%
Total	136.13	137.28	138.39	139.48	140.58	0.9%
Average House Square Footage	2016	2024	2031	2038	2046	0.5%
Energy Intensity						
(million Btu per household)						
Delivered Energy Consumption	92.9	92.6	92.5	91.9	91.6	-0.2%
Total Energy Consumption	178.8	178.7	178.9	178.2	177.9	-0.2%
(thousand Btu per square foot)						
Delivered Energy Consumption	46.1	45.8	45.5	45.1	44.8	-0.7%
Total Energy Consumption	88.7	88.3	88.1	87.4	87.0	-0.7%
Delivered Energy Consumption by Fuel						
Electricity						
Space Heating	0.33	0.33	0.33	0.33	0.33	0.8%
Space Cooling	0.99	1.00	1.01	1.03	1.04	1.4%
Water Heating	0.43	0.43	0.43	0.43	0.43	0.5%

	2026	2027	2028	2029	2030	2030
Refrigeration	0.38	0.38	0.39	0.39	0.39	0.0%
Cooking	0.13	0.13	0.14	0.14	0.14	1.2%
Clothes Dryers	0.28	0.29	0.29	0.29	0.30	0.6%
Freezers	0.10	0.10	0.11	0.11	0.11	1.3%
Lighting	0.48	0.48	0.48	0.48	0.49	-1.7%
Clothes Washers 1/	0.03	0.03	0.03	0.03	0.03	-1.1%
Dishwashers 1/	0.10	0.10	0.10	0.11	0.11	0.4%
Color Televisions and Set-Top Boxes	0.50	0.51	0.53	0.54	0.55	2.2%
Personal Computers	0.14	0.15	0.15	0.15	0.16	3.6%
Furnace Fans	0.08	0.08	0.08	0.08	0.08	1.6%
Other Uses 2/	1.63	1.66	1.69	1.71	1.73	2.1%
Delivered Energy	5.60	5.67	5.75	5.81	5.88	1.0%
Natural Gas						
Space Heating	3.88	3.88	3.90	3.88	3.88	0.9%
Space Cooling	0.00	0.00	0.00	0.00	0.00	24.1%
Water Heating	1.13	1.13	1.12	1.11	1.09	0.1%
Cooking	0.26	0.26	0.26	0.26	0.26	0.8%
Clothes Dryers	0.08	0.08	0.08	0.08	0.08	0.6%
Delivered Energy	5.35	5.35	5.36	5.33	5.32	0.7%
Distillate Fuel Oil						
Space Heating	0.61	0.60	0.60	0.59	0.59	-0.1%
Water Heating	0.07	0.07	0.07	0.07	0.07	-1.8%
Delivered Energy	0.68	0.68	0.67	0.66	0.65	-0.3%
Liquefied Petroleum Gases						
Space Heating	0.23	0.23	0.23	0.23	0.23	0.0%
Water Heating	0.04	0.04	0.04	0.04	0.04	-1.1%
Cooking	0.03	0.03	0.03	0.03	0.03	0.3%
Other Uses 3/	0.23	0.23	0.24	0.24	0.25	2.0%
Delivered Energy	0.54	0.54	0.55	0.55	0.55	0.7%

	2026	2027	2028	2029	2030	2030
Marketed Renewables (wood) 4/	0.39	0.39	0.38	0.38	0.38	-0.3%
Other Fuels 5/	0.09	0.09	0.09	0.09	0.09	0.4%
Delivered Energy Consumption by End Use						
Space Heating	5.53	5.53	5.53	5.51	5.50	0.6%
Space Cooling	0.99	1.00	1.01	1.03	1.04	1.4%
Water Heating	1.68	1.67	1.67	1.65	1.63	0.0%
Refrigeration	0.38	0.38	0.39	0.39	0.39	0.0%
Cooking	0.42	0.43	0.43	0.43	0.43	0.9%
Clothes Dryers	0.37	0.37	0.37	0.38	0.38	0.6%
Freezers	0.10	0.10	0.11	0.11	0.11	1.3%
Lighting	0.48	0.48	0.48	0.48	0.49	-1.7%
Clothes Washers	0.03	0.03	0.03	0.03	0.03	-1.1%
Dishwashers	0.10	0.10	0.10	0.11	0.11	0.4%
Color Televisions and Set-Top Boxes	0.50	0.51	0.53	0.54	0.55	2.2%
Personal Computers	0.14	0.15	0.15	0.15	0.16	3.6%
Furnace Fans	0.08	0.08	0.08	0.08	0.08	1.6%
Other Uses 6/	1.86	1.89	1.92	1.95	1.98	2.1%
Delivered Energy	12.65	12.72	12.80	12.82	12.88	0.7%
Electricity Related Losses	11.69	11.82	11.96	12.03	12.14	0.8%
Total Energy Consumption by End Use						
Space Heating	6.22	6.21	6.22	6.19	6.18	0.6%
Space Cooling	3.05	3.09	3.12	3.16	3.19	1.2%
Water Heating	2.58	2.57	2.57	2.54	2.52	0.1%
Refrigeration	1.17	1.18	1.19	1.19	1.20	-0.1%
Cooking	0.70	0.71	0.71	0.72	0.72	0.9%
Clothes Dryers	0.96	0.97	0.98	0.98	0.99	0.5%
Freezers	0.32	0.32	0.33	0.34	0.34	1.1%
Lighting	1.47	1.47	1.48	1.48	1.49	-1.9%
Clothes Washers	0.08	0.08	0.08	0.08	0.08	-1.2%
Dishwashers	0.31	0.32	0.32	0.32	0.33	0.3%

	2026	2027	2028	2029	2030	2030
Color Televisions and Set-Top Boxes	1.53	1.57	1.62	1.65	1.69	2.0%
Personal Computers	0.44	0.45	0.46	0.47	0.48	3.5%
Furnace Fans	0.24	0.24	0.24	0.24	0.24	1.5%
Other Uses 6/	5.27	5.34	5.43	5.48	5.55	1.9%
Total	24.34	24.53	24.76	24.85	25.01	0.8%
Nonmarketed Renewables 7/						
Geothermal Heat Pumps	0.01	0.01	0.01	0.01	0.01	6.1%
Solar Hot Water Heating	0.04	0.04	0.04	0.04	0.05	5.3%
Solar Photovoltaic	0.00	0.00	0.00	0.01	0.01	16.9%
Total	0.06	0.06	0.06	0.06	0.07	5.9%

1/ Does not include water heating portion of I

2/ Includes small electric devices, heating ele

3/ Includes such appliances as outdoor grills

4/ Includes wood used for primary and secon

5/ Includes kerosene and coal.

6/ Includes all other uses listed above.

7/ Represents primary energy displaced.

Btu = British thermal unit.

- - = Not applicable.

Note: Totals may not equal sum of compone

Source: 2005 and 2006 based on: Energy II
EIA, AEO2008 National Energy Modeling Syst

Mnemonic: FPDPGDP.US
Description: NIPA: Chain-Type Price Index - GDP, (Index 2005=100, SA)
Source: U.S. Bureau of Economic Analysis (BEA); Moody's Analytics (ECCA) Forecast
Native Frequency: QUARTERLY
Geography: United States

Mar-1947	13.48
Apr-1947	13.54
May-1947	13.61
Jun-1947	13.67
Jul-1947	13.74
Aug-1947	13.83
Sep-1947	13.93
Oct-1947	14.04
Nov-1947	14.13
Dec-1947	14.19
Jan-1948	14.24
Feb-1948	14.28
Mar-1948	14.31
Apr-1948	14.35
May-1948	14.42
Jun-1948	14.53
Jul-1948	14.63
Aug-1948	14.71
Sep-1948	14.73
Oct-1948	14.71
Nov-1948	14.68
Dec-1948	14.67
Jan-1949	14.66
Feb-1949	14.65
Mar-1949	14.63
Apr-1949	14.60
May-1949	14.56
Jun-1949	14.50
Jul-1949	14.45
Aug-1949	14.42
Sep-1949	14.42
Oct-1949	14.43
Nov-1949	14.43
Dec-1949	14.42
Jan-1950	14.40
Feb-1950	14.37
Mar-1950	14.35
Apr-1950	14.36
May-1950	14.42
Jun-1950	14.52
Jul-1950	14.64
Aug-1950	14.74
Sep-1950	14.80
Oct-1950	14.85
Nov-1950	14.95
Dec-1950	15.13
Jan-1951	15.36

Feb-1951	15.53
Mar-1951	15.60
Apr-1951	15.60
May-1951	15.58
Jun-1951	15.56
Jul-1951	15.58
Aug-1951	15.62
Sep-1951	15.70
Oct-1951	15.79
Nov-1951	15.85
Dec-1951	15.87
Jan-1952	15.86
Feb-1952	15.84
Mar-1952	15.85
Apr-1952	15.88
May-1952	15.92
Jun-1952	15.96
Jul-1952	16.00
Aug-1952	16.04
Sep-1952	16.07
Oct-1952	16.09
Nov-1952	16.10
Dec-1952	16.10
Jan-1953	16.10
Feb-1953	16.11
Mar-1953	16.12
Apr-1953	16.13
May-1953	16.15
Jun-1953	16.16
Jul-1953	16.18
Aug-1953	16.20
Sep-1953	16.22
Oct-1953	16.23
Nov-1953	16.25
Dec-1953	16.28
Jan-1954	16.30
Feb-1954	16.33
Mar-1954	16.34
Apr-1954	16.35
May-1954	16.35
Jun-1954	16.35
Jul-1954	16.34
Aug-1954	16.34
Sep-1954	16.34
Oct-1954	16.34
Nov-1954	16.35
Dec-1954	16.37
Jan-1955	16.40
Feb-1955	16.42
Mar-1955	16.45
Apr-1955	16.47
May-1955	16.51

Jun-1955	16.55
Jul-1955	16.59
Aug-1955	16.63
Sep-1955	16.67
Oct-1955	16.70
Nov-1955	16.74
Dec-1955	16.79
Jan-1956	16.85
Feb-1956	16.91
Mar-1956	16.96
Apr-1956	17.00
May-1956	17.06
Jun-1956	17.13
Jul-1956	17.21
Aug-1956	17.27
Sep-1956	17.30
Oct-1956	17.32
Nov-1956	17.35
Dec-1956	17.42
Jan-1957	17.50
Feb-1957	17.57
Mar-1957	17.62
Apr-1957	17.65
May-1957	17.68
Jun-1957	17.73
Jul-1957	17.78
Aug-1957	17.83
Sep-1957	17.86
Oct-1957	17.88
Nov-1957	17.91
Dec-1957	17.96
Jan-1958	18.03
Feb-1958	18.08
Mar-1958	18.11
Apr-1958	18.13
May-1958	18.15
Jun-1958	18.17
Jul-1958	18.19
Aug-1958	18.20
Sep-1958	18.20
Oct-1958	18.20
Nov-1958	18.21
Dec-1958	18.23
Jan-1959	18.26
Feb-1959	18.29
Mar-1959	18.30
Apr-1959	18.31
May-1959	18.32
Jun-1959	18.34
Jul-1959	18.36
Aug-1959	18.38
Sep-1959	18.41

Oct-1959	18.44
Nov-1959	18.46
Dec-1959	18.48
Jan-1960	18.48
Feb-1960	18.50
Mar-1960	18.52
Apr-1960	18.55
May-1960	18.58
Jun-1960	18.61
Jul-1960	18.63
Aug-1960	18.66
Sep-1960	18.69
Oct-1960	18.72
Nov-1960	18.75
Dec-1960	18.76
Jan-1961	18.76
Feb-1961	18.76
Mar-1961	18.77
Apr-1961	18.78
May-1961	18.80
Jun-1961	18.82
Jul-1961	18.84
Aug-1961	18.85
Sep-1961	18.86
Oct-1961	18.87
Nov-1961	18.89
Dec-1961	18.93
Jan-1962	18.98
Feb-1962	19.01
Mar-1962	19.04
Apr-1962	19.05
May-1962	19.06
Jun-1962	19.07
Jul-1962	19.09
Aug-1962	19.11
Sep-1962	19.13
Oct-1962	19.15
Nov-1962	19.18
Dec-1962	19.20
Jan-1963	19.22
Feb-1963	19.23
Mar-1963	19.24
Apr-1963	19.25
May-1963	19.25
Jun-1963	19.25
Jul-1963	19.26
Aug-1963	19.28
Sep-1963	19.32
Oct-1963	19.36
Nov-1963	19.40
Dec-1963	19.43
Jan-1964	19.45

Feb-1964	19.47
Mar-1964	19.49
Apr-1964	19.51
May-1964	19.53
Jun-1964	19.56
Jul-1964	19.60
Aug-1964	19.63
Sep-1964	19.66
Oct-1964	19.69
Nov-1964	19.72
Dec-1964	19.75
Jan-1965	19.78
Feb-1965	19.80
Mar-1965	19.83
Apr-1965	19.87
May-1965	19.89
Jun-1965	19.92
Jul-1965	19.95
Aug-1965	19.98
Sep-1965	20.02
Oct-1965	20.06
Nov-1965	20.11
Dec-1965	20.14
Jan-1966	20.18
Feb-1966	20.22
Mar-1966	20.28
Apr-1966	20.35
May-1966	20.42
Jun-1966	20.48
Jul-1966	20.54
Aug-1966	20.61
Sep-1966	20.67
Oct-1966	20.74
Nov-1966	20.80
Dec-1966	20.83
Jan-1967	20.86
Feb-1967	20.89
Mar-1967	20.92
Apr-1967	20.97
May-1967	21.02
Jun-1967	21.08
Jul-1967	21.14
Aug-1967	21.21
Sep-1967	21.29
Oct-1967	21.37
Nov-1967	21.45
Dec-1967	21.52
Jan-1968	21.60
Feb-1968	21.67
Mar-1968	21.76
Apr-1968	21.85
May-1968	21.92

Jun-1968	21.98
Jul-1968	22.04
Aug-1968	22.12
Sep-1968	22.23
Oct-1968	22.34
Nov-1968	22.45
Dec-1968	22.52
Jan-1969	22.59
Feb-1969	22.66
Mar-1969	22.74
Apr-1969	22.85
May-1969	22.97
Jun-1969	23.08
Jul-1969	23.20
Aug-1969	23.30
Sep-1969	23.40
Oct-1969	23.50
Nov-1969	23.59
Dec-1969	23.69
Jan-1970	23.80
Feb-1970	23.91
Mar-1970	24.04
Apr-1970	24.17
May-1970	24.27
Jun-1970	24.34
Jul-1970	24.39
Aug-1970	24.44
Sep-1970	24.53
Oct-1970	24.64
Nov-1970	24.76
Dec-1970	24.89
Jan-1971	25.02
Feb-1971	25.14
Mar-1971	25.25
Apr-1971	25.37
May-1971	25.47
Jun-1971	25.58
Jul-1971	25.67
Aug-1971	25.74
Sep-1971	25.78
Oct-1971	25.82
Nov-1971	25.91
Dec-1971	26.06
Jan-1972	26.24
Feb-1972	26.38
Mar-1972	26.45
Apr-1972	26.47
May-1972	26.50
Jun-1972	26.56
Jul-1972	26.65
Aug-1972	26.75
Sep-1972	26.86

Oct-1972	26.96
Nov-1972	27.06
Dec-1972	27.17
Jan-1973	27.29
Feb-1973	27.41
Mar-1973	27.55
Apr-1973	27.70
May-1973	27.87
Jun-1973	28.05
Jul-1973	28.24
Aug-1973	28.42
Sep-1973	28.57
Oct-1973	28.72
Nov-1973	28.88
Dec-1973	29.08
Jan-1974	29.29
Feb-1974	29.49
Mar-1974	29.69
Apr-1974	29.89
May-1974	30.13
Jun-1974	30.42
Jul-1974	30.75
Aug-1974	31.10
Sep-1974	31.43
Oct-1974	31.75
Nov-1974	32.06
Dec-1974	32.34
Jan-1975	32.60
Feb-1975	32.80
Mar-1975	32.96
Apr-1975	33.10
May-1975	33.25
Jun-1975	33.44
Jul-1975	33.66
Aug-1975	33.89
Sep-1975	34.11
Oct-1975	34.32
Nov-1975	34.50
Dec-1975	34.64
Jan-1976	34.76
Feb-1976	34.87
Mar-1976	34.98
Apr-1976	35.10
May-1976	35.23
Jun-1976	35.37
Jul-1976	35.53
Aug-1976	35.71
Sep-1976	35.90
Oct-1976	36.11
Nov-1976	36.32
Dec-1976	36.53
Jan-1977	36.73

Feb-1977	36.93
Mar-1977	37.13
Apr-1977	37.34
May-1977	37.53
Jun-1977	37.70
Jul-1977	37.86
Aug-1977	38.03
Sep-1977	38.24
Oct-1977	38.47
Nov-1977	38.69
Dec-1977	38.89
Jan-1978	39.10
Feb-1978	39.31
Mar-1978	39.56
Apr-1978	39.84
May-1978	40.09
Jun-1978	40.32
Jul-1978	40.53
Aug-1978	40.77
Sep-1978	41.04
Oct-1978	41.34
Nov-1978	41.62
Dec-1978	41.86
Jan-1979	42.09
Feb-1979	42.35
Mar-1979	42.67
Apr-1979	43.05
May-1979	43.42
Jun-1979	43.74
Jul-1979	44.02
Aug-1979	44.30
Sep-1979	44.58
Oct-1979	44.87
Nov-1979	45.17
Dec-1979	45.49
Jan-1980	45.83
Feb-1980	46.16
Mar-1980	46.51
Apr-1980	46.86
May-1980	47.20
Jun-1980	47.53
Jul-1980	47.88
Aug-1980	48.26
Sep-1980	48.69
Oct-1980	49.15
Nov-1980	49.63
Dec-1980	50.11
Jan-1981	50.58
Feb-1981	50.96
Mar-1981	51.28
Apr-1981	51.56
May-1981	51.84

Jun-1981	52.14
Jul-1981	52.47
Aug-1981	52.81
Sep-1981	53.13
Oct-1981	53.44
Nov-1981	53.73
Dec-1981	54.00
Jan-1982	54.26
Feb-1982	54.48
Mar-1982	54.69
Apr-1982	54.91
May-1982	55.14
Jun-1982	55.41
Jul-1982	55.68
Aug-1982	55.93
Sep-1982	56.15
Oct-1982	56.33
Nov-1982	56.51
Dec-1982	56.69
Jan-1983	56.86
Feb-1983	57.00
Mar-1983	57.12
Apr-1983	57.24
May-1983	57.39
Jun-1983	57.60
Jul-1983	57.83
Aug-1983	58.02
Sep-1983	58.14
Oct-1983	58.24
Nov-1983	58.39
Dec-1983	58.62
Jan-1984	58.91
Feb-1984	59.16
Mar-1984	59.36
Apr-1984	59.51
May-1984	59.67
Jun-1984	59.85
Jul-1984	60.04
Aug-1984	60.18
Sep-1984	60.27
Oct-1984	60.35
Nov-1984	60.48
Dec-1984	60.72
Jan-1985	61.01
Feb-1985	61.24
Mar-1985	61.38
Apr-1985	61.46
May-1985	61.52
Jun-1985	61.59
Jul-1985	61.69
Aug-1985	61.81
Sep-1985	61.94

Oct-1985	62.07
Nov-1985	62.20
Dec-1985	62.31
Jan-1986	62.42
Feb-1986	62.51
Mar-1986	62.60
Apr-1986	62.71
May-1986	62.82
Jun-1986	62.94
Jul-1986	63.08
Aug-1986	63.22
Sep-1986	63.36
Oct-1986	63.51
Nov-1986	63.67
Dec-1986	63.85
Jan-1987	64.04
Feb-1987	64.19
Mar-1987	64.30
Apr-1987	64.40
May-1987	64.52
Jun-1987	64.68
Jul-1987	64.87
Aug-1987	65.06
Sep-1987	65.21
Oct-1987	65.36
Nov-1987	65.51
Dec-1987	65.67
Jan-1988	65.86
Feb-1988	66.04
Mar-1988	66.22
Apr-1988	66.42
May-1988	66.66
Jun-1988	66.94
Jul-1988	67.23
Aug-1988	67.49
Sep-1988	67.68
Oct-1988	67.83
Nov-1988	67.99
Dec-1988	68.21
Jan-1989	68.47
Feb-1989	68.72
Mar-1989	68.97
Apr-1989	69.20
May-1989	69.41
Jun-1989	69.60
Jul-1989	69.76
Aug-1989	69.88
Sep-1989	69.99
Oct-1989	70.11
Nov-1989	70.29
Dec-1989	70.55
Jan-1990	70.86

Feb-1990	71.18
Mar-1990	71.47
Apr-1990	71.74
May-1990	72.00
Jun-1990	72.25
Jul-1990	72.47
Aug-1990	72.68
Sep-1990	72.85
Oct-1990	73.03
Nov-1990	73.25
Dec-1990	73.52
Jan-1991	73.82
Feb-1991	74.07
Mar-1991	74.26
Apr-1991	74.40
May-1991	74.56
Jun-1991	74.74
Jul-1991	74.95
Aug-1991	75.15
Sep-1991	75.30
Oct-1991	75.43
Nov-1991	75.55
Dec-1991	75.68
Jan-1992	75.83
Feb-1992	75.98
Mar-1992	76.14
Apr-1992	76.30
May-1992	76.45
Jun-1992	76.56
Jul-1992	76.66
Aug-1992	76.77
Sep-1992	76.90
Oct-1992	77.05
Nov-1992	77.21
Dec-1992	77.37
Jan-1993	77.54
Feb-1993	77.69
Mar-1993	77.84
Apr-1993	77.98
May-1993	78.11
Jun-1993	78.24
Jul-1993	78.35
Aug-1993	78.48
Sep-1993	78.60
Oct-1993	78.74
Nov-1993	78.88
Dec-1993	79.03
Jan-1994	79.19
Feb-1994	79.32
Mar-1994	79.44
Apr-1994	79.56
May-1994	79.69

Jun-1994	79.84
Jul-1994	80.00
Aug-1994	80.16
Sep-1994	80.29
Oct-1994	80.42
Nov-1994	80.56
Dec-1994	80.73
Jan-1995	80.91
Feb-1995	81.06
Mar-1995	81.19
Apr-1995	81.31
May-1995	81.42
Jun-1995	81.52
Jul-1995	81.64
Aug-1995	81.76
Sep-1995	81.89
Oct-1995	82.02
Nov-1995	82.18
Dec-1995	82.34
Jan-1996	82.50
Feb-1996	82.64
Mar-1996	82.74
Apr-1996	82.82
May-1996	82.92
Jun-1996	83.05
Jul-1996	83.20
Aug-1996	83.35
Sep-1996	83.48
Oct-1996	83.60
Nov-1996	83.72
Dec-1996	83.85
Jan-1997	84.00
Feb-1997	84.15
Mar-1997	84.29
Apr-1997	84.43
May-1997	84.53
Jun-1997	84.61
Jul-1997	84.67
Aug-1997	84.75
Sep-1997	84.86
Oct-1997	84.99
Nov-1997	85.10
Dec-1997	85.15
Jan-1998	85.18
Feb-1998	85.20
Mar-1998	85.24
Apr-1998	85.31
May-1998	85.41
Jun-1998	85.53
Jul-1998	85.65
Aug-1998	85.75
Sep-1998	85.82

Oct-1998	85.88
Nov-1998	85.95
Dec-1998	86.06
Jan-1999	86.19
Feb-1999	86.33
Mar-1999	86.45
Apr-1999	86.57
May-1999	86.69
Jun-1999	86.80
Jul-1999	86.91
Aug-1999	87.00
Sep-1999	87.08
Oct-1999	87.17
Nov-1999	87.33
Dec-1999	87.55
Jan-2000	87.81
Feb-2000	88.04
Mar-2000	88.20
Apr-2000	88.32
May-2000	88.45
Jun-2000	88.62
Jul-2000	88.81
Aug-2000	89.00
Sep-2000	89.15
Oct-2000	89.28
Nov-2000	89.42
Dec-2000	89.60
Jan-2001	89.82
Feb-2001	90.05
Mar-2001	90.29
Apr-2001	90.51
May-2001	90.70
Jun-2001	90.82
Jul-2001	90.90
Aug-2001	90.97
Sep-2001	91.04
Oct-2001	91.13
Nov-2001	91.22
Dec-2001	91.32
Jan-2002	91.43
Feb-2002	91.55
Mar-2002	91.68
Apr-2002	91.82
May-2002	91.96
Jun-2002	92.09
Jul-2002	92.23
Aug-2002	92.36
Sep-2002	92.50
Oct-2002	92.67
Nov-2002	92.88
Dec-2002	93.14
Jan-2003	93.40

Feb-2003	93.58
Mar-2003	93.67
Apr-2003	93.72
May-2003	93.79
Jun-2003	93.95
Jul-2003	94.16
Aug-2003	94.36
Sep-2003	94.51
Oct-2003	94.64
Nov-2003	94.81
Dec-2003	95.05
Jan-2004	95.35
Feb-2004	95.65
Mar-2004	95.93
Apr-2004	96.20
May-2004	96.46
Jun-2004	96.71
Jul-2004	96.95
Aug-2004	97.17
Sep-2004	97.38
Oct-2004	97.59
Nov-2004	97.85
Dec-2004	98.18
Jan-2005	98.53
Feb-2005	98.81
Mar-2005	99.01
Apr-2005	99.19
May-2005	99.41
Jun-2005	99.73
Jul-2005	100.11
Aug-2005	100.49
Sep-2005	100.81
Oct-2005	101.07
Nov-2005	101.31
Dec-2005	101.54
Jan-2006	101.79
Feb-2006	102.05
Mar-2006	102.32
Apr-2006	102.63
May-2006	102.95
Jun-2006	103.28
Jul-2006	103.56
Aug-2006	103.77
Sep-2006	103.87
Oct-2006	103.95
Nov-2006	104.15
Dec-2006	104.52
Jan-2007	105.00
Feb-2007	105.44
Mar-2007	105.76
Apr-2007	105.98
May-2007	106.13

Jun-2007	106.24
Jul-2007	106.34
Aug-2007	106.45
Sep-2007	106.58
Oct-2007	106.75
Nov-2007	106.95
Dec-2007	107.18
Jan-2008	107.42
Feb-2008	107.63
Mar-2008	107.82
Apr-2008	108.00
May-2008	108.25
Jun-2008	108.59
Jul-2008	108.93
Aug-2008	109.17
Sep-2008	109.23
Oct-2008	109.20
Nov-2008	109.21
Dec-2008	109.33
Jan-2009	109.49
Feb-2009	109.57
Mar-2009	109.52
Apr-2009	109.39
May-2009	109.29
Jun-2009	109.28
Jul-2009	109.35
Aug-2009	109.46
Sep-2009	109.58
Oct-2009	109.69
Nov-2009	109.82
Dec-2009	109.95
Jan-2010	110.09
Feb-2010	110.23
Mar-2010	110.37
Apr-2010	110.52
May-2010	110.68
Jun-2010	110.86
Jul-2010	111.05
Aug-2010	111.25
Sep-2010	111.45
Oct-2010	111.65
Nov-2010	111.84
Dec-2010	112.03
Jan-2011	112.21
Feb-2011	112.39
Mar-2011	112.57
Apr-2011	112.80
May-2011	113.09
Jun-2011	113.44
Jul-2011	113.78
Aug-2011	114.00
Sep-2011	114.03

Oct-2011	113.98
Nov-2011	113.99
Dec-2011	114.15
Jan-2012	114.41
Feb-2012	114.64
Mar-2012	114.78
Apr-2012	114.88
May-2012	115.02
Jun-2012	115.26
Jul-2012	115.55
Aug-2012	115.83
Sep-2012	116.04
Oct-2012	116.21
Nov-2012	116.39
Dec-2012	116.62
Jan-2013	116.88
Feb-2013	117.09
Mar-2013	117.25
Apr-2013	117.40
May-2013	117.58
Jun-2013	117.83
Jul-2013	118.12
Aug-2013	118.40
Sep-2013	118.61
Oct-2013	118.79
Nov-2013	118.97
Dec-2013	119.17
Jan-2014	119.39
Feb-2014	119.60
Mar-2014	119.80
Apr-2014	120.00
May-2014	120.21
Jun-2014	120.45
Jul-2014	120.69
Aug-2014	120.95
Sep-2014	121.21
Oct-2014	121.47
Nov-2014	121.71
Dec-2014	121.95
Jan-2015	122.18
Feb-2015	122.40
Mar-2015	122.61
Apr-2015	122.83
May-2015	123.05
Jun-2015	123.26
Jul-2015	123.47
Aug-2015	123.68
Sep-2015	123.89
Oct-2015	124.10
Nov-2015	124.32
Dec-2015	124.53
Jan-2016	124.74

Feb-2016	124.93
Mar-2016	125.12
Apr-2016	125.30
May-2016	125.49
Jun-2016	125.68
Jul-2016	125.87
Aug-2016	126.06
Sep-2016	126.25
Oct-2016	126.43
Nov-2016	126.61
Dec-2016	126.80
Jan-2017	127.01
Feb-2017	127.20
Mar-2017	127.39
Apr-2017	127.59
May-2017	127.80
Jun-2017	128.01
Jul-2017	128.22
Aug-2017	128.44
Sep-2017	128.67
Oct-2017	128.89
Nov-2017	129.11
Dec-2017	129.33
Jan-2018	129.54
Feb-2018	129.75
Mar-2018	129.96
Apr-2018	130.17
May-2018	130.39
Jun-2018	130.60
Jul-2018	130.81
Aug-2018	131.02
Sep-2018	131.23
Oct-2018	131.44
Nov-2018	131.65
Dec-2018	131.86
Jan-2019	132.07
Feb-2019	132.27
Mar-2019	132.48
Apr-2019	132.68
May-2019	132.89
Jun-2019	133.09
Jul-2019	133.30
Aug-2019	133.51
Sep-2019	133.72
Oct-2019	133.93
Nov-2019	134.15
Dec-2019	134.35
Jan-2020	134.56
Feb-2020	134.76
Mar-2020	134.97
Apr-2020	135.18
May-2020	135.39

Jun-2020	135.60
Jul-2020	135.82
Aug-2020	136.03
Sep-2020	136.24
Oct-2020	136.46
Nov-2020	136.67
Dec-2020	136.89
Jan-2021	137.11
Feb-2021	137.32
Mar-2021	137.52
Apr-2021	137.74
May-2021	137.96
Jun-2021	138.18
Jul-2021	138.40
Aug-2021	138.63
Sep-2021	138.85
Oct-2021	139.07
Nov-2021	139.30
Dec-2021	139.52
Jan-2022	139.75
Feb-2022	139.96
Mar-2022	140.18
Apr-2022	140.40
May-2022	140.62
Jun-2022	140.85
Jul-2022	141.08
Aug-2022	141.31
Sep-2022	141.54
Oct-2022	141.77
Nov-2022	142.00
Dec-2022	142.23
Jan-2023	142.46
Feb-2023	142.68
Mar-2023	142.90
Apr-2023	143.13
May-2023	143.37
Jun-2023	143.60
Jul-2023	143.84
Aug-2023	144.08
Sep-2023	144.31
Oct-2023	144.55
Nov-2023	144.79
Dec-2023	145.02
Jan-2024	145.27
Feb-2024	145.50
Mar-2024	145.72
Apr-2024	145.95
May-2024	146.18
Jun-2024	146.42
Jul-2024	146.66
Aug-2024	146.90
Sep-2024	147.14

Oct-2024	147.38
Nov-2024	147.62
Dec-2024	147.86
Jan-2025	148.10
Feb-2025	148.33
Mar-2025	148.56
Apr-2025	148.80
May-2025	149.03
Jun-2025	149.27
Jul-2025	149.51
Aug-2025	149.75
Sep-2025	149.99
Oct-2025	150.23
Nov-2025	150.47
Dec-2025	150.71
Jan-2026	150.96
Feb-2026	151.19
Mar-2026	151.42
Apr-2026	151.65
May-2026	151.89
Jun-2026	152.12
Jul-2026	152.36
Aug-2026	152.60
Sep-2026	152.84
Oct-2026	153.08
Nov-2026	153.32
Dec-2026	153.57
Jan-2027	153.82
Feb-2027	154.05
Mar-2027	154.28
Apr-2027	154.51
May-2027	154.74
Jun-2027	154.98
Jul-2027	155.22
Aug-2027	155.46
Sep-2027	155.71
Oct-2027	155.96
Nov-2027	156.20
Dec-2027	156.45
Jan-2028	156.69
Feb-2028	156.92
Mar-2028	157.15
Apr-2028	157.38
May-2028	157.61
Jun-2028	157.84
Jul-2028	158.08
Aug-2028	158.32
Sep-2028	158.55
Oct-2028	158.78
Nov-2028	159.02
Dec-2028	159.27
Jan-2029	159.53

Feb-2029	159.76
Mar-2029	159.99
Apr-2029	160.22
May-2029	160.44
Jun-2029	160.67
Jul-2029	160.91
Aug-2029	161.16
Sep-2029	161.40
Oct-2029	161.64
Nov-2029	161.89
Dec-2029	162.13
Jan-2030	162.38
Feb-2030	162.61
Mar-2030	162.84
Apr-2030	163.08
May-2030	163.31
Jun-2030	163.55
Jul-2030	163.78
Aug-2030	164.02
Sep-2030	164.26
Oct-2030	164.50
Nov-2030	164.75
Dec-2030	165.00
Jan-2031	165.26
Feb-2031	165.49
Mar-2031	165.71
Apr-2031	165.93
May-2031	166.16
Jun-2031	166.40
Jul-2031	166.65
Aug-2031	166.91
Sep-2031	167.15
Oct-2031	167.39
Nov-2031	167.64
Dec-2031	167.89
Jan-2032	168.14
Feb-2032	168.37
Mar-2032	168.60
Apr-2032	168.83
May-2032	169.06
Jun-2032	169.30
Jul-2032	169.54
Aug-2032	169.79
Sep-2032	170.03
Oct-2032	170.27
Nov-2032	170.52
Dec-2032	170.78
Jan-2033	171.03
Feb-2033	171.27
Mar-2033	171.50
Apr-2033	171.72
May-2033	171.95

Jun-2033	172.19
Jul-2033	172.44
Aug-2033	172.70
Sep-2033	172.94
Oct-2033	173.19
Nov-2033	173.44
Dec-2033	173.70
Jan-2034	173.96
Feb-2034	174.20
Mar-2034	174.43
Apr-2034	174.66
May-2034	174.89
Jun-2034	175.12
Jul-2034	175.37
Aug-2034	175.61
Sep-2034	175.86
Oct-2034	176.11
Nov-2034	176.37
Dec-2034	176.65
Jan-2035	176.92
Feb-2035	177.18
Mar-2035	177.42
Apr-2035	177.65
May-2035	177.88
Jun-2035	178.12
Jul-2035	178.37
Aug-2035	178.63
Sep-2035	178.89
Oct-2035	179.16
Nov-2035	179.42
Dec-2035	179.68
Jan-2036	179.93
Feb-2036	180.17
Mar-2036	180.41
Apr-2036	180.64
May-2036	180.88
Jun-2036	181.12
Jul-2036	181.37
Aug-2036	181.64
Sep-2036	181.90
Oct-2036	182.18
Nov-2036	182.45
Dec-2036	182.72
Jan-2037	182.99
Feb-2037	183.23
Mar-2037	183.46
Apr-2037	183.70
May-2037	183.94
Jun-2037	184.18
Jul-2037	184.44
Aug-2037	184.71
Sep-2037	184.98

Oct-2037	185.25
Nov-2037	185.53
Dec-2037	185.82
Jan-2038	186.10
Feb-2038	186.36
Mar-2038	186.61
Apr-2038	186.86
May-2038	187.11
Jun-2038	187.37
Jul-2038	187.64
Aug-2038	187.92
Sep-2038	188.21
Oct-2038	188.51
Nov-2038	188.81
Dec-2038	189.11
Jan-2039	189.41
Feb-2039	189.70
Mar-2039	189.96
Apr-2039	190.23
May-2039	190.50
Jun-2039	190.77
Jul-2039	191.05
Aug-2039	191.36
Sep-2039	191.66
Oct-2039	191.98
Nov-2039	192.30
Dec-2039	192.62
Jan-2040	192.94
Feb-2040	193.24
Mar-2040	193.51
Apr-2040	193.79
May-2040	194.06
Jun-2040	194.35
Jul-2040	194.65
Aug-2040	194.97
Sep-2040	195.29
Oct-2040	195.61
Nov-2040	195.95
Dec-2040	196.29
Jan-2041	196.64
Feb-2041	196.95
Mar-2041	197.26
Apr-2041	197.56
May-2041	197.86
Jun-2041	198.17
Jul-2041	198.49
Aug-2041	198.84
Sep-2041	199.19
Oct-2041	199.56
Nov-2041	199.93
Dec-2041	200.31
Jan-2042	200.69

Feb-2042	201.03
Mar-2042	201.35
Apr-2042	201.67
May-2042	201.99
Jun-2042	202.33
Jul-2042	202.68
Aug-2042	203.06
Sep-2042	203.44
Oct-2042	203.83
Nov-2042	204.23
Dec-2042	204.62

10. HOUSE HEATING FUEL - Universe: Occupied housing units

	Total Occupied Units	Utility gas	Bottled, tank, or LP gas	Electricity	Fuel oil, kerosene, etc.
Adair County, Kentucky	5800	893	383	1939	504
Allen County, Kentucky	5595	1067	661	2255	236
Anderson County, Kentucky	5438	1894	551	2099	262
Ballard County, Kentucky	3191	1108	739	852	127
Barren County, Kentucky	13136	4773	1464	3997	499
Bath County, Kentucky	3659	918	1037	656	83
Bell County, Kentucky	11512	3217	339	4341	911
Boone County, Kentucky	20127	6266	1809	8284	2791
Bourbon County, Kentucky	7250	3236	633	2011	773
Boyd County, Kentucky	19876	12073	727	5916	390
Boyle County, Kentucky	9483	5778	516	2102	330
Bracken County, Kentucky	2872	945	423	701	376
Breathitt County, Kentucky	5555	525	520	1886	201
Breckinridge County, Kentucky	6159	1770	1063	1461	172
Bullitt County, Kentucky	15965	5071	2566	5268	1287
Butler County, Kentucky	4180	552	587	1458	150
Caldwell County, Kentucky	5274	2682	916	818	118
Calloway County, Kentucky	11607	2753	1208	5565	485
Campbell County, Kentucky	31169	19881	1324	6814	2286
Carlisle County, Kentucky	2106	748	276	618	58
Carroll County, Kentucky	3505	1565	329	719	358
Carter County, Kentucky	8679	1404	1251	2786	359
Casey County, Kentucky	5436	544	443	1400	553
Christian County, Kentucky	21636	9689	1761	8784	302
Clark County, Kentucky	10973	5979	807	3055	210
Clay County, Kentucky	7367	2088	348	2162	255
Clinton County, Kentucky	3591	141	469	1229	771
Crittenden County, Kentucky	3646	1078	964	836	63
Cumberland County, Kentucky	2714	70	181	786	249
Daviess County, Kentucky	33036	24165	1630	5736	168
Edmonson County, Kentucky	3843	53	568	1393	204
Elliott County, Kentucky	2324	111	544	489	46
Estill County, Kentucky	5357	1908	577	1284	217
Fayette County, Kentucky	89529	53637	969	33151	748
Fleming County, Kentucky	4626	656	1219	1216	308
Floyd County, Kentucky	15664	8513	694	4739	184
Franklin County, Kentucky	17385	9214	1380	5543	491
Fulton County, Kentucky	3378	1632	332	1070	76
Gallatin County, Kentucky	1941	279	488	478	412
Garrard County, Kentucky	4435	1191	504	1539	248
Grant County, Kentucky	5585	411	1368	1253	1824
Graves County, Kentucky	13377	5801	2218	3470	324
Grayson County, Kentucky	7991	936	1107	2797	454
Green County, Kentucky	4089	1073	555	993	170
Greenup County, Kentucky	13414	6682	774	3714	372

	Total Occupied Units	Utility gas	Bottled, tank, or LP gas	Electricity	Fuel oil, kerosene, etc.
Hancock County, Kentucky	2795	1118	469	634	15
Hardin County, Kentucky	29358	10323	2120	12810	1904
Harlan County, Kentucky	13269	152	432	5724	2928
Harrison County, Kentucky	6086	2102	819	1577	777
Hart County, Kentucky	5740	1446	1047	1188	225
Henderson County, Kentucky	16558	9386	1626	4665	185
Henry County, Kentucky	4896	1371	1024	1354	432
Hickman County, Kentucky	2188	646	572	598	69
Hopkins County, Kentucky	17760	10244	1655	4504	151
Jackson County, Kentucky	4381	60	258	1654	390
Jefferson County, Kentucky	264138	201821	4055	50249	3636
Jessamine County, Kentucky	10601	4084	799	4312	541
Johnson County, Kentucky	8469	2764	897	3011	395
Kenton County, Kentucky	52690	31806	2120	13636	3891
Knott County, Kentucky	6086	2719	243	1887	59
Knox County, Kentucky	10718	4164	677	3003	657
Larue County, Kentucky	4503	1124	715	1126	654
Laurel County, Kentucky	15585	2363	898	7720	1905
Lawrence County, Kentucky	5007	1310	682	1638	220
Lee County, Kentucky	2760	71	671	820	194
Leslie County, Kentucky	4711	113	193	2217	201
Letcher County, Kentucky	9731	159	215	4734	1311
Letcher County, Kentucky	4713	710	934	1078	122
Letcher County, Kentucky	7431	1275	705	2211	856
Livingston County, Kentucky	3593	321	1275	1215	138
Logan County, Kentucky	9302	3177	1633	2836	357
Lyon County, Kentucky	2355	770	493	621	34
McCracken County, Kentucky	25625	15615	1808	7106	290
McCreary County, Kentucky	5479	0	225	1421	1235
McLean County, Kentucky	3672	1334	705	1034	79
Madison County, Kentucky	20012	6961	1436	8639	673
Magoffin County, Kentucky	4440	621	650	1691	236
Marion County, Kentucky	5688	2065	729	1297	217
Marshall County, Kentucky	10789	2758	1514	4533	277
Martin County, Kentucky	4300	2019	333	1407	83
Mason County, Kentucky	6537	3504	735	1242	251
Meade County, Kentucky	8080	2442	1346	2555	351
Menifee County, Kentucky	1842	272	303	367	55
Mercer County, Kentucky	7413	3067	923	2205	442
Metcalfe County, Kentucky	3433	424	328	867	123
Monroe County, Kentucky	4505	414	450	1812	121
Montgomery County, Kentucky	7312	3551	641	2144	252
Morgan County, Kentucky	4089	323	732	1196	187
Muhlenberg County, Kentucky	11683	4913	1449	3570	165
Nelson County, Kentucky	10417	1777	1420	4171	1737
Nicholas County, Kentucky	2621	752	434	635	215
Ohio County, Kentucky	7816	2520	1185	2119	158
Ohio County, Kentucky	10673	3062	1215	5240	614
Owen County, Kentucky	3412	20	654	1172	499



	Total Occupied Units	Utility gas	Bottled, tank, or LP gas	Electricity	Fuel oil, kerosene, etc.
Owsley County, Kentucky	1848	24	291	500	95
Pendleton County, Kentucky	4332	1231	789	727	926
Perry County, Kentucky	10598	2261	404	4723	236
Pike County, Kentucky	26148	7335	1178	12321	1537
Powell County, Kentucky	4057	1262	507	937	226
Pulaski County, Kentucky	18866	2956	1271	8250	2664
Robertson County, Kentucky	820	224	144	141	79
Rockcastle County, Kentucky	5464	38	578	1877	1414
Rowan County, Kentucky	6755	2352	671	1790	118
Russell County, Kentucky	5896	37	245	2751	1491
Scott County, Kentucky	8501	2897	1071	3199	453
Shelby County, Kentucky	9048	3293	1255	2838	643
Simpson County, Kentucky	5767	2491	858	1952	167
Spencer County, Kentucky	2451	59	1065	673	252
Taylor County, Kentucky	8216	3940	497	2156	325
Todd County, Kentucky	4104	581	856	1661	193
Trigg County, Kentucky	4104	604	843	1770	142
Trimble County, Kentucky	2246	280	387	601	457
Union County, Kentucky	5580	2432	1235	1533	139
Warren County, Kentucky	28819	14439	2014	9679	566
Washington County, Kentucky	3709	971	901	837	308
Wayne County, Kentucky	6517	7	279	2382	1003
Webster County, Kentucky	5372	2582	932	1291	61
Whitley County, Kentucky	12153	4616	901	3143	545
Wolfe County, Kentucky	2451	158	399	606	88
Woodford County, Kentucky	7223	3257	713	2569	280
	1379782	629310	105948	414015	66320



10. HOUSE HEATING FUEL - Universe: Occupied hou

	Coal or coke	Wood	Solar energy	Other fuel	No fuel used
Adair County, Kentucky	12	2062	0	0	7
Allen County, Kentucky	18	1358	0	0	0
Anderson County, Kentucky	14	599	0	19	0
Ballard County, Kentucky	5	360	0	0	0
Barren County, Kentucky	35	2311	5	46	6
Bath County, Kentucky	90	872	0	3	0
Bell County, Kentucky	2175	515	0	0	14
Boone County, Kentucky	24	825	0	98	30
Bourbon County, Kentucky	80	512	0	0	5
Boyd County, Kentucky	132	557	0	60	21
Boyle County, Kentucky	95	651	0	11	0
Bracken County, Kentucky	15	405	0	0	7
Breathitt County, Kentucky	1600	806	0	9	8
Breckinridge County, Kentucky	23	1655	0	6	9
Bullitt County, Kentucky	50	1704	0	15	4
Butler County, Kentucky	134	1269	0	14	16
Caldwell County, Kentucky	52	688	0	0	0
Calloway County, Kentucky	10	1565	13	8	0
Campbell County, Kentucky	34	582	0	201	47
Carlisle County, Kentucky	0	400	0	6	0
Carroll County, Kentucky	2	522	0	5	5
Carter County, Kentucky	630	2204	6	19	20
Casey County, Kentucky	76	2393	0	16	11
Christian County, Kentucky	275	753	0	47	25
Clark County, Kentucky	118	794	0	0	10
Clay County, Kentucky	1938	446	9	100	21
Clinton County, Kentucky	142	825	0	14	0
Crittenden County, Kentucky	24	681	0	0	0
Cumberland County, Kentucky	5	1398	0	25	0
Daviess County, Kentucky	279	1004	12	29	13
Edmonson County, Kentucky	96	1523	0	0	6
Elliott County, Kentucky	260	839	0	30	5
Estill County, Kentucky	155	1216	0	0	0
Fayette County, Kentucky	127	600	5	177	115
Fleming County, Kentucky	76	1138	7	6	0
Floyd County, Kentucky	1268	253	6	5	2
Franklin County, Kentucky	52	669	0	20	16
Fulton County, Kentucky	13	255	0	0	0
Gallatin County, Kentucky	15	267	2	0	0
Garrard County, Kentucky	261	672	0	13	7
Grant County, Kentucky	65	625	12	11	16
Graves County, Kentucky	12	1546	0	6	0
Grayson County, Kentucky	17	2642	0	23	15
Green County, Kentucky	0	1298	0	0	0
Greenup County, Kentucky	497	1362	0	13	0

	Coal or coke	Wood	Solar energy	Other fuel	No fuel used
Hancock County, Kentucky	48	509	0	2	0
Hardin County, Kentucky	68	2037	0	71	25
Harlan County, Kentucky	3665	341	0	25	2
Harrison County, Kentucky	10	796	0	5	0
Hart County, Kentucky	23	1804	0	7	0
Henderson County, Kentucky	124	525	0	12	35
Henry County, Kentucky	41	653	1	16	4
Hickman County, Kentucky	0	303	0	0	0
Hopkins County, Kentucky	380	797	0	16	13
Jackson County, Kentucky	676	1319	0	22	2
Jefferson County, Kentucky	169	1308	44	1955	901
Jessamine County, Kentucky	157	676	4	20	8
Johnson County, Kentucky	1121	218	0	53	10
Kenton County, Kentucky	64	592	2	388	191
Knott County, Kentucky	1001	161	0	16	0
Knox County, Kentucky	1643	545	0	23	6
Larue County, Kentucky	21	847	0	6	10
Laurel County, Kentucky	1137	1528	0	29	5
Lawrence County, Kentucky	663	465	0	29	0
Lee County, Kentucky	436	563	0	2	3
Leslie County, Kentucky	1723	254	0	10	0
Letcher County, Kentucky	3022	266	0	0	24
Letcher County, Kentucky	68	1794	0	0	7
Letcher County, Kentucky	331	2046	0	0	7
Livingston County, Kentucky	2	632	0	0	10
Logan County, Kentucky	75	1207	0	9	8
Lyon County, Kentucky	7	420	2	8	0
McCracken County, Kentucky	7	715	0	70	14
McCreary County, Kentucky	578	2012	0	8	0
McLean County, Kentucky	110	407	0	1	2
Madison County, Kentucky	596	1582	15	60	50
Magoffin County, Kentucky	933	288	0	19	2
Marion County, Kentucky	15	1334	9	15	7
Marshall County, Kentucky	12	1667	10	0	18
Martin County, Kentucky	345	106	0	5	2
Mason County, Kentucky	23	765	0	12	5
Meade County, Kentucky	4	1360	8	14	0
Menifee County, Kentucky	35	796	0	7	7
Mercer County, Kentucky	73	687	0	16	0
Metcalfe County, Kentucky	0	1674	0	13	4
Monroe County, Kentucky	7	1680	0	14	7
Montgomery County, Kentucky	63	643	0	11	7
Morgan County, Kentucky	763	880	0	8	0
Muhlenberg County, Kentucky	526	1049	0	11	0
Nelson County, Kentucky	40	1225	5	23	19
Nicholas County, Kentucky	18	565	0	0	2
Ohio County, Kentucky	436	1389	0	5	4
Ohio County, Kentucky	10	477	8	45	2
Owen County, Kentucky	24	1039	0	4	0



	Coal or coke	Wood	Solar energy	Other fuel	No fuel used
Owsley County, Kentucky	530	392	0	6	10
Pendleton County, Kentucky	42	617	0	0	0
Perry County, Kentucky	2564	339	0	25	46
Pike County, Kentucky	3339	427	0	11	0
Powell County, Kentucky	185	940	0	0	0
Pulaski County, Kentucky	624	3076	6	14	5
Robertson County, Kentucky	11	219	0	2	0
Rockcastle County, Kentucky	450	1107	0	0	0
Rowan County, Kentucky	87	1642	0	72	23
Russell County, Kentucky	29	1325	0	11	7
Scott County, Kentucky	63	806	0	12	0
Shelby County, Kentucky	44	961	0	0	14
Simpson County, Kentucky	0	287	0	12	0
Spencer County, Kentucky	7	389	0	6	0
Taylor County, Kentucky	0	1257	19	9	13
Todd County, Kentucky	121	669	2	12	9
Trigg County, Kentucky	70	664	0	0	11
Trimble County, Kentucky	14	507	0	0	0
Union County, Kentucky	58	183	0	0	0
Warren County, Kentucky	58	1933	12	108	10
Washington County, Kentucky	11	679	0	2	0
Wayne County, Kentucky	381	2417	0	15	33
Webster County, Kentucky	166	337	0	3	0
Whitley County, Kentucky	2011	830	9	88	10
Wolfe County, Kentucky	425	775	0	0	0
Woodford County, Kentucky	33	360	6	5	0
	43617	#####	239	4553	2075



9. HOUSE HEATING FUEL - Universe: Occupied housing units

	Total Occupied Units	Utility gas	Bottled, tank, or LP gas	Electricity
Adair County, Kentucky	6747	1013	726	3499
Allen County, Kentucky	6910	1100	1466	3744
Anderson County, Kentucky	7320	2376	727	3740
Ballard County, Kentucky	3395	1221	897	1186
Barren County, Kentucky	15346	5854	2895	5629
Bath County, Kentucky	4445	1083	1331	1515
Bell County, Kentucky	12004	3048	286	7065
Boone County, Kentucky	31258	13011	2977	12667
Bourbon County, Kentucky	7681	3359	842	2788
Boyd County, Kentucky	20010	11383	462	7706
Boyle County, Kentucky	10574	6047	827	3156
Bracken County, Kentucky	3228	1079	519	1154
Breathitt County, Kentucky	6170	755	845	3095
Breckinridge County, Kentucky	7324	1978	2068	2341
Bullitt County, Kentucky	22171	11019	2498	7470
Butler County, Kentucky	5059	894	1287	2250
Caldwell County, Kentucky	5431	2648	1360	1118
Calloway County, Kentucky	13862	4918	3051	5398
Campbell County, Kentucky	34742	20603	2114	9763
Carlisle County, Kentucky	2208	894	556	631
Carroll County, Kentucky	3940	1751	708	1179
Carter County, Kentucky	10342	1454	1819	5420
Casey County, Kentucky	6260	614	812	2937
Christian County, Kentucky	24857	10506	3052	10541
Clark County, Kentucky	13015	6758	1124	4610
Clay County, Kentucky	8556	2392	433	4474
Clinton County, Kentucky	4086	170	919	2060
Crittenden County, Kentucky	3829	1092	1304	1159
Cumberland County, Kentucky	2976	292	401	1443
Daviess County, Kentucky	36033	26208	1912	7229
Edmonson County, Kentucky	4648	138	1171	2717
Elliott County, Kentucky	2638	78	822	1053
Estill County, Kentucky	6108	1829	1125	2454
Fayette County, Kentucky	108288	63761	1500	42058
Fleming County, Kentucky	5367	609	1351	2424
Floyd County, Kentucky	16881	7277	592	8317
Franklin County, Kentucky	19907	10926	1647	6788
Fulton County, Kentucky	3237	1820	501	843
Gallatin County, Kentucky	2902	487	830	1130
Garrard County, Kentucky	5741	1503	621	2933
Grant County, Kentucky	8175	1086	2770	2653
Graves County, Kentucky	14841	6343	4295	3704
Grayson County, Kentucky	9596	1366	2599	4442
Green County, Kentucky	4706	1148	923	1808
Greenup County, Kentucky	14536	6815	1555	5372



	Total Occupied Units	Utility gas	Bottled, tank, or LP gas	Electricity
Hancock County, Kentucky	3215	1507	659	783
Hardin County, Kentucky	34497	11246	3111	18212
Harlan County, Kentucky	13291	150	463	9124
Harrison County, Kentucky	7012	2184	1336	2472
Hart County, Kentucky	6769	1528	1372	2828
Henderson County, Kentucky	18095	9554	1616	6561
Henry County, Kentucky	5844	1636	1538	2216
Hickman County, Kentucky	2188	640	907	584
Hopkins County, Kentucky	18820	10063	1448	6784
Jackson County, Kentucky	5307	149	617	3653
Jefferson County, Kentucky	287012	212265	3704	67210
Jessamine County, Kentucky	13867	6123	928	6261
Johnson County, Kentucky	9103	2225	944	5184
Kenton County, Kentucky	59444	36166	2898	17083
Knott County, Kentucky	6717	2539	130	3489
Knox County, Kentucky	12416	5277	685	5167
Larue County, Kentucky	5275	1157	972	2378
Laurel County, Kentucky	20353	3234	1308	13601
Lawrence County, Kentucky	5954	1271	819	3137
Lee County, Kentucky	2985	419	830	1269
Leslie County, Kentucky	4885	145	130	3556
Letcher County, Kentucky	10085	137	215	7831
Letcher County, Kentucky	5422	783	1239	2168
Letcher County, Kentucky	9206	1462	1159	4936
Livingston County, Kentucky	3996	475	1889	1427
Logan County, Kentucky	10506	3551	3195	3256
Lyon County, Kentucky	2898	838	941	1021
McCracken County, Kentucky	27736	17591	2352	7324
McCreary County, Kentucky	6520	325	687	3141
McLean County, Kentucky	3984	1354	757	1647
Madison County, Kentucky	27152	7362	1389	17324
Magoffin County, Kentucky	5024	1180	723	2616
Marion County, Kentucky	6613	2051	1354	2490
Marshall County, Kentucky	12412	5517	2615	3767
Martin County, Kentucky	4776	1633	352	2574
Mason County, Kentucky	6847	3469	890	2066
Meade County, Kentucky	9470	1858	2214	4520
Menifee County, Kentucky	2537	331	777	981
Mercer County, Kentucky	8423	3110	1279	3646
Metcalfe County, Kentucky	4016	953	772	1481
Monroe County, Kentucky	4741	1028	691	2139
Montgomery County, Kentucky	8902	3746	959	3744
Morgan County, Kentucky	4752	366	1548	2026
Muhlenberg County, Kentucky	12357	4453	1570	5772
Nelson County, Kentucky	13953	2464	2078	7908
Nicholas County, Kentucky	2710	720	530	1048
Ohio County, Kentucky	8899	2622	2087	3391
Ohio County, Kentucky	14856	6874	1290	6145
Owen County, Kentucky	4086	41	1395	1892



	Total Occupied Units	Utility gas	Bottled, tank, or LP gas	Electricity
Owsley County, Kentucky	1894	35	482	947
Pendleton County, Kentucky	5170	1080	1674	1298
Perry County, Kentucky	11460	2082	285	7574
Pike County, Kentucky	27612	5560	726	19632
Powell County, Kentucky	5044	1986	827	1637
Pulaski County, Kentucky	22719	3488	1481	14008
Robertson County, Kentucky	866	268	152	265
Rockcastle County, Kentucky	6544	38	946	3488
Rowan County, Kentucky	7927	2371	814	3700
Russell County, Kentucky	6941	56	446	4708
Scott County, Kentucky	12110	4266	1559	5744
Shelby County, Kentucky	12104	4802	2193	4554
Simpson County, Kentucky	6415	3059	1306	1809
Spencer County, Kentucky	4251	69	2188	1663
Taylor County, Kentucky	9233	4257	708	3173
Todd County, Kentucky	4569	851	1640	1722
Trigg County, Kentucky	5215	1012	1885	2045
Trimble County, Kentucky	3137	424	927	1331
Union County, Kentucky	5710	2357	1057	2117
Warren County, Kentucky	35365	17388	3499	13700
Washington County, Kentucky	4121	1005	1148	1482
Wayne County, Kentucky	7913	83	925	4370
Webster County, Kentucky	5560	2495	1058	1761
Whitley County, Kentucky	13780	6048	1188	5017
Wolfe County, Kentucky	2816	413	684	1047
Woodford County, Kentucky	8893	4278	709	3596
	1590647	706249	156389	617884



9. HOUSE HEATING FUEL - Universe: Occupied housing units

	Fuel oil, kerosene, etc.	Coal or coke	Wood	Solar energy	Other fuel
Adair County, Kentucky	537		910		35
Allen County, Kentucky	140	11	427	12	
Anderson County, Kentucky	155		278	6	23
Ballard County, Kentucky	22		69		
Barren County, Kentucky	203		686		47
Bath County, Kentucky	145	9	360		2
Bell County, Kentucky	610	652	307		21
Boone County, Kentucky	2174	2	298	9	69
Bourbon County, Kentucky	494	5	141		41
Boyd County, Kentucky	181	60	137		51
Boyle County, Kentucky	186	20	296	15	13
Bracken County, Kentucky	283	2	138	2	22
Breathitt County, Kentucky	454	602	384	2	22
Breckinridge County, Kentucky	146	3	760		12
Bullitt County, Kentucky	557	13	533		54
Butler County, Kentucky	186	18	413		5
Caldwell County, Kentucky	21		275		
Calloway County, Kentucky	117	25	334		6
Campbell County, Kentucky	1710	28	338	8	121
Carlisle County, Kentucky	14		88		6
Carroll County, Kentucky	201		101		
Carter County, Kentucky	271	102	1239		29
Casey County, Kentucky	509	8	1365		
Christian County, Kentucky	224	46	360		31
Clark County, Kentucky	129	14	295		25
Clay County, Kentucky	252	729	160		111
Clinton County, Kentucky	625	37	252	5	8
Crittenden County, Kentucky	67	6	201		
Cumberland County, Kentucky	215		618		7
Daviess County, Kentucky	96	59	393	10	56
Edmonson County, Kentucky	89		499	3	17
Elliott County, Kentucky	62	129	439		50
Estill County, Kentucky	65	63	550		22
Fayette County, Kentucky	306	31	188	10	242
Fleming County, Kentucky	172	14	755	16	20
Floyd County, Kentucky	298	261	111		8
Franklin County, Kentucky	223	13	250		28
Fulton County, Kentucky	21		41		6
Gallatin County, Kentucky	294		126		21
Garrard County, Kentucky	203	56	403		12
Grant County, Kentucky	1395	6	232		29
Graves County, Kentucky	96	6	362		17
Grayson County, Kentucky	249	7	875		34
Green County, Kentucky	116		699		12
Greenup County, Kentucky	301	46	423	21	3



	Fuel oil, kerosene, etc.	Coal or coke	Wood	Solar energy	Other fuel
Hancock County, Kentucky	6	18	240		2
Hardin County, Kentucky	1016	23	698		68
Harlan County, Kentucky	1958	1287	138	10	45
Harrison County, Kentucky	623		359		28
Hart County, Kentucky	119	11	901	3	2
Henderson County, Kentucky	136		216		5
Henry County, Kentucky	197		233	6	6
Hickman County, Kentucky	18		39		
Hopkins County, Kentucky	70	47	354	6	9
Jackson County, Kentucky	262	73	542		11
Jefferson County, Kentucky	1399	63	245	12	1249
Jessamine County, Kentucky	221	25	257		41
Johnson County, Kentucky	339	233	137		35
Kenton County, Kentucky	2648	8	164	6	286
Knott County, Kentucky	187	307	57		6
Knox County, Kentucky	372	613	248		39
Larue County, Kentucky	365	6	391		6
Laurel County, Kentucky	1284	224	592		50
Lawrence County, Kentucky	238	145	288		45
Lee County, Kentucky	119	71	243		34
Leslie County, Kentucky	176	661	173		9
Letcher County, Kentucky	649	979	212	7	22
Letcher County, Kentucky	190	6	988	8	35
Lincoln County, Kentucky	631	60	870	15	25
Livingston County, Kentucky	71		132		2
Logan County, Kentucky	97	12	364		8
Lyon County, Kentucky	6	3	89		
McCracken County, Kentucky	115		264		44
McCreary County, Kentucky	1128	69	1113		37
McLean County, Kentucky	43	11	148		9
Madison County, Kentucky	338	157	447		109
Magoffin County, Kentucky	217	147	88		33
Marion County, Kentucky	120		558	1	24
Marshall County, Kentucky	89		380		13
Martin County, Kentucky	99	76	26		13
Mason County, Kentucky	143	14	226	20	6
Meade County, Kentucky	215		648	8	4
Menifee County, Kentucky	41		401		6
Mercer County, Kentucky	215	14	136		23
Metcalfe County, Kentucky	151		638		12
Monroe County, Kentucky	118		734		22
Montgomery County, Kentucky	223	2	213		
Morgan County, Kentucky	169	275	321		32
Muhlenberg County, Kentucky	117	85	305	9	30
Nelson County, Kentucky	897	11	514	20	36
Nicholas County, Kentucky	176	24	208		
Ohio County, Kentucky	155	139	498		
Ohio County, Kentucky	338		149		36
Owen County, Kentucky	453	18	272	5	10

	Fuel oil, kerosene, etc.	Coal or coke	Wood	Solar energy	Other fuel
Owsley County, Kentucky	66	151	193		20
Pendleton County, Kentucky	797	13	272	5	16
Perry County, Kentucky	390	910	156		7
Pike County, Kentucky	852	616	152		12
Powell County, Kentucky	144	43	366	3	38
Pulaski County, Kentucky	2101	208	1264		77
Robertson County, Kentucky	58	2	109		8
Rockcastle County, Kentucky	1275	170	595		16
Rowan County, Kentucky	110	17	894		14
Russell County, Kentucky	1119		539		6
Scott County, Kentucky	238	16	279		8
Shelby County, Kentucky	286	16	216		21
Simpson County, Kentucky	136		72		18
Spencer County, Kentucky	119	7	184		15
Taylor County, Kentucky	257		788	8	25
Todd County, Kentucky	90	16	225		12
Trigg County, Kentucky	61	20	175	6	
Trimble County, Kentucky	284		151	9	5
Union County, Kentucky	87	14	76		
Warren County, Kentucky	226	28	378		78
Washington County, Kentucky	96		369	5	11
Wayne County, Kentucky	834	159	1465		33
Westerly County, Kentucky	69	9	128	8	8
Whitley County, Kentucky	436	594	347		144
Wolfe County, Kentucky	150	115	382		8
Woodford County, Kentucky	151		124		29
	44203	12124	45465	299	4534

1030. HOUSE HEATING FUEL - Universe: Occupied housing units

	No fuel used
Adair County, Kentucky	27
Allen County, Kentucky	10
Anderson County, Kentucky	15
Ballard County, Kentucky	
Barren County, Kentucky	32
Bath County, Kentucky	
Bell County, Kentucky	15
Boone County, Kentucky	51
Bourbon County, Kentucky	11
Boyd County, Kentucky	30
Boyle County, Kentucky	14
Bracken County, Kentucky	29
Breathitt County, Kentucky	11
Breckinridge County, Kentucky	16
Bullitt County, Kentucky	27
Butler County, Kentucky	6
Caldwell County, Kentucky	9
Calloway County, Kentucky	13
Campbell County, Kentucky	57
Carter County, Kentucky	19
Carroll County, Kentucky	
Carter County, Kentucky	8
Casey County, Kentucky	15
Christian County, Kentucky	97
Clark County, Kentucky	60
Clay County, Kentucky	5
Clinton County, Kentucky	10
Crittenden County, Kentucky	
Cumberland County, Kentucky	
Daviess County, Kentucky	70
Edmonson County, Kentucky	14
Elliott County, Kentucky	5
Estill County, Kentucky	
Fayette County, Kentucky	192
Fleming County, Kentucky	6
Floyd County, Kentucky	17
Franklin County, Kentucky	32
Fulton County, Kentucky	5
Gallatin County, Kentucky	14
Garrard County, Kentucky	10
Grant County, Kentucky	4
Graves County, Kentucky	18
Grayson County, Kentucky	24
Green County, Kentucky	
Greenup County, Kentucky	



No fuel
used

Hancock County, Kentucky	
Hardin County, Kentucky	123
Harlan County, Kentucky	116
Harrison County, Kentucky	10
Hart County, Kentucky	5
Henderson County, Kentucky	7
Henry County, Kentucky	12
Hickman County, Kentucky	
Hopkins County, Kentucky	39
Jackson County, Kentucky	
Jefferson County, Kentucky	865
Jessamine County, Kentucky	11
Johnson County, Kentucky	6
Kenton County, Kentucky	185
Knott County, Kentucky	2
Knox County, Kentucky	15
Larue County, Kentucky	
Laurel County, Kentucky	60
Lawrence County, Kentucky	11
Lee County, Kentucky	
Leslie County, Kentucky	35
Letcher County, Kentucky	33
Lewis County, Kentucky	5
Lincoln County, Kentucky	48
Livingston County, Kentucky	
Logan County, Kentucky	23
Lyon County, Kentucky	
McCracken County, Kentucky	46
McCreary County, Kentucky	20
McLean County, Kentucky	15
Madison County, Kentucky	26
Magoffin County, Kentucky	20
Marion County, Kentucky	15
Marshall County, Kentucky	31
Martin County, Kentucky	3
Mason County, Kentucky	13
Meade County, Kentucky	3
Menifee County, Kentucky	
Mercer County, Kentucky	
Metcalfe County, Kentucky	9
Monroe County, Kentucky	9
Montgomery County, Kentucky	15
Morgan County, Kentucky	15
Muhlenberg County, Kentucky	16
Nelson County, Kentucky	25
Nicholas County, Kentucky	4
Ohio County, Kentucky	7
Orwell County, Kentucky	24
Owen County, Kentucky	

	No fuel used
Owsley County, Kentucky	
Pendleton County, Kentucky	15
Perry County, Kentucky	56
Pike County, Kentucky	62
Powell County, Kentucky	
Pulaski County, Kentucky	92
Robertson County, Kentucky	4
Rockcastle County, Kentucky	16
Rowan County, Kentucky	7
Russell County, Kentucky	67
Scott County, Kentucky	
Shelby County, Kentucky	16
Simpson County, Kentucky	15
Spencer County, Kentucky	6
Taylor County, Kentucky	17
Todd County, Kentucky	13
Trigg County, Kentucky	11
Trimble County, Kentucky	6
Union County, Kentucky	2
Warren County, Kentucky	68
Washington County, Kentucky	5
Wayne County, Kentucky	44
Westerly County, Kentucky	24
Whitley County, Kentucky	6
Wolfe County, Kentucky	17
Woodford County, Kentucky	6
	3500

County	Item	Total:	Utility gas	Bottled, tank, or LP gas	Electricity	Fuel oil, kerosene, etc.	Coal or coke	Wood	Solar energy	Other fuel	No fuel used
Ballard County, Kentucky	Estimate	3,502	1,325	748	1,354	22	0	48	0	5	0
Breckinridge County, Kentucky	Estimate	7,309	1,616	1,998	2,852	46	0	757	0	17	23
Caldwell County, Kentucky	Estimate	5,377	2,936	797	1,470	8	0	146	0	8	12
Carlisle County, Kentucky	Estimate	2,169	835	413	826	0	0	79	0	16	0
Crittenden County, Kentucky	Estimate	3,749	958	966	1,371	52	0	340	0	41	21
Daviess County, Kentucky	Estimate	39,116	27,321	2,001	9,384	73	50	223	0	25	39
Graves County, Kentucky	Estimate	14,807	5,612	3,646	4,990	96	0	406	18	22	17
Grayson County, Kentucky	Estimate	9,648	1,093	1,957	5,796	116	9	630	0	36	11
Hancock County, Kentucky	Estimate	3,232	1,397	584	1,024	26	5	177	0	0	19
Henderson County, Kentucky	Estimate	18,897	9,164	1,254	8,109	74	0	223	32	26	15
Hopkins County, Kentucky	Estimate	18,743	8,688	1,053	8,448	27	62	432	10	0	23
Livingston County, Kentucky	Estimate	3,955	407	1,401	1,960	66	0	65	37	16	3
Lyon County, Kentucky	Estimate	3,241	970	738	1,444	3	0	86	0	0	0
McCracken County, Kentucky	Estimate	28,159	15,660	2,261	9,645	155	27	260	0	92	59
McLean County, Kentucky	Estimate	3,939	1,290	707	1,726	50	0	143	0	23	0
Marshall County, Kentucky	Estimate	12,822	5,108	2,452	4,800	35	0	378	0	18	31
Meade County, Kentucky	Estimate	9,768	1,779	1,934	5,382	178	0	436	0	28	31
Ohio County, Kentucky	Estimate	9,057	2,604	1,679	4,120	98	24	499	0	24	9
Union County, Kentucky	Estimate	5,811	2,056	823	2,691	99	0	83	0	37	22
Webster County, Kentucky	Estimate	5,500	2,150	666	2,557	31	0	66	0	11	19

2005-2009

County	Utility gas	Bottled, tank, or LP gas	Electricity	Fuel oil, kerosene, etc.	Coal or coke	Wood	Solar energy	Other fuel	No fuel used
Ballard County, Kentucky	0.378	0.214	0.387	0.006	0.000	0.014	0.000	0.001	0.000
Breckinridge County, Kentucky	0.221	0.273	0.390	0.006	0.000	0.104	0.000	0.002	0.003
Caldwell County, Kentucky	0.546	0.148	0.273	0.001	0.000	0.027	0.000	0.001	0.002
Carlisle County, Kentucky	0.385	0.190	0.381	0.000	0.000	0.036	0.000	0.007	0.000
Crittenden County, Kentucky	0.256	0.258	0.366	0.014	0.000	0.091	0.000	0.011	0.006
Daviess County, Kentucky	0.698	0.051	0.240	0.002	0.001	0.006	0.000	0.001	0.001
Graves County, Kentucky	0.379	0.246	0.337	0.006	0.000	0.027	0.001	0.001	0.001
Grayson County, Kentucky	0.113	0.203	0.601	0.012	0.001	0.065	0.000	0.004	0.001
Hancock County, Kentucky	0.432	0.181	0.317	0.008	0.002	0.055	0.000	0.000	0.006
Henderson County, Kentucky	0.485	0.066	0.429	0.004	0.000	0.012	0.002	0.001	0.001
Hopkins County, Kentucky	0.464	0.056	0.451	0.001	0.003	0.023	0.001	0.000	0.001
Livingston County, Kentucky	0.103	0.354	0.496	0.017	0.000	0.016	0.009	0.004	0.001
Lyon County, Kentucky	0.299	0.228	0.446	0.001	0.000	0.027	0.000	0.000	0.000
McCracken County, Kentucky	0.556	0.080	0.343	0.006	0.001	0.009	0.000	0.003	0.002
McLean County, Kentucky	0.327	0.179	0.438	0.013	0.000	0.036	0.000	0.006	0.000
Marshall County, Kentucky	0.398	0.191	0.374	0.003	0.000	0.029	0.000	0.001	0.002
Meade County, Kentucky	0.182	0.198	0.551	0.018	0.000	0.045	0.000	0.003	0.003
Ohio County, Kentucky	0.288	0.185	0.455	0.011	0.003	0.055	0.000	0.003	0.001
Union County, Kentucky	0.354	0.142	0.463	0.017	0.000	0.014	0.000	0.006	0.004
Webster County, Kentucky	0.391	0.121	0.465	0.006	0.000	0.012	0.000	0.002	0.003

2005-2009

County	Item	Total:	Utility gas	Bottled, tank, or LP gas	Electricity	Fuel oil, kerosene, etc.	Coal or coke	Wood	Solar energy	Other fuel	No fuel used
Ballard County, Kentucky	Estimate	3,358	1,164	611	1,559	0	4	16	0	4	0
Breckinridge County, Kentucky	Estimate	7,519	1,603	1,758	3,503	49	0	558	0	31	17
Caldwell County, Kentucky	Estimate	5,047	2,573	781	1,485	7	0	173	0	28	0
Carlisle County, Kentucky	Estimate	2,018	726	460	761	13	0	44	0	14	0
Crittenden County, Kentucky	Estimate	3,855	753	916	1,749	61	0	332	0	32	12
Daviess County, Kentucky	Estimate	37,279	24,699	1,824	10,302	79	34	229	6	51	55
Graves County, Kentucky	Estimate	14,789	5,460	3,642	5,170	94	0	357	0	55	11
Grayson County, Kentucky	Estimate	9,939	1,306	1,795	5,918	122	7	751	8	14	18
Hancock County, Kentucky	Estimate	3,309	1,426	428	1,196	21	5	233	0	0	0
Henderson County, Kentucky	Estimate	18,652	9,077	1,302	7,955	61	0	195	15	11	36
Hopkins County, Kentucky	Estimate	18,518	8,399	1,086	8,530	15	75	365	0	19	29
Livingston County, Kentucky	Estimate	3,576	309	1,269	1,880	36	0	54	26	2	0
Lyon County, Kentucky	Estimate	3,295	1,044	639	1,520	2	0	63	0	27	0
McCracken County, Kentucky	Estimate	27,182	15,063	2,015	9,515	217	0	254	0	90	28
McLean County, Kentucky	Estimate	3,765	1,145	545	1,936	36	18	76	0	9	0
Marshall County, Kentucky	Estimate	12,434	4,779	2,064	5,191	24	0	340	0	24	12
Meade County, Kentucky	Estimate	10,162	2,153	1,832	5,637	97	0	414	0	21	8
Ohio County, Kentucky	Estimate	8,667	2,299	1,313	4,261	119	18	625	0	32	0
Union County, Kentucky	Estimate	5,468	1,845	807	2,591	91	0	73	30	31	0
Webster County, Kentucky	Estimate	4,990	1,712	534	2,625	37	4	71	0	0	7

2007-2011

County	Utility gas	Bottled, tank, or LP gas	Electricity	Fuel oil, kerosene, etc.	Coal or coke	Wood	Solar energy	Other fuel	No fuel used
Ballard County, Kentucky	0.347	0.182	0.464	0.000	0.001	0.005	0.000	0.001	0.000
Breckinridge County, Kentucky	0.213	0.234	0.466	0.007	0.000	0.074	0.000	0.004	0.002
Caldwell County, Kentucky	0.510	0.155	0.294	0.001	0.000	0.034	0.000	0.006	0.000
Carlisle County, Kentucky	0.360	0.228	0.377	0.006	0.000	0.022	0.000	0.007	0.000
Crittenden County, Kentucky	0.195	0.238	0.454	0.016	0.000	0.086	0.000	0.008	0.003
Daviess County, Kentucky	0.663	0.049	0.276	0.002	0.001	0.006	0.000	0.001	0.001
Graves County, Kentucky	0.369	0.246	0.350	0.006	0.000	0.024	0.000	0.004	0.001
Grayson County, Kentucky	0.131	0.181	0.595	0.012	0.001	0.076	0.001	0.001	0.002
Hancock County, Kentucky	0.431	0.129	0.361	0.006	0.002	0.070	0.000	0.000	0.000
Henderson County, Kentucky	0.487	0.070	0.426	0.003	0.000	0.010	0.001	0.001	0.002
Hopkins County, Kentucky	0.454	0.059	0.461	0.001	0.004	0.020	0.000	0.001	0.002
Livingston County, Kentucky	0.086	0.355	0.526	0.010	0.000	0.015	0.007	0.001	0.000
Lyon County, Kentucky	0.317	0.194	0.461	0.001	0.000	0.019	0.000	0.008	0.000
McCracken County, Kentucky	0.554	0.074	0.350	0.008	0.000	0.009	0.000	0.003	0.001
McLean County, Kentucky	0.304	0.145	0.514	0.010	0.005	0.020	0.000	0.002	0.000
Marshall County, Kentucky	0.384	0.166	0.417	0.002	0.000	0.027	0.000	0.002	0.001
Meade County, Kentucky	0.212	0.180	0.555	0.010	0.000	0.041	0.000	0.002	0.001
Ohio County, Kentucky	0.265	0.151	0.492	0.014	0.002	0.072	0.000	0.004	0.000
Union County, Kentucky	0.337	0.148	0.474	0.017	0.000	0.013	0.005	0.006	0.000
Webster County, Kentucky	0.343	0.107	0.526	0.007	0.001	0.014	0.000	0.000	0.001

2007-2011

Description:

Employment: Total Total Population, (Gross Product: To Series does not ex Number of Housef Income: Total Per Total Retail Sales,

Source:

U.S. Bureau of Labor Statistics: Census of Employment & Wages (QCEW - ES202); Moody's Analytics (ECCA) Forecast

U.S. Census Bureau (BOC); Moody's Analytics (ECCA) Forecast

U.S. Bureau of Economic Analysis (BEA); Moody's Analytics (ECCA) Forecast

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U.S. Census Bureau (BOC); Moody's Analytics (ECCA) Forecast

U.S. Bureau of Economic Analysis (BEA); Moody's Analytics (ECCA) Forecast

U.S. Census Bureau (BOC); Moody's Analytics (ECCA) Forecast

Native Frequency:

MONTHLY

Ballard County (KY)|Carlisle County (KY)|Graves County (KY)|Livingston County (KY)|Marshall County (KY)|McCracken County (KY)

Ballard County (KY)|Carlisle County (KY)|Graves County (KY)|Livingston County (KY)|Marshall County (KY)|McCracken County (KY)

Ballard County (KY)|Carlisle County (KY)|Graves County (KY)|Livingston County (KY)|Marshall County (KY)|McCracken County (KY)

Ballard County (KY)|Carlisle County (KY)|Graves County (KY)|Livingston County (KY)|Marshall County (KY)|McCracken County (KY)

Ballard County (KY)|Carlisle County (KY)|Graves County (KY)|Livingston County (KY)|Marshall County (KY)|McCracken County (KY)

Ballard County (KY)|Carlisle County (KY)|Graves County (KY)|Livingston County (KY)|Marshall County (KY)|McCracken County (KY)

Ballard County (KY)|Carlisle County (KY)|Graves County (KY)|Livingston County (KY)|Marshall County (KY)|McCracken County (KY)

Geography:

	1970	40.08	128.81	na	44.07	415.26	150.42
Jan-70	1970	40.00	129.32	na	44.28	418.56	161.93
Feb-70	1970	39.94	129.81	na	44.48	421.89	172.15
Mar-70	1970	39.89	130.29	na	44.67	425.36	181.47
Apr-70	1970	39.86	130.74	na	44.86	428.85	189.58
May-70	1970	39.84	131.16	na	45.03	432.36	196.56
Jun-70	1970	39.84	131.56	na	45.20	435.88	202.49
Jul-70	1970	39.86	131.94	na	45.36	439.45	207.50
Aug-70	1970	39.89	132.28	na	45.51	442.96	211.52
Sep-70	1970	39.93	132.61	na	45.66	446.46	214.70
Oct-70	1970	39.98	132.91	na	45.79	449.93	217.13
Nov-70	1970	40.05	133.18	na	45.92	453.37	218.86
Dec-70	1970	40.13	133.44	na	46.04	456.84	220.00
Jan-71	1971	40.22	133.67	na	46.15	460.10	220.58
Feb-71	1971						

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-71	1971	40.32	133.88	na	46.26	463.31	220.70
Apr-71	1971	40.43	134.07	na	46.36	466.57	220.46
May-71	1971	40.55	134.25	na	46.45	469.78	219.89
Jun-71	1971	40.68	134.41	na	46.54	472.91	219.07
Jul-71	1971	40.82	134.55	na	46.63	475.96	218.09
Aug-71	1971	40.97	134.68	na	46.70	479.00	216.99
Sep-71	1971	41.13	134.79	na	46.78	481.97	215.88
Oct-71	1971	41.29	134.89	na	46.84	484.94	214.83
Nov-71	1971	41.45	134.97	na	46.91	487.96	213.90
Dec-71	1971	41.63	135.04	na	46.96	491.05	213.17
Jan-72	1972	41.81	135.10	na	47.02	494.32	212.71
Feb-72	1972	41.99	135.14	na	47.07	497.63	212.60
Mar-72	1972	42.17	135.18	na	47.11	501.13	212.91
Apr-72	1972	42.36	135.20	na	47.16	504.91	213.71
May-72	1972	42.55	135.22	na	47.19	508.94	215.09
Jun-72	1972	42.74	135.22	na	47.23	513.28	217.10
Jul-72	1972	42.94	135.22	na	47.26	517.94	219.82
Aug-72	1972	43.13	135.22	na	47.29	523.02	223.29
Sep-72	1972	43.33	135.20	na	47.32	528.32	227.27
Oct-72	1972	43.52	135.18	na	47.35	533.88	231.68
Nov-72	1972	43.72	135.16	na	47.37	539.68	236.39
Dec-72	1972	43.91	135.13	na	47.39	545.66	241.28
Jan-73	1973	44.10	135.10	na	47.42	551.91	246.28
Feb-73	1973	44.28	135.06	na	47.44	557.97	250.97
Mar-73	1973	44.45	135.03	na	47.46	564.12	255.44
Apr-73	1973	44.63	134.99	na	47.48	570.52	259.73
May-73	1973	44.80	134.94	na	47.50	576.95	263.55
Jun-73	1973	44.96	134.90	na	47.52	583.36	266.77
Jul-73	1973	45.12	134.86	na	47.54	589.72	269.26
Aug-73	1973	45.27	134.82	na	47.56	596.10	271.04
Sep-73	1973	45.41	134.78	na	47.58	602.29	272.18
Oct-73	1973	45.54	134.75	na	47.61	608.35	272.84
Nov-73	1973	45.66	134.73	na	47.64	614.29	273.16
Dec-73	1973	45.77	134.71	na	47.67	620.07	273.25
Jan-74	1974	45.88	134.71	na	47.71	625.77	273.25
Feb-74	1974	45.96	134.73	na	47.75	631.02	273.30

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-74 1974	46.04	134.75	na	47.80	636.07	273.50	
Apr-74 1974	46.11	134.80	na	47.85	641.07	274.00	
May-74 1974	46.17	134.87	na	47.91	645.83	274.93	
Jun-74 1974	46.21	134.96	na	47.98	650.33	276.42	
Jul-74 1974	46.24	135.07	na	48.06	654.55	278.59	
Aug-74 1974	46.26	135.21	na	48.15	658.59	281.53	
Sep-74 1974	46.27	135.37	na	48.25	662.40	285.08	
Oct-74 1974	46.27	135.55	na	48.35	666.13	289.23	
Nov-74 1974	46.28	135.74	na	48.45	669.85	293.89	
Dec-74 1974	46.28	135.95	na	48.56	673.66	299.01	
Jan-75 1975	46.28	136.16	na	48.68	677.71	304.61	
Feb-75 1975	46.29	136.37	na	48.79	681.79	310.24	
Mar-75 1975	46.31	136.58	na	48.90	686.19	316.11	
Apr-75 1975	46.35	136.80	na	49.02	691.14	322.36	
May-75 1975	46.39	137.01	na	49.13	696.58	328.73	
Jun-75 1975	46.46	137.21	na	49.24	702.60	335.14	
Jul-75 1975	46.55	137.40	na	49.35	709.29	341.54	
Aug-75 1975	46.66	137.58	na	49.46	716.76	348.00	
Sep-75 1975	46.78	137.75	na	49.56	724.74	354.33	
Oct-75 1975	46.92	137.90	na	49.66	733.28	360.64	
Nov-75 1975	47.07	138.04	na	49.75	742.31	366.97	
Dec-75 1975	47.23	138.18	na	49.84	751.78	373.32	
Jan-76 1976	47.39	138.30	na	49.93	761.79	379.82	
Feb-76 1976	47.55	138.42	na	50.01	771.80	386.17	
Mar-76 1976	47.70	138.52	na	50.09	782.05	392.61	
Apr-76 1976	47.85	138.62	na	50.17	792.67	399.25	
May-76 1976	47.99	138.72	na	50.24	803.43	406.00	
Jun-76 1976	48.11	138.80	na	50.32	814.27	412.90	
Jul-76 1976	48.21	138.89	na	50.39	825.13	419.95	
Aug-76 1976	48.29	138.97	na	50.46	836.14	427.26	
Sep-76 1976	48.36	139.05	na	50.53	846.92	434.57	
Oct-76 1976	48.42	139.13	na	50.60	857.61	441.97	
Nov-76 1976	48.47	139.22	na	50.67	868.19	449.42	
Dec-76 1976	48.52	139.31	na	50.74	878.61	456.89	
Jan-77 1977	48.57	139.42	na	50.82	889.02	464.47	
Feb-77 1977	48.63	139.53	na	50.90	898.74	471.65	

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY	
Mar-77	1977	48.70	139.65	na		50.98	908.22	478.75
Apr-77	1977	48.78	139.79	na		51.07	917.77	485.99
May-77	1977	48.88	139.95	na		51.17	927.02	493.09
Jun-77	1977	49.00	140.13	na		51.27	935.94	500.02
Jul-77	1977	49.16	140.33	na		51.38	944.51	506.75
Aug-77	1977	49.34	140.55	na		51.51	952.91	513.38
Sep-77	1977	49.54	140.79	na		51.63	961.00	519.72
Oct-77	1977	49.76	141.04	na		51.77	969.05	525.89
Nov-77	1977	49.99	141.30	na		51.90	977.21	531.93
Dec-77	1977	50.24	141.56	na		52.04	985.61	537.84
Jan-78	1978	50.49	141.83	2930.27		52.17	994.53	543.76
Feb-78	1978	50.73	142.07	2981.20		52.30	1003.51	549.33
Mar-78	1978	50.97	142.30	3025.99		52.43	1013.10	554.84
Apr-78	1978	51.21	142.52	3066.32		52.55	1023.78	560.52
May-78	1978	51.44	142.73	3100.79		52.66	1035.38	566.20
Jun-78	1978	51.65	142.90	3129.80		52.77	1048.03	571.90
Jul-78	1978	51.84	143.05	3153.61		52.86	1061.86	577.64
Aug-78	1978	52.01	143.16	3172.87		52.94	1077.04	583.51
Sep-78	1978	52.16	143.25	3187.28		53.02	1092.80	589.30
Oct-78	1978	52.28	143.32	3197.48		53.08	1109.05	595.07
Nov-78	1978	52.37	143.36	3203.85		53.14	1125.49	600.80
Dec-78	1978	52.45	143.39	3206.67		53.19	1141.82	606.45
Jan-79	1979	52.50	143.42	3206.26		53.24	1157.96	612.09
Feb-79	1979	52.53	143.43	3203.14		53.28	1172.63	617.34
Mar-79	1979	52.54	143.45	3197.59		53.33	1186.30	622.43
Apr-79	1979	52.53	143.46	3189.68		53.38	1199.12	627.51
May-79	1979	52.49	143.49	3179.85		53.43	1210.28	632.37
Jun-79	1979	52.44	143.53	3168.44		53.49	1219.49	636.98
Jul-79	1979	52.36	143.58	3155.77		53.56	1226.44	641.32
Aug-79	1979	52.26	143.65	3141.94		53.63	1231.23	645.43
Sep-79	1979	52.14	143.73	3127.73		53.71	1234.09	649.18
Oct-79	1979	52.01	143.83	3113.25		53.79	1235.48	652.61
Nov-79	1979	51.86	143.93	3098.83		53.88	1235.82	655.72
Dec-79	1979	51.71	144.04	3084.79		53.97	1235.50	658.51
Jan-80	1980	51.54	144.16	3071.24		54.06	1234.91	661.01
Feb-80	1980	51.37	144.28	3059.15		54.15	1234.48	663.10

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-80	1980	51.20	144.40	3048.40	54.24	1234.58	664.85
Apr-80	1980	51.03	144.51	3039.12	54.32	1235.60	666.28
May-80	1980	50.86	144.62	3031.87	54.40	1237.96	667.34
Jun-80	1980	50.69	144.72	3026.94	54.48	1242.03	668.04
Jul-80	1980	50.53	144.82	3024.66	54.55	1248.22	668.37
Aug-80	1980	50.38	144.90	3024.94	54.62	1256.71	668.33
Sep-80	1980	50.23	144.96	3027.28	54.68	1266.96	667.96
Oct-80	1980	50.09	145.02	3031.16	54.73	1278.79	667.30
Nov-80	1980	49.95	145.07	3036.02	54.77	1291.90	666.39
Dec-80	1980	49.81	145.10	3041.36	54.81	1305.97	665.26
Jan-81	1981	49.66	145.12	3046.72	54.85	1320.96	663.92
Feb-81	1981	49.52	145.13	3051.27	54.88	1335.56	662.51
Mar-81	1981	49.37	145.13	3054.77	54.90	1350.22	660.99
Apr-81	1981	49.21	145.12	3056.82	54.92	1365.15	659.35
May-81	1981	49.04	145.09	3056.71	54.94	1379.53	657.66
Jun-81	1981	48.85	145.06	3053.95	54.95	1393.08	655.96
Jul-81	1981	48.66	145.01	3048.01	54.96	1405.49	654.30
Aug-81	1981	48.44	144.95	3038.70	54.97	1416.79	652.69
Sep-81	1981	48.23	144.89	3026.76	54.97	1426.63	651.23
Oct-81	1981	48.00	144.82	3012.51	54.97	1435.22	649.96
Nov-81	1981	47.77	144.75	2996.48	54.97	1442.60	648.92
Dec-81	1981	47.55	144.67	2979.12	54.98	1448.80	648.18
Jan-82	1982	47.32	144.60	2960.62	54.98	1453.91	647.78
Feb-82	1982	47.11	144.54	2942.68	54.99	1457.69	647.78
Mar-82	1982	46.91	144.48	2924.85	55.00	1460.43	648.21
Apr-82	1982	46.72	144.44	2906.99	55.01	1462.22	649.15
May-82	1982	46.55	144.40	2890.21	55.03	1462.95	650.66
Jun-82	1982	46.39	144.38	2874.98	55.05	1462.67	652.78
Jul-82	1982	46.27	144.38	2861.77	55.08	1461.41	655.56
Aug-82	1982	46.16	144.39	2850.61	55.12	1459.30	659.06
Sep-82	1982	46.08	144.42	2841.78	55.16	1456.77	663.09
Oct-82	1982	46.02	144.47	2835.00	55.21	1454.11	667.61
Nov-82	1982	45.99	144.52	2830.13	55.26	1451.69	672.55
Dec-82	1982	45.97	144.57	2827.10	55.31	1449.86	677.82
Jan-83	1983	45.97	144.63	2825.77	55.37	1448.94	683.44
Feb-83	1983	45.98	144.68	2826.05	55.42	1449.29	688.94

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-83	1983	46.01	144.73	2827.75	55.46	1451.17	694.52
Apr-83	1983	46.05	144.77	2830.88	55.51	1455.03	700.31
May-83	1983	46.10	144.80	2835.32	55.55	1461.20	706.02
Jun-83	1983	46.17	144.82	2840.95	55.59	1470.01	711.57
Jul-83	1983	46.24	144.82	2847.67	55.62	1481.81	716.89
Aug-83	1983	46.31	144.80	2855.52	55.64	1496.76	722.03
Sep-83	1983	46.40	144.77	2864.16	55.66	1513.90	726.85
Oct-83	1983	46.49	144.72	2873.63	55.67	1532.95	731.46
Nov-83	1983	46.58	144.67	2883.84	55.68	1553.34	735.89
Dec-83	1983	46.68	144.60	2894.72	55.69	1574.58	740.17
Jan-84	1984	46.79	144.54	2906.36	55.69	1596.48	744.41
Feb-84	1984	46.90	144.47	2918.12	55.70	1617.47	748.41
Mar-84	1984	47.01	144.40	2930.29	55.70	1637.73	752.37
Apr-84	1984	47.13	144.34	2942.99	55.71	1657.09	756.35
May-84	1984	47.26	144.29	2955.94	55.72	1674.66	760.34
Jun-84	1984	47.38	144.24	2969.06	55.73	1689.94	764.36
Jul-84	1984	47.51	144.21	2982.26	55.75	1702.39	768.43
Aug-84	1984	47.65	144.18	2995.60	55.77	1712.09	772.63
Sep-84	1984	47.78	144.17	3008.42	55.80	1719.03	776.78
Oct-84	1984	47.92	144.17	3020.69	55.83	1723.70	780.91
Nov-84	1984	48.05	144.18	3032.18	55.86	1726.48	785.00
Dec-84	1984	48.18	144.19	3042.65	55.90	1727.70	788.99
Jan-85	1985	48.32	144.21	3052.01	55.94	1727.71	792.93
Feb-85	1985	48.44	144.23	3059.51	55.98	1726.89	796.52
Mar-85	1985	48.56	144.25	3065.37	56.02	1725.58	799.93
Apr-85	1985	48.68	144.27	3069.54	56.05	1724.04	803.22
May-85	1985	48.79	144.29	3071.50	56.09	1722.66	806.25
Jun-85	1985	48.89	144.30	3071.07	56.13	1721.78	808.98
Jul-85	1985	48.99	144.31	3067.99	56.17	1721.74	811.38
Aug-85	1985	49.08	144.32	3062.30	56.20	1722.72	813.49
Sep-85	1985	49.17	144.32	3054.70	56.23	1724.67	815.32
Oct-85	1985	49.25	144.31	3045.61	56.26	1727.57	816.99
Nov-85	1985	49.34	144.30	3035.58	56.28	1731.38	818.58
Dec-85	1985	49.43	144.29	3025.13	56.31	1736.05	820.16
Jan-86	1986	49.53	144.28	3014.64	56.33	1741.65	821.85
Feb-86	1986	49.63	144.26	3005.26	56.36	1747.73	823.60

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-86	1986	49.75	144.25	2996.98	56.38	1754.54	825.58
Apr-86	1986	49.88	144.23	2990.06	56.40	1762.27	827.93
May-86	1986	50.03	144.21	2985.36	56.43	1770.70	830.66
Jun-86	1986	50.20	144.20	2983.38	56.45	1779.76	833.87
Jul-86	1986	50.40	144.18	2984.64	56.48	1789.44	837.62
Aug-86	1986	50.62	144.17	2989.30	56.50	1799.82	842.01
Sep-86	1986	50.86	144.16	2996.81	56.53	1810.48	846.87
Oct-86	1986	51.11	144.15	3006.83	56.56	1821.49	852.22
Nov-86	1986	51.37	144.14	3018.89	56.58	1832.73	858.02
Dec-86	1986	51.63	144.14	3032.59	56.61	1844.12	864.24
Jan-87	1987	51.90	144.13	3047.74	56.64	1855.73	870.94
Feb-87	1987	52.14	144.12	3062.89	56.67	1866.73	877.63
Mar-87	1987	52.38	144.11	3078.37	56.70	1877.57	884.61
Apr-87	1987	52.61	144.10	3094.31	56.73	1888.54	892.07
May-87	1987	52.82	144.09	3109.75	56.75	1899.15	899.75
Jun-87	1987	53.01	144.08	3124.28	56.78	1909.30	907.60
Jul-87	1987	53.16	144.07	3137.47	56.81	1918.91	915.59
Aug-87	1987	53.29	144.05	3149.38	56.84	1928.14	923.82
Sep-87	1987	53.39	144.04	3159.82	56.87	1936.81	931.97
Oct-87	1987	53.47	144.02	3169.18	56.89	1945.23	940.14
Nov-87	1987	53.54	144.00	3177.69	56.92	1953.54	948.29
Dec-87	1987	53.60	143.99	3185.53	56.95	1961.88	956.40
Jan-88	1988	53.66	143.98	3193.05	56.98	1970.53	964.54
Feb-88	1988	53.72	143.97	3200.09	57.01	1979.21	972.29
Mar-88	1988	53.80	143.96	3207.10	57.04	1988.34	979.88
Apr-88	1988	53.88	143.96	3214.40	57.07	1998.22	987.39
May-88	1988	53.99	143.97	3222.08	57.11	2008.84	994.65
Jun-88	1988	54.12	143.98	3230.34	57.14	2020.34	1001.64
Jul-88	1988	54.28	144.00	3239.38	57.18	2032.86	1008.32
Aug-88	1988	54.47	144.03	3249.40	57.22	2046.62	1014.79
Sep-88	1988	54.69	144.07	3259.95	57.27	2061.04	1020.90
Oct-88	1988	54.94	144.11	3271.02	57.31	2076.19	1026.82
Nov-88	1988	55.20	144.16	3282.47	57.36	2091.91	1032.62
Dec-88	1988	55.47	144.22	3294.14	57.42	2108.04	1038.35
Jan-89	1989	55.76	144.29	3306.08	57.47	2124.71	1044.16
Feb-89	1989	56.04	144.36	3317.37	57.53	2140.68	1049.75

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-89	1989	56.31	144.44	3328.45	57.59	2156.61	1055.43
Apr-89	1989	56.59	144.52	3339.54	57.66	2172.91	1061.48
May-89	1989	56.87	144.62	3350.10	57.73	2188.86	1067.76
Jun-89	1989	57.13	144.72	3360.00	57.81	2204.33	1074.32
Jul-89	1989	57.37	144.83	3369.07	57.89	2219.16	1081.23
Aug-89	1989	57.59	144.95	3377.41	57.97	2233.50	1088.59
Sep-89	1989	57.79	145.07	3384.77	58.06	2246.91	1096.06
Oct-89	1989	57.97	145.19	3391.35	58.15	2259.63	1103.66
Nov-89	1989	58.12	145.32	3397.21	58.24	2271.69	1111.29
Dec-89	1989	58.26	145.45	3402.38	58.33	2283.09	1118.84
Jan-90	1990	58.38	145.58	3406.98	58.42	2294.02	1126.33
Feb-90	1990	58.47	145.70	3410.82	58.51	2303.83	1133.20
Mar-90	1990	58.55	145.82	3414.14	58.59	2313.07	1139.70
Apr-90	1990	58.60	145.94	3417.12	58.67	2322.05	1145.96
May-90	1990	58.64	146.05	3419.65	58.75	2330.45	1151.63
Jun-90	1990	58.65	146.16	3421.80	58.82	2338.29	1156.63
Jul-90	1990	58.65	146.26	3423.63	58.88	2345.60	1160.84
Aug-90	1990	58.63	146.35	3425.31	58.94	2352.59	1164.31
Sep-90	1990	58.59	146.43	3427.03	58.98	2359.24	1167.05
Oct-90	1990	58.55	146.50	3429.09	59.03	2365.87	1169.19
Nov-90	1990	58.51	146.57	3431.74	59.07	2372.71	1170.86
Dec-90	1990	58.46	146.64	3435.26	59.10	2379.95	1172.15
Jan-91	1991	58.42	146.71	3439.96	59.14	2387.94	1173.19
Feb-91	1991	58.40	146.77	3445.75	59.17	2396.33	1174.02
Mar-91	1991	58.39	146.84	3453.08	59.20	2405.70	1174.79
Apr-91	1991	58.40	146.91	3462.50	59.24	2416.60	1175.62
May-91	1991	58.43	146.98	3474.06	59.27	2428.95	1176.60
Jun-91	1991	58.50	147.05	3488.01	59.31	2442.95	1177.82
Jul-91	1991	58.60	147.14	3504.60	59.35	2458.81	1179.39
Aug-91	1991	58.73	147.23	3524.07	59.40	2476.74	1181.41
Sep-91	1991	58.90	147.32	3545.36	59.45	2495.81	1183.86
Oct-91	1991	59.09	147.42	3568.30	59.50	2515.92	1186.79
Nov-91	1991	59.30	147.53	3592.43	59.56	2536.67	1190.23
Dec-91	1991	59.53	147.63	3617.29	59.62	2557.69	1194.23
Jan-92	1992	59.78	147.75	3642.83	59.68	2578.94	1198.87
Feb-92	1992	60.02	147.86	3667.35	59.74	2599.01	1203.96

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-92	1992	60.26	147.97	3691.23	59.80	2618.22	1209.68
Apr-92	1992	60.50	148.09	3714.41	59.87	2636.50	1216.15
May-92	1992	60.74	148.21	3736.00	59.93	2653.14	1223.33
Jun-92	1992	60.96	148.33	3755.57	60.00	2667.76	1231.23
Jul-92	1992	61.17	148.45	3772.65	60.06	2679.99	1239.89
Aug-92	1992	61.35	148.57	3787.41	60.13	2689.98	1249.44
Sep-92	1992	61.52	148.69	3799.66	60.19	2697.75	1259.46
Oct-92	1992	61.66	148.81	3809.97	60.25	2703.84	1270.01
Nov-92	1992	61.80	148.93	3818.69	60.32	2708.66	1280.98
Dec-92	1992	61.91	149.05	3826.13	60.38	2712.57	1292.26
Jan-93	1993	62.02	149.17	3832.72	60.44	2716.01	1303.95
Feb-93	1993	62.11	149.29	3838.41	60.51	2719.15	1315.19
Mar-93	1993	62.19	149.41	3843.81	60.57	2722.50	1326.44
Apr-93	1993	62.27	149.53	3849.42	60.63	2726.54	1337.98
May-93	1993	62.34	149.66	3855.38	60.70	2731.57	1349.33
Jun-93	1993	62.40	149.78	3862.01	60.76	2737.94	1360.40
Jul-93	1993	62.46	149.91	3869.63	60.83	2746.04	1371.07
Aug-93	1993	62.52	150.05	3878.57	60.90	2756.10	1381.48
Sep-93	1993	62.58	150.18	3888.56	60.97	2767.59	1391.34
Oct-93	1993	62.64	150.31	3899.76	61.04	2780.44	1400.84
Nov-93	1993	62.70	150.45	3912.17	61.11	2794.38	1410.03
Dec-93	1993	62.77	150.58	3925.81	61.17	2809.18	1418.96
Jan-94	1994	62.85	150.72	3940.93	61.24	2824.86	1427.79
Feb-94	1994	62.93	150.84	3956.50	61.31	2840.15	1436.02
Mar-94	1994	63.03	150.97	3973.27	61.37	2855.57	1444.11
Apr-94	1994	63.15	151.09	3991.83	61.44	2871.43	1452.36
May-94	1994	63.28	151.22	4011.67	61.51	2886.95	1460.55
Jun-94	1994	63.43	151.33	4032.80	61.57	2901.90	1468.70
Jul-94	1994	63.61	151.45	4055.21	61.63	2916.05	1476.87
Aug-94	1994	63.80	151.56	4079.19	61.69	2929.58	1485.20
Sep-94	1994	64.01	151.67	4103.73	61.75	2942.21	1493.46
Oct-94	1994	64.24	151.77	4128.98	61.80	2954.34	1501.79
Nov-94	1994	64.47	151.87	4154.68	61.86	2966.15	1510.21
Dec-94	1994	64.71	151.96	4180.59	61.91	2977.83	1518.73
Jan-95	1995	64.96	152.06	4206.90	61.96	2989.73	1527.52
Feb-95	1995	65.20	152.15	4231.67	62.02	3001.27	1536.01

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-95	1995	65.43	152.24	4255.96	62.07	3013.19	1544.65
Apr-95	1995	65.66	152.34	4280.34	62.12	3026.07	1553.74
May-95	1995	65.88	152.44	4303.73	62.17	3039.70	1563.02
Jun-95	1995	66.09	152.53	4325.89	62.23	3054.26	1572.49
Jul-95	1995	66.28	152.63	4346.59	62.28	3069.92	1582.18
Aug-95	1995	66.46	152.74	4366.16	62.34	3086.93	1592.21
Sep-95	1995	66.61	152.84	4384.28	62.40	3104.52	1602.17
Oct-95	1995	66.75	152.95	4401.56	62.45	3122.72	1612.12
Nov-95	1995	66.87	153.05	4418.35	62.51	3141.28	1621.98
Dec-95	1995	66.97	153.16	4434.95	62.57	3159.96	1631.65
Jan-96	1996	67.07	153.27	4451.95	62.63	3178.81	1641.19
Feb-96	1996	67.15	153.37	4468.85	62.68	3196.70	1650.05
Mar-96	1996	67.23	153.47	4486.50	62.74	3213.99	1658.46
Apr-96	1996	67.29	153.57	4505.50	62.80	3230.73	1666.46
May-96	1996	67.35	153.67	4525.91	62.85	3246.37	1673.81
Jun-96	1996	67.40	153.77	4548.02	62.90	3260.69	1680.42
Jul-96	1996	67.45	153.86	4572.14	62.95	3273.43	1686.20
Aug-96	1996	67.50	153.94	4598.61	63.01	3284.84	1691.24
Sep-96	1996	67.54	154.03	4626.14	63.05	3294.85	1695.47
Oct-96	1996	67.59	154.11	4654.64	63.10	3303.98	1699.08
Nov-96	1996	67.63	154.18	4683.61	63.15	3312.58	1702.19
Dec-96	1996	67.68	154.25	4712.56	63.19	3320.98	1704.90
Jan-97	1997	67.74	154.32	4741.47	63.23	3329.66	1707.37
Feb-97	1997	67.80	154.38	4768.02	63.27	3338.37	1709.55
Mar-97	1997	67.86	154.45	4793.16	63.31	3347.84	1711.65
Apr-97	1997	67.94	154.51	4817.23	63.35	3358.73	1713.87
May-97	1997	68.03	154.56	4838.84	63.39	3371.09	1716.22
Jun-97	1997	68.13	154.62	4857.51	63.43	3385.24	1718.82
Jul-97	1997	68.25	154.67	4872.76	63.47	3401.50	1721.78
Aug-97	1997	68.38	154.73	4884.84	63.50	3420.11	1725.24
Sep-97	1997	68.52	154.78	4893.96	63.54	3440.02	1729.11
Oct-97	1997	68.68	154.83	4901.00	63.58	3461.02	1733.51
Nov-97	1997	68.85	154.87	4906.61	63.61	3482.61	1738.46
Dec-97	1997	69.02	154.92	4911.46	63.64	3504.30	1744.03
Jan-98	1998	69.21	154.97	4916.29	63.68	3525.93	1750.34
Feb-98	1998	69.39	155.01	4921.39	63.71	3545.66	1756.99

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-98	1998	69.58	155.06	4927.64	63.74	3564.08	1764.34
Apr-98	1998	69.78	155.10	4935.89	63.78	3581.29	1772.68
May-98	1998	69.99	155.15	4946.65	63.81	3596.14	1781.83
Jun-98	1998	70.19	155.19	4960.54	63.84	3608.15	1791.82
Jul-98	1998	70.40	155.24	4978.20	63.87	3616.83	1802.71
Aug-98	1998	70.61	155.29	4999.91	63.91	3622.36	1814.63
Sep-98	1998	70.81	155.33	5024.17	63.94	3625.25	1827.11
Oct-98	1998	71.02	155.38	5050.45	63.97	3626.33	1840.19
Nov-98	1998	71.22	155.43	5077.86	64.01	3626.34	1853.77
Dec-98	1998	71.43	155.48	5105.53	64.04	3626.02	1867.71
Jan-99	1999	71.63	155.52	5133.03	64.07	3626.10	1882.14
Feb-99	1999	71.83	155.57	5157.80	64.11	3627.25	1895.98
Mar-99	1999	72.02	155.62	5180.35	64.14	3630.17	1909.83
Apr-99	1999	72.22	155.67	5200.55	64.18	3635.69	1924.04
May-99	1999	72.41	155.73	5216.69	64.22	3644.53	1938.01
Jun-99	1999	72.61	155.78	5227.94	64.26	3657.38	1951.63
Jul-99	1999	72.80	155.83	5233.42	64.30	3674.96	1964.77
Aug-99	1999	72.99	155.89	5232.97	64.34	3697.61	1977.50
Sep-99	1999	73.16	155.94	5227.17	64.38	3723.79	1989.27
Oct-99	1999	73.33	155.99	5216.68	64.42	3752.99	2000.14
Nov-99	1999	73.48	156.04	5202.17	64.46	3784.30	2009.99
Dec-99	1999	73.61	156.08	5184.25	64.49	3816.87	2018.65
Jan-00	2000	73.72	156.12	5163.22	64.53	3850.36	2026.10
Feb-00	2000	73.80	156.14	5140.81	64.55	3882.27	2031.88
Mar-00	2000	73.85	156.16	5116.96	64.58	3912.84	2036.10
Apr-00	2000	73.87	156.16	5091.88	64.60	3941.73	2038.68
May-00	2000	73.85	156.16	5066.60	64.61	3967.48	2039.36
Jun-00	2000	73.79	156.13	5041.75	64.61	3989.28	2038.03
Jul-00	2000	73.69	156.10	5017.97	64.61	4006.26	2034.54
Aug-00	2000	73.54	156.04	4995.28	64.59	4018.44	2028.94
Sep-00	2000	73.35	155.98	4974.54	64.57	4025.95	2021.78
Oct-00	2000	73.14	155.90	4955.51	64.55	4029.58	2013.40
Nov-00	2000	72.91	155.82	4938.27	64.52	4029.95	2004.20
Dec-00	2000	72.66	155.73	4922.96	64.48	4027.61	1994.61
Jan-01	2001	72.41	155.63	4909.48	64.45	4023.07	1984.86
Feb-01	2001	72.16	155.53	4898.70	64.41	4017.30	1975.98

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-01 2001	71.92	155.44	4890.05		64.37	4010.61	1967.87
Apr-01 2001	71.69	155.34	4883.42		64.34	4003.33	1960.67
May-01 2001	71.48	155.25	4879.28		64.30	3996.23	1955.10
Jun-01 2001	71.30	155.16	4877.71		64.27	3989.91	1951.55
Jul-01 2001	71.15	155.08	4878.84		64.24	3984.91	1950.43
Aug-01 2001	71.04	155.01	4882.60		64.22	3981.44	1951.85
Sep-01 2001	70.97	154.95	4888.50		64.20	3979.49	1955.51
Oct-01 2001	70.91	154.90	4896.20		64.19	3978.85	1961.16
Nov-01 2001	70.88	154.86	4905.30		64.18	3979.38	1968.52
Dec-01 2001	70.87	154.83	4915.40		64.17	3980.92	1977.32
Jan-02 2002	70.86	154.80	4926.30		64.17	3983.39	1987.45
Feb-02 2002	70.85	154.78	4936.89		64.17	3986.43	1997.94
Mar-02 2002	70.85	154.77	4947.32		64.17	3990.03	2009.02
Apr-02 2002	70.83	154.77	4957.57		64.18	3994.18	2020.82
May-02 2002	70.81	154.77	4966.89		64.18	3998.63	2032.71
Jun-02 2002	70.76	154.78	4974.88		64.20	4003.24	2044.41
Jul-02 2002	70.69	154.80	4981.17		64.21	4007.87	2055.66
Aug-02 2002	70.59	154.82	4985.71		64.22	4012.56	2066.53
Sep-02 2002	70.48	154.85	4988.50		64.24	4017.28	2076.75
Oct-02 2002	70.35	154.87	4989.82		64.26	4022.19	2086.59
Nov-02 2002	70.20	154.90	4989.85		64.27	4027.41	2096.14
Dec-02 2002	70.05	154.93	4988.78		64.29	4033.04	2105.51
Jan-03 2003	69.89	154.96	4986.75		64.31	4039.31	2114.92
Feb-03 2003	69.75	154.99	4984.12		64.32	4045.88	2123.88
Mar-03 2003	69.61	155.01	4980.97		64.33	4053.14	2132.92
Apr-03 2003	69.48	155.03	4977.35		64.34	4061.48	2142.44
May-03 2003	69.36	155.04	4973.54		64.35	4070.78	2152.23
Jun-03 2003	69.26	155.04	4969.74		64.36	4081.13	2162.39
Jul-03 2003	69.19	155.03	4966.11		64.36	4092.65	2173.00
Aug-03 2003	69.14	155.01	4962.71		64.35	4105.54	2184.27
Sep-03 2003	69.12	154.99	4959.68		64.35	4119.30	2195.80
Oct-03 2003	69.12	154.95	4957.00		64.34	4134.00	2207.70
Nov-03 2003	69.13	154.92	4954.67		64.33	4149.53	2219.92
Dec-03 2003	69.16	154.88	4952.73		64.32	4165.78	2232.41
Jan-04 2004	69.20	154.85	4951.17		64.31	4182.90	2245.33
Feb-04 2004	69.25	154.82	4950.08		64.30	4199.95	2257.99

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-04 2004	69.30	154.79	4949.43		64.29	4217.37	2270.75
Apr-04 2004	69.36	154.77	4949.24		64.29	4235.32	2283.78
May-04 2004	69.41	154.76	4949.54		64.29	4253.42	2296.82
Jun-04 2004	69.46	154.75	4950.35		64.29	4271.55	2309.80
Jul-04 2004	69.50	154.77	4951.72		64.30	4289.60	2322.68
Aug-04 2004	69.54	154.79	4953.72		64.32	4307.82	2335.60
Sep-04 2004	69.56	154.83	4956.38		64.34	4325.64	2348.10
Oct-04 2004	69.58	154.87	4959.85		64.36	4343.39	2360.31
Nov-04 2004	69.60	154.92	4964.20		64.39	4361.10	2372.18
Dec-04 2004	69.60	154.98	4969.55		64.42	4378.80	2383.65
Jan-05 2005	69.61	155.05	4976.09		64.45	4396.82	2394.84
Feb-05 2005	69.60	155.11	4983.45		64.48	4414.00	2404.99
Mar-05 2005	69.60	155.18	4992.02		64.51	4431.27	2414.60
Apr-05 2005	69.58	155.24	5002.22		64.54	4449.22	2423.91
May-05 2005	69.57	155.30	5013.90		64.57	4467.32	2432.53
Jun-05 2005	69.55	155.36	5027.14		64.60	4485.58	2440.39
Jul-05 2005	69.54	155.41	5042.04		64.62	4504.04	2447.45
Aug-05 2005	69.52	155.46	5058.71		64.65	4522.95	2453.84
Sep-05 2005	69.50	155.50	5076.23		64.67	4541.56	2459.49
Oct-05 2005	69.48	155.53	5094.45		64.69	4560.04	2464.65
Nov-05 2005	69.47	155.56	5112.95		64.70	4578.24	2469.48
Dec-05 2005	69.47	155.59	5131.30		64.72	4596.03	2474.11
Jan-06 2006	69.47	155.62	5149.39		64.73	4613.55	2478.77
Feb-06 2006	69.48	155.64	5165.69		64.75	4629.56	2483.29
Mar-06 2006	69.50	155.66	5180.68		64.76	4644.77	2488.04
Apr-06 2006	69.53	155.68	5194.44		64.78	4659.56	2493.32
May-06 2006	69.58	155.70	5206.00		64.79	4673.23	2499.13
Jun-06 2006	69.64	155.73	5214.96		64.81	4685.66	2505.61
Jul-06 2006	69.73	155.75	5220.93		64.83	4696.71	2512.90
Aug-06 2006	69.82	155.78	5223.95		64.85	4706.73	2521.12
Sep-06 2006	69.93	155.81	5224.40		64.87	4715.90	2529.85
Oct-06 2006	70.06	155.85	5222.83		64.89	4724.90	2539.06
Nov-06 2006	70.19	155.88	5219.75		64.92	4734.27	2548.56
Dec-06 2006	70.32	155.91	5215.65		64.94	4744.54	2558.20
Jan-07 2007	70.47	155.95	5210.97		64.97	4756.44	2567.94
Feb-07 2007	70.60	155.98	5206.48		64.99	4769.61	2577.01

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-07 2007	70.73	156.02	5202.45		65.01	4785.13	2585.71
Apr-07 2007	70.86	156.05	5199.22		65.04	4804.09	2594.16
May-07 2007	70.99	156.08	5197.45		65.06	4826.57	2601.90
Jun-07 2007	71.10	156.11	5197.62		65.08	4853.07	2608.74
Jul-07 2007	71.20	156.13	5200.21		65.10	4884.11	2614.51
Aug-07 2007	71.28	156.15	5205.23		65.12	4920.02	2619.16
Sep-07 2007	71.34	156.18	5211.88		65.13	4958.66	2622.41
Oct-07 2007	71.38	156.19	5219.54		65.15	4999.53	2624.24
Nov-07 2007	71.40	156.21	5227.52		65.16	5041.55	2624.56
Dec-07 2007	71.39	156.23	5235.10		65.18	5083.66	2623.25
Jan-08 2008	71.35	156.25	5241.71		65.19	5125.46	2620.17
Feb-08 2008	71.28	156.26	5246.37		65.21	5163.92	2615.40
Mar-08 2008	71.18	156.28	5248.63		65.22	5199.35	2608.74
Apr-08 2008	71.04	156.30	5247.83		65.24	5231.28	2599.97
May-08 2008	70.86	156.33	5243.16		65.26	5257.98	2589.06
Jun-08 2008	70.64	156.35	5234.00		65.27	5278.44	2575.93
Jul-08 2008	70.38	156.38	5219.65		65.29	5291.60	2560.47
Aug-08 2008	70.07	156.41	5200.09		65.32	5297.49	2542.66
Sep-08 2008	69.73	156.45	5177.13		65.34	5296.80	2523.67
Oct-08 2008	69.37	156.49	5151.76		65.36	5290.61	2503.86
Nov-08 2008	69.00	156.52	5125.27		65.39	5279.95	2483.85
Dec-08 2008	68.62	156.56	5098.94		65.41	5265.76	2464.28
Jan-09 2009	68.23	156.61	5073.66		65.44	5248.73	2445.48
Feb-09 2009	67.88	156.64	5052.16		65.46	5231.03	2429.20
Mar-09 2009	67.55	156.68	5034.45		65.49	5212.74	2415.12
Apr-09 2009	67.23	156.72	5021.22		65.51	5194.16	2403.42
May-09 2009	66.95	156.76	5014.50		65.53	5176.88	2395.29
Jun-09 2009	66.72	156.79	5015.51		65.55	5161.86	2391.32
Jul-09 2009	66.54	156.82	5025.52		65.57	5150.07	2392.15
Aug-09 2009	66.41	156.85	5044.80		65.58	5141.81	2397.93
Sep-09 2009	66.34	156.87	5071.40		65.60	5137.26	2407.95
Oct-09 2009	66.32	156.89	5104.16		65.61	5136.14	2421.74
Nov-09 2009	66.33	156.91	5141.56		65.62	5138.26	2438.69
Dec-09 2009	66.38	156.93	5182.17		65.63	5143.52	2458.25
Jan-10 2010	66.46	156.95	5225.22		65.64	5151.89	2480.21
Feb-10 2010	66.56	156.97	5266.47		65.66	5162.55	2502.51

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-10 2010	66.68	156.99	5306.62		65.67	5175.76	2525.67
Apr-10 2010	66.81	157.01	5345.62		65.68	5191.88	2549.94
May-10 2010	66.95	157.03	5380.58		65.70	5210.41	2574.01
Jun-10 2010	67.10	157.05	5410.08		65.71	5231.17	2597.29
Jul-10 2010	67.24	157.08	5432.69		65.73	5254.03	2619.23
Aug-10 2010	67.37	157.10	5448.35		65.76	5279.15	2639.95
Sep-10 2010	67.50	157.13	5457.41		65.78	5305.35	2658.90
Oct-10 2010	67.62	157.17	5461.10		65.81	5332.67	2676.58
Nov-10 2010	67.73	157.20	5460.44		65.84	5360.73	2693.17
Dec-10 2010	67.84	157.23	5456.36		65.87	5389.18	2708.80
Jan-11 2011	67.95	157.27	5449.72		65.90	5418.09	2723.90
Feb-11 2011	68.04	157.30	5441.99		65.93	5445.28	2737.68
Mar-11 2011	68.13	157.33	5433.75		65.95	5471.79	2751.01
Apr-11 2011	68.22	157.37	5425.65		65.98	5498.14	2764.51
May-11 2011	68.30	157.40	5418.93		66.01	5523.06	2777.86
Jun-11 2011	68.38	157.43	5414.54		66.03	5546.18	2791.23
Jul-11 2011	68.45	157.45	5413.42		66.06	5567.14	2804.77
Aug-11 2011	68.53	157.48	5415.92		66.08	5586.16	2818.73
Sep-11 2011	68.59	157.50	5421.60		66.09	5602.82	2832.58
Oct-11 2011	68.66	157.53	5430.08		66.11	5617.66	2846.42
Nov-11 2011	68.72	157.55	5440.89		66.12	5630.92	2860.14
Dec-11 2011	68.79	157.57	5453.65		66.14	5642.81	2873.63
Jan-12 2012	68.85	157.58	5468.15		66.15	5653.72	2886.99
Feb-12 2012	68.92	157.60	5483.25		66.16	5663.39	2899.49
Mar-12 2012	68.99	157.62	5498.99		66.17	5672.38	2911.44
Apr-12 2012	69.06	157.63	5515.22		66.18	5681.06	2922.93
May-12 2012	69.14	157.65	5531.28		66.19	5689.50	2933.64
Jun-12 2012	69.23	157.66	5546.73		66.20	5697.90	2943.47
Jul-12 2012	69.32	157.68	5561.17		66.21	5706.51	2952.31
Aug-12 2012	69.42	157.70	5574.72		66.23	5715.65	2960.31
Sep-12 2012	69.52	157.71	5587.13		66.24	5725.20	2967.38
Oct-12 2012	69.63	157.73	5598.86		66.26	5735.44	2973.82
Nov-12 2012	69.74	157.75	5610.14		66.27	5746.53	2979.81
Dec-12 2012	69.85	157.77	5621.20		66.29	5758.63	2985.53
Jan-13 2013	69.97	157.78	5632.45		66.31	5772.10	2991.23
Feb-13 2013	70.08	157.80	5643.38		66.32	5786.16	2996.72

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-13	2013	70.19	157.82	5654.76	66.34	5801.61	3002.44
Apr-13	2013	70.30	157.84	5667.19	66.36	5819.14	3008.74
May-13	2013	70.41	157.85	5680.54	66.38	5838.44	3015.63
Jun-13	2013	70.51	157.87	5695.03	66.40	5859.63	3023.27
Jul-13	2013	70.61	157.89	5710.89	66.41	5882.88	3031.83
Aug-13	2013	70.71	157.90	5728.45	66.43	5908.57	3041.51
Sep-13	2013	70.79	157.92	5747.00	66.45	5935.67	3051.89
Oct-13	2013	70.88	157.94	5766.66	66.47	5964.35	3063.03
Nov-13	2013	70.96	157.95	5787.27	66.49	5994.39	3074.80
Dec-13	2013	71.04	157.97	5808.68	66.51	6025.55	3087.10
Jan-14	2014	71.12	157.98	5831.10	66.54	6058.15	3100.03
Feb-14	2014	71.19	157.99	5852.88	66.56	6089.81	3112.64
Mar-14	2014	71.27	158.01	5874.98	66.58	6121.90	3125.44
Apr-14	2014	71.35	158.02	5898.00	66.60	6155.30	3138.76
May-14	2014	71.43	158.04	5921.03	66.63	6188.71	3152.08
Jun-14	2014	71.52	158.05	5943.92	66.65	6221.90	3165.27
Jul-14	2014	71.61	158.06	5966.51	66.68	6254.65	3178.23
Aug-14	2014	71.70	158.08	5989.11	66.70	6287.39	3191.12
Sep-14	2014	71.80	158.09	6010.98	66.73	6319.10	3203.51
Oct-14	2014	71.90	158.11	6032.51	66.76	6350.37	3215.60
Nov-14	2014	72.00	158.12	6053.71	66.79	6381.23	3227.42
Dec-14	2014	72.11	158.13	6074.62	66.82	6411.74	3238.94
Jan-15	2015	72.22	158.15	6095.56	66.85	6442.44	3250.36
Feb-15	2015	72.32	158.16	6115.24	66.88	6471.41	3260.95
Mar-15	2015	72.43	158.17	6134.68	66.91	6500.19	3271.27
Apr-15	2015	72.54	158.18	6154.54	66.94	6529.78	3281.67
May-15	2015	72.65	158.19	6174.19	66.97	6559.26	3291.77
Jun-15	2015	72.75	158.21	6193.63	67.00	6588.68	3301.60
Jul-15	2015	72.86	158.22	6212.89	67.03	6618.07	3311.14
Aug-15	2015	72.97	158.23	6232.29	67.06	6647.94	3320.57
Sep-15	2015	73.07	158.24	6251.19	67.09	6677.26	3329.64
Oct-15	2015	73.17	158.25	6269.93	67.12	6706.48	3338.53
Nov-15	2015	73.27	158.26	6288.49	67.14	6735.56	3347.30
Dec-15	2015	73.36	158.28	6306.89	67.17	6764.44	3355.99
Jan-16	2016	73.46	158.29	6325.42	67.20	6793.54	3364.78
Feb-16	2016	73.54	158.30	6343.19	67.23	6821.43	3373.31

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-16	2016	73.63	158.31	6360.79	67.25	6848.99	3381.89
Apr-16	2016	73.71	158.32	6378.54	67.28	6876.64	3390.72
May-16	2016	73.79	158.34	6396.12	67.31	6903.86	3399.70
Jun-16	2016	73.86	158.35	6413.54	67.33	6930.62	3408.87
Jul-16	2016	73.93	158.37	6430.81	67.36	6956.86	3418.28
Aug-16	2016	73.99	158.38	6448.21	67.38	6983.02	3428.10
Sep-16	2016	74.05	158.40	6465.17	67.41	7008.29	3437.97
Oct-16	2016	74.11	158.42	6482.00	67.43	7033.16	3448.02
Nov-16	2016	74.16	158.43	6498.69	67.46	7057.69	3458.23
Dec-16	2016	74.21	158.45	6515.25	67.48	7081.92	3468.55
Jan-17	2017	74.25	158.47	6531.96	67.51	7106.32	3479.12
Feb-17	2017	74.29	158.49	6547.75	67.53	7129.36	3489.22
Mar-17	2017	74.33	158.51	6563.44	67.55	7152.29	3499.35
Apr-17	2017	74.36	158.53	6579.56	67.58	7175.92	3509.79
May-17	2017	74.39	158.55	6595.58	67.60	7199.54	3520.19
Jun-17	2017	74.41	158.57	6611.51	67.62	7223.20	3530.51
Jul-17	2017	74.44	158.59	6627.36	67.65	7246.96	3540.71
Aug-17	2017	74.46	158.62	6643.38	67.67	7271.22	3550.96
Sep-17	2017	74.48	158.64	6659.07	67.69	7295.17	3560.93
Oct-17	2017	74.49	158.66	6674.70	67.71	7319.19	3570.81
Nov-17	2017	74.51	158.68	6690.27	67.73	7343.24	3580.62
Dec-17	2017	74.52	158.70	6705.78	67.75	7367.30	3590.37
Jan-18	2018	74.53	158.73	6721.49	67.78	7391.73	3600.25
Feb-18	2018	74.54	158.75	6736.41	67.80	7414.93	3609.63
Mar-18	2018	74.55	158.77	6751.29	67.81	7438.07	3619.01
Apr-18	2018	74.56	158.79	6766.64	67.83	7461.90	3628.72
May-18	2018	74.57	158.81	6781.97	67.85	7485.60	3638.47
Jun-18	2018	74.58	158.83	6797.28	67.87	7509.15	3648.27
Jul-18	2018	74.59	158.86	6812.58	67.89	7532.52	3658.13
Aug-18	2018	74.60	158.88	6828.12	67.91	7556.09	3668.23
Sep-18	2018	74.61	158.90	6843.42	67.92	7579.14	3678.23
Oct-18	2018	74.62	158.92	6858.73	67.94	7602.06	3688.28
Nov-18	2018	74.63	158.94	6874.07	67.96	7624.90	3698.36
Dec-18	2018	74.64	158.96	6889.45	67.97	7647.67	3708.46
Jan-19	2019	74.66	158.99	6905.12	67.99	7670.78	3718.74
Feb-19	2019	74.67	159.01	6920.09	68.00	7692.77	3728.52

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-19 2019	74.68	159.03	6935.12		68.02	7714.79	3738.29
Apr-19 2019	74.69	159.05	6950.73		68.03	7737.60	3748.36
May-19 2019	74.71	159.07	6966.43		68.05	7760.50	3758.39
Jun-19 2019	74.72	159.10	6982.23		68.06	7783.51	3768.38
Jul-19 2019	74.74	159.12	6998.13		68.08	7806.66	3778.30
Aug-19 2019	74.75	159.15	7014.40		68.09	7830.35	3788.31
Sep-19 2019	74.77	159.17	7030.51		68.11	7853.81	3798.12
Oct-19 2019	74.78	159.20	7046.73		68.13	7877.44	3807.88
Nov-19 2019	74.79	159.22	7063.03		68.14	7901.22	3817.62
Dec-19 2019	74.81	159.25	7079.43		68.16	7925.16	3827.35
Jan-20 2020	74.82	159.27	7096.19		68.17	7949.66	3837.24
Feb-20 2020	74.83	159.30	7112.48		68.19	7973.52	3846.83
Mar-20 2020	74.85	159.32	7128.85		68.20	7997.54	3856.44
Apr-20 2020	74.86	159.35	7145.56		68.22	8022.11	3866.26
May-20 2020	74.87	159.37	7162.34		68.24	8046.85	3876.13
Jun-20 2020	74.88	159.40	7179.19		68.25	8071.74	3886.06
Jul-20 2020	74.89	159.42	7196.09		68.26	8096.80	3896.08
Aug-20 2020	74.90	159.45	7213.32		68.28	8122.44	3906.35
Sep-20 2020	74.91	159.47	7230.32		68.29	8147.83	3916.53
Oct-20 2020	74.91	159.49	7247.38		68.30	8173.39	3926.79
Nov-20 2020	74.92	159.52	7264.49		68.32	8199.12	3937.11
Dec-20 2020	74.93	159.54	7281.64		68.33	8225.03	3947.50
Jan-21 2021	74.94	159.56	7299.12		68.34	8251.56	3958.12
Feb-21 2021	74.94	159.59	7315.80		68.35	8276.97	3968.27
Mar-21 2021	74.95	159.61	7332.52		68.36	8302.56	3978.47
Apr-21 2021	74.95	159.63	7349.84		68.38	8329.21	3989.06
May-21 2021	74.96	159.65	7367.19		68.39	8356.05	3999.68
Jun-21 2021	74.96	159.68	7384.59		68.40	8383.10	4010.33
Jul-21 2021	74.97	159.70	7402.01		68.41	8410.34	4021.01
Aug-21 2021	74.97	159.72	7419.76		68.42	8438.23	4031.90
Sep-21 2021	74.98	159.75	7437.24		68.43	8465.85	4042.63
Oct-21 2021	74.98	159.77	7454.75		68.44	8493.64	4053.41
Nov-21 2021	74.98	159.79	7472.29		68.45	8521.57	4064.22
Dec-21 2021	74.99	159.82	7489.84		68.45	8549.63	4075.08
Jan-22 2022	74.99	159.84	7507.69		68.46	8578.27	4086.17
Feb-22 2022	75.00	159.86	7524.69		68.47	8605.60	4096.78

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-22 2022	75.00	159.89	7541.70		68.48	8633.02	4107.44
Apr-22 2022	75.00	159.91	7559.29		68.49	8661.42	4118.53
May-22 2022	75.01	159.93	7576.88		68.50	8689.87	4129.70
Jun-22 2022	75.01	159.95	7594.47		68.51	8718.35	4140.94
Jul-22 2022	75.01	159.98	7612.05		68.51	8746.84	4152.26
Aug-22 2022	75.02	160.00	7629.92		68.52	8775.80	4163.84
Sep-22 2022	75.02	160.02	7647.48		68.53	8804.30	4175.32
Oct-22 2022	75.02	160.04	7665.03		68.54	8832.82	4186.85
Nov-22 2022	75.03	160.07	7682.57		68.54	8861.35	4198.42
Dec-22 2022	75.03	160.09	7700.08		68.55	8889.91	4210.04
Jan-23 2023	75.03	160.11	7717.86		68.56	8918.97	4221.88
Feb-23 2023	75.03	160.13	7734.75		68.56	8946.65	4233.16
Mar-23 2023	75.03	160.15	7751.62		68.57	8974.36	4244.44
Apr-23 2023	75.03	160.18	7769.02		68.58	9003.06	4256.11
May-23 2023	75.03	160.20	7786.40		68.58	9031.80	4267.76
Jun-23 2023	75.03	160.22	7803.73		68.59	9060.60	4279.39
Jul-23 2023	75.03	160.24	7821.02		68.59	9089.45	4290.99
Aug-23 2023	75.03	160.26	7838.56		68.60	9118.83	4302.74
Sep-23 2023	75.03	160.29	7855.78		68.60	9147.82	4314.27
Oct-23 2023	75.03	160.31	7872.97		68.61	9176.89	4325.78
Nov-23 2023	75.03	160.33	7890.14		68.61	9206.05	4337.28
Dec-23 2023	75.02	160.35	7907.29		68.61	9235.31	4348.78
Jan-24 2024	75.02	160.38	7924.70		68.62	9265.16	4360.47
Feb-24 2024	75.02	160.40	7941.55		68.62	9294.17	4371.79
Mar-24 2024	75.02	160.42	7958.41		68.62	9323.31	4383.14
Apr-24 2024	75.01	160.44	7975.54		68.63	9353.07	4394.70
May-24 2024	75.01	160.47	7992.69		68.63	9382.99	4406.29
Jun-24 2024	75.01	160.49	8009.85		68.63	9413.06	4417.93
Jul-24 2024	75.01	160.51	8027.03		68.63	9443.30	4429.62
Aug-24 2024	75.01	160.53	8044.52		68.63	9474.21	4441.56
Sep-24 2024	75.01	160.55	8061.73		68.63	9504.77	4453.34
Oct-24 2024	75.00	160.57	8078.95		68.63	9535.48	4465.15
Nov-24 2024	75.00	160.60	8096.17		68.63	9566.31	4476.99
Dec-24 2024	75.00	160.62	8113.37		68.63	9597.26	4488.84
Jan-25 2025	75.00	160.64	8130.83		68.63	9628.82	4500.88
Feb-25 2025	75.00	160.66	8147.43		68.63	9658.93	4512.34

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-25 2025	75.00	160.68	8163.99		68.63	9689.12	4523.77
Apr-25 2025	75.00	160.70	8181.06		68.63	9720.39	4535.57
May-25 2025	75.00	160.72	8198.09		68.63	9751.71	4547.34
Jun-25 2025	74.99	160.74	8215.05		68.63	9783.06	4559.05
Jul-25 2025	74.99	160.77	8231.95		68.63	9814.44	4570.71
Aug-25 2025	74.99	160.79	8249.05		68.63	9846.34	4582.51
Sep-25 2025	74.99	160.81	8265.82		68.63	9877.75	4594.06
Oct-25 2025	74.98	160.83	8282.52		68.63	9909.18	4605.57
Nov-25 2025	74.98	160.85	8299.18		68.63	9940.62	4617.05
Dec-25 2025	74.97	160.87	8315.79		68.63	9972.08	4628.50
Jan-26 2026	74.97	160.90	8332.62		68.63	10004.08	4640.11
Feb-26 2026	74.96	160.92	8348.62		68.63	10034.55	4651.16
Mar-26 2026	74.96	160.94	8364.58		68.63	10065.04	4662.20
Apr-26 2026	74.95	160.96	8381.07		68.63	10096.59	4673.61
May-26 2026	74.94	160.98	8397.54		68.63	10128.15	4685.04
Jun-26 2026	74.94	161.00	8413.99		68.63	10159.75	4696.48
Jul-26 2026	74.93	161.02	8430.45		68.62	10191.36	4707.96
Aug-26 2026	74.92	161.04	8447.17		68.62	10223.53	4719.64
Sep-26 2026	74.91	161.07	8463.62		68.62	10255.22	4731.17
Oct-26 2026	74.90	161.09	8480.06		68.62	10286.96	4742.73
Nov-26 2026	74.89	161.11	8496.51		68.62	10318.77	4754.32
Dec-26 2026	74.88	161.13	8512.95		68.61	10350.65	4765.93
Jan-27 2027	74.87	161.15	8529.65		68.61	10383.13	4777.76
Feb-27 2027	74.86	161.17	8545.54		68.61	10414.14	4789.04
Mar-27 2027	74.85	161.19	8561.42		68.60	10445.26	4800.34
Apr-27 2027	74.84	161.21	8577.83		68.60	10477.54	4812.05
May-27 2027	74.83	161.23	8594.24		68.60	10509.95	4823.79
Jun-27 2027	74.82	161.25	8610.63		68.59	10542.50	4835.54
Jul-27 2027	74.80	161.27	8627.02		68.59	10575.20	4847.32
Aug-27 2027	74.79	161.29	8643.66		68.59	10608.59	4859.32
Sep-27 2027	74.78	161.31	8660.03		68.58	10641.58	4871.13
Oct-27 2027	74.76	161.33	8676.37		68.58	10674.71	4882.96
Nov-27 2027	74.75	161.35	8692.70		68.58	10707.97	4894.81
Dec-27 2027	74.73	161.37	8709.01		68.58	10741.33	4906.66
Jan-28 2028	74.72	161.40	8725.57		68.57	10775.35	4918.72
Feb-28 2028	74.70	161.42	8741.56		68.57	10808.37	4930.39

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-28 2028	74.69	161.44	8757.54	68.57	10841.47	4942.06	
Apr-28 2028	74.67	161.46	8773.75	68.56	10875.19	4953.93	
May-28 2028	74.65	161.48	8789.93	68.56	10908.98	4965.79	
Jun-28 2028	74.64	161.50	8806.08	68.56	10942.83	4977.65	
Jul-28 2028	74.62	161.52	8822.19	68.56	10976.72	4989.50	
Aug-28 2028	74.60	161.54	8838.53	68.55	11011.22	5001.53	
Sep-28 2028	74.58	161.56	8854.58	68.55	11045.21	5013.38	
Oct-28 2028	74.57	161.58	8870.61	68.55	11079.26	5025.23	
Nov-28 2028	74.55	161.60	8886.61	68.55	11113.37	5037.10	
Dec-28 2028	74.53	161.62	8902.60	68.54	11147.54	5048.99	
Jan-29 2029	74.51	161.65	8918.84	68.54	11182.36	5061.10	
Feb-29 2029	74.50	161.67	8934.28	68.54	11215.56	5072.67	
Mar-29 2029	74.48	161.69	8949.73	68.54	11248.84	5084.27	
Apr-29 2029	74.46	161.71	8965.69	68.53	11283.34	5096.32	
May-29 2029	74.44	161.73	8981.66	68.53	11317.94	5108.42	
Jun-29 2029	74.43	161.75	8997.64	68.53	11352.63	5120.60	
Jul-29 2029	74.41	161.77	9013.63	68.53	11387.44	5132.84	
Aug-29 2029	74.39	161.79	9029.89	68.52	11422.93	5145.36	
Sep-29 2029	74.38	161.81	9045.90	68.52	11457.96	5157.73	
Oct-29 2029	74.36	161.83	9061.89	68.52	11493.12	5170.16	
Nov-29 2029	74.35	161.85	9077.87	68.52	11528.39	5182.63	
Dec-29 2029	74.33	161.88	9093.83	68.52	11563.79	5195.14	
Jan-30 2030	74.31	161.90	9110.00	68.51	11599.91	5207.86	
Feb-30 2030	74.30	161.92	9125.36	68.51	11634.40	5219.99	
Mar-30 2030	74.28	161.94	9140.66	68.51	11669.03	5232.12	
Apr-30 2030	74.26	161.96	9156.41	68.51	11704.96	5244.65	
May-30 2030	74.24	161.98	9172.10	68.51	11741.04	5257.16	
Jun-30 2030	74.22	162.00	9187.70	68.50	11777.27	5269.64	
Jul-30 2030	74.20	162.03	9203.21	68.50	11813.65	5282.09	
Aug-30 2030	74.18	162.05	9218.88	68.50	11850.78	5294.70	
Sep-30 2030	74.16	162.07	9234.21	68.50	11887.47	5307.08	
Oct-30 2030	74.13	162.09	9249.46	68.49	11924.31	5319.45	
Nov-30 2030	74.11	162.11	9264.63	68.49	11961.32	5331.80	
Dec-30 2030	74.08	162.13	9279.72	68.49	11998.49	5344.16	
Jan-31 2031	74.06	162.16	9294.99	68.48	12036.44	5356.73	
Feb-31 2031	74.03	162.18	9309.47	68.48	12072.71	5368.71	

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-31 2031	74.01	162.20	9323.89		68.48	12109.15	5380.72
Apr-31 2031	73.98	162.22	9338.75		68.47	12146.98	5393.18
May-31 2031	73.95	162.24	9353.56		68.47	12184.99	5405.69
Jun-31 2031	73.93	162.26	9368.34		68.46	12223.18	5418.26
Jul-31 2031	73.90	162.29	9383.07		68.46	12261.55	5430.90
Aug-31 2031	73.88	162.31	9398.01		68.46	12300.72	5443.82
Sep-31 2031	73.85	162.33	9412.66		68.45	12339.42	5456.60
Oct-31 2031	73.83	162.35	9427.24		68.45	12378.27	5469.44
Nov-31 2031	73.80	162.38	9441.76		68.44	12417.27	5482.33
Dec-31 2031	73.78	162.40	9456.20		68.44	12456.38	5495.26
Jan-32 2032	73.75	162.42	9470.78		68.44	12496.26	5508.44
Feb-32 2032	73.73	162.44	9484.80		68.43	12534.95	5521.23
Mar-32 2032	73.70	162.47	9498.70		68.43	12573.73	5534.04
Apr-32 2032	73.67	162.49	9512.72		68.43	12613.23	5547.08
May-32 2032	73.65	162.51	9526.60		68.43	12652.79	5560.13
Jun-32 2032	73.62	162.53	9540.34		68.42	12692.41	5573.18
Jul-32 2032	73.59	162.56	9553.92		68.42	12732.07	5586.22
Aug-32 2032	73.56	162.58	9567.57		68.42	12772.43	5599.48
Sep-32 2032	73.53	162.60	9580.87		68.42	12812.19	5612.52
Oct-32 2032	73.50	162.62	9594.04		68.42	12852.01	5625.56
Nov-32 2032	73.47	162.65	9607.11		68.41	12891.90	5638.62
Dec-32 2032	73.43	162.67	9620.08		68.41	12931.89	5651.69
Jan-33 2033	73.40	162.69	9633.19		68.41	12972.63	5665.00
Feb-33 2033	73.37	162.71	9645.60		68.41	13011.50	5677.69
Mar-33 2033	73.34	162.74	9657.97		68.41	13050.49	5690.42
Apr-33 2033	73.31	162.76	9670.73		68.41	13090.93	5703.62
May-33 2033	73.27	162.78	9683.47		68.40	13131.51	5716.86
Jun-33 2033	73.24	162.80	9696.21		68.40	13172.25	5730.16
Jul-33 2033	73.21	162.83	9708.97		68.40	13213.15	5743.51
Aug-33 2033	73.18	162.85	9721.95		68.39	13254.90	5757.14
Sep-33 2033	73.16	162.87	9734.75		68.39	13296.15	5770.62
Oct-33 2033	73.13	162.89	9747.58		68.38	13337.56	5784.17
Nov-33 2033	73.11	162.92	9760.44		68.38	13379.14	5797.79
Dec-33 2033	73.08	162.94	9773.34		68.37	13420.88	5811.47
Jan-34 2034	73.06	162.96	9786.48		68.37	13463.46	5825.46
Feb-34 2034	73.04	162.98	9799.03		68.36	13504.14	5838.85

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-34	2034	73.02	163.01	9811.63	68.36	13544.96	5852.31
Apr-34	2034	73.00	163.03	9824.69	68.36	13587.31	5866.30
May-34	2034	72.98	163.05	9837.81	68.35	13629.81	5880.39
Jun-34	2034	72.97	163.07	9850.99	68.35	13672.46	5894.55
Jul-34	2034	72.96	163.10	9864.21	68.35	13715.26	5908.81
Aug-34	2034	72.95	163.12	9877.72	68.35	13758.90	5923.40
Sep-34	2034	72.94	163.14	9891.08	68.35	13801.98	5937.84
Oct-34	2034	72.93	163.16	9904.51	68.35	13845.21	5952.38
Nov-34	2034	72.93	163.19	9918.01	68.35	13888.58	5967.02
Dec-34	2034	72.92	163.21	9931.59	68.36	13932.09	5981.75
Jan-35	2035	72.92	163.23	9945.48	68.36	13976.47	5996.83
Feb-35	2035	72.92	163.25	9958.78	68.36	14018.83	6011.28
Mar-35	2035	72.93	163.28	9972.17	68.36	14061.33	6025.83
Apr-35	2035	72.93	163.30	9986.10	68.36	14105.41	6040.98
May-35	2035	72.94	163.32	10000.13	68.36	14149.64	6056.23
Jun-35	2035	72.94	163.34	10014.27	68.37	14194.01	6071.59
Jul-35	2035	72.95	163.37	10028.52	68.37	14238.52	6087.07
Aug-35	2035	72.96	163.39	10043.10	68.37	14283.92	6102.91
Sep-35	2035	72.97	163.41	10057.55	68.37	14328.74	6118.60
Oct-35	2035	72.98	163.43	10072.07	68.37	14373.74	6134.39
Nov-35	2035	73.00	163.46	10086.67	68.36	14418.91	6150.27
Dec-35	2035	73.01	163.48	10101.33	68.36	14464.28	6166.25
Jan-36	2036	73.03	163.50	10116.27	68.36	14510.60	6182.58
Feb-36	2036	73.04	163.52	10130.76	68.36	14555.63	6198.45
Mar-36	2036	73.06	163.55	10145.28	68.36	14600.88	6214.40
Apr-36	2036	73.08	163.57	10160.05	68.35	14647.11	6230.69
May-36	2036	73.09	163.59	10174.81	68.35	14693.58	6247.04
Jun-36	2036	73.11	163.61	10189.56	68.35	14740.31	6263.44
Jul-36	2036	73.13	163.63	10204.29	68.34	14787.31	6279.91
Aug-36	2036	73.15	163.66	10219.21	68.34	14835.33	6296.69
Sep-36	2036	73.17	163.68	10233.82	68.34	14882.82	6313.24
Oct-36	2036	73.18	163.70	10248.33	68.33	14930.53	6329.83
Nov-36	2036	73.20	163.72	10262.72	68.33	14978.43	6346.45
Dec-36	2036	73.22	163.75	10276.94	68.33	15026.50	6363.10
Jan-37	2037	73.23	163.77	10291.22	68.32	15075.51	6380.03
Feb-37	2037	73.25	163.79	10304.61	68.32	15122.27	6396.16

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-37	2037	73.26	163.81	10317.77	68.31	15169.13	6412.29
Apr-37	2037	73.27	163.83	10331.12	68.31	15217.66	6428.97
May-37	2037	73.29	163.86	10344.18	68.31	15266.25	6445.63
Jun-37	2037	73.30	163.88	10356.93	68.30	15314.89	6462.29
Jul-37	2037	73.30	163.90	10369.33	68.30	15363.54	6478.93
Aug-37	2037	73.31	163.92	10381.59	68.30	15413.01	6495.82
Sep-37	2037	73.32	163.95	10393.35	68.29	15461.71	6512.42
Oct-37	2037	73.32	163.97	10404.85	68.29	15510.46	6529.01
Nov-37	2037	73.33	163.99	10416.12	68.28	15559.27	6545.60
Dec-37	2037	73.33	164.01	10427.21	68.28	15608.17	6562.19
Jan-38	2038	73.33	164.04	10438.33	68.28	15657.98	6579.05
Feb-38	2038	73.33	164.06	10448.81	68.27	15705.48	6595.11
Mar-38	2038	73.33	164.08	10459.23	68.27	15753.11	6611.19
Apr-38	2038	73.34	164.10	10469.97	68.26	15802.51	6627.83
May-38	2038	73.34	164.12	10480.71	68.26	15852.07	6644.50
Jun-38	2038	73.34	164.14	10491.51	68.26	15901.82	6661.19
Jul-38	2038	73.34	164.17	10502.39	68.25	15951.77	6677.93
Aug-38	2038	73.35	164.19	10513.54	68.25	16002.75	6694.98
Sep-38	2038	73.35	164.21	10524.59	68.24	16053.12	6711.80
Oct-38	2038	73.35	164.23	10535.69	68.24	16103.68	6728.69
Nov-38	2038	73.36	164.26	10546.81	68.23	16154.43	6745.63
Dec-38	2038	73.36	164.28	10557.95	68.23	16205.37	6762.65
Jan-39	2039	73.37	164.30	10569.24	68.22	16257.33	6780.02
Feb-39	2039	73.37	164.32	10579.95	68.22	16306.94	6796.64
Mar-39	2039	73.38	164.34	10590.60	68.21	16356.70	6813.34
Apr-39	2039	73.38	164.37	10601.52	68.21	16408.32	6830.70
May-39	2039	73.39	164.39	10612.33	68.20	16460.09	6848.16
Jun-39	2039	73.39	164.41	10623.02	68.20	16512.01	6865.74
Jul-39	2039	73.40	164.43	10633.54	68.19	16564.08	6883.43
Aug-39	2039	73.40	164.45	10644.06	68.19	16617.15	6901.54
Sep-39	2039	73.40	164.48	10654.23	68.18	16669.51	6919.47
Oct-39	2039	73.41	164.50	10664.18	68.18	16722.02	6937.53
Nov-39	2039	73.41	164.52	10673.92	68.17	16774.68	6955.71
Dec-39	2039	73.41	164.54	10683.42	68.17	16827.49	6974.01
Jan-40	2040	73.42	164.57	10692.83	68.16	16881.33	6992.73
Feb-40	2040	73.42	164.59	10701.67	68.16	16933.58	7010.97

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-40	2040	73.42	164.61	10710.25	68.15	16985.99	7029.32
Apr-40	2040	73.42	164.63	10718.68	68.15	17039.44	7048.10
May-40	2040	73.43	164.65	10726.80	68.14	17093.05	7066.99
Jun-40	2040	73.43	164.68	10734.60	68.13	17146.82	7086.01
Jul-40	2040	73.43	164.70	10742.06	68.13	17200.77	7105.14
Aug-40	2040	73.43	164.72	10749.33	68.12	17255.81	7124.70
Sep-40	2040	73.44	164.74	10756.24	68.11	17310.21	7144.07
Oct-40	2040	73.44	164.76	10762.96	68.11	17364.92	7163.57
Nov-40	2040	73.44	164.79	10769.56	68.10	17419.99	7183.18
Dec-40	2040	73.45	164.81	10776.10	68.09	17475.49	7202.92
Jan-41	2041	73.45	164.83	10782.76	68.09	17532.38	7223.11
Feb-41	2041	73.46	164.85	10789.17	68.08	17587.02	7242.44
Mar-41	2041	73.46	164.87	10795.71	68.07	17642.21	7261.89
Apr-41	2041	73.46	164.90	10802.66	68.07	17699.90	7282.13
May-41	2041	73.47	164.92	10809.87	68.06	17758.28	7302.50
Jun-41	2041	73.47	164.94	10817.41	68.05	17817.40	7322.99
Jul-41	2041	73.48	164.96	10825.34	68.05	17877.32	7343.62
Aug-41	2041	73.48	164.99	10833.87	68.04	17939.11	7364.72
Sep-41	2041	73.49	165.01	10842.78	68.03	18000.82	7385.62
Oct-41	2041	73.49	165.03	10852.28	68.02	18063.50	7406.65
Nov-41	2041	73.49	165.05	10862.42	68.02	18127.20	7427.82
Dec-41	2041	73.50	165.07	10873.28	68.01	18191.98	7449.13
Jan-42	2042	73.50	165.10	10885.10	68.00	18258.98	7470.93
Feb-42	2042	73.51	165.12	10897.16	67.99	18323.87	7491.80
Mar-42	2042	73.51	165.14	10910.08	67.99	18389.95	7512.81
Apr-42	2042	73.51	165.16	10924.37	67.98	18459.52	7534.68
May-42	2042	73.52	165.18	10939.70	67.97	18530.46	7556.68
Jun-42	2042	73.52	165.21	10956.11	67.97	18602.79	7578.83
Jul-42	2042	73.53	165.23	10973.69	67.96	18676.59	7601.13
Aug-42	2042	73.53	165.25	10992.81	67.95	18753.15	7623.94
Sep-42	2042	73.53	165.27	11012.92	67.95	18830.06	7646.53
Oct-42	2042	73.54	165.30	11034.38	67.94	18908.60	7669.27
Nov-42	2042	73.54	165.32	11057.25	67.93	18988.82	7692.17
Dec-42	2042	73.54	165.34	11081.61	67.93	19070.79	7715.21

Description:	Employment: Total Nonfarm Payroll, (Ths.) U.S. Bureau of Labor Statistics: Census of Employment & Wages (QCEW - ES202); Moody's Analytics (ECCA) Forecast	Total Population, (Ths.) U.S. Census Bureau (BOC); Moody's Analytics (ECCA) Forecast	Gross Product: Total, (Mil. Chained 2005 \$) U.S. Bureau of Economic Analysis (BEA); Moody's Analytics (ECCA) Forecast	Series does not exist. na	Number of Households: Total, (Ths.) U.S. Census Bureau (BOC); Moody's Analytics (ECCA) Forecast	Income: Total Personal, (Mil. \$) U.S. Bureau of Economic Analysis (BEA); Moody's Analytics (ECCA) Forecast	Total Retail Sales, (Mil \$) U.S. Census Bureau (BOC); Moody's Analytics (ECCA) Forecast	
Source:								
Native								
Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY	
Geography:	Caldwell County (KY) Crittenden County (KY) Daviess County (KY) Hancock County (KY) Henderson County (KY) Hopkins County (KY) Lyon County (KY) McLean County (KY) Ohio County (KY) Union County (KY) Webster County (KY)	Caldwell County (KY) Crittenden County (KY) Daviess County (KY) Hancock County (KY) Henderson County (KY) Hopkins County (KY) Lyon County (KY) McLean County (KY) Ohio County (KY) Union County (KY) Webster County (KY)	Caldwell County (KY) Crittenden County (KY) Daviess County (KY) Hancock County (KY) Henderson County (KY) Hopkins County (KY) Lyon County (KY) McLean County (KY) Ohio County (KY) Union County (KY) Webster County (KY)	Caldwell County (KY) Crittenden County (KY) Daviess County (KY) Hancock County (KY) Henderson County (KY) Hopkins County (KY) Lyon County (KY) McLean County (KY) Ohio County (KY) Union County (KY) Webster County (KY)	Caldwell County (KY) Crittenden County (KY) Daviess County (KY) Hancock County (KY) Henderson County (KY) Hopkins County (KY) Lyon County (KY) McLean County (KY) Ohio County (KY) Union County (KY) Webster County (KY)	Caldwell County (KY) Crittenden County (KY) Daviess County (KY) Hancock County (KY) Henderson County (KY) Hopkins County (KY) Lyon County (KY) McLean County (KY) Ohio County (KY) Union County (KY) Webster County (KY)	Caldwell County (KY) Crittenden County (KY) Daviess County (KY) Hancock County (KY) Henderson County (KY) Hopkins County (KY) Lyon County (KY) McLean County (KY) Ohio County (KY) Union County (KY) Webster County (KY)	Caldwell County (KY) Crittenden County (KY) Daviess County (KY) Hancock County (KY) Henderson County (KY) Hopkins County (KY) Lyon County (KY) McLean County (KY) Ohio County (KY) Union County (KY) Webster County (KY)
Jan-70	1970	71.01	243.57	na		76.85	752.73	365.69
Feb-70	1970	70.69	244.08	na		77.06	758.44	375.28
Mar-70	1970	70.42	244.55	na		77.26	764.20	384.09

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Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Apr-70	1970	70.20	244.99	na	77.45	770.22	392.46
May-70	1970	70.03	245.40	na	77.64	776.31	400.11
Jun-70	1970	69.91	245.77	na	77.81	782.47	407.08
Jul-70	1970	69.83	246.11	na	77.98	788.69	413.42
Aug-70	1970	69.81	246.42	na	78.14	795.07	419.26
Sep-70	1970	69.82	246.70	na	78.30	801.42	424.48
Oct-70	1970	69.88	246.95	na	78.44	807.84	429.20
Nov-70	1970	69.97	247.18	na	78.58	814.32	433.48
Dec-70	1970	70.11	247.39	na	78.71	820.86	437.36
Jan-71	1971	70.27	247.58	na	78.84	827.58	440.94
Feb-71	1971	70.46	247.75	na	78.96	834.03	444.06
Mar-71	1971	70.68	247.90	na	79.08	840.54	446.93
Apr-71	1971	70.93	248.05	na	79.20	847.33	449.69
May-71	1971	71.20	248.19	na	79.32	854.19	452.28
Jun-71	1971	71.50	248.33	na	79.43	861.11	454.74
Jul-71	1971	71.81	248.46	na	79.54	868.09	457.13
Aug-71	1971	72.15	248.59	na	79.66	875.28	459.52
Sep-71	1971	72.49	248.72	na	79.77	882.48	461.89
Oct-71	1971	72.85	248.85	na	79.89	889.86	464.32
Nov-71	1971	73.22	248.99	na	80.00	897.46	466.85
Dec-71	1971	73.59	249.13	na	80.12	905.33	469.54
Jan-72	1972	73.97	249.29	na	80.24	913.65	472.48
Feb-72	1972	74.35	249.46	na	80.37	922.05	475.56
Mar-72	1972	74.72	249.64	na	80.50	930.84	478.92
Apr-72	1972	75.10	249.84	na	80.63	940.23	482.67
May-72	1972	75.47	250.06	na	80.77	950.12	486.81
Jun-72	1972	75.84	250.30	na	80.92	960.54	491.37
Jul-72	1972	76.19	250.57	na	81.07	971.55	496.40
Aug-72	1972	76.54	250.87	na	81.23	983.31	501.97
Sep-72	1972	76.88	251.18	na	81.40	995.36	507.82
Oct-72	1972	77.21	251.51	na	81.57	1007.79	513.94
Nov-72	1972	77.53	251.85	na	81.74	1020.50	520.24
Dec-72	1972	77.85	252.19	na	81.92	1033.40	526.63
Jan-73	1973	78.16	252.55	na	82.10	1046.61	533.13
Feb-73	1973	78.46	252.89	na	82.27	1059.19	539.22

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Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-73	1973	78.76	253.23	na	82.44	1071.68	545.14
Apr-73	1973	79.06	253.57	na	82.62	1084.42	551.00
May-73	1973	79.37	253.90	na	82.79	1096.88	556.50
Jun-73	1973	79.68	254.22	na	82.96	1108.98	561.54
Jul-73	1973	79.99	254.51	na	83.13	1120.62	566.05
Aug-73	1973	80.31	254.79	na	83.29	1131.96	570.07
Sep-73	1973	80.61	255.05	na	83.45	1142.68	573.50
Oct-73	1973	80.91	255.29	na	83.61	1153.02	576.47
Nov-73	1973	81.19	255.52	na	83.76	1163.04	579.04
Dec-73	1973	81.45	255.73	na	83.91	1172.79	581.26
Jan-74	1974	81.68	255.95	na	84.06	1182.48	583.21
Feb-74	1974	81.88	256.14	na	84.20	1191.54	584.83
Mar-74	1974	82.03	256.34	na	84.34	1200.49	586.28
Apr-74	1974	82.15	256.54	na	84.48	1209.70	587.64
May-74	1974	82.23	256.74	na	84.63	1218.90	588.91
Jun-74	1974	82.24	256.95	na	84.78	1228.16	590.15
Jul-74	1974	82.20	257.16	na	84.93	1237.51	591.42
Aug-74	1974	82.10	257.38	na	85.08	1247.17	592.78
Sep-74	1974	81.96	257.61	na	85.23	1256.84	594.25
Oct-74	1974	81.78	257.85	na	85.39	1266.71	595.91
Nov-74	1974	81.59	258.09	na	85.54	1276.79	597.81
Dec-74	1974	81.40	258.34	na	85.70	1287.11	600.00
Jan-75	1975	81.21	258.60	na	85.87	1297.87	602.59
Feb-75	1975	81.05	258.86	na	86.03	1308.38	605.43
Mar-75	1975	80.92	259.11	na	86.19	1319.19	608.70
Apr-75	1975	80.84	259.39	na	86.36	1330.70	612.58
May-75	1975	80.82	259.66	na	86.53	1342.56	617.02
Jun-75	1975	80.87	259.94	na	86.70	1354.80	622.08
Jul-75	1975	81.00	260.23	na	86.88	1367.46	627.80
Aug-75	1975	81.23	260.52	na	87.06	1380.76	634.28
Sep-75	1975	81.53	260.81	na	87.24	1394.31	641.24
Oct-75	1975	81.90	261.10	na	87.43	1408.36	648.68
Nov-75	1975	82.31	261.39	na	87.61	1422.93	656.53
Dec-75	1975	82.77	261.68	na	87.80	1438.06	664.71
Jan-76	1976	83.26	261.98	na	87.98	1454.04	673.25

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Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Feb-76	1976	83.74	262.26	na	88.16	1470.10	681.67
Mar-76	1976	84.23	262.54	na	88.34	1486.80	690.15
Apr-76	1976	84.71	262.82	na	88.52	1504.43	698.76
May-76	1976	85.18	263.09	na	88.70	1522.78	707.27
Jun-76	1976	85.60	263.36	na	88.87	1541.85	715.59
Jul-76	1976	85.98	263.63	na	89.05	1561.69	723.65
Aug-76	1976	86.31	263.89	na	89.22	1582.53	731.56
Sep-76	1976	86.60	264.14	na	89.38	1603.49	739.14
Oct-76	1976	86.85	264.38	na	89.55	1624.67	746.58
Nov-76	1976	87.07	264.63	na	89.71	1645.86	753.96
Dec-76	1976	87.27	264.88	na	89.87	1666.83	761.36
Jan-77	1977	87.46	265.13	na	90.04	1687.70	768.97
Feb-77	1977	87.64	265.38	na	90.20	1706.92	776.35
Mar-77	1977	87.82	265.63	na	90.36	1725.31	783.96
Apr-77	1977	88.02	265.90	na	90.53	1743.25	792.13
May-77	1977	88.24	266.17	na	90.71	1759.87	800.67
Jun-77	1977	88.48	266.46	na	90.89	1774.95	809.65
Jul-77	1977	88.75	266.76	na	91.07	1788.28	819.15
Aug-77	1977	89.07	267.08	na	91.26	1800.16	829.35
Sep-77	1977	89.41	267.41	na	91.46	1810.64	839.84
Oct-77	1977	89.77	267.74	na	91.66	1820.38	850.73
Nov-77	1977	90.16	268.08	na	91.86	1829.85	861.96
Dec-77	1977	90.56	268.42	na	92.06	1839.51	873.45
Jan-78	1978	90.97	268.78	5708.22	92.27	1850.01	885.33
Feb-78	1978	91.36	269.11	5799.12	92.47	1861.06	896.76
Mar-78	1978	91.76	269.45	5878.05	92.67	1873.61	908.26
Apr-78	1978	92.16	269.79	5948.04	92.87	1888.57	920.16
May-78	1978	92.55	270.12	6006.67	93.07	1906.03	931.99
Jun-78	1978	92.92	270.45	6054.71	93.26	1926.43	943.70
Jul-78	1978	93.26	270.77	6092.72	93.46	1950.22	955.21
Aug-78	1978	93.59	271.08	6121.82	93.64	1977.78	966.67
Sep-78	1978	93.88	271.37	6141.74	93.83	2007.58	977.65
Oct-78	1978	94.14	271.65	6153.61	94.00	2039.38	988.32
Nov-78	1978	94.38	271.92	6158.17	94.17	2072.48	998.63
Dec-78	1978	94.58	272.18	6156.00	94.34	2106.22	1008.55

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Native								
Frequency:		MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Jan-79	1979	94.76	272.43	6147.63		94.51	2140.46	1018.19
Feb-79	1979	94.91	272.65	6134.55		94.67	2172.36	1026.92
Mar-79	1979	95.02	272.86	6116.96		94.82	2202.93	1035.18
Apr-79	1979	95.10	273.07	6094.79		94.98	2232.53	1043.19
May-79	1979	95.16	273.27	6069.17		95.14	2259.39	1050.62
Jun-79	1979	95.18	273.45	6040.77		95.29	2282.86	1057.44
Jul-79	1979	95.16	273.61	6010.23		95.45	2302.26	1063.62
Aug-79	1979	95.12	273.77	5977.68		95.60	2317.81	1069.27
Sep-79	1979	95.04	273.91	5944.84		95.75	2329.59	1074.27
Oct-79	1979	94.94	274.05	5911.85		95.90	2338.51	1078.83
Nov-79	1979	94.81	274.17	5879.36		96.05	2345.24	1083.01
Dec-79	1979	94.67	274.28	5848.04		96.19	2350.41	1086.91
Jan-80	1980	94.51	274.39	5818.06		96.33	2354.75	1090.68
Feb-80	1980	94.34	274.48	5791.47		96.46	2358.71	1094.22
Mar-80	1980	94.15	274.58	5767.94		96.59	2363.05	1097.73
Apr-80	1980	93.96	274.66	5747.74		96.71	2368.49	1101.37
May-80	1980	93.77	274.75	5731.99		96.83	2375.63	1105.15
Jun-80	1980	93.57	274.83	5721.30		96.94	2385.09	1109.17
Jul-80	1980	93.37	274.91	5716.32		97.04	2397.50	1113.50
Aug-80	1980	93.18	274.99	5716.91		97.14	2413.30	1118.22
Sep-80	1980	92.99	275.06	5722.11		97.23	2431.66	1123.08
Oct-80	1980	92.81	275.14	5730.92		97.31	2452.47	1128.05
Nov-80	1980	92.62	275.21	5742.30		97.39	2475.36	1133.05
Dec-80	1980	92.44	275.28	5755.26		97.47	2500.00	1137.96
Jan-81	1981	92.27	275.34	5769.03		97.54	2526.44	1142.77
Feb-81	1981	92.10	275.40	5781.73		97.60	2552.59	1147.08
Mar-81	1981	91.93	275.46	5793.09		97.66	2579.39	1151.03
Apr-81	1981	91.76	275.51	5802.50		97.73	2607.42	1154.65
May-81	1981	91.59	275.56	5808.51		97.79	2635.43	1157.69
Jun-81	1981	91.43	275.60	5810.15		97.85	2663.07	1160.06
Jul-81	1981	91.27	275.64	5806.44		97.91	2689.99	1161.66
Aug-81	1981	91.10	275.67	5797.04		97.97	2716.28	1162.53
Sep-81	1981	90.94	275.70	5782.92		98.03	2740.81	1162.81
Oct-81	1981	90.77	275.72	5764.67		98.09	2763.70	1162.68
Nov-81	1981	90.60	275.75	5743.08		98.16	2784.69	1162.31

Native								
Frequency:		MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Dec-81	1981	90.42	275.78	5718.85		98.22	2803.48	1161.86
Jan-82	1982	90.22	275.81	5692.31		98.29	2820.03	1161.51
Feb-82	1982	90.03	275.85	5665.96		98.36	2833.15	1161.42
Mar-82	1982	89.83	275.89	5639.21		98.43	2843.36	1161.75
Apr-82	1982	89.60	275.94	5611.87		98.51	2850.67	1162.66
May-82	1982	89.36	276.00	5585.57		98.59	2854.35	1164.35
Jun-82	1982	89.09	276.08	5561.04		98.68	2854.15	1166.96
Jul-82	1982	88.81	276.16	5539.03		98.77	2849.79	1170.66
Aug-82	1982	88.50	276.26	5519.75		98.86	2841.49	1175.58
Sep-82	1982	88.20	276.38	5504.12		98.96	2830.52	1181.46
Oct-82	1982	87.89	276.50	5492.10		99.06	2817.85	1188.26
Nov-82	1982	87.60	276.64	5483.93		99.17	2804.54	1195.86
Dec-82	1982	87.34	276.79	5479.91		99.28	2791.67	1204.18
Jan-83	1983	87.10	276.96	5480.33		99.40	2780.12	1213.23
Feb-83	1983	86.92	277.13	5485.18		99.51	2771.57	1222.30
Mar-83	1983	86.79	277.31	5494.73		99.63	2766.45	1231.73
Apr-83	1983	86.72	277.50	5509.68		99.76	2765.69	1241.74
May-83	1983	86.72	277.71	5530.14		99.89	2770.68	1251.91
Jun-83	1983	86.81	277.93	5556.31		100.03	2782.41	1262.13
Jul-83	1983	86.99	278.15	5588.49		100.16	2801.95	1272.29
Aug-83	1983	87.27	278.39	5626.90		100.31	2829.68	1282.47
Sep-83	1983	87.62	278.63	5669.26		100.45	2863.49	1292.32
Oct-83	1983	88.04	278.86	5715.04		100.60	2902.52	1301.95
Nov-83	1983	88.50	279.10	5763.11		100.74	2945.40	1311.33
Dec-83	1983	88.99	279.32	5812.38		100.88	2990.86	1320.42
Jan-84	1984	89.51	279.53	5862.52		101.01	3038.33	1329.32
Feb-84	1984	90.02	279.72	5910.03		101.14	3084.22	1337.57
Mar-84	1984	90.51	279.90	5955.44		101.26	3128.77	1345.42
Apr-84	1984	90.99	280.04	5998.41		101.37	3171.45	1352.97
May-84	1984	91.42	280.16	6036.99		101.47	3210.14	1360.03
Jun-84	1984	91.80	280.25	6070.14		101.57	3243.59	1366.57
Jul-84	1984	92.10	280.30	6096.73		101.64	3270.50	1372.54
Aug-84	1984	92.32	280.32	6116.84		101.71	3290.89	1378.04
Sep-84	1984	92.48	280.30	6130.39		101.76	3304.74	1382.89
Oct-84	1984	92.57	280.25	6138.37		101.81	3313.13	1387.20

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Native

Frequency:		MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Nov-84	1984	92.60	280.18	6141.48		101.84	3316.85	1391.00
Dec-84	1984	92.58	280.09	6140.32		101.87	3316.60	1394.29
Jan-85	1985	92.52	279.99	6135.49		101.89	3313.07	1397.15
Feb-85	1985	92.43	279.88	6128.09		101.91	3307.35	1399.43
Mar-85	1985	92.32	279.77	6118.50		101.93	3299.96	1401.28
Apr-85	1985	92.18	279.65	6106.97		101.94	3291.32	1402.78
May-85	1985	92.02	279.53	6094.42		101.96	3282.38	1403.87
Jun-85	1985	91.86	279.42	6081.51		101.98	3273.88	1404.57
Jul-85	1985	91.70	279.32	6068.86		102.01	3266.53	1404.90
Aug-85	1985	91.54	279.24	6056.64		102.04	3260.60	1404.90
Sep-85	1985	91.39	279.16	6045.31		102.07	3256.25	1404.68
Oct-85	1985	91.26	279.10	6034.72		102.10	3253.33	1404.32
Nov-85	1985	91.14	279.04	6024.89		102.14	3251.74	1403.93
Dec-85	1985	91.03	278.99	6015.88		102.18	3251.43	1403.59
Jan-86	1986	90.95	278.93	6007.57		102.22	3252.36	1403.40
Feb-86	1986	90.88	278.87	6000.50		102.25	3254.34	1403.44
Mar-86	1986	90.85	278.82	5994.31		102.29	3257.34	1403.80
Apr-86	1986	90.84	278.75	5988.83		102.32	3261.43	1404.59
May-86	1986	90.86	278.67	5984.34		102.35	3266.48	1405.90
Jun-86	1986	90.92	278.58	5980.88		102.37	3272.40	1407.82
Jul-86	1986	91.01	278.48	5978.51		102.39	3279.16	1410.44
Aug-86	1986	91.14	278.36	5977.41		102.41	3286.85	1413.86
Sep-86	1986	91.30	278.23	5978.02		102.42	3295.28	1417.94
Oct-86	1986	91.49	278.08	5980.72		102.43	3304.64	1422.71
Nov-86	1986	91.71	277.93	5985.89		102.43	3314.97	1428.14
Dec-86	1986	91.95	277.76	5993.96		102.43	3326.33	1434.20
Jan-87	1987	92.21	277.58	6005.54		102.42	3338.98	1440.97
Feb-87	1987	92.48	277.41	6020.07		102.42	3352.10	1447.97
Mar-87	1987	92.75	277.23	6038.48		102.41	3366.36	1455.48
Apr-87	1987	93.04	277.03	6061.89		102.40	3382.32	1463.75
May-87	1987	93.34	276.84	6090.21		102.39	3399.58	1472.52
Jun-87	1987	93.64	276.64	6123.78		102.38	3418.20	1481.74
Jul-87	1987	93.93	276.43	6163.02		102.37	3438.22	1491.41
Aug-87	1987	94.23	276.23	6208.33		102.36	3459.93	1501.63
Sep-87	1987	94.51	276.03	6257.21		102.35	3482.43	1512.01

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Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Oct-87 1987	94.80	275.84	6309.26		102.34	3505.86	1522.67
Nov-87 1987	95.08	275.65	6363.34		102.34	3529.99	1533.53
Dec-87 1987	95.35	275.47	6418.36		102.34	3554.63	1544.55
Jan-88 1988	95.63	275.30	6474.08		102.34	3579.96	1555.82
Feb-88 1988	95.90	275.14	6526.73		102.34	3604.56	1566.76
Mar-88 1988	96.16	275.00	6577.02		102.36	3629.02	1577.67
Apr-88 1988	96.43	274.88	6624.70		102.37	3653.56	1588.65
May-88 1988	96.70	274.77	6667.74		102.39	3677.54	1599.48
Jun-88 1988	96.97	274.68	6705.08		102.42	3700.77	1610.10
Jul-88 1988	97.24	274.61	6735.61		102.46	3723.04	1620.43
Aug-88 1988	97.52	274.57	6759.51		102.50	3744.63	1630.62
Sep-88 1988	97.78	274.54	6776.67		102.55	3764.96	1640.34
Oct-88 1988	98.05	274.53	6788.23		102.61	3784.47	1649.76
Nov-88 1988	98.32	274.54	6795.00		102.67	3803.28	1658.89
Dec-88 1988	98.59	274.55	6797.66		102.73	3821.51	1667.73
Jan-89 1989	98.86	274.58	6796.96		102.80	3839.54	1676.43
Feb-89 1989	99.11	274.60	6793.83		102.86	3856.35	1684.44
Mar-89 1989	99.36	274.63	6788.93		102.93	3872.91	1692.20
Apr-89 1989	99.62	274.66	6782.77		103.00	3889.88	1699.96
May-89 1989	99.87	274.68	6776.21		103.07	3906.80	1707.46
Jun-89 1989	100.12	274.70	6770.01		103.14	3923.78	1714.71
Jul-89 1989	100.36	274.71	6764.87		103.21	3940.93	1721.70
Aug-89 1989	100.60	274.71	6761.04		103.28	3958.54	1728.53
Sep-89 1989	100.83	274.69	6758.48		103.34	3975.96	1734.90
Oct-89 1989	101.04	274.68	6756.91		103.41	3993.39	1740.88
Nov-89 1989	101.24	274.65	6756.12		103.47	4010.73	1746.41
Dec-89 1989	101.43	274.63	6755.91		103.53	4027.89	1751.41
Jan-90 1990	101.60	274.60	6756.09		103.59	4045.06	1755.90
Feb-90 1990	101.74	274.57	6756.41		103.64	4061.05	1759.57
Mar-90 1990	101.86	274.55	6756.71		103.70	4076.61	1762.57
Apr-90 1990	101.96	274.53	6756.79		103.75	4092.17	1764.93
May-90 1990	102.03	274.51	6756.42		103.80	4107.09	1766.47
Jun-90 1990	102.06	274.50	6755.42		103.86	4121.30	1767.13
Jul-90 1990	102.07	274.50	6753.59		103.90	4134.70	1766.85
Aug-90 1990	102.04	274.51	6750.96		103.95	4147.59	1765.69

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Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Sep-90	1990	101.98	274.53	6747.97	104.00	4159.85	1763.85
Oct-90	1990	101.90	274.56	6744.97	104.05	4171.99	1761.54
Nov-90	1990	101.80	274.60	6742.35	104.10	4184.30	1758.95
Dec-90	1990	101.70	274.65	6740.48	104.15	4197.10	1756.29
Jan-91	1991	101.59	274.72	6739.74	104.21	4210.90	1753.72
Feb-91	1991	101.48	274.79	6740.49	104.26	4225.05	1751.59
Mar-91	1991	101.38	274.87	6743.04	104.32	4240.51	1749.95
Apr-91	1991	101.28	274.97	6747.89	104.38	4258.11	1748.97
May-91	1991	101.20	275.08	6755.41	104.46	4277.68	1748.91
Jun-91	1991	101.14	275.20	6765.94	104.53	4299.50	1749.97
Jul-91	1991	101.11	275.34	6779.88	104.62	4323.86	1752.35
Aug-91	1991	101.11	275.49	6797.37	104.71	4351.08	1756.17
Sep-91	1991	101.13	275.65	6817.22	104.80	4379.71	1761.20
Oct-91	1991	101.18	275.81	6839.03	104.90	4409.61	1767.39
Nov-91	1991	101.24	275.98	6862.10	105.01	4440.15	1774.61
Dec-91	1991	101.33	276.16	6885.77	105.12	4470.75	1782.76
Jan-92	1992	101.43	276.34	6909.72	105.22	4501.31	1791.87
Feb-92	1992	101.53	276.51	6932.16	105.33	4529.77	1801.37
Mar-92	1992	101.65	276.68	6953.19	105.44	4556.54	1811.44
Apr-92	1992	101.77	276.84	6972.48	105.54	4581.48	1822.13
May-92	1992	101.89	277.00	6988.97	105.65	4603.50	1833.18
Jun-92	1992	102.02	277.15	7002.01	105.74	4622.04	1844.46
Jul-92	1992	102.14	277.29	7010.97	105.84	4636.51	1855.88
Aug-92	1992	102.26	277.41	7016.18	105.93	4647.15	1867.58
Sep-92	1992	102.38	277.53	7018.68	106.01	4654.33	1879.19
Oct-92	1992	102.51	277.63	7019.83	106.09	4658.99	1890.93
Nov-92	1992	102.65	277.73	7020.90	106.17	4661.92	1902.84
Dec-92	1992	102.81	277.82	7023.16	106.24	4663.87	1914.93
Jan-93	1993	102.99	277.91	7027.98	106.32	4665.64	1927.44
Feb-93	1993	103.18	277.99	7036.10	106.39	4667.85	1939.57
Mar-93	1993	103.41	278.07	7048.95	106.45	4671.30	1951.96
Apr-93	1993	103.67	278.15	7068.28	106.52	4676.87	1965.05
May-93	1993	103.98	278.23	7095.10	106.59	4685.26	1978.47
Jun-93	1993	104.33	278.32	7130.61	106.66	4697.21	1992.23
Jul-93	1993	104.72	278.41	7176.05	106.74	4713.46	2006.36

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Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Aug-93	1993	105.18	278.51	7232.12	106.82	4734.38	2021.04
Sep-93	1993	105.66	278.61	7295.33	106.89	4758.60	2035.67
Oct-93	1993	106.17	278.71	7364.73	106.97	4785.65	2050.35
Nov-93	1993	106.69	278.82	7438.45	107.05	4814.73	2064.94
Dec-93	1993	107.23	278.94	7514.68	107.14	4845.08	2079.29
Jan-94	1994	107.77	279.06	7592.84	107.22	4876.41	2093.49
Feb-94	1994	108.27	279.17	7666.15	107.31	4905.94	2106.53
Mar-94	1994	108.76	279.30	7736.66	107.39	4934.47	2118.95
Apr-94	1994	109.23	279.42	7804.95	107.48	4962.17	2131.03
May-94	1994	109.67	279.56	7866.67	107.57	4987.26	2142.18
Jun-94	1994	110.05	279.69	7920.08	107.66	5008.99	2152.29
Jul-94	1994	110.38	279.83	7963.37	107.76	5026.59	2161.20
Aug-94	1994	110.65	279.97	7996.66	107.85	5040.22	2169.06
Sep-94	1994	110.87	280.11	8019.97	107.94	5050.09	2175.80
Oct-94	1994	111.03	280.25	8035.04	108.04	5057.15	2181.74
Nov-94	1994	111.16	280.39	8043.17	108.13	5062.17	2187.08
Dec-94	1994	111.25	280.53	8045.49	108.23	5065.83	2191.99
Jan-95	1995	111.32	280.67	8043.18	108.32	5068.94	2196.77
Feb-95	1995	111.36	280.81	8037.77	108.41	5071.99	2201.27
Mar-95	1995	111.40	280.93	8030.28	108.50	5075.83	2205.93
Apr-95	1995	111.42	281.06	8021.57	108.59	5081.29	2211.08
May-95	1995	111.45	281.19	8013.04	108.68	5089.02	2216.77
Jun-95	1995	111.49	281.31	8005.90	108.76	5099.70	2223.17
Jul-95	1995	111.54	281.42	8001.33	108.85	5114.05	2230.49
Aug-95	1995	111.60	281.53	8000.05	108.93	5132.51	2238.88
Sep-95	1995	111.68	281.63	8002.33	109.01	5154.00	2247.97
Oct-95	1995	111.78	281.72	8008.35	109.08	5178.29	2257.75
Nov-95	1995	111.89	281.81	8018.25	109.16	5204.81	2268.08
Dec-95	1995	112.02	281.90	8032.27	109.23	5233.07	2278.84
Jan-96	1996	112.16	281.98	8050.90	109.30	5263.01	2290.07
Feb-96	1996	112.31	282.05	8073.30	109.37	5292.63	2301.08
Mar-96	1996	112.47	282.12	8100.26	109.44	5322.39	2312.12
Apr-96	1996	112.65	282.19	8132.44	109.50	5352.26	2323.23
May-96	1996	112.83	282.26	8169.68	109.57	5381.21	2334.10
Jun-96	1996	113.02	282.32	8212.12	109.64	5408.72	2344.59

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Jul-96	1996	113.23	282.39	8259.95	109.70	5434.29	2354.58
Aug-96	1996	113.44	282.45	8313.53	109.76	5458.18	2364.12
Sep-96	1996	113.65	282.51	8369.96	109.83	5479.91	2372.87
Oct-96	1996	113.87	282.57	8428.86	109.89	5500.19	2380.96
Nov-96	1996	114.08	282.62	8489.00	109.95	5519.36	2388.34
Dec-96	1996	114.30	282.68	8549.15	110.02	5537.74	2394.99
Jan-97	1997	114.51	282.74	8609.04	110.08	5555.95	2400.96
Feb-97	1997	114.70	282.80	8663.73	110.14	5573.14	2405.88
Mar-97	1997	114.89	282.86	8714.95	110.20	5590.51	2410.01
Apr-97	1997	115.07	282.92	8763.20	110.27	5608.96	2413.43
May-97	1997	115.23	282.99	8805.37	110.34	5628.23	2415.93
Jun-97	1997	115.38	283.05	8840.30	110.40	5648.63	2417.51
Jul-97	1997	115.51	283.12	8866.78	110.47	5670.50	2418.12
Aug-97	1997	115.62	283.20	8885.12	110.55	5694.15	2417.90
Sep-97	1997	115.71	283.27	8895.98	110.62	5718.43	2417.16
Oct-97	1997	115.79	283.34	8901.06	110.69	5743.27	2416.24
Nov-97	1997	115.86	283.42	8901.77	110.76	5768.22	2415.45
Dec-97	1997	115.92	283.49	8899.46	110.83	5792.85	2415.13
Jan-98	1998	115.98	283.56	8895.45	110.91	5817.09	2415.61
Feb-98	1998	116.04	283.63	8891.38	110.97	5839.02	2417.12
Mar-98	1998	116.11	283.69	8888.35	111.04	5859.38	2419.99
Apr-98	1998	116.18	283.74	8887.59	111.10	5878.42	2424.66
May-98	1998	116.26	283.80	8890.65	111.16	5894.93	2431.41
Jun-98	1998	116.35	283.84	8898.86	111.22	5908.52	2440.55
Jul-98	1998	116.46	283.88	8913.54	111.27	5918.74	2452.39
Aug-98	1998	116.59	283.91	8935.01	111.32	5925.92	2467.19
Sep-98	1998	116.74	283.93	8961.16	111.37	5930.69	2484.18
Oct-98	1998	116.89	283.95	8990.74	111.42	5934.07	2503.27
Nov-98	1998	117.06	283.96	9022.17	111.46	5936.99	2524.10
Dec-98	1998	117.24	283.97	9053.88	111.50	5940.35	2546.37
Jan-99	1999	117.43	283.98	9084.80	111.55	5945.17	2570.12
Feb-99	1999	117.62	283.99	9111.52	111.59	5951.90	2593.46
Mar-99	1999	117.81	284.00	9134.08	111.63	5961.64	2617.23
Apr-99	1999	118.01	284.02	9151.64	111.68	5975.66	2641.92
May-99	1999	118.21	284.04	9161.71	111.74	5994.65	2666.42

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Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Jun-99 1999	118.42	284.07	9162.80		111.79	6019.47	2690.40
Jul-99 1999	118.62	284.11	9153.35		111.86	6051.03	2713.53
Aug-99 1999	118.81	284.15	9132.82		111.93	6089.83	2735.97
Sep-99 1999	119.00	284.20	9103.05		112.00	6133.47	2756.93
Oct-99 1999	119.17	284.25	9065.02		112.07	6181.33	2776.72
Nov-99 1999	119.32	284.30	9020.14		112.14	6232.11	2795.30
Dec-99 1999	119.45	284.34	8969.63		112.21	6284.60	2812.58
Jan-00 2000	119.55	284.39	8913.91		112.28	6338.41	2828.78
Feb-00 2000	119.62	284.42	8857.07		112.34	6389.71	2843.10
Mar-00 2000	119.66	284.44	8798.59		112.39	6439.02	2856.00
Apr-00 2000	119.66	284.45	8738.74		112.44	6485.95	2867.64
May-00 2000	119.61	284.45	8679.81		112.47	6528.36	2877.71
Jun-00 2000	119.52	284.43	8623.07		112.50	6565.05	2886.17
Jul-00 2000	119.37	284.39	8569.83		112.50	6594.81	2892.96
Aug-00 2000	119.18	284.32	8520.25		112.50	6617.75	2898.21
Sep-00 2000	118.94	284.25	8476.51		112.48	6633.88	2901.90
Oct-00 2000	118.68	284.16	8438.35		112.45	6644.41	2904.27
Nov-00 2000	118.39	284.06	8406.27		112.42	6650.21	2905.48
Dec-00 2000	118.09	283.96	8380.88		112.38	6652.08	2905.69
Jan-01 2001	117.79	283.86	8362.44		112.34	6650.82	2905.03
Feb-01 2001	117.50	283.77	8352.26		112.30	6647.47	2903.75
Mar-01 2001	117.23	283.69	8349.96		112.26	6642.74	2901.96
Apr-01 2001	116.97	283.61	8356.17		112.23	6637.23	2899.74
May-01 2001	116.75	283.55	8371.79		112.20	6631.90	2897.28
Jun-01 2001	116.57	283.51	8397.27		112.18	6627.57	2894.74
Jul-01 2001	116.45	283.49	8433.18		112.17	6625.05	2892.28
Aug-01 2001	116.37	283.50	8479.72		112.18	6624.70	2889.99
Sep-01 2001	116.35	283.53	8533.75		112.20	6626.42	2888.03
Oct-01 2001	116.35	283.58	8594.26		112.22	6630.05	2886.44
Nov-01 2001	116.39	283.65	8659.43		112.25	6635.41	2885.32
Dec-01 2001	116.45	283.73	8727.58		112.30	6642.37	2884.74
Jan-02 2002	116.52	283.82	8798.07		112.34	6650.90	2884.81
Feb-02 2002	116.58	283.91	8864.65		112.39	6660.23	2885.56
Mar-02 2002	116.65	284.01	8929.10		112.44	6670.62	2887.07
Apr-02 2002	116.70	284.12	8991.88		112.49	6682.31	2889.50

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Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
May-02 2002	116.72	284.23	9048.96		112.54	6694.82	2892.90
Jun-02 2002	116.72	284.33	9098.66		112.59	6707.99	2897.36
Jul-02 2002	116.68	284.43	9139.25		112.64	6721.67	2902.97
Aug-02 2002	116.59	284.52	9170.77		112.69	6736.04	2909.82
Sep-02 2002	116.47	284.61	9193.04		112.73	6750.72	2917.60
Oct-02 2002	116.33	284.69	9207.51		112.76	6766.00	2926.30
Nov-02 2002	116.17	284.77	9215.24		112.80	6781.96	2935.80
Dec-02 2002	115.99	284.84	9217.09		112.83	6798.67	2946.00
Jan-03 2003	115.81	284.91	9213.99		112.86	6816.50	2956.96
Feb-03 2003	115.64	284.98	9207.30		112.89	6834.33	2967.84
Mar-03 2003	115.48	285.04	9197.75		112.92	6853.08	2979.06
Apr-03 2003	115.33	285.11	9185.88		112.95	6873.48	2990.91
May-03 2003	115.20	285.18	9172.89		112.98	6895.01	3002.91
Jun-03 2003	115.11	285.25	9159.73		113.01	6917.73	3014.94
Jul-03 2003	115.05	285.32	9147.31		113.04	6941.72	3026.89
Aug-03 2003	115.03	285.40	9135.84		113.07	6967.41	3038.93
Sep-03 2003	115.04	285.47	9125.47		113.10	6993.92	3050.70
Oct-03 2003	115.09	285.55	9115.76		113.13	7021.62	3062.45
Nov-03 2003	115.16	285.63	9106.44		113.17	7050.45	3074.22
Dec-03 2003	115.25	285.70	9097.25		113.20	7080.35	3086.06
Jan-04 2004	115.35	285.78	9087.77		113.23	7111.80	3098.21
Feb-04 2004	115.45	285.86	9078.22		113.26	7143.19	3110.12
Mar-04 2004	115.56	285.93	9068.02		113.30	7175.48	3122.24
Apr-04 2004	115.67	286.00	9056.76		113.33	7209.16	3134.80
May-04 2004	115.77	286.07	9044.31		113.36	7243.67	3147.67
Jun-04 2004	115.85	286.13	9030.44		113.39	7278.95	3160.88
Jul-04 2004	115.92	286.19	9014.91		113.41	7314.95	3174.47
Aug-04 2004	115.96	286.25	8997.70		113.44	7352.19	3188.64
Sep-04 2004	115.99	286.30	8980.14		113.46	7389.36	3202.81
Oct-04 2004	116.01	286.35	8962.78		113.48	7426.95	3217.06
Nov-04 2004	116.01	286.40	8946.42		113.51	7464.85	3231.28
Dec-04 2004	116.01	286.45	8931.91		113.53	7502.95	3245.32
Jan-05 2005	116.01	286.50	8919.87		113.55	7541.76	3259.28
Feb-05 2005	116.01	286.55	8911.69		113.57	7578.69	3272.17
Mar-05 2005	116.01	286.60	8907.57		113.60	7615.49	3284.51

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Frequency:		MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Apr-05	2005	116.03	286.66	8908.24		113.62	7653.31	3296.61
May-05	2005	116.05	286.72	8914.80		113.65	7690.79	3307.89
Jun-05	2005	116.09	286.79	8928.01		113.68	7727.81	3318.23
Jul-05	2005	116.15	286.86	8948.67		113.71	7764.28	3327.50
Aug-05	2005	116.23	286.95	8976.85		113.74	7800.59	3335.89
Sep-05	2005	116.32	287.03	9010.05		113.77	7835.38	3343.36
Oct-05	2005	116.43	287.13	9047.03		113.81	7869.00	3350.28
Nov-05	2005	116.55	287.22	9086.05		113.85	7901.26	3356.92
Dec-05	2005	116.67	287.31	9125.45		113.89	7931.91	3363.51
Jan-06	2006	116.80	287.41	9164.12		113.93	7961.20	3370.43
Feb-06	2006	116.92	287.50	9198.06		113.96	7987.15	3377.44
Mar-06	2006	117.04	287.58	9227.54		114.00	8010.97	3385.10
Apr-06	2006	117.16	287.67	9251.86		114.04	8033.19	3393.94
May-06	2006	117.27	287.75	9268.12		114.08	8052.73	3403.97
Jun-06	2006	117.37	287.82	9274.74		114.11	8069.40	3415.41
Jul-06	2006	117.45	287.88	9270.02		114.14	8082.98	3428.51
Aug-06	2006	117.51	287.94	9253.68		114.18	8094.09	3443.50
Sep-06	2006	117.56	287.99	9227.90		114.21	8103.43	3459.61
Oct-06	2006	117.60	288.04	9194.22		114.24	8112.31	3476.78
Nov-06	2006	117.64	288.08	9154.54		114.27	8121.86	3494.67
Dec-06	2006	117.66	288.13	9110.60		114.30	8133.20	3513.00
Jan-07	2007	117.69	288.18	9063.46		114.34	8147.71	3531.76
Feb-07	2007	117.72	288.23	9018.00		114.37	8165.33	3549.44
Mar-07	2007	117.75	288.29	8973.62		114.41	8187.84	3566.66
Apr-07	2007	117.78	288.37	8930.58		114.45	8217.17	3583.69
May-07	2007	117.83	288.45	8892.25		114.50	8253.88	3599.64
Jun-07	2007	117.89	288.56	8860.39		114.55	8298.99	3614.19
Jul-07	2007	117.97	288.68	8836.75		114.61	8353.61	3627.04
Aug-07	2007	118.06	288.82	8821.21		114.67	8418.38	3638.11
Sep-07	2007	118.16	288.97	8812.74		114.74	8489.28	3646.86
Oct-07	2007	118.25	289.13	8809.35		114.81	8565.23	3653.30
Nov-07	2007	118.33	289.29	8809.31		114.88	8644.11	3657.27
Dec-07	2007	118.39	289.46	8810.94		114.96	8723.86	3658.57
Jan-08	2008	118.42	289.64	8812.53		115.03	8803.65	3657.00
Feb-08	2008	118.41	289.80	8812.36		115.10	8877.65	3652.53

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Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-08 2008	118.36	289.95	8808.82		115.17	8946.39	3644.96
Apr-08 2008	118.26	290.09	8800.16		115.23	9008.95	3633.95
May-08 2008	118.10	290.22	8784.65		115.29	9061.96	3619.39
Jun-08 2008	117.86	290.33	8760.65		115.33	9103.44	3601.15
Jul-08 2008	117.55	290.41	8726.53		115.38	9131.32	3579.04
Aug-08 2008	117.16	290.48	8681.88		115.41	9145.61	3552.99
Sep-08 2008	116.71	290.52	8630.41		115.43	9147.40	3524.66
Oct-08 2008	116.22	290.54	8573.89		115.45	9138.70	3494.50
Nov-08 2008	115.69	290.55	8514.80		115.47	9121.32	3463.42
Dec-08 2008	115.15	290.55	8455.58		115.47	9096.93	3432.26
Jan-09 2009	114.59	290.54	8397.76		115.48	9066.78	3401.42
Feb-09 2009	114.07	290.53	8347.24		115.48	9034.73	3373.65
Mar-09 2009	113.57	290.51	8303.54		115.48	9000.95	3348.29
Apr-09 2009	113.10	290.50	8267.65		115.48	8965.92	3325.35
May-09 2009	112.68	290.49	8243.81		115.49	8932.48	3306.67
Jun-09 2009	112.32	290.49	8234.30		115.49	8902.35	3293.07
Jul-09 2009	112.05	290.50	8241.56		115.49	8877.23	3285.43
Aug-09 2009	111.86	290.52	8266.00		115.50	8857.70	3283.93
Sep-09 2009	111.76	290.55	8304.38		115.52	8844.38	3288.16
Oct-09 2009	111.72	290.59	8354.40		115.53	8836.89	3297.56
Nov-09 2009	111.75	290.64	8413.26		115.55	8835.07	3311.56
Dec-09 2009	111.83	290.69	8478.37		115.57	8838.91	3329.68
Jan-10 2010	111.96	290.75	8548.16		115.60	8848.49	3351.74
Feb-10 2010	112.12	290.82	8615.42		115.63	8862.81	3375.64
Mar-10 2010	112.32	290.88	8681.02		115.66	8882.25	3401.94
Apr-10 2010	112.54	290.95	8744.57		115.70	8907.52	3431.09
May-10 2010	112.78	291.02	8801.08		115.73	8938.05	3461.76
Jun-10 2010	113.03	291.09	8847.94		115.78	8973.69	3493.39
Jul-10 2010	113.28	291.16	8882.54		115.82	9014.42	3525.48
Aug-10 2010	113.53	291.23	8904.60		115.87	9060.52	3558.21
Sep-10 2010	113.77	291.29	8914.88		115.92	9109.74	3590.35
Oct-10 2010	114.00	291.35	8915.41		115.97	9162.01	3622.26
Nov-10 2010	114.24	291.41	8907.95		116.03	9216.50	3653.79
Dec-10 2010	114.46	291.47	8894.08		116.08	9272.41	3684.79
Jan-11 2011	114.69	291.54	8875.19		116.14	9329.85	3715.58

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AG 1-26 Attachment 7

Native		MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Frequency:								
Feb-11	2011	114.90	291.60	8854.29		116.19	9384.34	3744.07
Mar-11	2011	115.10	291.66	8832.05		116.24	9437.88	3771.60
Apr-11	2011	115.31	291.73	8809.27		116.30	9491.51	3798.93
May-11	2011	115.51	291.80	8788.34		116.35	9542.55	3824.95
Jun-11	2011	115.70	291.88	8770.91		116.40	9590.22	3849.50
Jul-11	2011	115.89	291.95	8758.60		116.45	9633.73	3872.42
Aug-11	2011	116.07	292.04	8751.85		116.50	9673.45	3894.02
Sep-11	2011	116.24	292.13	8750.30		116.55	9708.38	3913.71
Oct-11	2011	116.40	292.22	8753.14		116.59	9739.52	3931.94
Nov-11	2011	116.55	292.32	8759.65		116.63	9767.25	3948.82
Dec-11	2011	116.69	292.42	8769.17		116.68	9791.86	3964.46
Jan-12	2012	116.81	292.52	8781.20		116.72	9814.08	3979.18
Feb-12	2012	116.92	292.62	8794.43		116.76	9833.22	3992.42
Mar-12	2012	117.01	292.73	8808.58		116.81	9850.34	4004.74
Apr-12	2012	117.08	292.84	8823.21		116.85	9866.06	4016.46
May-12	2012	117.14	292.95	8837.41		116.90	9880.38	4027.45
Jun-12	2012	117.17	293.06	8850.50		116.95	9893.67	4037.83
Jul-12	2012	117.19	293.18	8861.82		117.00	9906.25	4047.69
Aug-12	2012	117.18	293.30	8871.34		117.05	9918.74	4057.30
Sep-12	2012	117.16	293.41	8879.07		117.11	9931.17	4066.43
Oct-12	2012	117.13	293.53	8885.54		117.16	9944.21	4075.36
Nov-12	2012	117.09	293.64	8891.11		117.22	9958.28	4084.16
Dec-12	2012	117.04	293.76	8896.13		117.29	9973.85	4092.96
Jan-13	2013	117.00	293.87	8901.06		117.35	9991.66	4101.97
Feb-13	2013	116.97	293.98	8905.93		117.41	10010.88	4110.73
Mar-13	2013	116.94	294.09	8911.30		117.47	10032.80	4119.74
Apr-13	2013	116.93	294.20	8917.73		117.54	10058.64	4129.42
May-13	2013	116.94	294.31	8925.41		117.60	10088.21	4139.58
Jun-13	2013	116.97	294.42	8934.69		117.67	10121.92	4150.29
Jul-13	2013	117.02	294.52	8945.94		117.73	10160.22	4161.67
Aug-13	2013	117.11	294.63	8959.49		117.80	10203.82	4173.94
Sep-13	2013	117.22	294.73	8974.76		117.86	10250.86	4186.67
Oct-13	2013	117.35	294.82	8991.82		117.93	10301.52	4200.01
Nov-13	2013	117.51	294.92	9010.49		117.99	10355.26	4213.89
Dec-13	2013	117.68	295.01	9030.62		118.06	10411.60	4228.30

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Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Jan-14 2014	117.88	295.11	9052.41		118.13	10471.01	4243.41
Feb-14 2014	118.07	295.20	9074.23		118.19	10529.06	4258.19
Mar-14 2014	118.28	295.29	9096.98		118.26	10588.14	4273.32
Apr-14 2014	118.50	295.38	9121.32		118.33	10649.81	4289.29
May-14 2014	118.74	295.47	9146.33		118.40	10711.58	4305.54
Jun-14 2014	118.97	295.57	9171.85		118.47	10772.95	4322.03
Jul-14 2014	119.21	295.66	9197.73		118.55	10833.43	4338.70
Aug-14 2014	119.45	295.76	9224.29		118.63	10893.77	4355.79
Sep-14 2014	119.69	295.86	9250.61		118.70	10952.10	4372.69
Oct-14 2014	119.92	295.95	9277.07		118.79	11009.48	4389.62
Nov-14 2014	120.16	296.05	9303.61		118.87	11066.02	4406.51
Dec-14 2014	120.39	296.15	9330.18		118.95	11121.81	4423.32
Jan-15 2015	120.63	296.25	9357.15		119.04	11177.85	4440.27
Feb-15 2015	120.85	296.34	9382.74		119.12	11230.65	4456.21
Mar-15 2015	121.07	296.44	9408.19		119.20	11283.01	4471.91
Apr-15 2015	121.30	296.53	9434.33		119.28	11336.79	4487.85
May-15 2015	121.52	296.63	9460.22		119.37	11390.30	4503.42
Jun-15 2015	121.74	296.72	9485.81		119.45	11443.63	4518.58
Jul-15 2015	121.95	296.81	9511.05		119.53	11496.88	4533.28
Aug-15 2015	122.16	296.90	9536.30		119.62	11550.93	4547.74
Sep-15 2015	122.36	296.99	9560.72		119.70	11603.95	4561.55
Oct-15 2015	122.56	297.08	9584.69		119.78	11656.72	4575.02
Nov-15 2015	122.75	297.17	9608.19		119.85	11709.16	4588.21
Dec-15 2015	122.93	297.26	9631.19		119.93	11761.18	4601.18
Jan-16 2016	123.11	297.34	9654.03		120.01	11813.52	4614.20
Feb-16 2016	123.27	297.43	9675.60		120.08	11863.60	4626.72
Mar-16 2016	123.43	297.52	9696.60		120.16	11913.00	4639.20
Apr-16 2016	123.58	297.61	9717.36		120.23	11962.46	4651.93
May-16 2016	123.73	297.70	9737.49		120.31	12011.05	4664.75
Jun-16 2016	123.86	297.79	9756.96		120.38	12058.69	4677.73
Jul-16 2016	123.99	297.88	9775.76		120.45	12105.30	4690.93
Aug-16 2016	124.10	297.98	9794.19		120.53	12151.63	4704.59
Sep-16 2016	124.21	298.07	9811.70		120.60	12196.28	4718.23
Oct-16 2016	124.30	298.17	9828.64		120.67	12240.13	4732.03
Nov-16 2016	124.39	298.27	9845.08		120.74	12283.28	4745.96

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Native Frequency:		MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Dec-16	2016	124.47	298.37	9861.06		120.81	12325.86	4759.97
Jan-17	2017	124.55	298.48	9876.89		120.89	12368.66	4774.27
Feb-17	2017	124.61	298.58	9891.63		120.95	12409.06	4787.90
Mar-17	2017	124.66	298.68	9906.08		121.02	12449.22	4801.51
Apr-17	2017	124.71	298.78	9920.79		121.09	12490.63	4815.52
May-17	2017	124.76	298.89	9935.30		121.16	12532.01	4829.44
Jun-17	2017	124.79	298.99	9949.67		121.23	12573.50	4843.23
Jul-17	2017	124.82	299.10	9963.95		121.29	12615.18	4856.85
Aug-17	2017	124.85	299.21	9978.41		121.36	12657.80	4870.53
Sep-17	2017	124.87	299.32	9992.56		121.43	12699.94	4883.82
Oct-17	2017	124.89	299.42	10006.64		121.49	12742.23	4896.99
Nov-17	2017	124.90	299.53	10020.65		121.56	12784.63	4910.04
Dec-17	2017	124.90	299.64	10034.57		121.62	12827.10	4923.01
Jan-18	2018	124.91	299.75	10048.64		121.69	12870.28	4936.13
Feb-18	2018	124.91	299.85	10061.93		121.75	12911.34	4948.57
Mar-18	2018	124.91	299.95	10075.13		121.81	12952.34	4960.99
Apr-18	2018	124.91	300.06	10088.67		121.87	12994.61	4973.83
May-18	2018	124.91	300.17	10102.11		121.93	13036.71	4986.70
Jun-18	2018	124.91	300.27	10115.43		121.99	13078.61	4999.61
Jul-18	2018	124.91	300.38	10128.63		122.05	13120.25	5012.59
Aug-18	2018	124.91	300.49	10141.93		122.10	13162.31	5025.85
Sep-18	2018	124.91	300.59	10154.93		122.16	13203.47	5038.97
Oct-18	2018	124.91	300.70	10167.87		122.21	13244.46	5052.13
Nov-18	2018	124.91	300.80	10180.78		122.27	13285.31	5065.34
Dec-18	2018	124.91	300.91	10193.67		122.32	13326.06	5078.57
Jan-19	2019	124.91	301.02	10206.80		122.38	13367.44	5092.03
Feb-19	2019	124.92	301.12	10219.33		122.43	13406.80	5104.84
Mar-19	2019	124.92	301.23	10231.93		122.48	13446.20	5117.65
Apr-19	2019	124.92	301.33	10245.05		122.53	13487.00	5130.87
May-19	2019	124.93	301.44	10258.28		122.58	13527.92	5144.06
Jun-19	2019	124.93	301.55	10271.66		122.64	13569.00	5157.21
Jul-19	2019	124.94	301.66	10285.21		122.69	13610.28	5170.31
Aug-19	2019	124.94	301.77	10299.15		122.75	13652.47	5183.56
Sep-19	2019	124.95	301.88	10313.03		122.80	13694.22	5196.56
Oct-19	2019	124.96	302.00	10327.03		122.85	13736.22	5209.53

Native

Frequency:		MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Nov-19	2019	124.97	302.11	10341.13		122.91	13778.49	5222.48
Dec-19	2019	124.97	302.22	10355.32		122.96	13821.03	5235.43
Jan-20	2020	124.98	302.34	10369.80		123.02	13864.57	5248.59
Feb-20	2020	124.99	302.45	10383.85		123.07	13906.99	5261.35
Mar-20	2020	125.00	302.56	10397.92		123.12	13949.72	5274.14
Apr-20	2020	125.01	302.67	10412.20		123.17	13993.48	5287.19
May-20	2020	125.01	302.78	10426.46		123.22	14037.57	5300.30
Jun-20	2020	125.02	302.89	10440.66		123.28	14082.01	5313.48
Jul-20	2020	125.03	303.01	10454.79		123.33	14126.81	5326.74
Aug-20	2020	125.04	303.12	10469.07		123.38	14172.71	5340.30
Sep-20	2020	125.04	303.23	10483.06		123.43	14218.24	5353.72
Oct-20	2020	125.05	303.34	10497.02		123.48	14264.13	5367.23
Nov-20	2020	125.06	303.44	10510.97		123.52	14310.39	5380.80
Dec-20	2020	125.06	303.55	10524.93		123.57	14357.02	5394.44
Jan-21	2021	125.07	303.66	10539.15		123.62	14404.78	5408.36
Feb-21	2021	125.08	303.76	10552.74		123.66	14450.58	5421.66
Mar-21	2021	125.08	303.87	10566.41		123.70	14496.73	5435.01
Apr-21	2021	125.09	303.97	10580.63		123.75	14544.80	5448.86
May-21	2021	125.09	304.08	10594.98		123.79	14593.24	5462.74
Jun-21	2021	125.10	304.18	10609.47		123.83	14642.04	5476.66
Jul-21	2021	125.10	304.28	10624.13		123.87	14691.21	5490.61
Aug-21	2021	125.11	304.39	10639.20		123.92	14741.55	5504.81
Sep-21	2021	125.11	304.49	10654.16		123.96	14791.40	5518.83
Oct-21	2021	125.12	304.59	10669.23		124.00	14841.54	5532.88
Nov-21	2021	125.12	304.70	10684.37		124.04	14891.94	5546.98
Dec-21	2021	125.13	304.80	10699.55		124.08	14942.58	5561.13
Jan-22	2022	125.13	304.90	10714.99		124.11	14994.25	5575.58
Feb-22	2022	125.13	305.00	10729.67		124.15	15043.59	5589.39
Mar-22	2022	125.14	305.10	10744.30		124.19	15093.06	5603.26
Apr-22	2022	125.14	305.21	10759.35		124.23	15144.31	5617.68
May-22	2022	125.15	305.31	10774.28		124.27	15195.65	5632.18
Jun-22	2022	125.15	305.42	10789.08		124.31	15247.03	5646.77
Jul-22	2022	125.16	305.52	10803.71		124.35	15298.44	5661.46
Aug-22	2022	125.16	305.63	10818.40		124.39	15350.70	5676.47
Sep-22	2022	125.17	305.74	10832.69		124.43	15402.13	5691.33

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Oct-22 2022	125.17	305.85	10846.83		124.46	15453.58	5706.25
Nov-22 2022	125.17	305.96	10860.85		124.50	15505.05	5721.22
Dec-22 2022	125.18	306.06	10874.77		124.54	15556.55	5736.23
Jan-23 2023	125.18	306.17	10888.82		124.58	15608.92	5751.53
Feb-23 2023	125.18	306.28	10902.12		124.62	15658.80	5766.09
Mar-23 2023	125.18	306.38	10915.38		124.66	15708.72	5780.66
Apr-23 2023	125.19	306.48	10929.05		124.69	15760.38	5795.71
May-23 2023	125.19	306.59	10942.71		124.73	15812.09	5810.75
Jun-23 2023	125.18	306.69	10956.37		124.76	15863.86	5825.75
Jul-23 2023	125.18	306.79	10970.05		124.80	15915.69	5840.70
Aug-23 2023	125.18	306.89	10983.98		124.83	15968.46	5855.86
Sep-23 2023	125.17	306.99	10997.73		124.86	16020.47	5870.73
Oct-23 2023	125.17	307.08	11011.50		124.90	16072.61	5885.57
Nov-23 2023	125.16	307.18	11025.31		124.93	16124.88	5900.40
Dec-23 2023	125.16	307.27	11039.15		124.96	16177.33	5915.22
Jan-24 2024	125.15	307.37	11053.25		124.99	16230.82	5930.29
Feb-24 2024	125.14	307.46	11066.93		125.01	16282.80	5944.89
Mar-24 2024	125.14	307.55	11080.64		125.04	16335.00	5959.52
Apr-24 2024	125.13	307.65	11094.62		125.07	16388.32	5974.43
May-24 2024	125.12	307.75	11108.64		125.10	16441.92	5989.39
Jun-24 2024	125.12	307.85	11122.69		125.12	16495.81	6004.40
Jul-24 2024	125.11	307.95	11136.79		125.15	16550.03	6019.49
Aug-24 2024	125.11	308.05	11151.15		125.18	16605.46	6034.89
Sep-24 2024	125.11	308.16	11165.32		125.21	16660.30	6050.10
Oct-24 2024	125.11	308.26	11179.52		125.23	16715.41	6065.36
Nov-24 2024	125.10	308.37	11193.75		125.26	16770.79	6080.64
Dec-24 2024	125.10	308.48	11208.02		125.29	16826.40	6095.95
Jan-25 2025	125.10	308.59	11222.55		125.32	16883.14	6111.52
Feb-25 2025	125.10	308.69	11236.41		125.34	16937.32	6126.33
Mar-25 2025	125.10	308.80	11250.29		125.37	16991.66	6141.12
Apr-25 2025	125.10	308.90	11264.66		125.39	17048.00	6156.39
May-25 2025	125.11	309.01	11279.06		125.42	17104.47	6171.61
Jun-25 2025	125.11	309.12	11293.48		125.45	17161.05	6186.79
Jul-25 2025	125.11	309.22	11307.92		125.47	17217.72	6201.90
Aug-25 2025	125.11	309.33	11322.62		125.50	17275.39	6217.19

Native					Undefined			
Frequency:		MONTHLY	MONTHLY	MONTHLY		MONTHLY	MONTHLY	MONTHLY
Sep-25	2025	125.11	309.43	11337.09		125.53	17332.21	6232.17
Oct-25	2025	125.11	309.53	11351.58		125.55	17389.11	6247.10
Nov-25	2025	125.12	309.63	11366.08		125.58	17446.07	6262.00
Dec-25	2025	125.12	309.73	11380.59		125.60	17503.10	6276.87
Jan-26	2026	125.12	309.83	11395.34		125.63	17561.13	6291.96
Feb-26	2026	125.12	309.93	11409.39		125.65	17616.42	6306.30
Mar-26	2026	125.12	310.02	11423.43		125.68	17671.76	6320.65
Apr-26	2026	125.12	310.12	11437.95		125.70	17729.03	6335.49
May-26	2026	125.12	310.21	11452.46		125.72	17786.36	6350.35
Jun-26	2026	125.12	310.31	11466.97		125.75	17843.75	6365.23
Jul-26	2026	125.12	310.40	11481.47		125.77	17901.19	6380.15
Aug-26	2026	125.12	310.50	11496.21		125.79	17959.63	6395.35
Sep-26	2026	125.12	310.60	11510.71		125.81	18017.23	6410.35
Oct-26	2026	125.12	310.69	11525.24		125.83	18074.93	6425.40
Nov-26	2026	125.12	310.79	11539.80		125.85	18132.78	6440.49
Dec-26	2026	125.11	310.88	11554.40		125.86	18190.79	6455.63
Jan-27	2027	125.11	310.98	11569.30		125.88	18249.96	6471.06
Feb-27	2027	125.11	311.07	11583.54		125.90	18306.47	6485.80
Mar-27	2027	125.11	311.17	11597.86		125.92	18363.21	6500.58
Apr-27	2027	125.11	311.26	11612.76		125.94	18422.14	6515.91
May-27	2027	125.10	311.36	11627.76		125.95	18481.36	6531.30
Jun-27	2027	125.10	311.45	11642.87		125.97	18540.91	6546.73
Jul-27	2027	125.10	311.55	11658.11		125.99	18600.80	6562.23
Aug-27	2027	125.10	311.65	11673.73		126.01	18662.03	6578.03
Sep-27	2027	125.10	311.74	11689.21		126.02	18722.61	6593.63
Oct-27	2027	125.10	311.84	11704.80		126.04	18783.51	6609.28
Nov-27	2027	125.10	311.93	11720.46		126.06	18844.69	6624.97
Dec-27	2027	125.09	312.03	11736.20		126.08	18906.15	6640.69
Jan-28	2028	125.09	312.12	11752.25		126.10	18968.87	6656.71
Feb-28	2028	125.09	312.22	11767.83		126.12	19029.80	6672.25
Mar-28	2028	125.09	312.31	11783.43		126.14	19090.93	6687.80
Apr-28	2028	125.09	312.41	11799.30		126.16	19153.27	6703.64
May-28	2028	125.09	312.50	11815.18		126.18	19215.78	6719.50
Jun-28	2028	125.09	312.60	11831.04		126.20	19278.44	6735.37
Jul-28	2028	125.09	312.70	11846.87		126.21	19341.24	6751.26

Case No. 2014-00166

AG 1-26 Attachment 7

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Aug-28 2028	125.09	312.80	11862.94		126.23	19405.20	6767.41
Sep-28 2028	125.09	312.89	11878.74		126.25	19468.25	6783.33
Oct-28 2028	125.09	312.99	11894.57		126.27	19531.45	6799.27
Nov-28 2028	125.09	313.09	11910.45		126.29	19594.80	6815.26
Dec-28 2028	125.09	313.19	11926.40		126.31	19658.31	6831.28
Jan-29 2029	125.10	313.29	11942.70		126.34	19723.03	6847.63
Feb-29 2029	125.10	313.38	11958.33		126.35	19784.79	6863.24
Mar-29 2029	125.10	313.48	11974.09		126.37	19846.72	6878.91
Apr-29 2029	125.10	313.58	11990.55		126.40	19910.94	6895.20
May-29 2029	125.10	313.68	12007.20		126.42	19975.35	6911.57
Jun-29 2029	125.11	313.78	12024.06		126.44	20039.98	6928.03
Jul-29 2029	125.11	313.88	12041.16		126.46	20104.82	6944.59
Aug-29 2029	125.12	313.98	12058.77		126.48	20170.95	6961.53
Sep-29 2029	125.12	314.08	12076.28		126.50	20236.26	6978.28
Oct-29 2029	125.13	314.19	12093.92		126.52	20301.81	6995.12
Nov-29 2029	125.13	314.29	12111.64		126.55	20367.61	7012.01
Dec-29 2029	125.14	314.39	12129.41		126.57	20433.67	7028.97
Jan-30 2030	125.14	314.49	12147.45		126.59	20501.10	7046.25
Feb-30 2030	125.15	314.58	12164.58		126.61	20565.53	7062.72
Mar-30 2030	125.15	314.68	12181.60		126.63	20630.23	7079.21
Apr-30 2030	125.16	314.78	12199.06		126.65	20697.42	7096.28
May-30 2030	125.16	314.88	12216.33		126.67	20764.92	7113.34
Jun-30 2030	125.17	314.97	12233.35		126.69	20832.73	7130.39
Jul-30 2030	125.17	315.07	12250.09		126.71	20900.87	7147.42
Aug-30 2030	125.17	315.16	12266.81		126.73	20970.47	7164.70
Sep-30 2030	125.17	315.25	12283.03		126.74	21039.28	7181.70
Oct-30 2030	125.17	315.35	12299.06		126.76	21108.42	7198.69
Nov-30 2030	125.17	315.44	12314.96		126.78	21177.89	7215.70
Dec-30 2030	125.17	315.53	12330.78		126.79	21247.70	7232.74
Jan-31 2031	125.16	315.62	12346.84		126.81	21319.00	7250.10
Feb-31 2031	125.16	315.70	12362.14		126.82	21387.17	7266.66
Mar-31 2031	125.16	315.79	12377.52		126.84	21455.66	7283.29
Apr-31 2031	125.16	315.88	12393.54		126.85	21526.81	7300.55
May-31 2031	125.16	315.97	12409.75		126.87	21598.29	7317.91
Jun-31 2031	125.15	316.06	12426.19		126.88	21670.11	7335.36

Native

Frequency:		MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Jul-31 2031		125.15	316.15	12442.92		126.90	21742.27	7352.93
Aug-31 2031		125.15	316.24	12460.23		126.91	21815.96	7370.90
Sep-31 2031		125.15	316.33	12477.53		126.93	21888.79	7388.69
Oct-31 2031		125.15	316.43	12495.07		126.94	21961.93	7406.58
Nov-31 2031		125.15	316.52	12512.83		126.96	22035.37	7424.57
Dec-31 2031		125.15	316.61	12530.77		126.97	22109.09	7442.64
Jan-32 2032		125.15	316.71	12549.16		126.99	22184.31	7461.09
Feb-32 2032		125.16	316.80	12567.08		127.00	22257.36	7479.01
Mar-32 2032		125.16	316.89	12585.09		127.02	22330.65	7496.99
Apr-32 2032		125.16	316.99	12603.47		127.04	22405.40	7515.33
May-32 2032		125.16	317.08	12621.89		127.05	22480.37	7533.71
Jun-32 2032		125.16	317.18	12640.31		127.07	22555.56	7552.13
Jul-32 2032		125.16	317.27	12658.71		127.09	22630.95	7570.59
Aug-32 2032		125.17	317.37	12677.38		127.11	22707.78	7589.38
Sep-32 2032		125.17	317.47	12695.72		127.13	22783.58	7607.89
Oct-32 2032		125.17	317.56	12714.05		127.15	22859.58	7626.44
Nov-32 2032		125.17	317.66	12732.38		127.17	22935.80	7645.03
Dec-32 2032		125.18	317.76	12750.71		127.19	23012.23	7663.66
Jan-33 2033		125.18	317.86	12769.35		127.21	23090.14	7682.63
Feb-33 2033		125.18	317.95	12787.12		127.22	23164.50	7700.73
Mar-33 2033		125.18	318.04	12804.91		127.24	23239.07	7718.88
Apr-33 2033		125.19	318.14	12823.36		127.26	23316.40	7737.69
May-33 2033		125.19	318.24	12841.85		127.28	23393.98	7756.55
Jun-33 2033		125.19	318.34	12860.40		127.29	23471.79	7775.46
Jul-33 2033		125.20	318.44	12879.03		127.31	23549.85	7794.43
Aug-33 2033		125.20	318.54	12898.04		127.33	23629.45	7813.78
Sep-33 2033		125.21	318.64	12916.81		127.34	23707.99	7832.89
Oct-33 2033		125.21	318.73	12935.66		127.35	23786.77	7852.07
Nov-33 2033		125.22	318.83	12954.58		127.37	23865.75	7871.34
Dec-33 2033		125.22	318.93	12973.57		127.38	23944.95	7890.71
Jan-34 2034		125.23	319.03	12992.93		127.39	24025.64	7910.49
Feb-34 2034		125.24	319.13	13011.43		127.41	24102.60	7929.42
Mar-34 2034		125.25	319.23	13029.98		127.42	24179.73	7948.46
Apr-34 2034		125.26	319.33	13049.22		127.44	24259.63	7968.26
May-34 2034		125.27	319.43	13068.53		127.45	24339.68	7988.20

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Jun-34 2034	125.28	319.52	13087.89		127.47	24419.88	8008.27
Jul-34 2034	125.30	319.62	13107.31		127.49	24500.21	8028.49
Aug-34 2034	125.32	319.72	13127.11		127.51	24581.98	8049.18
Sep-34 2034	125.33	319.82	13146.64		127.53	24662.56	8069.69
Oct-34 2034	125.36	319.92	13166.24		127.56	24743.24	8090.34
Nov-34 2034	125.38	320.02	13185.89		127.58	24824.03	8111.12
Dec-34 2034	125.40	320.11	13205.60		127.60	24904.91	8132.02
Jan-35 2035	125.42	320.21	13225.70		127.63	24987.21	8153.39
Feb-35 2035	125.45	320.31	13244.88		127.65	25065.61	8173.84
Mar-35 2035	125.47	320.40	13264.11		127.68	25144.07	8194.40
Apr-35 2035	125.50	320.49	13284.06		127.70	25225.26	8215.76
May-35 2035	125.52	320.58	13304.07		127.73	25306.51	8237.22
Jun-35 2035	125.55	320.68	13324.14		127.75	25387.82	8258.78
Jul-35 2035	125.57	320.77	13344.27		127.77	25469.17	8280.43
Aug-35 2035	125.60	320.86	13364.79		127.79	25551.93	8302.52
Sep-35 2035	125.62	320.95	13385.05		127.81	25633.45	8324.34
Oct-35 2035	125.65	321.04	13405.37		127.83	25715.12	8346.25
Nov-35 2035	125.67	321.13	13425.75		127.85	25796.97	8368.22
Dec-35 2035	125.70	321.22	13446.21		127.87	25879.06	8390.27
Jan-36 2036	125.73	321.30	13467.06		127.89	25962.76	8412.74
Feb-36 2036	125.75	321.39	13487.31		127.91	26044.07	8434.56
Mar-36 2036	125.78	321.47	13507.63		127.92	26125.73	8456.43
Apr-36 2036	125.81	321.56	13528.36		127.94	26209.14	8478.71
May-36 2036	125.83	321.64	13549.15		127.95	26292.98	8501.05
Jun-36 2036	125.86	321.73	13570.02		127.97	26377.30	8523.43
Jul-36 2036	125.89	321.81	13590.96		127.98	26462.14	8545.86
Aug-36 2036	125.92	321.90	13612.30		128.00	26548.90	8568.69
Sep-36 2036	125.95	321.98	13633.32		128.01	26634.74	8591.19
Oct-36 2036	125.98	322.07	13654.33		128.03	26721.03	8613.73
Nov-36 2036	126.02	322.15	13675.31		128.04	26807.72	8636.30
Dec-36 2036	126.05	322.24	13696.21		128.05	26894.78	8658.91
Jan-37 2037	126.08	322.32	13717.35		128.07	26983.59	8681.92
Feb-37 2037	126.11	322.40	13737.34		128.08	27068.39	8703.85
Mar-37 2037	126.13	322.48	13757.17		128.09	27153.42	8725.81
Apr-37 2037	126.16	322.57	13777.47		128.11	27241.53	8748.55

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
May-37 2037	126.19	322.65	13797.55		128.12	27329.82	8771.31
Jun-37 2037	126.21	322.73	13817.36		128.13	27418.24	8794.10
Jul-37 2037	126.23	322.82	13836.88		128.15	27506.76	8816.92
Aug-37 2037	126.25	322.90	13856.42		128.16	27596.81	8840.14
Sep-37 2037	126.27	322.99	13875.41		128.17	27685.52	8862.99
Oct-37 2037	126.29	323.07	13894.20		128.19	27774.36	8885.84
Nov-37 2037	126.30	323.15	13912.86		128.20	27863.36	8908.68
Dec-37 2037	126.32	323.24	13931.42		128.22	27952.54	8931.50
Jan-38 2038	126.33	323.32	13950.25		128.23	28043.39	8954.65
Feb-38 2038	126.34	323.40	13968.16		128.24	28130.06	8976.65
Mar-38 2038	126.35	323.48	13986.13		128.26	28216.97	8998.59
Apr-38 2038	126.37	323.56	14004.81		128.27	28307.10	9021.21
May-38 2038	126.38	323.64	14023.64		128.28	28397.53	9043.75
Jun-38 2038	126.39	323.73	14042.67		128.29	28488.27	9066.21
Jul-38 2038	126.40	323.81	14061.95		128.31	28579.37	9088.56
Aug-38 2038	126.42	323.89	14081.81		128.32	28672.32	9111.21
Sep-38 2038	126.43	323.97	14101.59		128.33	28764.13	9133.46
Oct-38 2038	126.44	324.05	14121.57		128.34	28856.29	9155.74
Nov-38 2038	126.46	324.13	14141.73		128.35	28948.78	9178.11
Dec-38 2038	126.47	324.21	14162.04		128.36	29041.61	9200.60
Jan-39 2039	126.49	324.30	14182.81		128.37	29136.29	9223.67
Feb-39 2039	126.50	324.38	14202.66		128.38	29226.70	9245.84
Mar-39 2039	126.52	324.45	14222.57		128.39	29317.41	9268.30
Apr-39 2039	126.53	324.54	14243.19		128.40	29411.49	9291.85
May-39 2039	126.54	324.62	14263.82		128.41	29505.87	9315.82
Jun-39 2039	126.56	324.70	14284.43		128.42	29600.55	9340.23
Jul-39 2039	126.57	324.78	14304.99		128.43	29695.53	9365.15
Aug-39 2039	126.58	324.87	14325.82		128.45	29792.35	9390.95
Sep-39 2039	126.60	324.95	14346.27		128.46	29887.90	9416.68
Oct-39 2039	126.61	325.04	14366.65		128.47	29983.75	9442.62
Nov-39 2039	126.62	325.12	14386.98		128.48	30079.90	9468.63
Dec-39 2039	126.63	325.21	14407.26		128.49	30176.34	9494.57
Jan-40 2040	126.64	325.29	14427.83		128.50	30274.68	9520.74
Feb-40 2040	126.66	325.38	14447.69		128.52	30370.15	9545.74
Mar-40 2040	126.67	325.46	14467.51		128.53	30465.92	9570.29

Native		MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Frequency:								
Apr-40	2040	126.68	325.55	14487.62		128.54	30563.60	9594.66
May-40	2040	126.69	325.64	14507.70		128.55	30661.59	9618.29
Jun-40	2040	126.70	325.72	14527.75		128.56	30759.90	9641.06
Jul-40	2040	126.71	325.81	14547.78		128.57	30858.54	9662.83
Aug-40	2040	126.73	325.90	14568.10		128.58	30959.18	9683.92
Sep-40	2040	126.74	325.98	14588.08		128.59	31058.68	9703.73
Oct-40	2040	126.75	326.07	14608.04		128.60	31158.76	9722.67
Nov-40	2040	126.77	326.16	14628.00		128.61	31259.51	9740.84
Dec-40	2040	126.78	326.24	14647.95		128.62	31361.04	9758.33
Jan-41	2041	126.79	326.33	14668.22		128.63	31465.13	9775.49
Feb-41	2041	126.81	326.41	14687.52		128.63	31565.13	9791.33
Mar-41	2041	126.82	326.50	14706.83		128.64	31666.14	9806.77
Apr-41	2041	126.84	326.58	14726.81		128.65	31771.73	9822.39
May-41	2041	126.85	326.67	14746.80		128.66	31878.61	9837.75
Jun-41	2041	126.86	326.76	14766.82		128.67	31986.86	9852.93
Jul-41	2041	126.88	326.84	14786.86		128.67	32096.59	9868.03
Aug-41	2041	126.89	326.93	14807.27		128.68	32209.75	9883.38
Sep-41	2041	126.90	327.02	14827.38		128.69	32322.77	9898.55
Oct-41	2041	126.92	327.11	14847.54		128.70	32437.58	9913.91
Nov-41	2041	126.93	327.19	14867.74		128.70	32554.27	9929.51
Dec-41	2041	126.94	327.28	14887.99		128.71	32672.97	9945.46
Jan-42	2042	126.96	327.37	14908.64		128.72	32795.74	9962.11
Feb-42	2042	126.97	327.45	14928.34		128.73	32914.65	9978.43
Mar-42	2042	126.98	327.54	14948.10		128.74	33035.74	9995.33
Apr-42	2042	126.99	327.62	14968.60		128.74	33163.26	10013.46
May-42	2042	127.00	327.71	14989.18		128.75	33293.28	10032.37
Jun-42	2042	127.01	327.80	15009.83		128.76	33425.88	10052.12
Jul-42	2042	127.02	327.89	15030.57		128.77	33561.18	10072.81
Aug-42	2042	127.03	327.97	15051.74		128.78	33701.55	10094.89
Sep-42	2042	127.04	328.06	15072.66		128.79	33842.57	10117.73
Oct-42	2042	127.04	328.15	15093.68		128.80	33986.60	10141.77
Nov-42	2042	127.05	328.24	15114.80		128.81	34133.70	10167.09
Dec-42	2042	127.06	328.33	15136.03		128.82	34284.02	10193.78

Description:	Employment: Total Nonfarm Payroll, (Ths.) U.S. Bureau of Labor Statistics: Census of Employment & Wages (QCEW - ES202); Moody's Analytics (ECCA) Forecast	Total Population, (Ths.) U.S. Census Bureau (BOC); Moody's Analytics (ECCA) Forecast	Gross Product: Total, (Mil. Chained 2005 \$) U.S. Bureau of Economic Analysis (BEA); Moody's Analytics (ECCA) Forecast	Series does not exist. na	Number of Households: Total, (Ths.) U.S. Census Bureau (BOC); Moody's Analytics (ECCA) Forecast	Income: Total Personal, (Mil. \$) U.S. Bureau of Economic Analysis (BEA); Moody's Analytics (ECCA) Forecast	Total Retail Sales, (Mil \$) U.S. Census Bureau (BOC); Moody's Analytics (ECCA) Forecast
Source:							
Native							
Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Geography:	Breckinridge County (KY) Grayson County (KY) Meade County (KY) Ohio County (KY)	Breckinridge County (KY) Grayson County (KY) Meade County (KY) Ohio County (KY)	Breckinridge County (KY) Grayson County (KY) Meade County (KY) Ohio County (KY)	Breckinridge County (KY) Grayson County (KY) Meade County (KY) Ohio County (KY)	Breckinridge County (KY) Grayson County (KY) Meade County (KY) Ohio County (KY)	Breckinridge County (KY) Grayson County (KY) Meade County (KY) Ohio County (KY)	Breckinridge County (KY) Grayson County (KY) Meade County (KY) Ohio County (KY)
Jan-70 1970	11.69	69.13	na		21.24	181.45	49.92
Feb-70 1970	11.66	69.06	na		21.23	182.68	53.11
Mar-70 1970	11.63	69.01	na		21.23	183.88	55.95
Apr-70 1970	11.61	68.97	na		21.24	185.09	58.54
May-70 1970	11.59	68.95	na		21.25	186.29	60.81
Jun-70 1970	11.58	68.94	na		21.27	187.48	62.78
Jul-70 1970	11.58	68.95	na		21.29	188.67	64.45
Aug-70 1970	11.58	68.98	na		21.32	189.89	65.89
Sep-70 1970	11.59	69.01	na		21.35	191.10	67.05
Oct-70 1970	11.60	69.06	na		21.38	192.34	67.99
Nov-70 1970	11.61	69.12	na		21.42	193.62	68.72
Dec-70 1970	11.63	69.19	na		21.46	194.93	69.27
Jan-71 1971	11.66	69.27	na		21.50	196.32	69.67
Feb-71 1971	11.69	69.35	na		21.54	197.69	69.91
Mar-71 1971	11.72	69.43	na		21.59	199.13	70.03
Apr-71 1971	11.75	69.53	na		21.63	200.68	70.06

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
May-71 1971	11.79	69.63	na		21.68	202.32	70.00
Jun-71 1971	11.83	69.73	na		21.73	204.05	69.89
Jul-71 1971	11.88	69.83	na		21.78	205.87	69.73
Aug-71 1971	11.93	69.94	na		21.83	207.83	69.55
Sep-71 1971	11.98	70.05	na		21.88	209.83	69.37
Oct-71 1971	12.03	70.15	na		21.93	211.92	69.22
Nov-71 1971	12.08	70.25	na		21.98	214.07	69.10
Dec-71 1971	12.14	70.35	na		22.03	216.27	69.05
Jan-72 1972	12.19	70.45	na		22.08	218.55	69.08
Feb-72 1972	12.25	70.53	na		22.12	220.79	69.21
Mar-72 1972	12.31	70.62	na		22.16	223.05	69.46
Apr-72 1972	12.37	70.69	na		22.20	225.36	69.85
May-72 1972	12.43	70.76	na		22.24	227.67	70.41
Jun-72 1972	12.49	70.82	na		22.28	229.97	71.15
Jul-72 1972	12.55	70.86	na		22.31	232.24	72.10
Aug-72 1972	12.61	70.90	na		22.33	234.54	73.26
Sep-72 1972	12.66	70.93	na		22.36	236.80	74.55
Oct-72 1972	12.72	70.95	na		22.38	239.08	75.97
Nov-72 1972	12.78	70.97	na		22.41	241.40	77.46
Dec-72 1972	12.84	70.99	na		22.43	243.79	78.98
Jan-73 1973	12.89	71.01	na		22.45	246.30	80.53
Feb-73 1973	12.94	71.03	na		22.47	248.78	81.96
Mar-73 1973	12.99	71.06	na		22.50	251.38	83.32
Apr-73 1973	13.04	71.09	na		22.52	254.21	84.60
May-73 1973	13.09	71.14	na		22.55	257.19	85.72
Jun-73 1973	13.14	71.19	na		22.59	260.36	86.64
Jul-73 1973	13.18	71.26	na		22.63	263.72	87.33
Aug-73 1973	13.22	71.34	na		22.67	267.33	87.78
Sep-73 1973	13.26	71.44	na		22.71	271.03	88.03
Oct-73 1973	13.30	71.54	na		22.76	274.82	88.12
Nov-73 1973	13.34	71.65	na		22.82	278.66	88.11
Dec-73 1973	13.37	71.77	na		22.87	282.50	88.04
Jan-74 1974	13.40	71.89	na		22.93	286.36	87.94
Feb-74 1974	13.42	72.00	na		22.98	289.94	87.88
Mar-74 1974	13.44	72.12	na		23.03	293.39	87.88

Native Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Apr-74 1974	13.46	72.24	na		23.09	296.78	88.00
May-74 1974	13.48	72.35	na		23.14	299.94	88.27
Jun-74 1974	13.50	72.46	na		23.19	302.82	88.74
Jul-74 1974	13.51	72.55	na		23.24	305.38	89.45
Aug-74 1974	13.52	72.64	na		23.29	307.66	90.44
Sep-74 1974	13.53	72.72	na		23.33	309.64	91.63
Oct-74 1974	13.53	72.80	na		23.38	311.40	93.01
Nov-74 1974	13.54	72.88	na		23.42	313.02	94.54
Dec-74 1974	13.56	72.96	na		23.47	314.55	96.20
Jan-75 1975	13.58	73.05	na		23.51	316.06	97.97
Feb-75 1975	13.60	73.15	na		23.56	317.52	99.70
Mar-75 1975	13.63	73.25	na		23.61	319.06	101.46
Apr-75 1975	13.67	73.37	na		23.67	320.78	103.26
May-75 1975	13.72	73.51	na		23.74	322.69	105.02
Jun-75 1975	13.78	73.66	na		23.81	324.85	106.70
Jul-75 1975	13.85	73.84	na		23.88	327.32	108.27
Aug-75 1975	13.94	74.05	na		23.97	330.15	109.75
Sep-75 1975	14.03	74.27	na		24.06	333.24	111.10
Oct-75 1975	14.13	74.51	na		24.16	336.60	112.37
Nov-75 1975	14.24	74.77	na		24.26	340.20	113.57
Dec-75 1975	14.35	75.03	na		24.37	344.01	114.74
Jan-76 1976	14.45	75.31	na		24.48	348.09	115.91
Feb-76 1976	14.55	75.58	na		24.59	352.19	117.03
Mar-76 1976	14.65	75.85	na		24.70	356.42	118.17
Apr-76 1976	14.73	76.13	na		24.81	360.82	119.37
May-76 1976	14.81	76.41	na		24.92	365.31	120.63
Jun-76 1976	14.87	76.68	na		25.02	369.85	121.96
Jul-76 1976	14.91	76.94	na		25.13	374.42	123.39
Aug-76 1976	14.94	77.19	na		25.23	379.06	124.95
Sep-76 1976	14.95	77.42	na		25.33	383.59	126.57
Oct-76 1976	14.94	77.65	na		25.42	388.05	128.26
Nov-76 1976	14.93	77.87	na		25.51	392.41	130.01
Dec-76 1976	14.91	78.07	na		25.59	396.64	131.81
Jan-77 1977	14.88	78.28	na		25.68	400.77	133.68
Feb-77 1977	14.85	78.46	na		25.76	404.51	135.47

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-77 1977	14.82	78.63	na		25.83	408.03	137.27
Apr-77 1977	14.79	78.81	na		25.91	411.42	139.12
May-77 1977	14.76	78.97	na		25.98	414.51	140.96
Jun-77 1977	14.73	79.13	na		26.05	417.29	142.76
Jul-77 1977	14.72	79.28	na		26.12	419.70	144.51
Aug-77 1977	14.71	79.42	na		26.19	421.83	146.25
Sep-77 1977	14.72	79.56	na		26.25	423.69	147.92
Oct-77 1977	14.73	79.69	na		26.31	425.41	149.57
Nov-77 1977	14.75	79.81	na		26.37	427.08	151.21
Dec-77 1977	14.78	79.92	na		26.43	428.81	152.86
Jan-78 1978	14.82	80.03		846.13	26.48	430.72	154.54
Feb-78 1978	14.87	80.13		873.26	26.54	432.77	156.18
Mar-78 1978	14.92	80.22		897.04	26.58	435.14	157.85
Apr-78 1978	14.99	80.31		918.37	26.63	438.01	159.64
May-78 1978	15.06	80.39		936.51	26.68	441.41	161.49
Jun-78 1978	15.14	80.46		951.66	26.72	445.43	163.43
Jul-78 1978	15.22	80.52		963.98	26.77	450.15	165.45
Aug-78 1978	15.32	80.58		973.80	26.81	455.66	167.60
Sep-78 1978	15.41	80.64		980.98	26.84	461.64	169.77
Oct-78 1978	15.51	80.69		985.87	26.88	468.04	171.99
Nov-78 1978	15.60	80.73		988.66	26.92	474.72	174.21
Dec-78 1978	15.70	80.78		989.50	26.95	481.52	176.41
Jan-79 1979	15.78	80.83		988.57	26.99	488.43	178.60
Feb-79 1979	15.85	80.88		986.19	27.03	494.85	180.63
Mar-79 1979	15.91	80.94		982.47	27.07	501.00	182.56
Apr-79 1979	15.96	81.00		977.43	27.11	506.93	184.44
May-79 1979	15.99	81.08		971.34	27.16	512.29	186.17
Jun-79 1979	16.00	81.16		964.37	27.20	516.94	187.74
Jul-79 1979	15.99	81.25		956.70	27.26	520.74	189.10
Aug-79 1979	15.96	81.35		948.38	27.32	523.74	190.28
Sep-79 1979	15.90	81.47		939.84	27.38	525.97	191.26
Oct-79 1979	15.83	81.59		931.15	27.44	527.64	192.08
Nov-79 1979	15.75	81.71		922.47	27.50	528.92	192.76
Dec-79 1979	15.66	81.83		913.98	27.56	529.93	193.33
Jan-80 1980	15.57	81.96		905.73	27.63	530.87	193.81

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Feb-80 1980	15.47	82.08	898.28		27.69	531.83	194.21
Mar-80 1980	15.38	82.19	891.55		27.75	532.99	194.55
Apr-80 1980	15.29	82.30	885.58		27.80	534.52	194.88
May-80 1980	15.21	82.40	880.70		27.86	536.57	195.20
Jun-80 1980	15.14	82.48	877.07		27.90	539.27	195.53
Jul-80 1980	15.09	82.55	874.86		27.94	542.78	195.90
Aug-80 1980	15.05	82.61	874.05		27.98	547.20	196.32
Sep-80 1980	15.02	82.65	874.48		28.01	552.29	196.77
Oct-80 1980	15.01	82.68	875.91		28.03	558.02	197.24
Nov-80 1980	15.01	82.69	878.14		28.05	564.29	197.72
Dec-80 1980	15.01	82.69	880.96		28.07	570.98	198.20
Jan-81 1981	15.02	82.69	884.20		28.08	578.13	198.68
Feb-81 1981	15.03	82.67	887.45		28.09	585.14	199.12
Mar-81 1981	15.03	82.65	890.67		28.10	592.28	199.53
Apr-81 1981	15.04	82.62	893.76		28.10	599.68	199.92
May-81 1981	15.04	82.59	896.40		28.10	607.00	200.25
Jun-81 1981	15.03	82.55	898.39		28.11	614.14	200.53
Jul-81 1981	15.02	82.51	899.52		28.11	621.00	200.73
Aug-81 1981	14.99	82.46	899.73		28.11	627.61	200.86
Sep-81 1981	14.95	82.42	899.10		28.11	633.71	200.94
Oct-81 1981	14.90	82.37	897.75		28.11	639.36	200.99
Nov-81 1981	14.85	82.32	895.77		28.11	644.51	201.01
Dec-81 1981	14.80	82.27	893.28		28.11	649.13	201.04
Jan-82 1982	14.73	82.22	890.31		28.12	653.22	201.07
Feb-82 1982	14.67	82.18	887.18		28.12	656.52	201.14
Mar-82 1982	14.61	82.13	883.85		28.12	659.18	201.26
Apr-82 1982	14.55	82.09	880.29		28.13	661.23	201.44
May-82 1982	14.49	82.05	876.71		28.13	662.52	201.70
Jun-82 1982	14.43	82.02	873.22		28.14	663.02	202.07
Jul-82 1982	14.38	81.98	869.92		28.14	662.66	202.55
Aug-82 1982	14.33	81.95	866.84		28.15	661.55	203.16
Sep-82 1982	14.29	81.93	864.17		28.16	659.93	203.89
Oct-82 1982	14.26	81.92	861.91		28.17	658.06	204.73
Nov-82 1982	14.23	81.91	860.15		28.19	656.17	205.69
Dec-82 1982	14.21	81.91	858.95		28.21	654.51	206.75

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Jan-83 1983	14.21	81.93	858.39		28.23	653.32	207.95
Feb-83 1983	14.21	81.95	858.52		28.25	652.88	209.19
Mar-83 1983	14.22	81.99	859.39		28.28	653.36	210.52
Apr-83 1983	14.24	82.04	861.12		28.32	655.03	212.00
May-83 1983	14.27	82.11	863.77		28.36	658.17	213.57
Jun-83 1983	14.31	82.20	867.41		28.40	663.01	215.23
Jul-83 1983	14.37	82.30	872.10		28.45	669.78	216.98
Aug-83 1983	14.44	82.42	877.88		28.51	678.60	218.84
Sep-83 1983	14.51	82.56	884.36		28.58	688.86	220.73
Oct-83 1983	14.59	82.70	891.41		28.64	700.33	222.66
Nov-83 1983	14.68	82.85	898.81		28.71	712.67	224.63
Dec-83 1983	14.76	83.00	906.36		28.78	725.52	226.60
Jan-84 1984	14.85	83.15	913.96		28.85	738.74	228.61
Feb-84 1984	14.93	83.29	921.03		28.92	751.35	230.52
Mar-84 1984	14.99	83.42	927.62		28.98	763.44	232.40
Apr-84 1984	15.06	83.54	933.61		29.04	774.85	234.25
May-84 1984	15.10	83.65	938.67		29.09	785.01	236.04
Jun-84 1984	15.14	83.73	942.60		29.14	793.60	237.73
Jul-84 1984	15.15	83.79	945.18		29.18	800.26	239.31
Aug-84 1984	15.15	83.82	946.39		29.21	805.01	240.81
Sep-84 1984	15.12	83.84	946.32		29.23	807.90	242.18
Oct-84 1984	15.09	83.83	945.13		29.25	809.26	243.45
Nov-84 1984	15.04	83.81	942.96		29.26	809.34	244.63
Dec-84 1984	14.99	83.77	939.95		29.26	808.37	245.71
Jan-85 1985	14.93	83.73	936.18		29.27	806.57	246.74
Feb-85 1985	14.86	83.68	932.05		29.27	804.31	247.64
Mar-85 1985	14.80	83.62	927.53		29.27	801.74	248.48
Apr-85 1985	14.73	83.56	922.58		29.26	798.99	249.29
May-85 1985	14.66	83.51	917.48		29.26	796.39	250.04
Jun-85 1985	14.60	83.46	912.37		29.26	794.17	250.75
Jul-85 1985	14.55	83.41	907.40		29.26	792.57	251.41
Aug-85 1985	14.50	83.38	902.56		29.27	791.67	252.05
Sep-85 1985	14.46	83.35	898.05		29.27	791.45	252.65
Oct-85 1985	14.43	83.33	893.81		29.28	791.85	253.23
Nov-85 1985	14.41	83.32	889.86		29.29	792.79	253.81

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Dec-85 1985	14.39	83.31	886.24		29.31	794.23	254.39
Jan-86 1986	14.39	83.31	882.91		29.32	796.13	254.99
Feb-86 1986	14.39	83.31	880.09		29.34	798.29	255.58
Mar-86 1986	14.40	83.32	877.65		29.36	800.76	256.20
Apr-86 1986	14.42	83.33	875.54		29.38	803.56	256.88
May-86 1986	14.44	83.34	873.87		29.40	806.57	257.61
Jun-86 1986	14.47	83.36	872.68		29.42	809.72	258.40
Jul-86 1986	14.51	83.37	871.97		29.44	812.95	259.25
Aug-86 1986	14.55	83.39	871.76		29.47	816.29	260.19
Sep-86 1986	14.60	83.40	872.02		29.49	819.61	261.17
Oct-86 1986	14.66	83.41	872.71		29.51	822.96	262.21
Nov-86 1986	14.71	83.42	873.81		29.53	826.32	263.30
Dec-86 1986	14.77	83.43	875.27		29.55	829.70	264.42
Jan-87 1987	14.83	83.42	877.12		29.57	833.13	265.60
Feb-87 1987	14.88	83.42	879.16		29.58	836.38	266.75
Mar-87 1987	14.93	83.40	881.48		29.60	839.62	267.91
Apr-87 1987	14.97	83.37	884.12		29.61	842.93	269.13
May-87 1987	15.01	83.34	886.98		29.61	846.21	270.35
Jun-87 1987	15.04	83.29	890.03		29.61	849.43	271.57
Jul-87 1987	15.06	83.23	893.25		29.61	852.60	272.78
Aug-87 1987	15.08	83.16	896.64		29.61	855.77	274.00
Sep-87 1987	15.08	83.08	900.08		29.59	858.88	275.19
Oct-87 1987	15.08	82.99	903.59		29.58	862.02	276.38
Nov-87 1987	15.08	82.90	907.14		29.57	865.22	277.58
Dec-87 1987	15.07	82.80	910.69		29.55	868.51	278.79
Jan-88 1988	15.07	82.71	914.26		29.53	872.00	280.03
Feb-88 1988	15.06	82.61	917.67		29.52	875.55	281.25
Mar-88 1988	15.06	82.53	920.99		29.51	879.30	282.50
Apr-88 1988	15.07	82.44	924.24		29.49	883.35	283.80
May-88 1988	15.08	82.37	927.35		29.49	887.68	285.14
Jun-88 1988	15.10	82.31	930.27		29.48	892.32	286.51
Jul-88 1988	15.13	82.26	932.97		29.48	897.32	287.93
Aug-88 1988	15.17	82.22	935.51		29.49	902.75	289.42
Sep-88 1988	15.22	82.20	937.80		29.50	908.39	290.92
Oct-88 1988	15.28	82.19	939.92		29.51	914.28	292.45

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Nov-88 1988	15.34	82.19	941.89		29.53	920.36	294.01
Dec-88 1988	15.41	82.21	943.74		29.56	926.58	295.58
Jan-89 1989	15.49	82.22	945.52		29.58	933.00	297.18
Feb-89 1989	15.56	82.25	947.13		29.61	939.14	298.70
Mar-89 1989	15.63	82.28	948.70		29.64	945.27	300.22
Apr-89 1989	15.70	82.32	950.28		29.67	951.55	301.77
May-89 1989	15.77	82.36	951.86		29.70	957.72	303.30
Jun-89 1989	15.84	82.40	953.46		29.73	963.73	304.80
Jul-89 1989	15.90	82.44	955.09		29.77	969.53	306.26
Aug-89 1989	15.96	82.48	956.79		29.80	975.17	307.71
Sep-89 1989	16.00	82.52	958.52		29.84	980.50	309.11
Oct-89 1989	16.05	82.56	960.29		29.87	985.59	310.49
Nov-89 1989	16.09	82.60	962.09		29.90	990.46	311.86
Dec-89 1989	16.13	82.64	963.93		29.93	995.11	313.24
Jan-90 1990	16.16	82.67	965.82		29.96	999.61	314.66
Feb-90 1990	16.20	82.70	967.65		29.99	1003.70	316.02
Mar-90 1990	16.23	82.73	969.49		30.02	1007.60	317.42
Apr-90 1990	16.26	82.75	971.41		30.04	1011.44	318.91
May-90 1990	16.29	82.76	973.34		30.07	1015.09	320.45
Jun-90 1990	16.33	82.77	975.28		30.09	1018.54	322.06
Jul-90 1990	16.36	82.77	977.22		30.10	1021.82	323.74
Aug-90 1990	16.40	82.77	979.21		30.12	1025.02	325.52
Sep-90 1990	16.44	82.76	981.22		30.13	1028.12	327.30
Oct-90 1990	16.48	82.75	983.32		30.14	1031.27	329.11
Nov-90 1990	16.53	82.73	985.54		30.15	1034.55	330.90
Dec-90 1990	16.57	82.71	987.92		30.16	1038.07	332.65
Jan-91 1991	16.61	82.69	990.53		30.17	1041.97	334.37
Feb-91 1991	16.65	82.67	993.24		30.18	1046.07	335.92
Mar-91 1991	16.70	82.65	996.19		30.18	1050.66	337.36
Apr-91 1991	16.74	82.63	999.53		30.19	1055.98	338.71
May-91 1991	16.78	82.61	1003.21		30.19	1061.98	339.90
Jun-91 1991	16.82	82.59	1007.25		30.20	1068.76	340.89
Jul-91 1991	16.85	82.57	1011.70		30.21	1076.39	341.67
Aug-91 1991	16.89	82.56	1016.60		30.22	1084.98	342.25
Sep-91 1991	16.92	82.56	1021.72		30.23	1094.07	342.65

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Oct-91 1991	16.95	82.56	1027.06		30.25	1103.59	342.94
Nov-91 1991	16.98	82.57	1032.52		30.27	1113.34	343.16
Dec-91 1991	17.01	82.60	1038.03		30.29	1123.14	343.36
Jan-92 1992	17.04	82.63	1043.60		30.31	1132.95	343.59
Feb-92 1992	17.07	82.67	1048.86		30.34	1142.09	343.88
Mar-92 1992	17.10	82.73	1053.93		30.38	1150.71	344.29
Apr-92 1992	17.13	82.80	1058.79		30.42	1158.75	344.87
May-92 1992	17.16	82.89	1063.28		30.46	1165.86	345.66
Jun-92 1992	17.20	82.99	1067.31		30.51	1171.84	346.72
Jul-92 1992	17.23	83.12	1070.81		30.57	1176.52	348.08
Aug-92 1992	17.27	83.26	1073.82		30.64	1179.95	349.77
Sep-92 1992	17.31	83.41	1076.33		30.71	1182.23	351.72
Oct-92 1992	17.35	83.58	1078.46		30.78	1183.62	353.90
Nov-92 1992	17.39	83.75	1080.31		30.86	1184.37	356.27
Dec-92 1992	17.43	83.93	1081.97		30.93	1184.68	358.79
Jan-93 1993	17.47	84.11	1083.54		31.01	1184.79	361.47
Feb-93 1993	17.51	84.28	1085.02		31.09	1184.89	364.09
Mar-93 1993	17.55	84.44	1086.56		31.16	1185.21	366.74
Apr-93 1993	17.58	84.59	1088.29		31.23	1185.97	369.48
May-93 1993	17.61	84.74	1090.26		31.29	1187.39	372.17
Jun-93 1993	17.64	84.86	1092.55		31.35	1189.69	374.77
Jul-93 1993	17.66	84.97	1095.24		31.40	1193.07	377.25
Aug-93 1993	17.68	85.05	1098.42		31.45	1197.64	379.64
Sep-93 1993	17.70	85.12	1101.95		31.49	1203.10	381.89
Oct-93 1993	17.71	85.17	1105.85		31.52	1209.33	384.08
Nov-93 1993	17.73	85.21	1110.08		31.55	1216.14	386.24
Dec-93 1993	17.74	85.24	1114.61		31.58	1223.35	388.41
Jan-94 1994	17.76	85.27	1119.48		31.60	1230.91	390.65
Feb-94 1994	17.78	85.30	1124.33		31.62	1238.14	392.85
Mar-94 1994	17.80	85.32	1129.37		31.65	1245.24	395.15
Apr-94 1994	17.83	85.35	1134.73		31.67	1252.27	397.66
May-94 1994	17.87	85.39	1140.21		31.70	1258.80	400.35
Jun-94 1994	17.92	85.44	1145.78		31.73	1264.66	403.24
Jul-94 1994	17.97	85.50	1151.41		31.77	1269.66	406.37
Aug-94 1994	18.03	85.58	1157.17		31.81	1273.87	409.77

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Sep-94 1994	18.10	85.67	1162.88		31.86	1277.30	413.29
Oct-94 1994	18.18	85.77	1168.65		31.91	1280.20	416.91
Nov-94 1994	18.26	85.88	1174.48		31.96	1282.75	420.56
Dec-94 1994	18.35	85.99	1180.39		32.02	1285.12	424.19
Jan-95 1995	18.45	86.11	1186.48		32.08	1287.54	427.77
Feb-95 1995	18.54	86.23	1192.36		32.13	1289.99	431.04
Mar-95 1995	18.64	86.35	1198.33		32.19	1292.78	434.09
Apr-95 1995	18.74	86.47	1204.61		32.25	1296.16	436.97
May-95 1995	18.84	86.59	1211.00		32.30	1300.24	439.50
Jun-95 1995	18.94	86.70	1217.52		32.36	1305.17	441.62
Jul-95 1995	19.03	86.80	1224.17		32.41	1311.13	443.26
Aug-95 1995	19.13	86.90	1231.08		32.46	1318.27	444.46
Sep-95 1995	19.23	86.99	1238.05		32.51	1326.21	445.25
Oct-95 1995	19.32	87.07	1245.20		32.56	1334.93	445.74
Nov-95 1995	19.41	87.15	1252.56		32.60	1344.27	446.01
Dec-95 1995	19.50	87.23	1260.14		32.64	1354.09	446.15
Jan-96 1996	19.59	87.30	1268.11		32.69	1364.41	446.24
Feb-96 1996	19.67	87.38	1276.07		32.73	1374.57	446.37
Mar-96 1996	19.75	87.46	1284.31		32.78	1384.78	446.62
Apr-96 1996	19.83	87.54	1292.99		32.82	1395.05	447.07
May-96 1996	19.90	87.63	1301.99		32.87	1405.07	447.82
Jun-96 1996	19.98	87.72	1311.34		32.92	1414.70	448.95
Jul-96 1996	20.05	87.82	1321.05		32.97	1423.79	450.53
Aug-96 1996	20.12	87.93	1331.25		33.03	1432.45	452.59
Sep-96 1996	20.19	88.05	1341.53		33.09	1440.51	455.00
Oct-96 1996	20.25	88.17	1351.97		33.15	1448.18	457.70
Nov-96 1996	20.32	88.29	1362.48		33.21	1455.59	460.58
Dec-96 1996	20.38	88.43	1372.97		33.28	1462.83	463.56
Jan-97 1997	20.45	88.56	1383.53		33.35	1470.11	466.61
Feb-97 1997	20.51	88.69	1393.39		33.41	1477.07	469.43
Mar-97 1997	20.57	88.83	1402.99		33.47	1484.15	472.10
Apr-97 1997	20.64	88.96	1412.56		33.54	1491.68	474.61
May-97 1997	20.71	89.10	1421.67		33.61	1499.54	476.77
Jun-97 1997	20.77	89.24	1430.26		33.68	1507.82	478.50
Jul-97 1997	20.85	89.37	1438.21		33.74	1516.61	479.71

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Aug-97 1997	20.92	89.50	1445.64		33.81	1526.04	480.41
Sep-97 1997	21.00	89.62	1452.30		33.87	1535.67	480.66
Oct-97 1997	21.07	89.74	1458.37		33.93	1545.47	480.56
Nov-97 1997	21.15	89.85	1463.86		33.98	1555.28	480.21
Dec-97 1997	21.22	89.96	1468.80		34.04	1564.95	479.70
Jan-98 1998	21.29	90.05	1473.29		34.09	1574.46	479.11
Feb-98 1998	21.36	90.14	1477.10		34.14	1583.07	478.57
Mar-98 1998	21.43	90.21	1480.46		34.18	1591.07	478.14
Apr-98 1998	21.49	90.27	1483.52		34.22	1598.59	477.88
May-98 1998	21.55	90.33	1486.16		34.26	1605.15	477.92
Jun-98 1998	21.61	90.36	1488.43		34.29	1610.62	478.35
Jul-98 1998	21.66	90.39	1490.34		34.31	1614.82	479.24
Aug-98 1998	21.70	90.40	1492.00		34.34	1617.88	480.66
Sep-98 1998	21.74	90.40	1493.46		34.35	1619.99	482.52
Oct-98 1998	21.78	90.40	1494.87		34.37	1621.51	484.79
Nov-98 1998	21.81	90.40	1496.34		34.39	1622.77	487.42
Dec-98 1998	21.85	90.41	1497.99		34.41	1624.06	490.38
Jan-99 1999	21.89	90.43	1499.97		34.43	1625.73	493.65
Feb-99 1999	21.94	90.47	1502.23		34.46	1627.95	496.98
Mar-99 1999	21.98	90.52	1505.00		34.50	1631.09	500.49
Apr-99 1999	22.04	90.60	1508.48		34.55	1635.58	504.24
May-99 1999	22.11	90.71	1512.71		34.60	1641.66	508.08
Jun-99 1999	22.19	90.85	1517.80		34.67	1649.62	511.96
Jul-99 1999	22.28	91.04	1523.86		34.76	1659.77	515.83
Aug-99 1999	22.38	91.26	1530.92		34.86	1672.31	519.72
Sep-99 1999	22.49	91.52	1538.49		34.96	1686.47	523.46
Oct-99 1999	22.60	91.80	1546.38		35.08	1702.10	527.07
Nov-99 1999	22.72	92.09	1554.31		35.20	1718.79	530.50
Dec-99 1999	22.83	92.40	1561.97		35.33	1736.20	533.73
Jan-00 2000	22.94	92.71	1569.19		35.46	1754.22	536.75
Feb-00 2000	23.03	93.01	1575.35		35.58	1771.62	539.39
Mar-00 2000	23.11	93.29	1580.41		35.70	1788.62	541.70
Apr-00 2000	23.18	93.56	1584.15		35.81	1805.13	543.69
May-00 2000	23.22	93.81	1586.17		35.91	1820.48	545.26
Jun-00 2000	23.24	94.02	1586.20		35.99	1834.30	546.38

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Jul-00 2000	23.23	94.18	1583.95		36.06	1846.24	547.01
Aug-00 2000	23.19	94.31	1579.40		36.12	1856.34	547.17
Sep-00 2000	23.13	94.40	1573.07		36.16	1864.43	546.90
Oct-00 2000	23.05	94.46	1565.29		36.19	1870.83	546.30
Nov-00 2000	22.96	94.49	1556.48		36.20	1875.75	545.42
Dec-00 2000	22.86	94.51	1547.04		36.21	1879.33	544.33
Jan-01 2001	22.75	94.50	1537.22		36.22	1881.78	543.08
Feb-01 2001	22.64	94.49	1528.04		36.22	1883.18	541.83
Mar-01 2001	22.54	94.47	1519.41		36.21	1883.80	540.57
Apr-01 2001	22.44	94.46	1511.44		36.21	1883.81	539.33
May-01 2001	22.36	94.45	1504.84		36.22	1883.33	538.23
Jun-01 2001	22.29	94.46	1500.01		36.22	1882.55	537.33
Jul-01 2001	22.24	94.48	1497.34		36.23	1881.62	536.69
Aug-01 2001	22.22	94.52	1496.92		36.26	1880.63	536.35
Sep-01 2001	22.22	94.58	1498.49		36.28	1879.68	536.31
Oct-01 2001	22.23	94.65	1501.77		36.32	1878.79	536.58
Nov-01 2001	22.25	94.74	1506.45		36.35	1877.99	537.13
Dec-01 2001	22.29	94.83	1512.27		36.39	1877.34	537.98
Jan-02 2002	22.33	94.92	1519.05		36.43	1876.86	539.13
Feb-02 2002	22.37	95.02	1526.04		36.48	1876.62	540.49
Mar-02 2002	22.42	95.11	1533.30		36.52	1876.63	542.12
Apr-02 2002	22.46	95.20	1540.81		36.56	1876.95	544.07
May-02 2002	22.49	95.29	1548.05		36.59	1877.61	546.29
Jun-02 2002	22.52	95.37	1554.73		36.63	1878.67	548.78
Jul-02 2002	22.53	95.43	1560.58		36.66	1880.16	551.53
Aug-02 2002	22.53	95.48	1565.61		36.68	1882.16	554.57
Sep-02 2002	22.52	95.53	1569.77		36.71	1884.63	557.77
Oct-02 2002	22.50	95.56	1573.29		36.72	1887.66	561.12
Nov-02 2002	22.47	95.59	1576.34		36.74	1891.26	564.58
Dec-02 2002	22.44	95.61	1579.05		36.75	1895.47	568.12
Jan-03 2003	22.41	95.64	1581.60		36.77	1900.43	571.75
Feb-03 2003	22.38	95.66	1584.00		36.78	1905.79	575.19
Mar-03 2003	22.36	95.70	1586.49		36.80	1911.84	578.58
Apr-03 2003	22.34	95.74	1589.30		36.82	1918.83	581.99
May-03 2003	22.33	95.79	1592.50		36.84	1926.61	585.26

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Jun-03 2003	22.33	95.85	1596.24		36.87	1935.22	588.36
Jul-03 2003	22.34	95.92	1600.66		36.91	1944.68	591.23
Aug-03 2003	22.37	96.02	1605.84		36.95	1955.13	593.93
Sep-03 2003	22.41	96.12	1611.47		36.99	1966.11	596.40
Oct-03 2003	22.45	96.24	1617.49		37.04	1977.67	598.74
Nov-03 2003	22.51	96.37	1623.73		37.09	1989.67	600.99
Dec-03 2003	22.57	96.50	1630.04		37.15	2002.00	603.20
Jan-04 2004	22.63	96.64	1636.38		37.20	2014.73	605.44
Feb-04 2004	22.69	96.78	1642.27		37.26	2027.13	607.65
Mar-04 2004	22.75	96.92	1647.78		37.32	2039.47	609.96
Apr-04 2004	22.81	97.06	1652.85		37.37	2051.85	612.43
May-04 2004	22.86	97.19	1657.22		37.43	2063.94	615.08
Jun-04 2004	22.90	97.32	1660.74		37.48	2075.60	617.96
Jul-04 2004	22.93	97.44	1663.26		37.53	2086.72	621.09
Aug-04 2004	22.96	97.56	1664.83		37.58	2097.43	624.54
Sep-04 2004	22.97	97.66	1665.59		37.63	2107.40	628.13
Oct-04 2004	22.97	97.75	1665.78		37.67	2116.86	631.83
Nov-04 2004	22.97	97.83	1665.61		37.70	2125.85	635.58
Dec-04 2004	22.96	97.91	1665.27		37.74	2134.39	639.32
Jan-05 2005	22.95	97.97	1664.99		37.77	2142.66	643.03
Feb-05 2005	22.94	98.03	1664.97		37.79	2150.19	646.41
Mar-05 2005	22.94	98.07	1665.39		37.81	2157.40	649.57
Apr-05 2005	22.93	98.11	1666.47		37.83	2164.58	652.56
May-05 2005	22.93	98.13	1668.43		37.85	2171.51	655.19
Jun-05 2005	22.93	98.15	1671.46		37.86	2178.23	657.39
Jul-05 2005	22.94	98.16	1675.76		37.86	2184.78	659.10
Aug-05 2005	22.96	98.15	1681.42		37.87	2191.31	660.34
Sep-05 2005	22.98	98.15	1688.00		37.87	2197.69	661.15
Oct-05 2005	23.01	98.13	1695.34		37.87	2204.11	661.65
Nov-05 2005	23.05	98.11	1703.15		37.86	2210.63	661.92
Dec-05 2005	23.09	98.08	1711.18		37.86	2217.32	662.06
Jan-06 2006	23.12	98.05	1719.29		37.85	2224.39	662.15
Feb-06 2006	23.16	98.03	1726.71		37.84	2231.43	662.28
Mar-06 2006	23.20	98.00	1733.60		37.84	2238.85	662.54
Apr-06 2006	23.24	97.97	1739.91		37.83	2246.98	663.02

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
May-06 2006	23.27	97.94	1745.12		37.82	2255.66	663.80
Jun-06 2006	23.30	97.92	1748.99		37.82	2264.96	664.98
Jul-06 2006	23.33	97.90	1751.25		37.82	2274.96	666.64
Aug-06 2006	23.34	97.89	1751.91		37.82	2285.86	668.85
Sep-06 2006	23.36	97.89	1751.20		37.83	2297.32	671.49
Oct-06 2006	23.37	97.89	1749.43		37.83	2309.50	674.56
Nov-06 2006	23.38	97.89	1746.87		37.84	2322.40	678.00
Dec-06 2006	23.39	97.90	1743.81		37.85	2336.00	681.76
Jan-07 2007	23.40	97.92	1740.48		37.87	2350.54	685.88
Feb-07 2007	23.41	97.94	1737.36		37.89	2365.05	690.03
Mar-07 2007	23.43	97.97	1734.56		37.90	2380.20	694.36
Apr-07 2007	23.44	98.01	1732.26		37.93	2396.54	698.98
May-07 2007	23.47	98.05	1730.86		37.95	2413.56	703.71
Jun-07 2007	23.50	98.10	1730.62		37.98	2431.24	708.49
Jul-07 2007	23.54	98.16	1731.81		38.00	2449.58	713.28
Aug-07 2007	23.58	98.23	1734.51		38.04	2468.78	718.06
Sep-07 2007	23.63	98.29	1738.37		38.07	2487.99	722.57
Oct-07 2007	23.68	98.36	1743.15		38.10	2507.29	726.73
Nov-07 2007	23.73	98.43	1748.58		38.13	2526.46	730.42
Dec-07 2007	23.78	98.49	1754.38		38.16	2545.25	733.51
Jan-08 2008	23.82	98.55	1760.38		38.19	2563.74	735.90
Feb-08 2008	23.85	98.60	1766.01		38.21	2580.82	737.36
Mar-08 2008	23.88	98.64	1771.19		38.23	2596.86	737.85
Apr-08 2008	23.89	98.66	1775.75		38.25	2611.91	737.24
May-08 2008	23.88	98.68	1779.31		38.26	2625.43	735.37
Jun-08 2008	23.85	98.67	1781.59		38.26	2637.21	732.11
Jul-08 2008	23.81	98.65	1782.35		38.26	2647.03	727.34
Aug-08 2008	23.74	98.60	1781.60		38.25	2655.03	721.04
Sep-08 2008	23.66	98.54	1779.70		38.23	2661.25	713.68
Oct-08 2008	23.56	98.47	1777.01		38.21	2666.10	705.48
Nov-08 2008	23.46	98.39	1773.90		38.18	2669.90	696.74
Dec-08 2008	23.35	98.31	1770.72		38.16	2672.95	687.75
Jan-09 2009	23.24	98.21	1767.81		38.13	2675.57	678.68
Feb-09 2009	23.13	98.13	1765.67		38.10	2677.91	670.38
Mar-09 2009	23.03	98.04	1764.50		38.07	2680.37	662.71

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Apr-09 2009	22.94	97.96	1764.63		38.04	2683.34	655.69
May-09 2009	22.87	97.89	1766.50		38.02	2687.02	649.92
Jun-09 2009	22.81	97.83	1770.47		38.00	2691.71	645.69
Jul-09 2009	22.77	97.78	1776.88		37.99	2697.72	643.28
Aug-09 2009	22.75	97.76	1785.86		37.98	2705.28	642.76
Sep-09 2009	22.75	97.75	1796.70		37.98	2714.11	643.94
Oct-09 2009	22.78	97.75	1809.09		37.99	2724.26	646.59
Nov-09 2009	22.81	97.77	1822.56		38.00	2735.67	650.48
Dec-09 2009	22.86	97.81	1836.67		38.02	2748.28	655.40
Jan-10 2010	22.91	97.86	1851.20		38.04	2762.25	661.24
Feb-10 2010	22.97	97.92	1864.77		38.06	2776.56	667.36
Mar-10 2010	23.03	97.99	1877.66		38.10	2791.83	673.84
Apr-10 2010	23.09	98.08	1889.87		38.13	2808.55	680.70
May-10 2010	23.15	98.18	1900.46		38.18	2826.15	687.51
Jun-10 2010	23.20	98.29	1909.01		38.22	2844.56	694.06
Jul-10 2010	23.24	98.41	1915.08		38.28	2863.74	700.13
Aug-10 2010	23.28	98.54	1918.63		38.34	2883.88	705.74
Sep-10 2010	23.30	98.68	1919.89		38.40	2904.14	710.76
Oct-10 2010	23.32	98.82	1919.26		38.46	2924.67	715.35
Nov-10 2010	23.33	98.96	1917.12		38.52	2945.28	719.60
Dec-10 2010	23.34	99.10	1913.80		38.59	2965.77	723.56
Jan-11 2011	23.35	99.24	1909.60		38.65	2986.30	727.38
Feb-11 2011	23.36	99.38	1905.16		38.71	3005.37	730.87
Mar-11 2011	23.36	99.50	1900.62		38.77	3023.80	734.31
Apr-11 2011	23.37	99.63	1896.15		38.82	3042.04	737.87
May-11 2011	23.38	99.74	1892.26		38.88	3059.23	741.50
Jun-11 2011	23.39	99.84	1889.30		38.92	3075.20	745.28
Jul-11 2011	23.41	99.93	1887.63		38.96	3089.77	749.27
Aug-11 2011	23.44	100.01	1887.34		39.00	3103.12	753.56
Sep-11 2011	23.47	100.07	1888.31		39.02	3114.92	757.96
Oct-11 2011	23.50	100.12	1890.37		39.05	3125.53	762.48
Nov-11 2011	23.54	100.16	1893.36		39.07	3135.08	767.08
Dec-11 2011	23.58	100.19	1897.12		39.08	3143.71	771.68
Jan-12 2012	23.63	100.21	1901.57		39.09	3151.66	776.33
Feb-12 2012	23.68	100.23	1906.32		39.10	3158.71	780.74

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Mar-12 2012	23.72	100.25	1911.35		39.11	3165.24	785.00
Apr-12 2012	23.77	100.27	1916.61		39.12	3171.47	789.15
May-12 2012	23.82	100.29	1921.84		39.13	3177.43	793.04
Jun-12 2012	23.87	100.31	1926.89		39.14	3183.25	796.62
Jul-12 2012	23.91	100.33	1931.62		39.16	3189.04	799.85
Aug-12 2012	23.96	100.36	1936.03		39.17	3195.05	802.77
Sep-12 2012	24.00	100.40	1940.03		39.19	3201.16	805.33
Oct-12 2012	24.04	100.44	1943.76		39.21	3207.60	807.63
Nov-12 2012	24.08	100.48	1947.28		39.23	3214.46	809.74
Dec-12 2012	24.12	100.52	1950.64		39.25	3221.85	811.69
Jan-13 2013	24.16	100.56	1953.96		39.27	3230.01	813.58
Feb-13 2013	24.19	100.61	1957.09		39.30	3238.49	815.34
Mar-13 2013	24.23	100.65	1960.24		39.32	3247.77	817.10
Apr-13 2013	24.26	100.70	1963.58		39.35	3258.29	818.99
May-13 2013	24.30	100.75	1967.05		39.37	3269.87	821.00
Jun-13 2013	24.33	100.80	1970.73		39.40	3282.60	823.16
Jul-13 2013	24.37	100.84	1974.66		39.42	3296.61	825.55
Aug-13 2013	24.40	100.88	1978.94		39.45	3312.12	828.22
Sep-13 2013	24.44	100.93	1983.42		39.47	3328.52	831.07
Oct-13 2013	24.47	100.97	1988.14		39.50	3345.94	834.13
Nov-13 2013	24.51	101.01	1993.07		39.52	3364.24	837.36
Dec-13 2013	24.55	101.05	1998.20		39.55	3383.29	840.75
Jan-14 2014	24.58	101.08	2003.59		39.57	3403.30	844.35
Feb-14 2014	24.62	101.12	2008.88		39.60	3422.81	847.89
Mar-14 2014	24.66	101.16	2014.28		39.62	3442.68	851.53
Apr-14 2014	24.70	101.20	2019.99		39.65	3463.46	855.38
May-14 2014	24.74	101.24	2025.78		39.67	3484.36	859.29
Jun-14 2014	24.78	101.28	2031.65		39.70	3505.26	863.25
Jul-14 2014	24.82	101.32	2037.56		39.73	3526.02	867.23
Aug-14 2014	24.87	101.36	2043.61		39.76	3546.93	871.29
Sep-14 2014	24.91	101.40	2049.59		39.79	3567.32	875.29
Oct-14 2014	24.96	101.44	2055.58		39.82	3587.54	879.27
Nov-14 2014	25.00	101.49	2061.58		39.85	3607.59	883.23
Dec-14 2014	25.05	101.53	2067.58		39.88	3627.50	887.15
Jan-15 2015	25.10	101.57	2073.66		39.91	3647.59	891.09

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Feb-15 2015	25.15	101.62	2079.43		39.94	3666.60	894.79
Mar-15 2015	25.19	101.66	2085.18		39.97	3685.49	898.42
Apr-15 2015	25.24	101.70	2091.08		40.01	3704.93	902.09
May-15 2015	25.29	101.74	2096.93		40.04	3724.28	905.68
Jun-15 2015	25.33	101.79	2102.73		40.07	3743.55	909.16
Jul-15 2015	25.38	101.83	2108.46		40.10	3762.76	912.52
Aug-15 2015	25.43	101.87	2114.22		40.13	3782.22	915.83
Sep-15 2015	25.47	101.91	2119.80		40.16	3801.27	918.99
Oct-15 2015	25.52	101.95	2125.31		40.19	3820.23	922.06
Nov-15 2015	25.56	101.99	2130.73		40.22	3839.06	925.07
Dec-15 2015	25.60	102.03	2136.07		40.25	3857.76	928.04
Jan-16 2016	25.64	102.07	2141.41		40.28	3876.61	931.01
Feb-16 2016	25.68	102.12	2146.48		40.30	3894.68	933.88
Mar-16 2016	25.72	102.16	2151.46		40.33	3912.57	936.75
Apr-16 2016	25.76	102.20	2156.43		40.36	3930.55	939.67
May-16 2016	25.80	102.24	2161.29		40.39	3948.31	942.63
Jun-16 2016	25.83	102.29	2166.04		40.42	3965.82	945.64
Jul-16 2016	25.86	102.33	2170.69		40.44	3983.07	948.71
Aug-16 2016	25.89	102.38	2175.30		40.47	4000.36	951.90
Sep-16 2016	25.92	102.43	2179.74		40.50	4017.13	955.10
Oct-16 2016	25.95	102.48	2184.07		40.53	4033.72	958.36
Nov-16 2016	25.98	102.53	2188.31		40.56	4050.14	961.66
Dec-16 2016	26.00	102.58	2192.46		40.59	4066.43	965.00
Jan-17 2017	26.03	102.64	2196.59		40.62	4082.89	968.43
Feb-17 2017	26.05	102.69	2200.45		40.64	4098.49	971.71
Mar-17 2017	26.07	102.74	2204.24		40.67	4114.05	975.02
Apr-17 2017	26.09	102.79	2208.08		40.70	4130.13	978.44
May-17 2017	26.11	102.84	2211.86		40.73	4146.24	981.87
Jun-17 2017	26.12	102.90	2215.58		40.76	4162.40	985.30
Jul-17 2017	26.14	102.95	2219.25		40.78	4178.64	988.71
Aug-17 2017	26.16	103.00	2222.92		40.81	4195.23	992.17
Sep-17 2017	26.17	103.06	2226.48		40.84	4211.63	995.55
Oct-17 2017	26.18	103.11	2230.00		40.86	4228.06	998.93
Nov-17 2017	26.19	103.16	2233.47		40.89	4244.50	1002.29
Dec-17 2017	26.21	103.21	2236.91		40.92	4260.93	1005.64

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Jan-18 2018	26.22	103.26	2240.37		40.94	4277.59	1009.04
Feb-18 2018	26.23	103.31	2243.64		40.96	4293.38	1012.26
Mar-18 2018	26.24	103.35	2246.87		40.99	4309.09	1015.47
Apr-18 2018	26.25	103.40	2250.19		41.01	4325.22	1018.79
May-18 2018	26.26	103.45	2253.49		41.03	4341.21	1022.10
Jun-18 2018	26.27	103.49	2256.77		41.05	4357.04	1025.40
Jul-18 2018	26.28	103.53	2260.04		41.07	4372.67	1028.70
Aug-18 2018	26.28	103.58	2263.35		41.09	4388.37	1032.05
Sep-18 2018	26.29	103.62	2266.59		41.11	4403.65	1035.34
Oct-18 2018	26.30	103.66	2269.83		41.13	4418.80	1038.62
Nov-18 2018	26.31	103.70	2273.07		41.15	4433.83	1041.89
Dec-18 2018	26.32	103.73	2276.31		41.17	4448.79	1045.16
Jan-19 2019	26.33	103.77	2279.61		41.18	4463.94	1048.47
Feb-19 2019	26.34	103.81	2282.76		41.20	4478.34	1051.62
Mar-19 2019	26.35	103.84	2285.92		41.22	4492.73	1054.75
Apr-19 2019	26.36	103.88	2289.20		41.23	4507.65	1057.99
May-19 2019	26.37	103.92	2292.50		41.25	4522.63	1061.21
Jun-19 2019	26.38	103.96	2295.82		41.27	4537.69	1064.42
Jul-19 2019	26.39	103.99	2299.17		41.28	4552.86	1067.62
Aug-19 2019	26.40	104.03	2302.60		41.30	4568.41	1070.86
Sep-19 2019	26.41	104.07	2305.99		41.32	4583.84	1074.04
Oct-19 2019	26.42	104.11	2309.40		41.34	4599.38	1077.21
Nov-19 2019	26.43	104.15	2312.83		41.35	4615.04	1080.38
Dec-19 2019	26.44	104.19	2316.27		41.37	4630.80	1083.55
Jan-20 2020	26.45	104.23	2319.77		41.39	4646.93	1086.77
Feb-20 2020	26.46	104.27	2323.17		41.41	4662.64	1089.88
Mar-20 2020	26.46	104.31	2326.56		41.42	4678.44	1093.01
Apr-20 2020	26.47	104.35	2330.01		41.44	4694.59	1096.19
May-20 2020	26.48	104.39	2333.45		41.46	4710.83	1099.39
Jun-20 2020	26.49	104.43	2336.88		41.47	4727.14	1102.60
Jul-20 2020	26.50	104.47	2340.30		41.49	4743.54	1105.82
Aug-20 2020	26.51	104.51	2343.76		41.50	4760.28	1109.11
Sep-20 2020	26.52	104.55	2347.15		41.52	4776.83	1112.37
Oct-20 2020	26.52	104.59	2350.54		41.53	4793.48	1115.64
Nov-20 2020	26.53	104.63	2353.92		41.55	4810.21	1118.93

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Dec-20 2020	26.54	104.67	2357.31		41.56	4827.04	1122.23
Jan-21 2021	26.55	104.71	2360.76		41.58	4844.25	1125.60
Feb-21 2021	26.55	104.74	2364.04		41.59	4860.73	1128.83
Mar-21 2021	26.56	104.78	2367.34		41.61	4877.32	1132.07
Apr-21 2021	26.57	104.82	2370.77		41.62	4894.59	1135.43
May-21 2021	26.57	104.86	2374.21		41.64	4911.98	1138.81
Jun-21 2021	26.58	104.90	2377.68		41.65	4929.50	1142.21
Jul-21 2021	26.59	104.94	2381.17		41.66	4947.15	1145.62
Aug-21 2021	26.60	104.98	2384.75		41.68	4965.23	1149.10
Sep-21 2021	26.60	105.02	2388.29		41.69	4983.13	1152.54
Oct-21 2021	26.61	105.06	2391.85		41.71	5001.15	1156.00
Nov-21 2021	26.62	105.10	2395.42		41.72	5019.27	1159.48
Dec-21 2021	26.63	105.14	2398.99		41.73	5037.48	1162.98
Jan-22 2022	26.63	105.19	2402.62		41.75	5056.07	1166.55
Feb-22 2022	26.64	105.23	2406.08		41.76	5073.82	1169.97
Mar-22 2022	26.65	105.27	2409.53		41.77	5091.63	1173.42
Apr-22 2022	26.66	105.31	2413.08		41.79	5110.10	1177.00
May-22 2022	26.66	105.35	2416.61		41.80	5128.61	1180.60
Jun-22 2022	26.67	105.40	2420.12		41.81	5147.14	1184.24
Jul-22 2022	26.68	105.44	2423.60		41.83	5165.69	1187.89
Aug-22 2022	26.68	105.48	2427.11		41.84	5184.57	1191.64
Sep-22 2022	26.69	105.52	2430.54		41.85	5203.15	1195.34
Oct-22 2022	26.70	105.57	2433.94		41.87	5221.76	1199.06
Nov-22 2022	26.71	105.61	2437.32		41.88	5240.38	1202.80
Dec-22 2022	26.71	105.65	2440.68		41.89	5259.02	1206.56
Jan-23 2023	26.72	105.69	2444.08		41.90	5277.99	1210.38
Feb-23 2023	26.73	105.73	2447.30		41.92	5296.07	1214.03
Mar-23 2023	26.73	105.77	2450.50		41.93	5314.18	1217.68
Apr-23 2023	26.74	105.82	2453.81		41.94	5332.92	1221.46
May-23 2023	26.74	105.86	2457.11		41.95	5351.70	1225.24
Jun-23 2023	26.75	105.90	2460.40		41.96	5370.50	1229.02
Jul-23 2023	26.75	105.94	2463.69		41.97	5389.34	1232.78
Aug-23 2023	26.76	105.98	2467.03		41.98	5408.53	1236.61
Sep-23 2023	26.76	106.02	2470.31		41.99	5427.45	1240.36
Oct-23 2023	26.77	106.06	2473.60		42.00	5446.43	1244.12

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Nov-23 2023	26.77	106.10	2476.88		42.01	5465.47	1247.87
Dec-23 2023	26.78	106.14	2480.17		42.02	5484.57	1251.63
Jan-24 2024	26.78	106.18	2483.51		42.03	5504.06	1255.46
Feb-24 2024	26.79	106.22	2486.74		42.04	5523.01	1259.17
Mar-24 2024	26.79	106.26	2489.97		42.05	5542.04	1262.89
Apr-24 2024	26.80	106.30	2493.26		42.06	5561.48	1266.68
May-24 2024	26.80	106.34	2496.55		42.07	5581.03	1270.48
Jun-24 2024	26.81	106.38	2499.84		42.08	5600.69	1274.31
Jul-24 2024	26.81	106.42	2503.13		42.09	5620.46	1278.15
Aug-24 2024	26.82	106.46	2506.48		42.09	5640.68	1282.08
Sep-24 2024	26.83	106.51	2509.77		42.10	5660.69	1285.96
Oct-24 2024	26.83	106.55	2513.07		42.11	5680.80	1289.85
Nov-24 2024	26.84	106.59	2516.37		42.12	5701.02	1293.75
Dec-24 2024	26.84	106.64	2519.67		42.13	5721.32	1297.66
Jan-25 2025	26.85	106.68	2523.03		42.14	5742.04	1301.64
Feb-25 2025	26.86	106.72	2526.22		42.15	5761.83	1305.43
Mar-25 2025	26.86	106.77	2529.41		42.16	5781.69	1309.22
Apr-25 2025	26.87	106.81	2532.71		42.16	5802.28	1313.13
May-25 2025	26.88	106.85	2536.01		42.17	5822.93	1317.03
Jun-25 2025	26.88	106.90	2539.31		42.18	5843.63	1320.93
Jul-25 2025	26.89	106.94	2542.61		42.19	5864.38	1324.81
Aug-25 2025	26.90	106.99	2545.96		42.20	5885.50	1328.74
Sep-25 2025	26.90	107.03	2549.26		42.21	5906.32	1332.60
Oct-25 2025	26.91	107.07	2552.55		42.22	5927.17	1336.45
Nov-25 2025	26.91	107.11	2555.85		42.23	5948.06	1340.30
Dec-25 2025	26.92	107.16	2559.15		42.23	5968.99	1344.14
Jan-26 2026	26.92	107.20	2562.50		42.24	5990.29	1348.04
Feb-26 2026	26.93	107.24	2565.68		42.25	6010.59	1351.75
Mar-26 2026	26.94	107.28	2568.87		42.26	6030.92	1355.46
Apr-26 2026	26.94	107.32	2572.17		42.27	6051.96	1359.30
May-26 2026	26.95	107.37	2575.47		42.27	6073.04	1363.15
Jun-26 2026	26.95	107.41	2578.77		42.28	6094.14	1367.01
Jul-26 2026	26.96	107.45	2582.08		42.29	6115.26	1370.87
Aug-26 2026	26.96	107.49	2585.44		42.30	6136.76	1374.82
Sep-26 2026	26.96	107.53	2588.74		42.30	6157.95	1378.71

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Oct-26 2026	26.97	107.58	2592.05		42.31	6179.19	1382.61
Nov-26 2026	26.97	107.62	2595.36		42.32	6200.47	1386.52
Dec-26 2026	26.98	107.66	2598.66		42.33	6221.81	1390.45
Jan-27 2027	26.98	107.70	2602.02		42.33	6243.58	1394.45
Feb-27 2027	26.98	107.74	2605.22		42.34	6264.35	1398.27
Mar-27 2027	26.99	107.78	2608.41		42.35	6285.21	1402.09
Apr-27 2027	26.99	107.83	2611.71		42.35	6306.86	1406.06
May-27 2027	27.00	107.87	2615.00		42.36	6328.60	1410.04
Jun-27 2027	27.00	107.91	2618.30		42.37	6350.45	1414.03
Jul-27 2027	27.00	107.95	2621.58		42.37	6372.40	1418.03
Aug-27 2027	27.00	107.99	2624.92		42.38	6394.83	1422.11
Sep-27 2027	27.01	108.04	2628.19		42.39	6417.01	1426.13
Oct-27 2027	27.01	108.08	2631.46		42.39	6439.29	1430.16
Nov-27 2027	27.01	108.12	2634.72		42.40	6461.67	1434.20
Dec-27 2027	27.02	108.16	2637.98		42.41	6484.15	1438.24
Jan-28 2028	27.02	108.20	2641.27		42.41	6507.08	1442.37
Feb-28 2028	27.02	108.24	2644.46		42.42	6529.35	1446.36
Mar-28 2028	27.02	108.28	2647.64		42.43	6551.70	1450.36
Apr-28 2028	27.03	108.33	2650.86		42.43	6574.50	1454.44
May-28 2028	27.03	108.37	2654.06		42.44	6597.37	1458.52
Jun-28 2028	27.03	108.41	2657.26		42.44	6620.30	1462.60
Jul-28 2028	27.03	108.45	2660.45		42.45	6643.29	1466.69
Aug-28 2028	27.03	108.49	2663.68		42.46	6666.72	1470.86
Sep-28 2028	27.04	108.54	2666.85		42.46	6689.83	1474.96
Oct-28 2028	27.04	108.58	2670.02		42.47	6713.01	1479.07
Nov-28 2028	27.04	108.62	2673.19		42.48	6736.24	1483.19
Dec-28 2028	27.04	108.66	2676.36		42.48	6759.55	1487.32
Jan-29 2029	27.04	108.70	2679.59		42.49	6783.30	1491.54
Feb-29 2029	27.04	108.75	2682.67		42.50	6805.97	1495.56
Mar-29 2029	27.05	108.79	2685.77		42.50	6828.71	1499.60
Apr-29 2029	27.05	108.83	2688.98		42.51	6852.29	1503.79
May-29 2029	27.05	108.87	2692.22		42.52	6875.94	1508.01
Jun-29 2029	27.05	108.91	2695.47		42.52	6899.67	1512.24
Jul-29 2029	27.05	108.95	2698.76		42.53	6923.48	1516.50
Aug-29 2029	27.06	109.00	2702.12		42.54	6947.76	1520.85

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Sep-29 2029	27.06	109.04	2705.44		42.54	6971.74	1525.15
Oct-29 2029	27.06	109.08	2708.77		42.55	6995.80	1529.47
Nov-29 2029	27.06	109.12	2712.11		42.56	7019.96	1533.81
Dec-29 2029	27.07	109.17	2715.44		42.56	7044.21	1538.15
Jan-30 2030	27.07	109.21	2718.82		42.57	7068.96	1542.59
Feb-30 2030	27.07	109.25	2722.01		42.58	7092.60	1546.81
Mar-30 2030	27.07	109.29	2725.19		42.58	7116.36	1551.04
Apr-30 2030	27.07	109.33	2728.43		42.59	7141.02	1555.41
May-30 2030	27.08	109.37	2731.64		42.60	7165.79	1559.79
Jun-30 2030	27.08	109.42	2734.81		42.60	7190.69	1564.17
Jul-30 2030	27.08	109.46	2737.92		42.61	7215.70	1568.54
Aug-30 2030	27.08	109.50	2741.03		42.61	7241.25	1572.98
Sep-30 2030	27.08	109.54	2744.04		42.62	7266.51	1577.35
Oct-30 2030	27.08	109.58	2747.02		42.62	7291.90	1581.72
Nov-30 2030	27.08	109.62	2749.97		42.63	7317.40	1586.10
Dec-30 2030	27.08	109.66	2752.90		42.63	7343.03	1590.48
Jan-31 2031	27.08	109.70	2755.86		42.64	7369.20	1594.94
Feb-31 2031	27.08	109.74	2758.67		42.64	7394.22	1599.19
Mar-31 2031	27.07	109.78	2761.49		42.65	7419.36	1603.46
Apr-31 2031	27.07	109.82	2764.41		42.65	7445.46	1607.88
May-31 2031	27.07	109.86	2767.35		42.66	7471.68	1612.33
Jun-31 2031	27.07	109.90	2770.32		42.66	7498.03	1616.79
Jul-31 2031	27.07	109.94	2773.32		42.67	7524.49	1621.28
Aug-31 2031	27.07	109.98	2776.40		42.67	7551.50	1625.86
Sep-31 2031	27.07	110.02	2779.47		42.68	7578.20	1630.40
Oct-31 2031	27.07	110.06	2782.55		42.68	7605.01	1634.95
Nov-31 2031	27.07	110.10	2785.66		42.69	7631.92	1639.53
Dec-31 2031	27.07	110.14	2788.77		42.69	7658.94	1644.13
Jan-32 2032	27.07	110.19	2791.94		42.69	7686.51	1648.82
Feb-32 2032	27.07	110.23	2795.00		42.70	7713.29	1653.38
Mar-32 2032	27.07	110.27	2798.05		42.71	7740.16	1657.95
Apr-32 2032	27.07	110.31	2801.14		42.71	7767.56	1662.62
May-32 2032	27.06	110.35	2804.20		42.72	7795.06	1667.31
Jun-32 2032	27.06	110.39	2807.24		42.72	7822.65	1672.01
Jul-32 2032	27.06	110.43	2810.24		42.73	7850.31	1676.72

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Aug-32 2032	27.06	110.47	2813.26		42.73	7878.52	1681.53
Sep-32 2032	27.06	110.51	2816.19		42.74	7906.35	1686.27
Oct-32 2032	27.05	110.55	2819.10		42.75	7934.27	1691.02
Nov-32 2032	27.05	110.60	2822.00		42.75	7962.28	1695.78
Dec-32 2032	27.05	110.64	2824.88		42.76	7990.37	1700.54
Jan-33 2033	27.05	110.68	2827.80		42.77	8019.02	1705.40
Feb-33 2033	27.04	110.72	2830.58		42.77	8046.37	1710.02
Mar-33 2033	27.04	110.76	2833.36		42.78	8073.81	1714.64
Apr-33 2033	27.04	110.80	2836.24		42.78	8102.27	1719.42
May-33 2033	27.04	110.84	2839.14		42.79	8130.83	1724.20
Jun-33 2033	27.04	110.88	2842.06		42.80	8159.49	1728.98
Jul-33 2033	27.03	110.92	2845.01		42.80	8188.25	1733.76
Aug-33 2033	27.03	110.96	2848.03		42.81	8217.58	1738.61
Sep-33 2033	27.03	111.00	2851.04		42.81	8246.54	1743.40
Oct-33 2033	27.03	111.04	2854.08		42.81	8275.59	1748.20
Nov-33 2033	27.03	111.09	2857.14		42.82	8304.74	1753.02
Dec-33 2033	27.03	111.13	2860.24		42.82	8333.98	1757.87
Jan-34 2034	27.03	111.17	2863.41		42.83	8363.80	1762.85
Feb-34 2034	27.03	111.20	2866.47		42.83	8392.25	1767.62
Mar-34 2034	27.03	111.24	2869.55		42.84	8420.79	1772.45
Apr-34 2034	27.03	111.28	2872.76		42.84	8450.38	1777.51
May-34 2034	27.04	111.32	2876.01		42.85	8480.05	1782.63
Jun-34 2034	27.04	111.36	2879.28		42.86	8509.80	1787.83
Jul-34 2034	27.04	111.40	2882.59		42.86	8539.63	1793.12
Aug-34 2034	27.05	111.44	2885.98		42.87	8570.03	1798.58
Sep-34 2034	27.05	111.48	2889.35		42.88	8600.01	1804.03
Oct-34 2034	27.06	111.52	2892.75		42.89	8630.07	1809.57
Nov-34 2034	27.06	111.56	2896.18		42.90	8660.19	1815.17
Dec-34 2034	27.07	111.60	2899.63		42.91	8690.39	1820.85
Jan-35 2035	27.08	111.64	2903.18		42.92	8721.14	1826.68
Feb-35 2035	27.09	111.67	2906.57		42.93	8750.47	1832.29
Mar-35 2035	27.09	111.71	2910.00		42.94	8779.85	1837.94
Apr-35 2035	27.10	111.75	2913.57		42.95	8810.29	1843.84
May-35 2035	27.11	111.79	2917.16		42.96	8840.79	1849.78
Jun-35 2035	27.12	111.82	2920.78		42.97	8871.33	1855.76

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Jul-35 2035	27.13	111.86	2924.43		42.98	8901.93	1861.78
Aug-35 2035	27.14	111.90	2928.17		42.99	8933.09	1867.93
Sep-35 2035	27.15	111.94	2931.87		42.99	8963.81	1874.01
Oct-35 2035	27.17	111.98	2935.59		43.00	8994.62	1880.11
Nov-35 2035	27.18	112.02	2939.34		43.01	9025.51	1886.25
Dec-35 2035	27.19	112.05	2943.11		43.02	9056.52	1892.42
Jan-36 2036	27.20	112.09	2946.96		43.03	9088.15	1898.71
Feb-36 2036	27.21	112.13	2950.70		43.03	9118.89	1904.83
Mar-36 2036	27.23	112.17	2954.47		43.04	9149.76	1910.97
Apr-36 2036	27.24	112.21	2958.32		43.05	9181.31	1917.23
May-36 2036	27.25	112.25	2962.18		43.05	9213.02	1923.52
Jun-36 2036	27.27	112.28	2966.06		43.06	9244.91	1929.83
Jul-36 2036	27.28	112.32	2969.95		43.07	9276.99	1936.16
Aug-36 2036	27.29	112.36	2973.92		43.07	9309.79	1942.62
Sep-36 2036	27.30	112.40	2977.83		43.08	9342.25	1948.99
Oct-36 2036	27.32	112.44	2981.73		43.09	9374.87	1955.38
Nov-36 2036	27.33	112.48	2985.62		43.09	9407.64	1961.78
Dec-36 2036	27.34	112.52	2989.50		43.10	9440.55	1968.20
Jan-37 2037	27.36	112.56	2993.42		43.11	9474.13	1974.75
Feb-37 2037	27.37	112.60	2997.11		43.11	9506.20	1980.99
Mar-37 2037	27.38	112.63	3000.77		43.12	9538.36	1987.24
Apr-37 2037	27.39	112.67	3004.51		43.13	9571.69	1993.72
May-37 2037	27.40	112.71	3008.19		43.13	9605.10	2000.21
Jun-37 2037	27.41	112.75	3011.82		43.14	9638.57	2006.70
Jul-37 2037	27.42	112.79	3015.38		43.15	9672.09	2013.21
Aug-37 2037	27.43	112.82	3018.93		43.15	9706.21	2019.84
Sep-37 2037	27.44	112.86	3022.37		43.16	9739.83	2026.37
Oct-37 2037	27.45	112.90	3025.76		43.17	9773.52	2032.91
Nov-37 2037	27.46	112.94	3029.11		43.17	9807.28	2039.46
Dec-37 2037	27.47	112.97	3032.44		43.18	9841.11	2046.02
Jan-38 2038	27.48	113.01	3035.81		43.19	9875.60	2052.71
Feb-38 2038	27.48	113.05	3039.01		43.19	9908.50	2059.08
Mar-38 2038	27.49	113.08	3042.22		43.20	9941.51	2065.47
Apr-38 2038	27.50	113.12	3045.54		43.20	9975.75	2072.08
May-38 2038	27.51	113.15	3048.90		43.21	10010.11	2078.71

Native

Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY
Jun-38 2038	27.52	113.19	3052.28		43.22	10044.60	2085.36
Jul-38 2038	27.52	113.23	3055.71		43.22	10079.23	2092.02
Aug-38 2038	27.53	113.27	3059.25		43.23	10114.57	2098.81
Sep-38 2038	27.54	113.30	3062.76		43.24	10149.49	2105.51
Oct-38 2038	27.55	113.34	3066.31		43.24	10184.54	2112.23
Nov-38 2038	27.56	113.38	3069.87		43.25	10219.73	2118.98
Dec-38 2038	27.57	113.41	3073.45		43.25	10255.06	2125.77
Jan-39 2039	27.58	113.45	3077.10		43.26	10291.10	2132.70
Feb-39 2039	27.58	113.49	3080.56		43.27	10325.52	2139.33
Mar-39 2039	27.59	113.52	3084.02		43.27	10360.06	2146.00
Apr-39 2039	27.60	113.56	3087.57		43.28	10395.90	2152.94
May-39 2039	27.61	113.59	3091.10		43.28	10431.86	2159.93
Jun-39 2039	27.62	113.63	3094.59		43.29	10467.94	2166.96
Jul-39 2039	27.63	113.67	3098.04		43.29	10504.14	2174.06
Aug-39 2039	27.64	113.71	3101.50		43.30	10541.06	2181.32
Sep-39 2039	27.64	113.74	3104.86		43.31	10577.50	2188.52
Oct-39 2039	27.65	113.78	3108.18		43.31	10614.07	2195.78
Nov-39 2039	27.66	113.82	3111.47		43.32	10650.75	2203.08
Dec-39 2039	27.67	113.85	3114.74		43.32	10687.56	2210.44
Jan-40 2040	27.68	113.89	3118.03		43.33	10725.09	2217.96
Feb-40 2040	27.69	113.93	3121.20		43.33	10761.53	2225.28
Mar-40 2040	27.69	113.96	3124.35		43.34	10798.10	2232.65
Apr-40 2040	27.70	114.00	3127.54		43.34	10835.39	2240.18
May-40 2040	27.71	114.04	3130.73		43.35	10872.81	2247.75
Jun-40 2040	27.72	114.07	3133.92		43.36	10910.35	2255.36
Jul-40 2040	27.73	114.11	3137.11		43.36	10948.02	2263.00
Aug-40 2040	27.73	114.15	3140.36		43.37	10986.46	2270.81
Sep-40 2040	27.74	114.18	3143.56		43.37	11024.45	2278.53
Oct-40 2040	27.75	114.22	3146.76		43.38	11062.65	2286.29
Nov-40 2040	27.76	114.26	3149.98		43.38	11101.08	2294.08
Dec-40 2040	27.77	114.29	3153.19		43.38	11139.79	2301.91
Jan-41 2041	27.78	114.33	3156.47		43.39	11179.44	2309.90
Feb-41 2041	27.79	114.37	3159.60		43.39	11217.50	2317.55
Mar-41 2041	27.79	114.40	3162.73		43.40	11255.91	2325.23
Apr-41 2041	27.80	114.44	3165.97		43.40	11296.00	2333.21

Native								
Frequency:	MONTHLY	MONTHLY	MONTHLY	Undefined	MONTHLY	MONTHLY	MONTHLY	MONTHLY
May-41 2041	27.81	114.48	3169.22		43.41	11336.54	2341.22	
Jun-41 2041	27.82	114.51	3172.48		43.41	11377.53	2349.28	
Jul-41 2041	27.83	114.55	3175.75		43.42	11419.03	2357.37	
Aug-41 2041	27.84	114.59	3179.08		43.42	11461.74	2365.64	
Sep-41 2041	27.85	114.62	3182.36		43.42	11504.34	2373.81	
Oct-41 2041	27.85	114.66	3185.65		43.43	11547.53	2382.02	
Nov-41 2041	27.86	114.70	3188.95		43.43	11591.35	2390.28	
Dec-41 2041	27.87	114.74	3192.26		43.44	11635.83	2398.57	
Jan-42 2042	27.88	114.77	3195.63		43.44	11681.74	2407.04	
Feb-42 2042	27.89	114.81	3198.85		43.45	11726.13	2415.14	
Mar-42 2042	27.90	114.84	3202.08		43.45	11771.24	2423.28	
Apr-42 2042	27.91	114.88	3205.42		43.45	11818.64	2431.73	
May-42 2042	27.92	114.92	3208.78		43.46	11866.87	2440.22	
Jun-42 2042	27.92	114.95	3212.15		43.46	11915.95	2448.76	
Jul-42 2042	27.93	114.99	3215.52		43.47	11965.91	2457.34	
Aug-42 2042	27.94	115.03	3218.97		43.47	12017.64	2466.10	
Sep-42 2042	27.95	115.07	3222.37		43.48	12069.49	2474.77	
Oct-42 2042	27.96	115.10	3225.78		43.48	12122.33	2483.47	
Nov-42 2042	27.97	115.14	3229.20		43.49	12176.17	2492.22	
Dec-42 2042	27.97	115.18	3232.64		43.49	12231.08	2501.02	

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville lHDD	Louisville lCDD	Louisville lMax	Louisville lMin
1970	1	1266	0	69	-5								
1970	2	896	0	64	0								
1970	3	716	0	66	18								
1970	4	225	43	86	30								
1970	5	57	169	89	38								
1970	6	1	220	91	54								
1970	7	2	329	96	54								
1970	8	0	331	92	56								
1970	9	24	286	93	42								
1970	10	255	18	83	30								
1970	11	605	0	72	12								
1970	12	846	0	72	14								
1971	1	1087	0	60	7								
1971	2	874	0	70	0								
1971	3	707	0	74	20								
1971	4	290	28	88	24								
1971	5	90	49	86	36								
1971	6	0	437	99	60								
1971	7	0	382	99	52								
1971	8	0	357	95	54								
1971	9	23	260	91	44								
1971	10	85	53	90	36								
1971	11	571	0	80	19								
1971	12	701	0	70	15								
1972	1	1000	0	71	-7								
1972	2	887	0	77	10								
1972	3	639	2	77	20								
1972	4	274	21	83	24								
1972	5	64	99	91	42								
1972	6	16	214	95	42								
1972	7	2	337	94	52								
1972	8	3	285	92	51								
1972	9	26	196	92	38								
1972	10	356	2	78	24								

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville lHDD	Louisville lCDD	Louisville lMax	Louisville lMin
1972	11	702	4	75	21								
1972	12	940	0	62	1								
1973	1	997	0	63	8								
1973	2	844	0	62	10								
1973	3	345	0	75	29								
1973	4	312	23	80	26								
1973	5	106	35	85	39								
1973	6	0	331	92	56								
1973	7	0	438	96	59								
1973	8	0	396	94	57								
1973	9	11	265	93	45								
1973	10	160	76	86	34								
1973	11	459	3	73	18								
1973	12	954	0	66	1								
1974	1	849	0	69	6								
1974	2	696	0	67	15								
1974	3	480	26	81	7								
1974	4	264	28	84	30								
1974	5	71	141	92	38								
1974	6	6	188	90	52								
1974	7	0	452	98	53								
1974	8	0	292	92	55								
1974	9	124	73	84	37								
1974	10	280	14	80	27								
1974	11	537	15	77	26								
1974	12	865	0	61	19								
1975	1	867	0	70	12								
1975	2	742	0	64	11								
1975	3	689	0	76	22								
1975	4	319	29	83	28								
1975	5	23	176	95	45								
1975	6	0	342	95	55								
1975	7	0	406	95	52								
1975	8	0	388	92	58								

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville lHDD	Louisville lCDD	Louisville lMax	Louisville lMin
1975	9	75	129	93	44								
1975	10	223	29	89	34								
1975	11	484	1	78	24								
1975	12	861	0	69	11								
1976	1	1100	0	60	-1								
1976	2	628	0	73	8								
1976	3	417	6	79	23								
1976	4	275	47	88	31								
1976	5	139	40	84	32								
1976	6	0	258	93	54								
1976	7	0	379	100	56								
1976	8	0	274	92	51								
1976	9	27	98	88	39								
1976	10	391	10	84	24								
1976	11	786	0	66	10								
1976	12	1021	0	67	-3								
1977	1	1549	0	41	-21								
1977	2	867	0	68	-4								
1977	3	428	9	81	24								
1977	4	162	61	88	36								
1977	5	32	255	94	43								
1977	6	4	323	99	50								
1977	7	0	501	98	59								
1977	8	0	376	93	56								
1977	9	3	232	93	51								
1977	10	289	6	82	33								
1977	11	495	16	76	12								
1977	12	970	0	60	6								
1978	1	1377	0	57	-10								
1978	2	1228	0	42	-3								
1978	3	774	0	82	-6								
1978	4	233	16	81	32								
1978	5	137	125	90	36								
1978	6	0	361	102	50								

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville IHDD	Louisville ICDD	Louisville IMax	Louisville IMin
1978	7	0	444	99	61								
1978	8	0	366	99	55								
1978	9	10	229	91	45								
1978	10	323	7	84	33								
1978	11	473	2	78	28								
1978	12	865	0	63	14								
1979	1	1360	0	43	-7								
1979	2	1125	0	61	-9								
1979	3	559	0	74	19								
1979	4	326	13	81	29								
1979	5	106	65	88	37								
1979	6	0	310	96	51								
1979	7	0	365	93	59								
1979	8	1	312	94	52								
1979	9	28	138	90	44								
1979	10	290	35	86	29								
1979	11	619	0	72	23								
1979	12	813	0	67	11								
1980	1	982	0	62	11					969	0		
1980	2	1103	0	61	-3					1021	0		
1980	3	756	0	66	3					713	0		
1980	4	367	5	86	32					342	8		
1980	5	81	102	87	34					68	134		
1980	6	10	264	96	48					8	266		
1980	7	0	535	101	61					0	519		
1980	8	0	521	101	59					0	504		
1980	9	24	257	98	44					12	276		
1980	10	329	39	88	28					309	31		
1980	11	591	3	80	25					555	1		
1980	12	852	0	69	7					821	0		
1981	1	1090	0	64	2					1065	0		
1981	2	771	0	74	3					728	0		
1981	3	624	1	84	23					595	5		
1981	4	161	69	88	33					142	68		

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville IHDD	Louisville ICDD	Louisville IMax	Louisville IMin
1981	5	155	50	84	37					122	63		
1981	6	0	355	96	53					0	343		
1981	7	0	425	96	55					0	435		
1981	8	0	343	93	58					0	348		
1981	9	53	128	89	44					61	150		
1981	10	256	15	90	23					268	10		
1981	11	498	3	78	24					523	0		
1981	12	940	0	64	7					960	0		
1982	1	1160	0	60	-18					1124	0		
1982	2	914	0	76	-4					837	0		
1982	3	534	8	81	21					549	1		
1982	4	386	3	84	26					408	2		
1982	5	16	198	91	44					13	183		
1982	6	0	179	93	53					3	139		
1982	7	0	458	94	59					0	408		
1982	8	0	290	97	53					1	274		
1982	9	52	134	87	42					56	118		
1982	10	233	59	88	30					246	68		
1982	11	486	9	81	24					495	13		
1982	12	618	11	77	20					624	8		
1983	1	918	0	56	18					933	0		
1983	2	711	0	70	20					763	0		
1983	3	567	3	82	26					571	7		
1983	4	406	8	79	27					399	8		
1983	5	106	42	83	40					121	39		
1983	6	4	303	98	48					5	264		
1983	7	0	514	102	52					0	504		
1983	8	0	532	102	57					0	524		
1983	9	61	236	98	34					54	240		
1983	10	186	17	88	35					196	19		
1983	11	486	9	73	28					509	0		
1983	12	1195	0	59	-7					1128	0		
1984	1	1169	0	57	-15	1103	0	59	(13)	1115	-		
1984	2	747	0	69	-1	659	0	70	1	673	-		

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville IHDD	Louisville ICDD	Louisville IMax	Louisville IMin
1984	3	769	0	76	13	656	0	77	14	757	-		
1984	4	329	16	84	30	269	29	85	31	315	20		
1984	5	131	60	86	39	82	76	87	40	141	69		
1984	6	0	416	95	49	0	415	96	50	0	386		
1984	7	0	348	94	54	0	369	95	55	0	333		
1984	8	0	349	94	53	0	375	95	54	0	349		
1984	9	78	127	94	43	69	182	95	44	73	145		
1984	10	108	49	83	37	108	53	84	38	84	56		
1984	11	638	0	72	21	591	0	73	22	623	-		
1984	12	653	0	70	2	611	2	71	4	584	1		
1985	1	1276	0	65	-16	1269	0	67	(14)	1222	-		
1985	2	985	3	77	-8	918	1	78	(6)	896	2		
1985	3	411	3	83	28	431	11	84	29	458	8		
1985	4	208	36	84	27	170	52	85	28	180	48		
1985	5	55	108	92	42	48	112	93	43	52	106		
1985	6	9	276	94	50	10	263	95	51	16	233		
1985	7	0	447	98	59	0	419	99	60	0	387		
1985	8	0	319	93	56	0	309	94	57	0	311		
1985	9	75	190	93	41	67	186	94	42	53	185		
1985	10	185	58	86	34	151	77	87	35	160	55		
1985	11	446	5	76	26	378	9	77	27	347	14		
1985	12	1135	0	59	-2	1037	0	61	(0)	1067	-		
1986	1	989	0	71	1	909	0	72	3	941	-		
1986	2	762	0	69	-2	688	0	70	(0)	696	-		
1986	3	538	2	84	17	475	6	85	18	516	5		
1986	4	226	27	88	29	173	50	89	30	224	37		
1986	5	70	156	89	38	47	169	90	39	69	138		
1986	6	0	360	97	54	0	379	98	55	0	330		
1986	7	0	488	97	61	0	524	98	62	0	481		
1986	8	15	265	93	43	8	286	94	44	12	306		
1986	9	14	246	92	43	3	273	93	44	5	255		
1986	10	240	32	88	35	191	47	89	36	210	46		
1986	11	632	0	76	11	589	0	77	13	570	-		
1986	12	900	0	57	14	863	0	59	15	869	-		

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville lHDD	Louisville lCDD	Louisville lMax	Louisville lMin
1987	1	1007	0	61	5	968	0	63	7	962	-		
1987	2	735	0	60	19	671	0	62	20	706	-		
1987	3	528	0	77	22	451	0	78	23	526	-		
1987	4	330	8	87	23	249	29	88	24	294	14		
1987	5	19	235	94	42	7	258	95	43	21	232		
1987	6	0	350	92	53	0	402	93	54	0	342		
1987	7	0	420	95	57	0	458	96	58	0	439		
1987	8	0	408	100	51	0	465	101	52	0	416		
1987	9	15	201	94	45	12	213	95	46	9	203		
1987	10	423	0	82	24	356	3	83	25	377	1		
1987	11	456	1	82	16	419	3	85	17	423	4		
1987	12	777	0	60	19	735	0	62	20	762	-		
1988	1	1108	0	61	1	1011	0	63	3	1048	-		
1988	2	917	0	69	5	861	0	70	7	872	-		
1988	3	602	0	80	22	534	0	81	23	580	4		
1988	4	284	11	87	31	239	19	88	32	244	10		
1988	5	46	113	93	39	38	117	94	40	38	111		
1988	6	4	329	101	48	0	333	102	49	7	333		
1988	7	0	441	102	54	0	482	103	55	0	481		
1988	8	0	436	100	50	0	499	101	51	0	472		
1988	9	18	162	94	43	16	197	95	44	13	173		
1988	10	418	8	78	25	383	11	79	26	398	10		
1988	11	548	0	70	25	491	0	71	26	510	-		
1988	12	877	0	63	9	825	0	65	11	833	-		
1989	1	765	0	68	21	726	0	69	22	720	-		
1989	2	902	0	65	8	897	0	67	10	860	-		
1989	3	558	3	79	20	525	11	80	21	513	6		
1989	4	308	64	91	26	292	68	92	27	291	48		
1989	5	142	96	92	37	115	108	93	38	156	88		
1989	6	1	272	95	53	0	266	96	54	4	264		
1989	7	0	403	96	62	0	419	97	63	0	412		
1989	8	1	369	93	52	0	398	94	53	0	364		
1989	9	54	161	92	38	42	177	93	39	49	188		
1989	10	225	28	91	32	193	42	92	33	230	30		

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville lHDD	Louisville lCDD	Louisville lMax	Louisville lMin
1989	11	577	0	75	22	488	3	76	23	539	-		
1989	12	1297	0	59	-15	1165	0	61	(13)	1222	-		
1990	1	707	0	69	17	651	0	70	18	672	-		
1990	2	603	0	66	18	534	0	68	19	574	-		
1990	3	487	21	82	22	438	26	83	23	445	22		
1990	4	358	29	87	23	313	46	88	24	320	44		
1990	5	97	43	82	40	89	63	83	41	82	65		
1990	6	15	318	94	45	10	356	95	46	13	323		
1990	7	2	387	100	52	0	435	101	53	0	427		
1990	8	1	336	96	52	1	344	97	53	0	392		
1990	9	35	220	100	39	28	247	101	40	34	244		
1990	10	291	23	85	29	273	28	86	30	229	42		
1990	11	432	3	79	26	352	12	80	27	387	7		
1990	12	828	0	63	4	771	0	65	6	745	-		
1991	1	1037	0	49	12	949	0	51	14	949	-		
1991	2	702	0	68	9	642	0	69	11	677	-		
1991	3	528	4	80	23	429	13	81	24	482	8		
1991	4	191	15	83	36	119	40	84	37	167	31		
1991	5	42	241	90	40	18	252	91	41	27	286		
1991	6	0	369	96	54	0	396	97	55	0	406		
1991	7	0	445	96	57	0	499	97	58	0	514		
1991	8	0	379	98	54	0	424	99	55	0	445		
1991	9	88	249	96	37	72	262	97	38	52	262		
1991	10	227	55	86	27	190	75	87	28	168	68		
1991	11	647	0	70	16	585	4	71	17	590	-		
1991	12	791	0	64	15	709	0	66	16	725	-		
1992	1	913	0	57	5	827	0	59	7	855	-		
1992	2	673	0	70	14	556	0	71	15	610	-		
1992	3	549	0	78	20	470	0	79	21	523	2		
1992	4	259	47	85	29	228	58	86	30	244	48		
1992	5	118	90	89	39	86	123	90	40	124	100		
1992	6	10	219	94	46	5	270	95	47	8	229		
1992	7	0	440	94	60	0	463	95	61	0	424		
1992	8	0	268	95	53	0	285	96	54	0	262		

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville lHDD	Louisville lCDD	Louisville lMax	Louisville lMin
1992	9	46	162	90	41	39	166	91	42	40	169		
1992	10	236	14	85	30	203	12	86	31	219	14		
1992	11	538	0	74	24	502	5	75	25	505	-		
1992	12	875	0	63	13	808	0	65	14	813	-		
1993	1	879	0	64	17	818	0	66	18	819	-		
1993	2	892	0	66	1	781	0	68	3	859	-		
1993	3	671	0	79	12	565	2	80	14	644	-		
1993	4	322	3	79	28	279	11	80	29	299	4		
1993	5	46	115	91	45	40	120	92	46	44	106		
1993	6	12	342	96	45	8	360	97	46	18	310		
1993	7	0	566	99	62	0	604	100	63	0	534		
1993	8	0	456	99	61	0	430	100	62	0	442		
1993	9	55	122	93	38	354	131	94	39	48	146		
1993	10	296	9	82	31	293	23	83	32	289	12		
1993	11	600	0	72	22	581	5	73	23	572	3		
1993	12	879	0	60	9	812	0	62	11	875	-		
1994	1	1164	0	60	-17	1110	0	62	(15)	1180	-		
1994	2	770	1	73	11	705	0	74	13	752	-		
1994	3	603	0	81	21	531	0	82	22	602	-		
1994	4	213	42	86	27	185	52	87	28	189	42		
1994	5	96	74	92	36	93	70	93	37	122	63		
1994	6	5	423	98	50	0	406	99	51	3	384		
1994	7	0	449	98	60	0	413	99	61	0	443		
1994	8	0	330	94	55	0	317	95	56	0	349		
1994	9	44	144	93	46	38	115	94	47	20	138		
1994	10	180	24	88	31	186	31	89	32	186	21		
1994	11	403	2	76	27	372	5	77	28	384	4		
1994	12	702	0	63	22	691	0	65	23	696	-		
1995	1	922	0	68	6	864	1	69	8	904	-		
1995	2	804	0	70	6	761	0	71	8	800	-		
1995	3	465	3	81	23	415	3	82	24	471	-		
1995	4	229	33	84	27	207	54	85	28	236	29		
1995	5	62	116	89	41	64	149	90	42	72	100		
1995	6	0	336	93	51	0	315	94	52	0	304		

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville IHDD	Louisville ICDD	Louisville IMax	Louisville IMin
1995	7	0	510	102	60	0	457	103	61	0	466		
1995	8	0	577	100	61	0	495	101	62	0	544		
1995	9	50	169	94	36	61	125	95	37	48	165		
1995	10	168	29	86	34	197	16	87	35	192	21		
1995	11	710	0	71	19	686	0	72	20	693	-		
1995	12	904	0	72	3	874	0	73	5	915	-		
1996	1	1048	0	66	6	994	0	68	8	1002	-		
1996	2	829	0	77	-7	782	4	78	(5)	782	-		
1996	3	819	0	72	9	739	0	73	11	738	-		
1996	4	407	8	81	25	337	12	82	26	353	18		
1996	5	75	154	91	39	46	197	92	40	66	183		
1996	6	5	282	96	49	3	316	97	50	2	298		
1996	7	0	321	95	51	0	345	96	52	0	330		
1996	8	0	338	93	57	0	367	94	58	0	356		
1996	9	70	105	87	41	40	132	88	42	97	125		
1996	10	253	6	80	31	216	16	81	32	202	19		
1996	11	732	10	69	11	656	1	70	13	689	-		
1996	12	830	0	68	10	760	0	69	12	741	-		
1997	1	1108	0	68	-3	1019	0	69	(1)	1005	-		
1997	2	702	0	73	23	625	0	74	24	634	-		
1997	3	542	0	75	20	455	0	76	21	472	-		
1997	4	428	0	82	25	372	3	83	26	366	2		
1997	5	172	32	86	34	129	49	87	35	140	35		
1997	6	11	227	92	53	5	253	93	54	12	237		
1997	7	0	386	98	56	0	425	99	57	0	435		
1997	8	0	288	91	53	0	321	92	54	0	330		
1997	9	24	116	92	45	18	142	93	46	9	174		
1997	10	300	70	86	26	292	78	87	27	263	79		
1997	11	692	0	70	14	670	0	71	15	621	-		
1997	12	922	0	59	8	860	0	61	10	854	-		
1998	1	786	0	67	11	750	0	68	13	696	-		
1998	2	635	0	69	15	577	0	70	16	594	-		
1998	3	604	28	81	11	576	36	82	13	561	44		
1998	4	301	3	74	30	255	9	75	31	261	4		

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville lHDD	Louisville lCDD	Louisville lMax	Louisville lMin
1998	5	30	188	90	49	26	223	91	50	27	200		
1998	6	20	330	94	48	9	357	95	49	15	321		
1998	7	0	398	95	63	0	429	96	63	0	416		
1998	8	0	370	95	58	0	384	96	59	0	436		
1998	9	4	276	96	47	2	304	97	48	0	345		
1998	10	181	35	89	33	158	50	90	34	119	52		
1998	11	492	0	71	26	428	2	72	27	405	-		
1998	12	810	1	73	7	754	4	74	9	711	7		
1999	1	931	0	66	2	839	0	68	4	866	-		
1999	2	667	0	75	19	588	0	76	20	620	-		
1999	3	720	0	72	21	654	0	73	22	676	-		
1999	4	220	10	81	35	168	28	82	36	183	18		
1999	5	39	59	85	45	32	69	86	46	16	103		
1999	6	4	297	91	50	0	324	92	51	0	345		
1999	7	0	454	98	59	0	520	99	60	0	573		
1999	8	0	298	95	53	0	361	96	54	0	427		
1999	9	53	158	97	37	45	185	98	38	20	238		
1999	10	257	8	82	26	213	37	83	27	197	12		
1999	11	404	0	79	21	356	7	80	22	346	6		
1999	12	854	0	64	8	755	0	66	10	796	-		
2000	1	976	0	69	6	884	0	70	8	942	-		
2000	2	641	0	76	14	590	4	77	15	575	5		
2000	3	518	0	78	19	450	3	79	20	416	2		
2000	4	327	0	78	28	293	4	79	29	270	-		
2000	5	45	126	90	42	29	164	91	43	26	162		
2000	6	5	271	93	46	3	305	94	47	2	308		
2000	7	0	327	92	56	0	383	93	57	0	375		
2000	8	0	356	96	56	0	428	97	57	0	385		
2000	9	71	146	91	40	55	196	92	41	60	156		
2000	10	191	57	85	29	153	75	86	30	174	68		
2000	11	659	6	81	17	611	4	82	18	608	2		
2000	12	1277	0	56	0	1205	0	58	2	1198	-		
2001	1	1053	0	58	0	1006	0	58	5	980	0		
2001	2	716	0	67	11	643	0	70	16	664	0		

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville lHDD	Louisville lCDD	Louisville lMax	Louisville lMin
2001	3	723	0	64	20	682	0	66	19	674	0		
2001	4	183	79	85	26	147	101	87	29	175	103		
2001	5	37	126	91	42	30	141	91	46	31	150		
2001	6	12	251	92	48	8	268	93	52	8	280		
2001	7	0	400	96	55	0	446	99	55	0	433		
2001	8	0	369	93	58	0	410	93	57	0	445		
2001	9	67	141	90	37	60	152	91	37	52	174		
2001	10	267	11	82	27	236	20	83	27	224	40		
2001	11	421	0	74	28	396	2	75	28	339	1		
2001	12	754	0	70	13	713	0	70	13	689	0		
2002	1	827	0	69	10	781	1	70	11	743	0		
2002	2	738	0	62	16	705	0	64	16	677	0		
2002	3	654	0	73	12	603	0	74	13	579	0		
2002	4	240	60	85	26	203	70	86	29	204	77		
2002	5	126	97	87	37	100	120	88	39	114	110		
2002	6	0	347	93	54	0	387	95	54	0	391		
2002	7	0	481	96	63	0	526	98	63	0	514		
2002	8	0	436	97	56	0	453	99	58	0	496		
2002	9	10	273	97	45	9	274	98	45	1	314		
2002	10	297	43	88	34	267	46	89	35	252	51		
2002	11	647	0	76	22	606	0	77	20	585	3		
2002	12	871	0	62	10	825	0	66	10	821	0		
2003	1	1160	0	58	0	1109	0	60	(3)	1114	0		
2003	2	932	0	62	6	854	0	65	4	898	0		
2003	3	566	0	75	18	514	0	75	20	474	0		
2003	4	234	15	82	32	187	32	85	36	205	46		
2003	5	72	61	83	47	36	87	84	48	48	87		
2003	6	28	170	91	42	15	194	93	48	14	203		
2003	7	0	382	92	59	0	419	94	59	0	398		
2003	8	0	387	95	61	0	414	97	62	0	411		
2003	9	53	113	88	39	43	112	87	40	37	136		
2003	10	233	13	82	33	200	21	82	34	214	17		
2003	11	436	2	80	27	408	10	80	23	380	17		
2003	12	815	0	64	19	784	0	63	18	788	0		

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville lHDD	Louisville lCDD	Louisville lMax	Louisville lMin
2004	1	1051	0	66	(5)	948	2	69	6	982	0		
2004	2	834	0	66	11	782	0	67	15	758	0		
2004	3	487	6	81	23	409	11	80	23	435	18		
2004	4	245	33	83	31	231	36	82	30	209	41		
2004	5	48	211	89	40	41	239	88	44	40	255		
2004	6	0	276	91	54	0	275	92	54	0	339		
2004	7	1	331	93	56	0	350	96	52	0	398		
2004	8	9	231	91	48	12	252	93	46	1	296		
2004	9	10	161	88	44	12	184	90	43	8	221		
2004	10	169	18	83	33	140	42	86	35	128	24		
2004	11	440	2	77	30	412	3	77	28	402	2		
2004	12	959	0	64	(11)	898	0	64	(8)	873	0		
2005	1	829	1	69	9	760	1	69	11	820	1		
2005	2	679	0	69	22	598	0	71	22	648	0		
2005	3	684	0	75	19	587	1	75	19	656	0		
2005	4	259	9	81	34	210	13	81	35	207	29		
2005	5	122	75	88	34	97	106	90	35	95	89		
2005	6	0	319	94	57	0	335	96	56	0	365		
2005	7	0	398	94	57	0	419	94	57	0	459		
2005	8	0	450	97	63	0	474	96	60	0	494		
2005	9	16	241	91	43	21	260	92	42	9	292		
2005	10	226	46	88	29	233	59	88	29	206	72		
2005	11	514	5	79	15	457	17	83	18	469	5		
2005	12	991	0	59	3	941	0	64	8	954	0		
2006	1	683	0	69	21	644	0	68	20	638	0		72
2006	2	824	0	67	5	779	0	69	6	756	0		68
2006	3	567	2	78	25	511	19	81	23	548	0		77
2006	4	175	42	85	33	134	74	87	32	152	53		88
2006	5	111	91	92	44	62	117	92	46	98	106		91
2006	6	0	278	92	54	0	319	94	54	0	269		92
2006	7	0	420	95	57	0	427	96	56	0	452		94
2006	8	0	415	95	62	0	425	96	58	0	452		95
2006	9	59	70	87	43	50	99	88	41	44	102		86
2006	10	346	24	87	30	308	32	90	27	311	30		87

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville lHDD	Louisville lCDD	Louisville lMax	Louisville lMin
2006	11	542	0	75	24	503	0	77	23	471	2	78	
2006	12	737	0	67	9	681	0	66	10	670	0	70	
2007	1	859	0	64	9	848	0	62	9	805	0	68	
2007	2	1002	0	60	5	862	0	72	7	971	0	63	
2007	3	371	26	82	23	300	48	83	23	346	51	85	
2007	4	357	26	87	26	312	35	88	21	329	51	89	
2007	5	26	175	88	43	27	205	89	42	27	202	90	
2007	6	0	327	93	54	0	338	93	57	0	376	95	
2007	7	0	368	94	56	0	369	96	56	0	396	93	
2007	8	0	574	104	63	0	584	105	61	0	629	105	
2007	9	9	272	97	48	8	274	95	46	3	350	99	
2007	10	163	120	93	34	165	105	92	31	114	149	93	
2007	11	566	0	72	22	533	0	76	22	480	2	73	
2007	12	806	0	69	18	768	0	67	20	712	0	74	
2008	1	1014	0	68	6	940	0	70	10	935	2	71	
2008	2	856	0	70	15	782	2	76	18	787	0	70	
2008	3	615	0	72	21	516	0	75	22	569	0	73	
2008	4	306	17	84	31	283	15	86	29	237	31	84	
2008	5	107	56	87	41	66	83	88	39	65	68	88	
2008	6	0	351	93	55	0	366	93	54	0	413	95	
2008	7	0	399	95	59	0	438	96	58	0	466	97	
2008	8	0	344	94	56	0	347	94	55	0	436	97	
2008	9	4	212	94	51	6	210	96	49	0	273	97	
2008	10	248	42	87	29	227	47	87	30	212	57	87	
2008	11	634	0	76	17	604	0	76	16	578	0	76	
2008	12	906	0	73	5	850	0	74	7	849	1	71	
2009	1	1112	0	61	(1)	863	0	65	3	1080	0	61	
2009	2	734	0	70	6	655	0	72	10	687	0	70	
2009	3	478	3	77	14	419	7	78	18	449	1	78	
2009	4	290	50	86	31	251	61	85	33	259	64	88	
2009	5	62	103	88	42	47	131	87	43	48	113	87	
2009	6	4	368	97	50	3	406	98	51	7	329	92	
2009	7	0	270	91	56	0	314	93	58	0	268	89	
2009	8	0	309	93	54	0	315	91	54	0	339	91	

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville lHDD	Louisville lCDD	Louisville lMax	Louisville lMin
2009	9	18	178	86	45	15	209	86	43	18	206	86	
2009	10	345	0	74	32	303	1	77	31	304	4	81	
2009	11	447	0	73	28	418	0	74	28	407	0	74	
2009	12	923	0	58	16	903	0	59	17	873	0	64	
2010	1	1146	0	56	1	1083	0	60	1	1075	0	57	
2010	2	974	0	61	11	899	0	65	12	949	0	63	
2010	3	539	0	79	21	511	1	77	21	489	0	79	
2010	4	152	43	86	36	133	54	84	37	131	70	87	
2010	5	53	167	91	38	42	191	91	42	39	218	92	
2010	6	0	423	95	61	0	445	94	59	0	492	95	
2010	7	0	489	96	56	0	523	98	57	0	561	97	
2010	8	0	514	102	54	0	529	104	55	0	560	102	
2010	9	10	231	98	44	14	237	96	45	2	311	99	
2010	10	183	35	91	29	182	31	89	29	115	63	91	
2010	11	540	2	79	23	500	2	78	24	450	5	77	
2010	12	1079	0	64	2	1013	0	64	4	1053	0	68	
2011	1	1118	0	58	4	1034	0	40	10	1051	0	62	
2011	2	746	0	72	6	711	0	74	(4)	669	0	71	
2011	3	543	4	79	26	504	6	79	25	481	16	82	
2011	4	176	42	85	31	140	52	86	36	139	58	90	
2011	5	133	151	91	37	116	162	91	36	102	188	94	
2011	6	0	345	98	59	0	398	98	57	0	379	95	
2011	7	0	522	99	67	0	531	97	65	0	577	98	
2011	8	0	411	46	125	0	407	99	56	0	451	97	
2011	9	46	125	100	48	36	127	99	48	39	153	102	
2011	10	252	13	85	33	232	15	84	31	232	27	85	
2011	11	436	3	76	26	422	5	76	24	387	3	76	
2011	12	745	0	65	20	716	0	64	20	677	0	66	
2012	1	856	0	63	12	766	0	67	17	793	0	64	
2012	2	704	0	70	18	631	0	74	17	650	0	70	
2012	3	217	48	84	27	189	60	83	27	227	69	85	
2012	4	217	48	86	31	210	76	86	30	194	34	85	
2012	5	10	239	94	47	12	247	95	44	10	252	93	
2012	6	9	349	107	49	7	356	108	47	7	352	105	

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville lHDD	Louisville lCDD	Louisville lMax	Louisville lMin
2012	7	0	612	107	65	0	613	107	66	0	610	106	
2012	8	0	371	99	55	0	429	101	53	0	424	97	
2012	9	43	154	92	39	40	171	93	38	32	180	92	
2012	10	300	22	81	34	280	25	81	31	258	27	81	
2012	11	619	0	73	22	572	0	72	21	564	0	74	
2012	12	691	2	73	12	635	1	71	18	637	4	75	

Insert Row

Year	eHDD	eCDD	pHDD	pCDD		
1970	4893	1396	0	0	0	0
1971	4428	1566	0	0	0	0
1972	4909	1160	0	0	0	0
1973	4188	1567	0	0	0	0
1974	4172	1229	0	0	0	0
1975	4283	1500	0	0	0	0
1976	4784	1112	0	0	0	0
1977	4799	1779	0	0	0	0
1978	5420	1550	0	0	0	0
1979	5227	1238	0	0	0	0
1980	5095	1726	0	0	4818	1739
1981	4548	1389	0	0	4464	1422
1982	4399	1349	0	0	4356	1214
1983	4640	1664	0	0	4679	1605
1984	4622	1365	4148	1501	4365	1359
1985	4785	1445	4479	1439	4451	1349
1986	4386	1576	3946	1734	4112	1598
1987	4290	1623	3868	1831	4080	1651
1988	4822	1500	4398	1658	4543	1594
1989	4830	1396	4443	1492	4584	1400

Year	Month	Evansville eHDD	Evansville eCDD	Evansville eMax	Evansville eMin	Paducah pHDD	Paducah pCDD	Paducah pMax	Paducah pMin	Louisville lHDD	Louisville lCDD	Louisville lMax	Louisville lMin
1990		3856	1380			3460	1557			3501	1566		
1991		4253	1757			3713	1965			3837	2020		12
1992		4217	1240			3724	1382			3941	1248		10
1993		4652	1613			4531	1686			4467	1557		
1994		4180	1489			3911	1409			4134	1444		8
1995		4314	1773			4129	1615			4331	1629		
1996		5068	1224			4573	1390			4672	1329		6
1997		4901	1119			4445	1271			4376	1292		4
1998		3863	1629			3535	1798			3389	1825		
1999		4149	1284			3650	1531			3720	1722		2
2000		4710	1289			4273	1566			4271	1463		
2001		4233	1377			3921	1540			3836	1626		
2002		4410	1737			4099	1877			3976	1956		
2003		4529	1143			4150	1289			4172	1315		
2004		4253	1269			3885	1394			3836	1594		
2005		4320	1544			3904	1685			4064	1806		
2006		4044	1342			3672	1512			3688	1466		
2007		4159	1888			3823	1958			3787	2206		
2008		4690	1421			4274	1508			4232	1747		
2009		4413	1281			3877	1444			4132	1324		
2010		4676	1904			4377	2013			4303	2280		
2011		4195	1616			3911	1703			3777	1852		
2012		3666	1845			3342	1978			3372	1952		

Insert Row

Year	Month	PKYear	15-Year	20-Year	15-Year	20-Year
			Norm Mo	Norm Mo	Norm An	Norm An
1970	1	1970	0.01	0.01	0	0
1970	2	1970	0.02	0.02	0	0
1970	3	1970	0.03	0.03	0	0
1970	4	1970	0.04	0.04	0	0
1970	5	1970	0.05	0.05	0	0
1970	6	1970	0.06	0.06	0	0
1970	7	1970	0.07	0.07	0	0
1970	8	1970	0.08	0.08	0	0
1970	9	1970	0.09	0.09	0	0
1970	10	1970	0.10	0.10	0	0
1970	11	1971	0.11	0.11	0	0
1970	12	1971	0.12	0.12	0	0
1971	1	1971	0.01	0.01	0	0
1971	2	1971	0.02	0.02	0	0
1971	3	1971	0.03	0.03	0	0
1971	4	1971	0.04	0.04	0	0
1971	5	1971	0.05	0.05	0	0
1971	6	1971	0.06	0.06	0	0
1971	7	1971	0.07	0.07	0	0
1971	8	1971	0.08	0.08	0	0
1971	9	1971	0.09	0.09	0	0
1971	10	1971	0.10	0.10	0	0
1971	11	1972	0.11	0.11	0	0
1971	12	1972	0.12	0.12	0	0
1972	1	1972	0.01	0.01	0	0
1972	2	1972	0.02	0.02	0	0
1972	3	1972	0.03	0.03	0	0
1972	4	1972	0.04	0.04	0	0
1972	5	1972	0.05	0.05	0	0
1972	6	1972	0.06	0.06	0	0
1972	7	1972	0.07	0.07	0	0
1972	8	1972	0.08	0.08	0	0
1972	9	1972	0.09	0.09	0	0
1972	10	1972	0.10	0.10	0	0

Year	Month	PKYear	15-Year	20-Year	15-Year	20-Year
			Norm Mo	Norm Mo	Norm An	Norm An
1972	11	1973	0.11	0.11	0	0
1972	12	1973	0.12	0.12	0	0
1973	1	1973	0.01	0.01	0	0
1973	2	1973	0.02	0.02	0	0
1973	3	1973	0.03	0.03	0	0
1973	4	1973	0.04	0.04	0	0
1973	5	1973	0.05	0.05	0	0
1973	6	1973	0.06	0.06	0	0
1973	7	1973	0.07	0.07	0	0
1973	8	1973	0.08	0.08	0	0
1973	9	1973	0.09	0.09	0	0
1973	10	1973	0.10	0.10	0	0
1973	11	1974	0.11	0.11	0	0
1973	12	1974	0.12	0.12	0	0
1974	1	1974	0.01	0.01	0	0
1974	2	1974	0.02	0.02	0	0
1974	3	1974	0.03	0.03	0	0
1974	4	1974	0.04	0.04	0	0
1974	5	1974	0.05	0.05	0	0
1974	6	1974	0.06	0.06	0	0
1974	7	1974	0.07	0.07	0	0
1974	8	1974	0.08	0.08	0	0
1974	9	1974	0.09	0.09	0	0
1974	10	1974	0.10	0.10	0	0
1974	11	1975	0.11	0.11	0	0
1974	12	1975	0.12	0.12	0	0
1975	1	1975	0.01	0.01	0	0
1975	2	1975	0.02	0.02	0	0
1975	3	1975	0.03	0.03	0	0
1975	4	1975	0.04	0.04	0	0
1975	5	1975	0.05	0.05	0	0
1975	6	1975	0.06	0.06	0	0
1975	7	1975	0.07	0.07	0	0
1975	8	1975	0.08	0.08	0	0

Year	Month	PKYear	15-Year	20-Year	15-Year	20-Year
			Norm Mo	Norm Mo	Norm An	Norm An
1975	9	1975	0.09	0.09	0	0
1975	10	1975	0.10	0.10	0	0
1975	11	1976	0.11	0.11	0	0
1975	12	1976	0.12	0.12	0	0
1976	1	1976	0.01	0.01	0	0
1976	2	1976	0.02	0.02	0	0
1976	3	1976	0.03	0.03	0	0
1976	4	1976	0.04	0.04	0	0
1976	5	1976	0.05	0.05	0	0
1976	6	1976	0.06	0.06	0	0
1976	7	1976	0.07	0.07	0	0
1976	8	1976	0.08	0.08	0	0
1976	9	1976	0.09	0.09	0	0
1976	10	1976	0.10	0.10	0	0
1976	11	1977	0.11	0.11	0	0
1976	12	1977	0.12	0.12	0	0
1977	1	1977	0.01	0.01	0	0
1977	2	1977	0.02	0.02	0	0
1977	3	1977	0.03	0.03	0	0
1977	4	1977	0.04	0.04	0	0
1977	5	1977	0.05	0.05	0	0
1977	6	1977	0.06	0.06	0	0
1977	7	1977	0.07	0.07	0	0
1977	8	1977	0.08	0.08	0	0
1977	9	1977	0.09	0.09	0	0
1977	10	1977	0.10	0.10	0	0
1977	11	1978	0.11	0.11	0	0
1977	12	1978	0.12	0.12	0	0
1978	1	1978	0.01	0.01	0	0
1978	2	1978	0.02	0.02	0	0
1978	3	1978	0.03	0.03	0	0
1978	4	1978	0.04	0.04	0	0
1978	5	1978	0.05	0.05	0	0
1978	6	1978	0.06	0.06	0	0

Year	Month	PKYear	15-Year	20-Year	15-Year	20-Year
			Norm Mo	Norm Mo	Norm An	Norm An
1978	7	1978	0.07	0.07	0	0
1978	8	1978	0.08	0.08	0	0
1978	9	1978	0.09	0.09	0	0
1978	10	1978	0.10	0.10	0	0
1978	11	1979	0.11	0.11	0	0
1978	12	1979	0.12	0.12	0	0
1979	1	1979	0.01	0.01	0	0
1979	2	1979	0.02	0.02	0	0
1979	3	1979	0.03	0.03	0	0
1979	4	1979	0.04	0.04	0	0
1979	5	1979	0.05	0.05	0	0
1979	6	1979	0.06	0.06	0	0
1979	7	1979	0.07	0.07	0	0
1979	8	1979	0.08	0.08	0	0
1979	9	1979	0.09	0.09	0	0
1979	10	1979	0.10	0.10	0	0
1979	11	1980	0.11	0.11	0	0
1979	12	1980	0.12	0.12	0	0
1980	1	1980	0.01	0.01	0	0
1980	2	1980	0.02	0.02	0	0
1980	3	1980	0.03	0.03	0	0
1980	4	1980	0.04	0.04	0	0
1980	5	1980	0.05	0.05	0	0
1980	6	1980	0.06	0.06	0	0
1980	7	1980	0.07	0.07	0	0
1980	8	1980	0.08	0.08	0	0
1980	9	1980	0.09	0.09	0	0
1980	10	1980	0.10	0.10	0	0
1980	11	1981	0.11	0.11	0	0
1980	12	1981	0.12	0.12	0	0
1981	1	1981	0.01	0.01	0	0
1981	2	1981	0.02	0.02	0	0
1981	3	1981	0.03	0.03	0	0
1981	4	1981	0.04	0.04	0	0

Year	Month	PKYear	15-Year	20-Year	15-Year	20-Year
			Norm Mo	Norm Mo	Norm An	Norm An
1981	5	1981	0.05	0.05	0	0
1981	6	1981	0.06	0.06	0	0
1981	7	1981	0.07	0.07	0	0
1981	8	1981	0.08	0.08	0	0
1981	9	1981	0.09	0.09	0	0
1981	10	1981	0.10	0.10	0	0
1981	11	1982	0.11	0.11	0	0
1981	12	1982	0.12	0.12	0	0
1982	1	1982	0.01	0.01	0	0
1982	2	1982	0.02	0.02	0	0
1982	3	1982	0.03	0.03	0	0
1982	4	1982	0.04	0.04	0	0
1982	5	1982	0.05	0.05	0	0
1982	6	1982	0.06	0.06	0	0
1982	7	1982	0.07	0.07	0	0
1982	8	1982	0.08	0.08	0	0
1982	9	1982	0.09	0.09	0	0
1982	10	1982	0.10	0.10	0	0
1982	11	1983	0.11	0.11	0	0
1982	12	1983	0.12	0.12	0	0
1983	1	1983	0.01	0.01	0	0
1983	2	1983	0.02	0.02	0	0
1983	3	1983	0.03	0.03	0	0
1983	4	1983	0.04	0.04	0	0
1983	5	1983	0.05	0.05	0	0
1983	6	1983	0.06	0.06	0	0
1983	7	1983	0.07	0.07	0	0
1983	8	1983	0.08	0.08	0	0
1983	9	1983	0.09	0.09	0	0
1983	10	1983	0.10	0.10	0	0
1983	11	1984	0.11	0.11	0	0
1983	12	1984	0.12	0.12	0	0
1984	1	1984	0.01	0.01	0	0
1984	2	1984	0.02	0.02	0	0

Year	Month	PKYear	15-Year	20-Year	15-Year	20-Year
			Norm Mo	Norm Mo	Norm An	Norm An
1984	3	1984	0.03	0.03	0	0
1984	4	1984	0.04	0.04	0	0
1984	5	1984	0.05	0.05	0	0
1984	6	1984	0.06	0.06	0	0
1984	7	1984	0.07	0.07	0	0
1984	8	1984	0.08	0.08	0	0
1984	9	1984	0.09	0.09	0	0
1984	10	1984	0.10	0.10	0	0
1984	11	1985	0.11	0.11	0	0
1984	12	1985	0.12	0.12	0	0
1985	1	1985	0.01	0.01	0	0
1985	2	1985	0.02	0.02	0	0
1985	3	1985	0.03	0.03	0	0
1985	4	1985	0.04	0.04	0	0
1985	5	1985	0.05	0.05	0	0
1985	6	1985	0.06	0.06	0	0
1985	7	1985	0.07	0.07	0	0
1985	8	1985	0.08	0.08	0	0
1985	9	1985	0.09	0.09	0	0
1985	10	1985	0.10	0.10	0	0
1985	11	1986	0.11	0.11	0	0
1985	12	1986	0.12	0.12	0	0
1986	1	1986	0.01	0.01	0	0
1986	2	1986	0.02	0.02	0	0
1986	3	1986	0.03	0.03	0	0
1986	4	1986	0.04	0.04	0	0
1986	5	1986	0.05	0.05	0	0
1986	6	1986	0.06	0.06	0	0
1986	7	1986	0.07	0.07	0	0
1986	8	1986	0.08	0.08	0	0
1986	9	1986	0.09	0.09	0	0
1986	10	1986	0.10	0.10	0	0
1986	11	1987	0.11	0.11	0	0
1986	12	1987	0.12	0.12	0	0

Year	Month	PKYear	15-Year	20-Year	15-Year	20-Year		
			Norm Mo	Norm Mo	Norm An	Norm An		
1987	1	1987	0.01	0.01	0	0		
1987	2	1987	0.02	0.02	0	0		
1987	3	1987	0.03	0.03	0	0		
1987	4	1987	0.04	0.04	0	0		
1987	5	1987	0.05	0.05	0	0		
1987	6	1987	0.06	0.06	0	0		
1987	7	1987	0.07	0.07	0	0		
1987	8	1987	0.08	0.08	0	0		
1987	9	1987	0.09	0.09	0	0		
1987	10	1987	0.10	0.10	0	0		
1987	11	1988	0.11	0.11	0	0		
1987	12	1988	0.12	0.12	0	0		
1988	1	1988	0.01	0.01	0	0		
1988	2	1988	0.02	0.02	0	0		
1988	3	1988	0.03	0.03	0	0		
1988	4	1988	0.04	0.04	0	0		
1988	5	1988	0.05	0.05	0	0		
1988	6	1988	0.06	0.06	0	0		
1988	7	1988	0.07	0.07	0	0		
1988	8	1988	0.08	0.08	0	0		
1988	9	1988	0.09	0.09	0	0		
1988	10	1988	0.10	0.10	0	0		
1988	11	1989	0.11	0.11	0	0		
1988	12	1989	0.12	0.12	0	0		
1989	1	1989	0.01	0.01	0	0	68.5	21.4
1989	2	1989	0.02	0.02	0	0	65.5	8.5
1989	3	1989	0.03	0.03	0	0	79.5	20.4
1989	4	1989	0.04	0.04	0	0	91.4	26.4
1989	5	1989	0.05	0.05	0	0	92.4	37.3
1989	6	1989	0.06	0.06	0	0	95.4	53.2
1989	7	1989	0.07	0.07	0	0	96.4	62.2
1989	8	1989	0.08	0.08	0	0	93.4	52.2
1989	9	1989	0.09	0.09	0	0	92.4	38.3
1989	10	1989	0.10	0.10	0	0	91.4	32.4

Year	Month	PKYear	15-Year Norm Mo	20-Year Norm Mo	15-Year Norm An	20-Year Norm An		
1989	11	1990	0.11	0.11	0	0	75.5	22.4
1989	12	1990	0.12	0.12	0	0	59.5	-14.3
1990	1	1990	0.01	0.01	0	0	69.5	17.5
1990	2	1990	0.02	0.02	0	0	66.5	18.5
1990	3	1990	0.03	0.03	0	0	82.5	22.4
1990	4	1990	0.04	0.04	0	0	87.4	23.4
1990	5	1990	0.05	0.05	0	0	82.5	40.3
1990	6	1990	0.06	0.06	0	0	94.4	45.3
1990	7	1990	0.07	0.07	0	0	100.4	52.2
1990	8	1990	0.08	0.08	0	0	96.4	52.2
1990	9	1990	0.09	0.09	0	0	100.4	39.3
1990	10	1990	0.10	0.10	0	0	85.4	29.4
1990	11	1991	0.11	0.11	0	0	79.5	26.4
1990	12	1991	0.12	0.12	0	0	63.5	4.6
1991	1	1991	0.01	0.01	0	0	49.5	12.5
1991	2	1991	0.02	0.02	0	0	68.5	9.5
1991	3	1991	0.03	0.03	0	0	80.5	23.4
1991	4	1991	0.04	0.04	0	0	83.4	36.3
1991	5	1991	0.05	0.05	0	0	90.4	40.3
1991	6	1991	0.06	0.06	0	0	96.4	54.2
1991	7	1991	0.07	0.07	0	0	96.4	57.2
1991	8	1991	0.08	0.08	0	0	98.4	54.2
1991	9	1991	0.09	0.09	0	0	96.4	37.3
1991	10	1991	0.10	0.10	0	0	86.4	27.4
1991	11	1992	0.11	0.11	0	0	70.5	16.5
1991	12	1992	0.12	0.12	0	0	64.5	15.5
1992	1	1992	0.01	0.01	0	0	57.5	5.5
1992	2	1992	0.02	0.02	0	0	70.5	14.5
1992	3	1992	0.03	0.03	0	0	78.5	20.4
1992	4	1992	0.04	0.04	0	0	85.4	29.4
1992	5	1992	0.05	0.05	0	0	89.4	39.3
1992	6	1992	0.06	0.06	0	0	94.4	46.3
1992	7	1992	0.07	0.07	0	0	94.4	60.2
1992	8	1992	0.08	0.08	0	0	95.4	53.2

Year	Month	PKYear	15-Year	20-Year	15-Year	20-Year		
			Norm Mo	Norm Mo	Norm An	Norm An		
1992	9	1992	0.09	0.09	0	0	90.4	41.3
1992	10	1992	0.10	0.10	0	0	85.4	30.4
1992	11	1993	0.11	0.11	0	0	74.5	24.4
1992	12	1993	0.12	0.12	0	0	63.5	13.5
1993	1	1993	0.01	1.01	0	1	64.5	17.5
1993	2	1993	0.02	1.02	0	1	66.5	1.6
1993	3	1993	0.03	1.03	0	1	79.5	12.5
1993	4	1993	0.04	1.04	0	1	79.5	28.4
1993	5	1993	0.05	1.05	0	1	91.4	45.3
1993	6	1993	0.06	1.06	0	1	96.4	45.3
1993	7	1993	0.07	1.07	0	1	99.4	62.2
1993	8	1993	0.08	1.08	0	1	99.4	61.2
1993	9	1993	0.09	1.09	0	1	93.4	38.3
1993	10	1993	0.10	1.10	0	1	82.5	31.4
1993	11	1994	0.11	1.11	0	1	72.5	22.4
1993	12	1994	0.12	1.12	0	1	60.5	9.5
1994	1	1994	0.01	1.01	0	1	60.5	-16.3
1994	2	1994	0.02	1.02	0	1	73.5	11.5
1994	3	1994	0.03	1.03	0	1	81.5	21.4
1994	4	1994	0.04	1.04	0	1	86.4	27.4
1994	5	1994	0.05	1.05	0	1	92.4	36.3
1994	6	1994	0.06	1.06	0	1	98.4	50.2
1994	7	1994	0.07	1.07	0	1	98.4	60.2
1994	8	1994	0.08	1.08	0	1	94.4	55.2
1994	9	1994	0.09	1.09	0	1	93.4	46.3
1994	10	1994	0.10	1.10	0	1	88.4	31.4
1994	11	1995	0.11	1.11	0	1	76.5	27.4
1994	12	1995	0.12	1.12	0	1	63.5	22.4
1995	1	1995	0.01	1.01	0	1	68.5	6.5
1995	2	1995	0.02	1.02	0	1	70.5	6.5
1995	3	1995	0.03	1.03	0	1	81.5	23.4
1995	4	1995	0.04	1.04	0	1	84.4	27.4
1995	5	1995	0.05	1.05	0	1	89.4	41.3
1995	6	1995	0.06	1.06	0	1	93.4	51.2

Year	Month	PKYear	15-Year Norm Mo	20-Year Norm Mo	15-Year Norm An	20-Year Norm An		
1995	7	1995	0.07	1.07	0	1	102.4	60.2
1995	8	1995	0.08	1.08	0	1	100.4	61.2
1995	9	1995	0.09	1.09	0	1	94.4	36.3
1995	10	1995	0.10	1.10	0	1	86.4	34.4
1995	11	1996	0.11	1.11	0	1	71.5	19.5
1995	12	1996	0.12	1.12	0	1	72.5	3.6
1996	1	1996	0.01	1.01	0	1	66.5	6.5
1996	2	1996	0.02	1.02	0	1	77.5	-6.4
1996	3	1996	0.03	1.03	0	1	72.5	9.5
1996	4	1996	0.04	1.04	0	1	81.5	25.4
1996	5	1996	0.05	1.05	0	1	91.4	39.3
1996	6	1996	0.06	1.06	0	1	96.4	49.3
1996	7	1996	0.07	1.07	0	1	95.4	51.2
1996	8	1996	0.08	1.08	0	1	93.4	57.2
1996	9	1996	0.09	1.09	0	1	87.4	41.3
1996	10	1996	0.10	1.10	0	1	80.5	31.4
1996	11	1997	0.11	1.11	0	1	69.5	11.5
1996	12	1997	0.12	1.12	0	1	68.5	10.5
1997	1	1997	0.01	1.01	0	1	68.5	-2.4
1997	2	1997	0.02	1.02	0	1	73.5	23.4
1997	3	1997	0.03	1.03	0	1	75.5	20.4
1997	4	1997	0.04	1.04	0	1	82.5	25.4
1997	5	1997	0.05	1.05	0	1	86.4	34.4
1997	6	1997	0.06	1.06	0	1	92.4	53.2
1997	7	1997	0.07	1.07	0	1	98.4	56.2
1997	8	1997	0.08	1.08	0	1	91.4	53.2
1997	9	1997	0.09	1.09	0	1	92.4	45.3
1997	10	1997	0.10	1.10	0	1	86.4	26.4
1997	11	1998	0.11	1.11	0	1	70.5	14.5
1997	12	1998	0.12	1.12	0	1	59.5	8.5
1998	1	1998	1.01	1.01	1	1	67.5	11.5
1998	2	1998	1.02	1.02	1	1	69.5	15.5
1998	3	1998	1.03	1.03	1	1	81.5	11.5
1998	4	1998	1.04	1.04	1	1	74.5	30.4

Year	Month	PKYear	15-Year Norm Mo	20-Year Norm Mo	15-Year Norm An	20-Year Norm An		
1998	5	1998	1.05	1.05	1	1	90.4	49.3
1998	6	1998	1.06	1.06	1	1	94.4	48.3
1998	7	1998	1.07	1.07	1	1	95.4	63.2
1998	8	1998	1.08	1.08	1	1	95.4	58.2
1998	9	1998	1.09	1.09	1	1	96.4	47.3
1998	10	1998	1.10	1.10	1	1	89.4	33.4
1998	11	1999	1.11	1.11	1	1	71.5	26.4
1998	12	1999	1.12	1.12	1	1	73.5	7.5
1999	1	1999	1.01	1.01	1	1	66.5	2.6
1999	2	1999	1.02	1.02	1	1	75.5	19.5
1999	3	1999	1.03	1.03	1	1	72.5	21.4
1999	4	1999	1.04	1.04	1	1	81.5	35.3
1999	5	1999	1.05	1.05	1	1	85.4	45.3
1999	6	1999	1.06	1.06	1	1	91.4	50.2
1999	7	1999	1.07	1.07	1	1	98.4	59.2
1999	8	1999	1.08	1.08	1	1	95.4	53.2
1999	9	1999	1.09	1.09	1	1	97.4	37.3
1999	10	1999	1.10	1.10	1	1	82.5	26.4
1999	11	2000	1.11	1.11	1	1	79.5	21.4
1999	12	2000	1.12	1.12	1	1	64.5	8.5
2000	1	2000	1.01	1.01	1	1	69.5	6.5
2000	2	2000	1.02	1.02	1	1	76.5	14.5
2000	3	2000	1.03	1.03	1	1	78.5	19.5
2000	4	2000	1.04	1.04	1	1	78.5	28.4
2000	5	2000	1.05	1.05	1	1	90.4	42.3
2000	6	2000	1.06	1.06	1	1	93.4	46.3
2000	7	2000	1.07	1.07	1	1	92.4	56.2
2000	8	2000	1.08	1.08	1	1	96.4	56.2
2000	9	2000	1.09	1.09	1	1	91.4	40.3
2000	10	2000	1.10	1.10	1	1	85.4	29.4
2000	11	2001	1.11	1.11	1	1	81.5	17.5
2000	12	2001	1.12	1.12	1	1	56.5	0.6
2001	1	2001	1.01	1.01	1	1	58.0	1.7
2001	2	2001	1.02	1.02	1	1	68.0	12.7

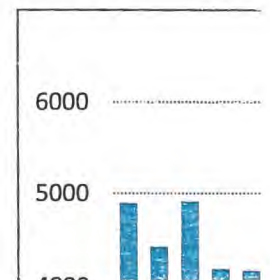
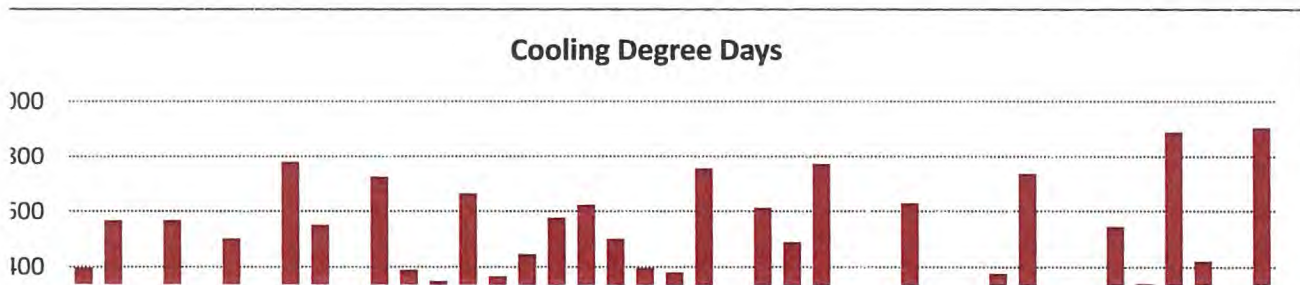
Year	Month	PKYear	15-Year Norm Mo	20-Year Norm Mo	15-Year Norm An	20-Year Norm An		
2001	3	2001	1.03	1.03	1	1	64.7	19.7
2001	4	2001	1.04	1.04	1	1	85.7	27.0
2001	5	2001	1.05	1.05	1	1	91.0	43.3
2001	6	2001	1.06	1.06	1	1	92.3	49.3
2001	7	2001	1.07	1.07	1	1	97.0	55.0
2001	8	2001	1.08	1.08	1	1	93.0	57.7
2001	9	2001	1.09	1.09	1	1	90.3	37.0
2001	10	2001	1.10	1.10	1	1	82.3	27.0
2001	11	2002	1.11	1.11	1	1	74.3	28.0
2001	12	2002	1.12	1.12	1	1	70.0	13.0
2002	1	2002	1.01	1.01	1	1	69.3	10.3
2002	2	2002	1.02	1.02	1	1	62.7	16.0
2002	3	2002	1.03	1.03	1	1	73.3	12.3
2002	4	2002	1.04	1.04	1	1	85.3	27.0
2002	5	2002	1.05	1.05	1	1	87.3	37.7
2002	6	2002	1.06	1.06	1	1	93.7	54.0
2002	7	2002	1.07	1.07	1	1	96.7	63.0
2002	8	2002	1.08	1.08	1	1	97.7	56.7
2002	9	2002	1.09	1.09	1	1	97.3	45.0
2002	10	2002	1.10	1.10	1	1	88.3	34.3
2002	11	2003	1.11	1.11	1	1	76.3	21.3
2002	12	2003	1.12	1.12	1	1	63.3	10.0
2003	1	2003	1.01	1.01	1	1	58.7	-1.0
2003	2	2003	1.02	1.02	1	1	63.0	5.3
2003	3	2003	1.03	1.03	1	1	75.0	18.7
2003	4	2003	1.04	1.04	1	1	83.0	33.3
2003	5	2003	1.05	1.05	1	1	83.3	47.3
2003	6	2003	1.06	1.06	1	1	91.7	44.0
2003	7	2003	1.07	1.07	1	1	92.7	59.0
2003	8	2003	1.08	1.08	1	1	95.7	61.3
2003	9	2003	1.09	1.09	1	1	87.7	39.3
2003	10	2003	1.10	1.10	1	1	82.0	33.3
2003	11	2004	1.11	1.11	1	1	80.0	25.7
2003	12	2004	1.12	1.12	1	1	63.7	18.7

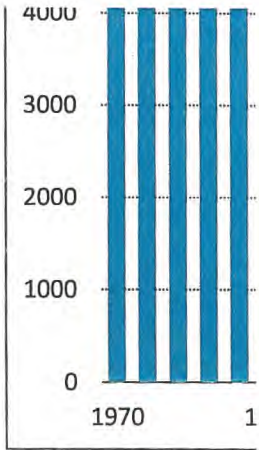
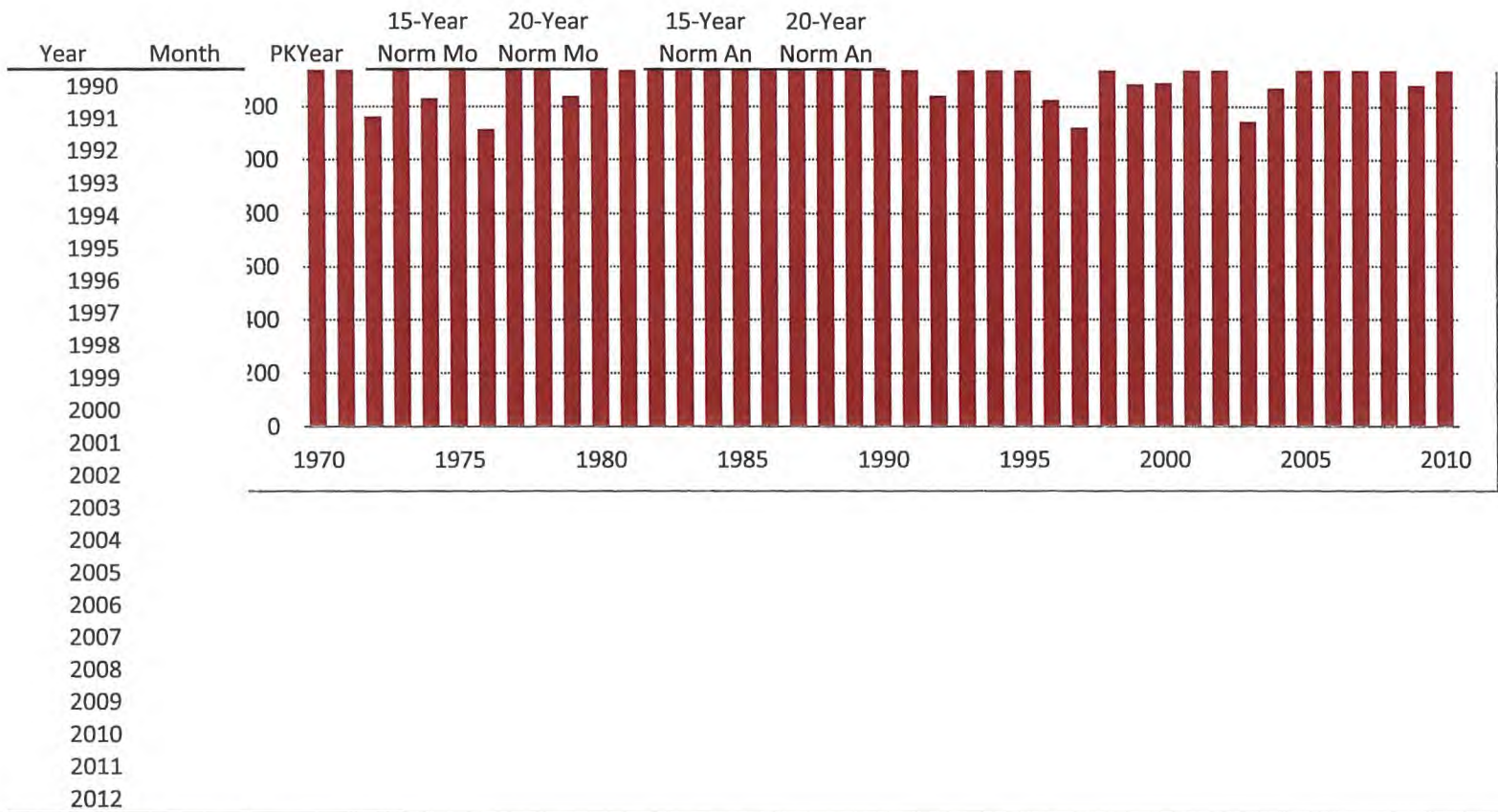
Year	Month	PKYear	15-Year	20-Year	15-Year	20-Year					
			Norm Mo	Norm Mo	Norm An	Norm An					
2006	11	2007	1.11	1.11	1	1	75.7	23.7	2	3	0%
2006	12	2007	1.12	1.12	1	1	66.7	9.3	3	4	0%
2007	1	2007	1.01	1.01	1	1	63.3	9.0	8	25	3%
2007	2	2007	1.02	1.02	1	1	64.0	5.7	13	33	4%
2007	3	2007	1.03	1.03	1	1	82.3	23.0	18	26	3%
2007	4	2007	1.04	1.04	1	1	87.3	24.4	23	48	5%
2007	5	2007	1.05	1.05	1	1	88.3	42.7	28	47	5%
2007	6	2007	1.06	1.06	1	1	93.0	55.0	33	37	4%
2007	7	2007	1.07	1.07	1	1	94.7	56.0	38	36	4%
2007	8	2007	1.08	1.08	1	1	104.3	62.3	43	38	4%
2007	9	2007	1.09	1.09	1	1	96.3	47.3	48	30	3%
2007	10	2007	1.10	1.10	1	1	92.7	33.0	53	38	4%
2007	11	2008	1.11	1.11	1	1	73.3	22.0	58	52	6%
2007	12	2008	1.12	1.12	1	1	68.3	18.7	63	57	6%
2008	1	2008	1.01	1.01	1	1	68.7	7.3	68	37	4%
2008	2	2008	1.02	1.02	1	1	72.0	16.0	73	50	5%
2008	3	2008	1.03	1.03	1	1	73.0	21.3	78	41	4%
2008	4	2008	1.04	1.04	1	1	84.7	30.3	83	54	6%
2008	5	2008	1.05	1.05	1	1	87.3	40.3	93	145	15%
2008	6	2008	1.06	1.06	1	1	93.0	54.7	95	40	4%
2008	7	2008	1.07	1.07	1	1	95.3	58.7	96	17	2%
2008	8	2008	1.08	1.08	1	1	94.0	55.7	97	8	1%
2008	9	2008	1.09	1.09	1	1	94.7	50.3	102	32	3%
2008	10	2008	1.10	1.10	1	1	87.0	29.3	107	1	0%
2008	11	2009	1.11	1.11	1	1	76.0	16.7		936	
2008	12	2009	1.12	1.12	1	1	73.3	5.7			
2009	1	2009	1.01	1.01	1	1	62.3	0.3			
2009	2	2009	1.02	1.02	1	1	70.7	7.3			
2009	3	2009	1.03	1.03	1	1	77.3	15.3			
2009	4	2009	1.04	1.04	1	1	85.7	31.7			
2009	5	2009	1.05	1.05	1	1	87.7	42.3			
2009	6	2009	1.06	1.06	1	1	97.3	50.3			
2009	7	2009	1.07	1.07	1	1	91.7	56.7			
2009	8	2009	1.08	1.08	1	1	92.3	54.0			

Year	Month	PKYear	15-Year Norm Mo	20-Year Norm Mo	15-Year Norm An	20-Year Norm An		
2009	9	2009	1.09	1.09	1	1	86.0	44.3
2009	10	2009	1.10	1.10	1	1	75.0	31.7
2009	11	2010	1.11	1.11	1	1	73.3	28.0
2009	12	2010	1.12	1.12	1	1	58.3	16.3
2010	1	2010	1.01	1.01	1	1	57.3	1.0
2010	2	2010	1.02	1.02	1	1	62.3	11.3
2010	3	2010	1.03	1.03	1	1	78.3	21.0
2010	4	2010	1.04	1.04	1	1	85.3	36.3
2010	5	2010	1.05	1.05	1	1	91.0	39.3
2010	6	2010	1.06	1.06	1	1	94.7	60.3
2010	7	2010	1.07	1.07	1	1	96.7	56.3
2010	8	2010	1.08	1.08	1	1	102.7	54.3
2010	9	2010	1.09	1.09	1	1	97.3	44.3
2010	10	2010	1.10	1.10	1	1	90.3	29.0
2010	11	2011	1.11	1.11	1	1	78.7	23.3
2010	12	2011	1.12	1.12	1	1	64.0	2.7
2011	1	2011	1.01	1.01	1	1	52.1	6.0
2011	2	2011	1.02	1.02	1	1	72.7	2.7
2011	3	2011	1.03	1.03	1	1	79.0	25.7
2011	4	2011	1.04	1.04	1	1	85.3	32.7
2011	5	2011	1.05	1.05	1	1	91.0	36.7
2011	6	2011	1.06	1.06	1	1	98.0	58.3
2011	7	2011	1.07	1.07	1	1	98.3	66.3
2011	8	2011	1.08	1.08	1	1	63.5	102.2
2011	9	2011	1.09	1.09	1	1	99.7	48.0
2011	10	2011	1.10	1.10	1	1	84.7	32.3
2011	11	2012	1.11	1.11	1	1	76.0	25.3
2011	12	2012	1.12	1.12	1	1	64.7	20.0
2012	1	2012	1.01	1.01	1	1	64.3	13.7
2012	2	2012	1.02	1.02	1	1	71.3	17.7
2012	3	2012	1.03	1.03	1	1	83.7	27.0
2012	4	2012	1.04	1.04	1	1	86.0	30.7
2012	5	2012	1.05	1.05	1	1	94.3	46.0
2012	6	2012	1.06	1.06	1	1	107.3	48.3

Year	Month	PKYear	15-Year Norm Mo	20-Year Norm Mo	15-Year Norm An	20-Year Norm An		
2012	7	2012	1.07	1.07	1	1	107.0	65.3
2012	8	2012	1.08	1.08	1	1	99.7	54.3
2012	9	2012	1.09	1.09	1	1	92.3	38.7
2012	10	2012	1.10	1.10	1	1	81.0	33.0
2012	11	2013	1.11	1.11	1	1	72.7	21.7
2012	12	2013	1.12	1.12	1	1	72.3	14.0
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<u>Year</u>	<u>Month</u>
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2006	4	
2006	5	0%
2006	6	1%
2006	7	1%
2006	8	2%
2006	9	3%
2006	10	4%

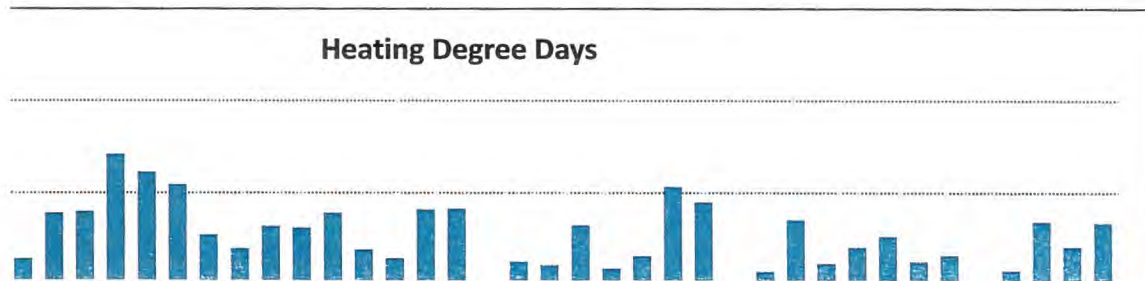
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2006	11	4%
2006	12	5%
2007	1	7%
2007	2	11%
2007	3	14%
2007	4	19%
2007	5	24%
2007	6	28%
2007	7	32%
2007	8	36%
2007	9	39%
2007	10	43%
2007	11	49%
2007	12	55%
2008	1	59%
2008	2	64%
2008	3	68%
2008	4	74%
2008	5	90%
2008	6	94%
2008	7	96%
2008	8	96%
2008	9	100%
2008	10	100%
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2008	12	
2009	1	
2009	2	
2009	3	
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2009	5	
2009	6	
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2009	8	

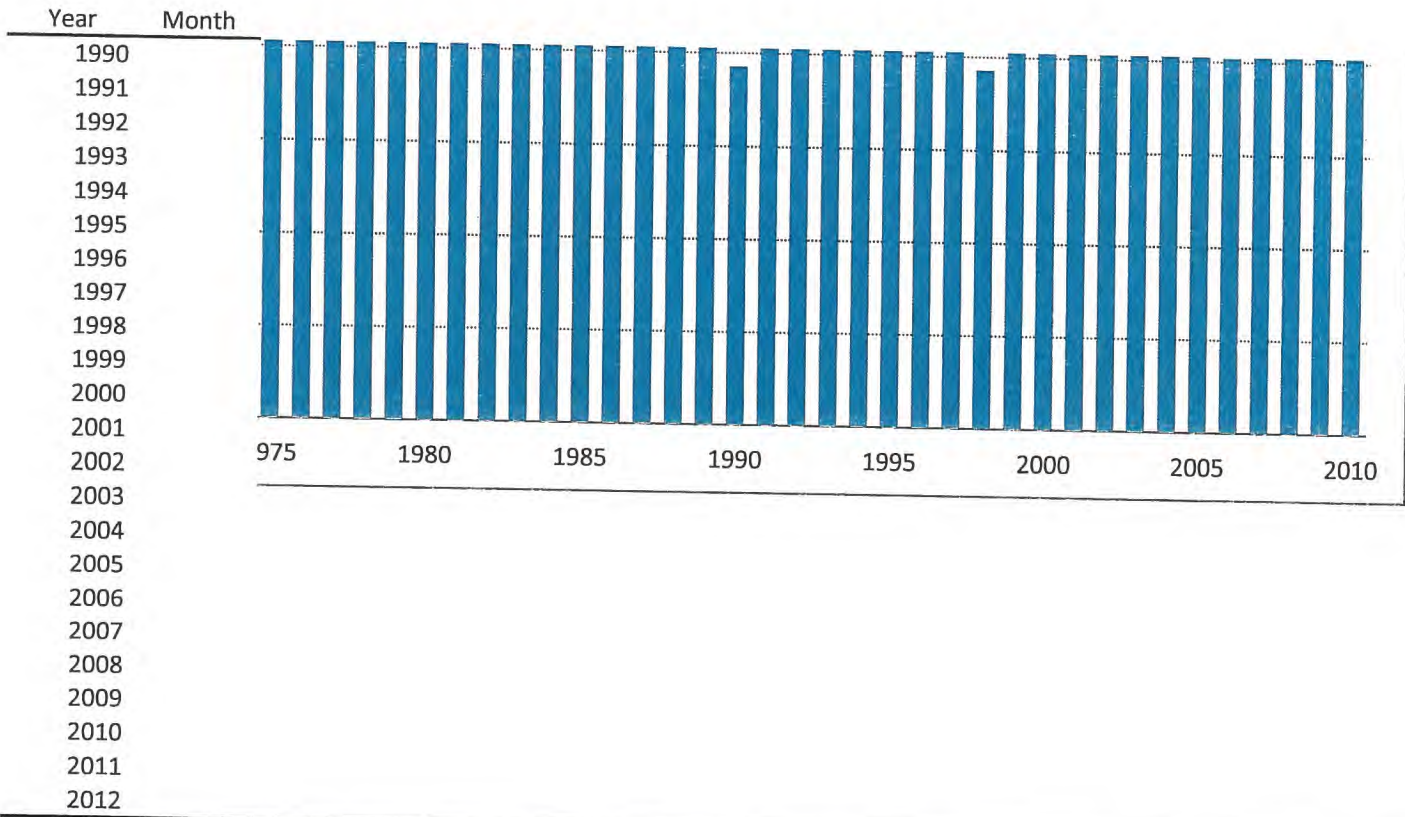
<u>Year</u>	<u>Month</u>
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Year	Month
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1989





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Year	(Multiple Items)
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Change YEAR range to get most recent 20 years

		Data						
Month	Average of eHDD	Average of eCDD	Average of pHDD	Average of pCDD	Average of IHDD	Average of ICDD	Count of Year	
1	976	0	903	0	922	0	20	
2	784	0	716	1	737	0	20	
3	569	6	507	10	525	10	20	
4	264	28	227	40	230	39	20	
5	74	121	57	144	62	140	20	
6	6	316	3	336	4	335	20	
7	0	424	-	448	-	462	20	
8	0	391	1	407	0	439	20	
9	36	170	46	182	23	214	20	
10	243	31	224	39	210	42	20	
11	547	2	510	3	492	3	20	
12	873	0	822	0	819	1	20	

4,371

1,489

4,014

1,608

4,022

1,684

Month	Evansville HDD	Evansville CDD	Paducah HDD	Paducah CDD	Louisville HDD	Louisville CDD	MUST MATCH PIVOT TABLE ON PRIOR SHEET!!!	
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15-Year Norm

Current Year	2012
15-Year First	1998
20-Year First	1993

1	960	0	884	0	901	0		
2	779	0	710	0	727	0		
3	552	8	495	13	505	13		
4	245	32	210	44	210	45		
5	68	128	51	152	52	154		
6	5	313	3	338	4	344		
7	0	417	0	447	0	460		
8	1	389	1	414	0	445		
9	32	183	28	200	22	230		
10	244	32	220	40	204	46		
11	520	1	482	3	458	3		
12	881	0	829	0	820	1		
	4,287	1,505	3,913	1,653	3,904	1,742		

20-Year Norm

1	976	0	903	0	922	0	0	949
2	784	0	716	1	737	0	0	760
3	569	6	507	10	525	10	8	547
4	264	28	227	40	230	39	33	247
5	74	121	57	144	62	140	130	68
6	6	316	3	336	4	335	325	5
7	0	424	0	448	0	455	440	0
8	0	391	1	407	0	435	413	0
9	36	170	46	182	27	210	190	32
10	243	31	224	39	210	42	37	226
11	547	2	510	3	492	3	2	519
12	873	0	822	0	819	1	0	846
	4,371	1,489	4,014	1,608	4,027	1,669		

Year	Evansville				Paducah				Louisville				Relative to Normal
	Heating Degree Days	Cooling Degree Days	Total Degree Days	Rank	Heating Degree Days	Cooling Degree Days	Total Degree Days	Rank	Heating Degree Days	Cooling Degree Days	Total Degree Days	Rank	
1993	4,652	1,613	6,265	3	4,531	1,686	6,217	2	4,467	1,557	6,024	2	6.9%
1994	4,180	1,489	5,669	14	3,911	1,409	5,320	16	4,134	1,444	5,578	12	-3.3%
1995	4,314	1,773	6,087	6	4,129	1,615	5,744	8	4,331	1,629	5,960	6	3.9%
1996	5,068	1,224	6,292	2	4,573	1,390	5,963	4	4,672	1,329	6,001	3	7.4%
1997	4,901	1,119	6,020	8	4,445	1,271	5,716	9	4,376	1,292	5,668	10	2.7%
1998	3,863	1,629	5,492	18	3,535	1,798	5,333	14	3,389	1,825	5,214	19	-6.3%
1999	4,149	1,284	5,433	19	3,650	1,531	5,181	20	3,720	1,722	5,442	16	-7.3%
2000	4,710	1,289	5,999	9	4,273	1,566	5,839	5	4,271	1,463	5,734	9	2.4%
2001	4,233	1,377	5,610	15	3,921	1,540	5,461	12	3,836	1,626	5,462	14	-4.3%
2002	4,410	1,737	6,147	4	4,099	1,877	5,976	3	3,976	1,956	5,932	7	4.9%
2003	4,529	1,143	5,672	13	4,150	1,289	5,439	13	4,172	1,315	5,487	13	-3.2%
2004	4,253	1,269	5,522	16	3,885	1,394	5,279	18	3,836	1,594	5,430	17	-5.8%
2005	4,320	1,544	5,864	10	3,904	1,685	5,589	11	4,064	1,806	5,870	8	0.1%
2006	4,044	1,342	5,386	20	3,672	1,512	5,184	19	3,688	1,466	5,154	20	-8.1%
2007	4,159	1,888	6,047	7	3,823	1,958	5,781	7	3,787	2,206	5,993	4	3.2%
2008	4,690	1,421	6,111	5	4,274	1,508	5,782	6	4,232	1,747	5,979	5	4.3%
2009	4,413	1,281	5,694	12	3,877	1,444	5,321	15	4,132	1,324	5,456	15	-2.8%
2010	4,676	1,904	6,580	1	4,377	2,013	6,390	1	4,303	2,280	6,583	1	12.3%
2011	4,195	1,616	5,811	11	3,911	1,703	5,614	10	3,777	1,852	5,629	11	-0.8%
2012	3,666	1,845	5,511	17	3,342	1,978	5,320	16	3,372	1,952	5,324	18	-6.0%
Average	4,371	1,489	5,861		4,014	1,608	5,622		4,027	1,669	5,696		
5% Scenario (1 out of 20 Years)			6580				6390				6583.00		
10% Scenario (2 out of 20 Years)			6292				6217				6024.00		
20% Scenario (4 out of 20 Years)			6147				5963				5993.00		

Year	Year to Year	Evansville, IN		Paducah, KY		Louisville, KY		Evansville and Louisville Avg			
		Heating Degree Days	Cooling Degree Days	Heating Degree Days	Cooling Degree Days	Heating Degree Days	Cooling Degree Days	Heating Degree Days	Cooling Degree Days	Total Degree Days	
1993		4,652	1,613	4,531	1,686	4,467	1,557	4,560	1,585	6,145	
1994	-9.5%	4,180	1,489	3,911	1,409	4,134	1,444	4,157	1,467	5,624	
1995	7.4%	4,314	1,773	4,129	1,615	4,331	1,629	4,323	1,701	6,024	
1996	3.4%	5,068	1,224	4,573	1,390	4,672	1,329	4,870	1,277	6,147	
1997	-4.3%	4,901	1,119	4,445	1,271	4,376	1,292	4,639	1,206	5,844	
1998	-8.8%	3,863	1,629	3,535	1,798	3,389	1,825	3,626	1,727	5,353	
1999	-1.1%	4,149	1,284	3,650	1,531	3,720	1,722	3,935	1,503	5,438	
2000	10.4%	4,710	1,289	4,273	1,566	4,271	1,463	4,491	1,376	5,867	
2001	-6.5%	4,233	1,377	3,921	1,540	3,836	1,626	4,035	1,502	5,536	
2002	9.6%	4,410	1,737	4,099	1,877	3,976	1,956	4,193	1,847	6,040	
2003	-7.7%	4,529	1,143	4,150	1,289	4,172	1,315	4,351	1,229	5,580	
2004	-2.6%	4,253	1,269	3,885	1,394	3,836	1,594	4,045	1,432	5,476	
2005	6.2%	4,320	1,544	3,904	1,685	4,064	1,806	4,192	1,675	5,867	
2006	-8.2%	4,044	1,342	3,672	1,512	3,688	1,466	3,866	1,404	5,270	
2007	12.3%	4,159	1,888	3,823	1,958	3,787	2,206	3,973	2,047	6,020	
2008	1.1%	4,690	1,421	4,274	1,508	4,232	1,747	4,461	1,584	6,045	
2009	-6.8%	4,413	1,281	3,877	1,444	4,132	1,324	4,273	1,303	5,575	
2010	15.6%	4,676	1,904	4,377	2,013	4,303	2,280	4,490	2,092	6,582	
2011	-11.7%	4,195	1,616	3,911	1,703	3,777	1,852	3,986	1,734	5,720	
2012	-5.2%	3,666	1,845	3,342	1,978	3,372	1,952	3,519	1,899	5,418	
Average		Average	4,371	1,489	4,014	1,608	4,027	1,669	4,199	1,579	5,778

Month	(All)
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PKYear	Data			
	Max of eMax	Min of eMin	Max of pMax	Min of pMin
1970	96	-5		
1971	99	0		
1972	95	-7		
1973	96	1		
1974	98	1		
1975	95	11		
1976	100	-1		
1977	99	-21		
1978	102	-10		
1979	96	-9		
1980	101	-3		
1981	96	2		
1982	97	-18		
1983	102	18		
1984	95	-15	96	-13
1985	98	-16	99	-14
1986	97	-2	98	0
1987	100	5	101	7
1988	102	1	103	3
1989	96	8	97	10
1990	100	-15	101	-13
1991	98	4	99	6
1992	95	5	96	7
1993	99	1	100	3
1994	98	-17	99	-15
1995	102	6	103	8
1996	96	-7	97	-5
1997	98	-3	99	-1
1998	96	8	97	10
1999	98	2	99	4
2000	96	6	97	8
2001	96	0	99	2
2002	97	10	99	11
2003	95	0	97	-3
2004	93	-5	96	6
2005	97	-11	96	-8
2006	95	3	96	6
2007	104	5	105	7
2008	95	6	96	10

20-year averages

	Evansville Max	Evansville Min	Paducha Max	Paducha Min
Average	97.4	0.7	98.7	2.9
Median	97.0	1.5	98.5	4.7

Temperature

-20	1	2.6%	2.6%
-19	0	0.0%	2.6%
-18	1	2.6%	5.3%
-17	1	2.6%	7.9%
-16	1	2.6%	10.5%
-15	2	5.3%	15.8%
-14	0	0.0%	15.8%
-13	0	0.0%	15.8%
-12	0	0.0%	15.8%
-11	1	2.6%	18.4%
-10	1	2.6%	21.1%
-5	5	13.2%	34.2%
-4	0	0.0%	34.2%
-3	2	5.3%	39.5%
-2	1	2.6%	42.1%
-1	1	2.6%	44.7%
0	3	7.9%	52.6%
1	4	10.5%	63.2%
2	2	5.3%	68.4%
3	1	2.6%	71.1%
4	1	2.6%	73.7%
5	3	7.9%	81.6%
6	3	7.9%	89.5%
7	0	0.0%	89.5%
8	2	5.3%	94.7%
9	0	0.0%	94.7%
10	1	2.6%	97.4%
11	1	2.6%	100.0%
12	0	0.0%	100.0%
14	0	0.0%	100.0%
	38		

2009	97	-1	98	3
2010	102	1	104	1
2011	79	2	78	4
(blank)	107	4	108	-4

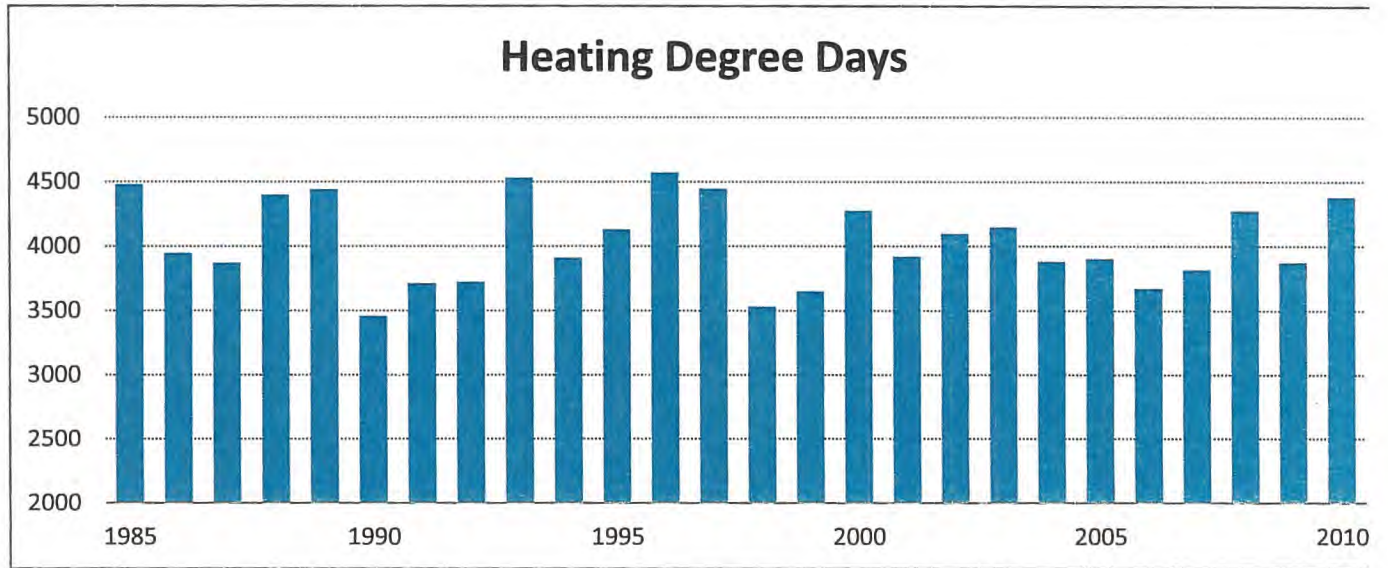
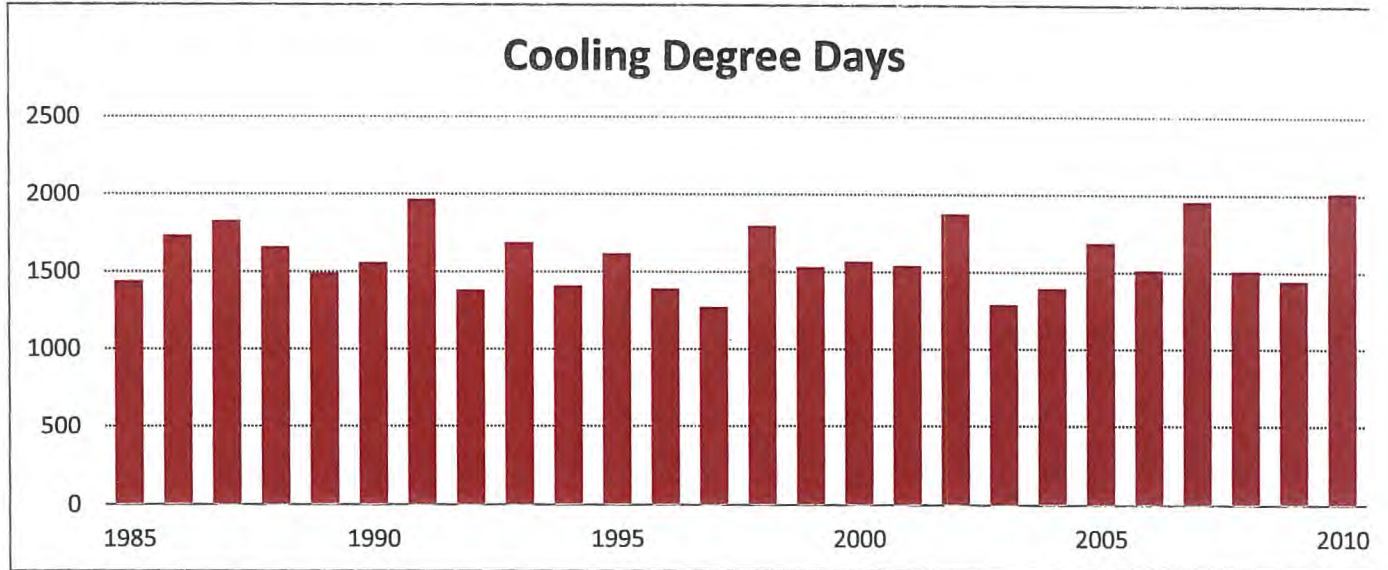
Year	(Multiple Items)
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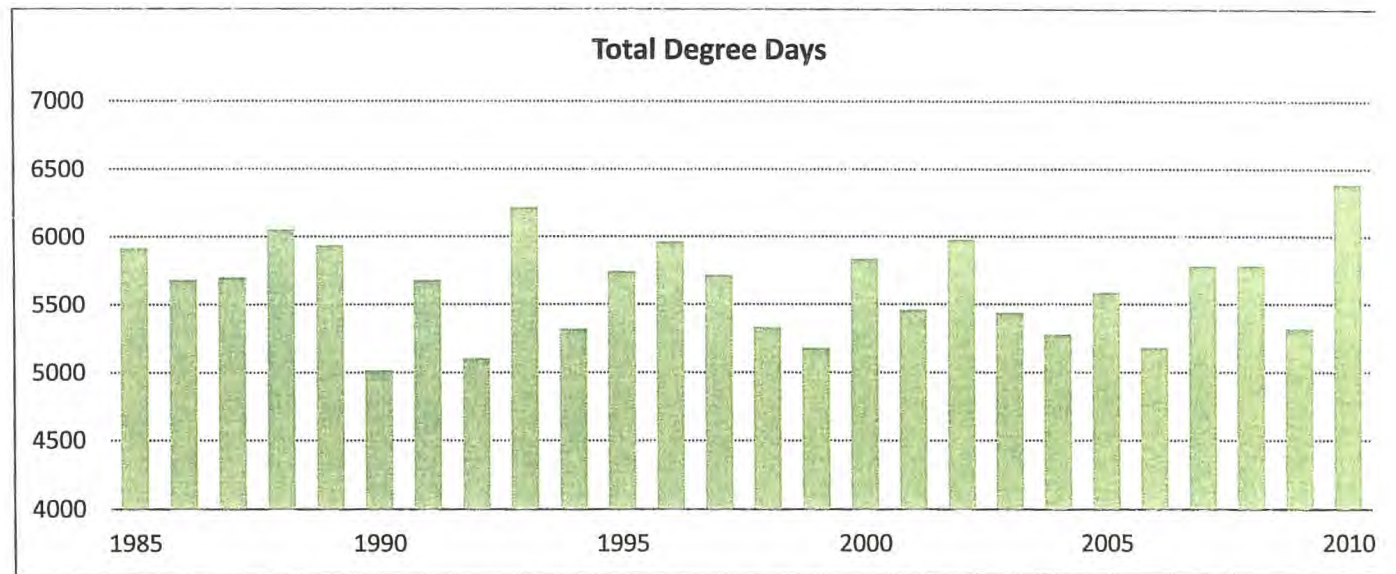
		Data						
Month		Count of eMax	Average of eMax	Average of eMin	Average of pMax	Average of pMin		
	1	24.0	63.8	6.2	64.5	8.4	64.0	6.9
	2	24.0	68.5	11.0	71.0	12.0	69.3	11.3
	3	24.0	77.4	19.6	78.4	20.4	77.7	19.9
	4	24.0	83.6	29.5	84.6	30.4	83.9	29.8
	5	24.0	89.0	40.8	89.9	41.8	89.3	41.1
	6	24.0	94.5	51.1	95.6	51.8	94.9	51.3
	7	24.0	96.3	58.5	97.6	58.6	96.7	58.5
	8	24.0	93.8	59.2	97.0	56.2	94.9	58.2
	9	24.0	92.9	42.1	93.6	42.2	93.1	42.2
	10	24.0	85.3	30.7	86.2	31.0	85.6	30.8
	11	24.0	74.9	22.0	76.1	22.3	75.3	22.1
	12	24.0	64.7	8.3	65.6	10.0	65.0	8.9

Year	Data							
	Sum of eCDD	Sum of eHDD	Max of eMax	Min of eMin	Sum of pCDD	Sum of pHDD	Max of pMax	Min of pMin
1970	1396	4893	96	-5				
1971	1566	4428	99	0				
1972	1160	4909	95	-7				
1973	1567	4188	96	1				
1974	1229	4172	98	6				
1975	1500	4283	95	11				
1976	1112	4784	100	-3				
1977	1779	4799	99	-21				
1978	1550	5420	102	-10				
1979	1238	5227	96	-9				
1980	1726	5095	101	-3				
1981	1389	4548	96	2				
1982	1349	4399	97	-18				
1983	1664	4640	102	-7				
1984	1365	4622	95	-15	1501	4148	96	-13
1985	1445	4785	98	-16	1439	4479	99	-14
1986	1576	4386	97	-2	1734	3946	98	0
1987	1623	4290	100	5	1831	3868	101	7
1988	1500	4822	102	1	1658	4398	103	3
1989	1396	4830	96	-15	1492	4443	97	-13
1990	1380	3856	100	4	1557	3460	101	6
1991	1757	4253	98	9	1965	3713	99	11
1992	1240	4217	95	5	1382	3724	96	7
1993	1613	4652	99	1	1686	4531	100	3
1994	1489	4180	98	-17	1409	3911	99	-15
1995	1773	4314	102	3	1615	4129	103	5
1996	1224	5068	96	-7	1390	4573	97	-5
1997	1119	4901	98	-3	1271	4445	99	-1
1998	1629	3863	96	7	1798	3535	97	9
1999	1284	4149	98	2	1531	3650	99	4
2000	1289	4710	96	0	1566	4273	97	2
2001	1377	4233	96	0	1540	3921	99	5
2002	1737	4410	97	10	1877	4099	99	10
2003	1143	4529	95	0	1289	4150	97	-3
2004	1269	4253	93	-11	1394	3885	96	-8
2005	1544	4320	97	3	1685	3904	96	8
2006	1342	4044	95	5	1512	3672	96	6
2007	1888	4159	104	5	1958	3823	105	7
2008	1421	4690	95	5	1508	4274	96	7
2009	1281	4413	97	-1	1444	3877	98	3
2010	1904	4676	102	1	2013	4377	104	1
2011	1616	4195	100	4	1703	3911	99	-4
2012	1845	3666	107	12	1978	3342	108	17

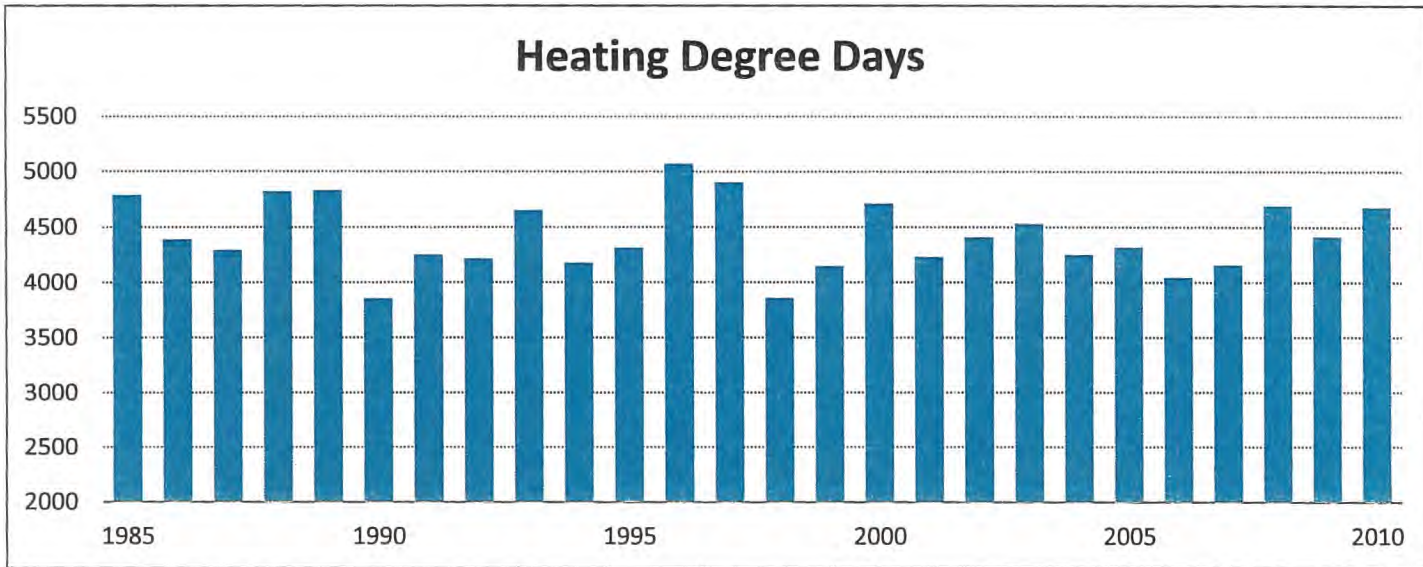
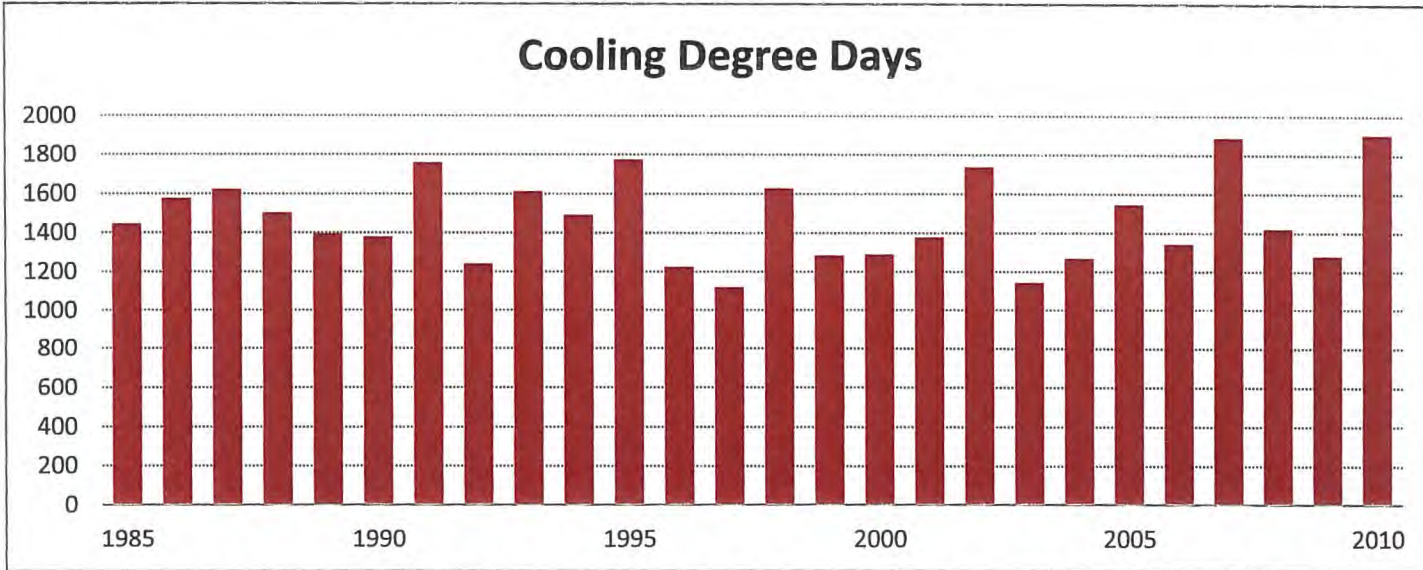
	eCDD	eHDD	eTDD	pCDD	pHDD	pTDD
1984	1365	4622	5987	1501	4148	5649
1985	1445	4785	6230	1439	4479	5918
1986	1576	4386	5962	1734	3946	5680
1987	1623	4290	5913	1831	3868	5699
1988	1500	4822	6322	1658	4398	6056
1989	1396	4830	6226	1492	4443	5935
1990	1380	3856	5236	1557	3460	5017
1991	1757	4253	6010	1965	3713	5678
1992	1240	4217	5457	1382	3724	5106
1993	1613	4652	6265	1686	4531	6217
1994	1489	4180	5669	1409	3911	5320
1995	1773	4314	6087	1615	4129	5744
1996	1224	5068	6292	1390	4573	5963
1997	1119	4901	6020	1271	4445	5716
1998	1629	3863	5492	1798	3535	5333
1999	1284	4149	5433	1531	3650	5181
2000	1289	4710	5999	1566	4273	5839
2001	1377	4233	5610	1540	3921	5461
2002	1737	4410	6147	1877	4099	5976
2003	1143	4529	5672	1289	4150	5439
2004	1269	4253	5522	1394	3885	5279
2005	1544	4320	5864	1685	3904	5589
2006	1342	4044	5386	1512	3672	5184
2007	1888	4159	6047	1958	3823	5781
2008	1421	4690	6111	1508	4274	5782
2009	1281	4413	5694	1444	3877	5321
2010	1904	4676	6580	2013	4377	6390

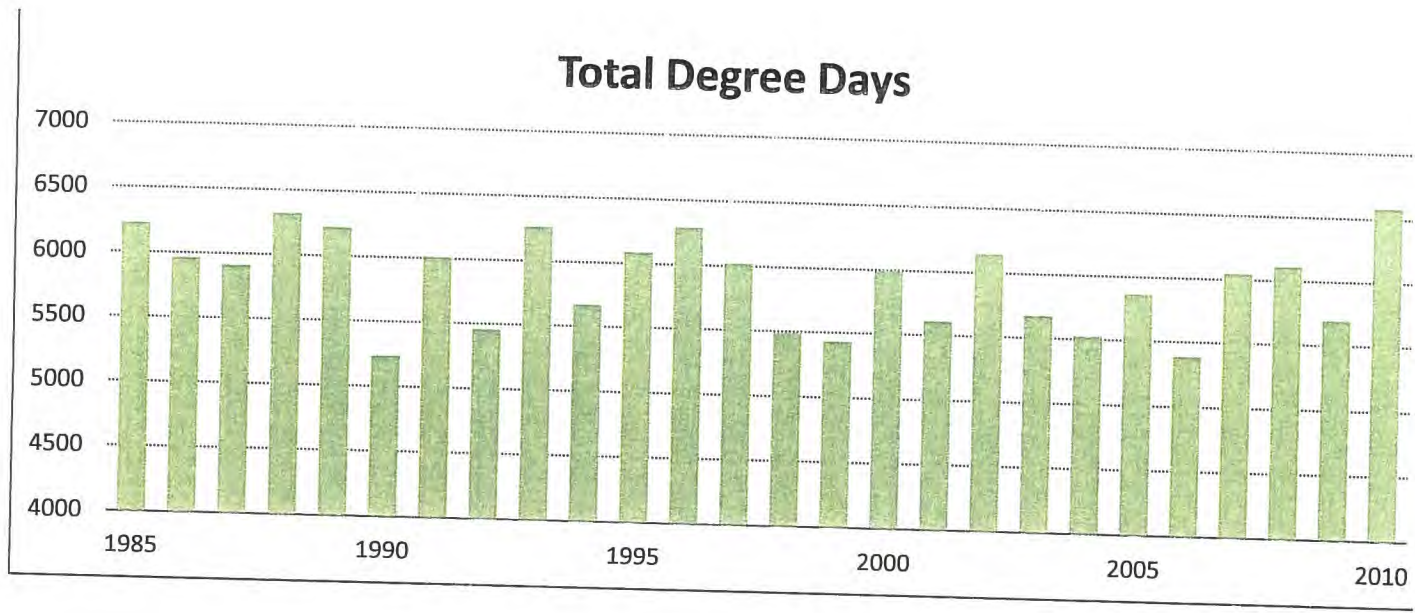
PADUCAH





EVANSVILLE





BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to the Office of the Attorney General's
Initial Request for Information
Dated August 20, 2014

September 10, 2014

1 **Item 27)** **Please provide tables in Appendix A in electronic Excel spreadsheet**
2 **format, with data and formulae in all cells and rows intact and fully accessible.**

3

4 **Response)** The spreadsheets developed to produce the tables in Appendix A (2013 Load
5 Forecast) are provided in the folder AG-1-27 on the electronic media accompanying these
6 responses. The following files correspond to the specific appendix items in the 2013 Load
7 Forecast

8 Appendix A: Big Rivers Forecast_2013-2016_v4.xlsx

9 Appendix B: Model Tables_v3.xlsx

10 Appendix C: Big Rivers Range Forecasts-2013.xlsx

11 Appendix D: Big Rivers Model Specs.xlsx

12

13 **Witness)** John W. Hutts

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to the Office of the Attorney General's
Initial Request for Information
Dated August 20, 2014

September 10, 2014

1 **Item 28)** Please provide Appendix F electronic information in electronic Excel
2 spreadsheet format, with data and formulae in all cells and rows intact and fully
3 accessible.

4

5 **Response)** Please see the requested electronic spreadsheet in the folder AG 1-28 on the
6 confidential electronic media provided with these responses.

7

8 **Witness)** Marlene S. Parsley

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to the Office of the Attorney General's
Initial Request for Information
Dated August 20, 2014

September 10, 2014

1 **Item 29)** Please provide Appendix G electronic information in electronic Excel
2 **spreadsheet format, with data and formulae in all cells and rows intact and fully**
3 **accessible.**

4

5 **Response)** See attachments in the folder AG 1-29 on the confidential electronic media
6 provided with this response.

7

8 **Witness)** Marlene S. Parsley

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to the Office of the Attorney General's
Initial Request for Information
Dated August 20, 2014

September 10, 2014

- 1 **Item 30) Big Rivers' 2014 IRP filing, which was filed with the Commission on May**
2 **15, 2014, includes an eight (8) page section regarding projected environmental costs.**
3 **However, on August 8, 2014, Big Rivers filed with the Commission a document entitled**
4 **"ELG Master Planning Study" (this Study defines the abbreviation "ELG" as**
5 **"National Effluent Limitations Guidelines and Standards"). The ELG Master Planning**
6 **Study, performed on Big Rivers' behalf by Burns & McDonnell Engineering Company**
7 **and signed on June 20, 2014, includes extensive analysis on projected environmental**
8 **capital spending that either was not included in the IRP filing¹, or which changes the**
9 **data supplied in the IRP filing.¹ Regarding this study and the IRP plan submitted in**
10 **this filing, please provide the following:**
- 11 **a. Any table, figure, graph or chart in the IRP plan affected by the new**
12 **information presented in this study, including but not limited to forecasted**
13 **spending pertaining to environmental compliance.**
- 14 **b. Updated tables, figures, graphs, charts and conclusions in the IRP plan**
15 **resulting from the new information presented in this study.**

¹ This was filed as an update to request for information Item 15 from the January 6-9, 2014 hearing in Case No. 2013-00199. Big Rivers is seeking confidential protection for a portion of this update.

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to the Office of the Attorney General's
Initial Request for Information
Dated August 20, 2014

September 10, 2014

- 1 c. Any resulting changes to Big Rivers' financial forecasts and production cost
2 modeling.
- 3 d. Any effect this has on Big Rivers' projected replacement power sales.
- 4 e. Any effect this has on Big Rivers' forecasted power prices.
- 5 f. Any effect this has on Big Rivers' forecasted variable operating and
6 maintenance costs for any Big Rivers' units.

7

8 **Response)** The capital costs contained in the ELG Master Planning Study were used in
9 developing the costs in the 2014 IRP filing. The costs in the ELG study were in 2014 dollars.
10 The costs used in the IRP filing were the same costs escalated 2% per year and are
11 considered 2018 dollars. Since the same costs were used in both instances, there is no need
12 to update any tables, figures, graphs or conclusions in the IRP. In addition, there are no
13 effects to the issues raised in subparts c through f.

14

15 **Witness)** Duane E. Braunecker

16 Eric M. Robeson

¹ This was filed as an update to request for information Item 15 from the January 6-9, 2014 hearing in Case No. 2013-00199. Big Rivers is seeking confidential protection for a portion of this update.

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to the Office of the Attorney General's
Initial Request for Information
Dated August 20, 2014

September 10, 2014

1

Marlene S. Parsley

¹ This was filed as an update to request for information Item 15 from the January 6-9, 2014 hearing in Case No. 2013-00199. Big Rivers is seeking confidential protection for a portion of this update.

BIG RIVERS ELECTRIC CORPORATION
2014 INTEGRATED RESOURCE PLAN
OF BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2014-00166

Response to the Office of the Attorney General's
Initial Request for Information
Dated August 20, 2014

September 10, 2014

1 **Item 31) For 2014 YTD, please provide copies of all monthly or otherwise periodic**
2 **reports given to the Board of Directors in the ordinary course of business regarding the**
3 **following, broken down on a monthly basis, and by customer class:**

4

- 5 (a) **Big Rivers' MWh Sales volume and revenues, both system and off-system;**
6 (b) **Cash on hand including specific MRSM balances.**

7

8 **Response)**


9 (a) Please refer to attachment.

10 (b) Big Rivers objects that this request is overly broad, unduly burdensome, and not
11 reasonably calculated to lead to the discovery of admissible evidence.

12

13 **Witness) Billie J. Richert**




Your Touchstone Energy® Cooperative 

Financial Report
January 2014
(\$ in Thousands)

Board Meeting Date: March 21, 2014



Your Touchstone Energy® Cooperative 


**Revenue
YTD January**

	Actual 2014	Budget 2014	Variance	Actual 2013	2013 Variance
MWh Sales					
Rural	282,316	232,021	50,295	235,718	46,598
Large Industrial	81,524	78,415	3,109	82,265	(741)
Smelter	284,900	259,661	25,239	630,197	(345,297)
Off-System/Other	232,764	197,888	34,876	188,059	44,705
Total	881,504	767,985	113,519	1,136,239	(254,735)
Revenue - \$/MWh					
Rural	68.75	69.50	(0.75)	49.41	19.34
Large Industrial	54.38	55.16	(0.78)	43.35	11.03
Smelter	56.10	55.93	0.17	48.35	7.75
Off-System/Other	47.82	33.89	13.93	26.33	21.49
Total	57.80	54.27	3.53	44.57	13.23
Revenue - Thousands of \$					
Rural	19,408	16,127	3,281	11,646	7,762
Large Industrial	4,433	4,325	108	3,566	867
Smelter	15,983	14,523	1,460	30,473	(14,490)
Off-System/Other	11,131	6,707	4,424	4,952	6,179
Total	50,955	41,682	9,273	50,637	318

**Revenue Price / Volume Analysis
January 2014**

	Price / Volume		
	Price	Volume	Total
Rural	(216)	3,497	3,281
Large Industrial	(62)	170	108
Smelter	48	1,412	1,460
Off-System/Other	3,242	1,182	4,424
	<u>3,012</u>	<u>6,261</u>	<u>9,273</u>



Your Touchstone Energy® Cooperative 

Financial Report February 2014 (\$ in Thousands)

Board Meeting Date: April 18, 2014



Your Touchstone Energy Cooperative


**Revenue
YTD February**

	<u>Actual</u> <u>2014</u>	<u>Budget</u> <u>2014</u>	<u>Variance</u>	<u>Actual</u> <u>2013</u>	<u>2013</u> <u>Variance</u>
MWh Sales					
Rural	514,564	429,369	85,195	440,031	74,533
Large Industrial	157,048	154,968	2,080	156,610	438
Smelter	284,900	259,661	25,239	1,200,878	(915,978)
Off-System/Other	731,339	345,634	385,705	367,783	363,556
Total	1,687,851	1,189,632	498,219	2,165,302	(477,451)
Revenue - \$/MWh					
Rural	83.65	81.80	1.85	54.66	28.99
Large Industrial	65.87	64.53	1.34	44.81	21.06
Smelter	56.10	55.93	0.17	48.87	7.23
Off-System/Other	47.05	33.70	13.35	27.48	19.57
Total	61.49	59.93	1.56	46.12	15.37
Revenue - Thousands of \$					
Rural	43,045	35,121	7,924	24,054	18,991
Large Industrial	10,344	10,000	344	7,018	3,326
Smelter	15,983	14,523	1,460	58,687	(42,704)
Off-System/Other	34,410	11,649	22,761	10,105	24,305
Total	103,782	71,293	32,489	99,864	3,918

**Revenue Price / Volume Analysis
February 2014**

	<u>Price / Volume</u>		
	<u>Price</u>	<u>Volume</u>	<u>Total</u>
Rural	956	6,968	7,924
Large Industrial	210	134	344
Smelter	48	1,412	1,460
Off-System/Other	9,762	12,999	22,761
	<u>10,976</u>	<u>21,513</u>	<u>32,489</u>



Your Touchstone Energy[®] Cooperative 

Financial Report March 2014 (\$ in Thousands)

Board Meeting Date: May 16, 2014



Your Touchstone Energy® Cooperative


**Revenue
YTD March**

	<u>Actual</u> <u>2014</u>	<u>Budget</u> <u>2014</u>	<u>Variance</u>	<u>Actual</u> <u>2013</u>	<u>2013</u> <u>Variance</u>
<u>MWh Sales</u>					
Rural	719,023	610,735	108,288	653,325	65,698
Large Industrial	239,865	236,104	3,761	238,582	1,283
Smelter	284,900	259,661	25,239	1,836,847	(1,551,947)
Off-System/Other	1,333,785	534,792	798,993	511,052	822,733
Total	2,577,573	1,641,292	936,281	3,239,806	(662,233)
<u>Revenue - \$/MWh</u>					
Rural	88.35	85.66	2.69	53.21	35.14
Large Industrial	69.32	67.32	2.00	44.60	24.72
Smelter	56.10	55.93	0.17	48.89	7.21
Off-System/Other	44.50	33.29	11.21	29.31	15.19
Total	60.32	61.26	(0.94)	46.36	13.96
<u>Revenue - Thousands of \$</u>					
Rural	63,524	52,318	11,206	34,764	28,760
Large Industrial	16,627	15,895	732	10,641	5,986
Smelter	15,983	14,523	1,460	89,802	(73,819)
Off-System/Other	59,355	17,802	41,553	14,979	44,376
Total	155,489	100,538	54,951	150,186	5,303

**Revenue Price / Volume Analysis
March 2014**

	<u>Price / Volume</u>		
	<u>Price</u>	<u>Volume</u>	<u>Total</u>
Rural	1,930	9,276	11,206
Large Industrial	480	252	732
Smelter	48	1,412	1,460
Off-System/Other	14,956	26,597	41,553
	17,414	37,537	54,951



Your Touchstone Energy® Cooperative 

Financial Report
April 2014
(\$ in Thousands)

Board Meeting Date: June 20, 2014



Your Touchstone Energy® Cooperative


**Revenue
YTD April**

	<u>Actual</u> <u>2014</u>	<u>Budget</u> <u>2014</u>	<u>Variance</u>	<u>Actual</u> <u>2013</u>	<u>2013</u> <u>Variance</u>
MWh Sales					
Rural	864,999	760,286	104,713	808,861	56,138
Large Industrial	318,352	317,105	1,247	316,553	1,799
Smelter	284,900	259,661	25,239	2,449,768	(2,164,868)
Off-System/Other	1,924,957	642,703	1,282,254	684,609	1,240,348
Total	3,393,208	1,979,755	1,413,453	4,259,791	(866,583)
Revenue - \$/MWh					
Rural	79.98	87.63	(7.65)	52.94	27.04
Large Industrial	63.76	68.95	(5.19)	44.66	19.10
Smelter	56.10	55.93	0.17	48.91	7.19
Off-System/Other	42.43	33.16	9.27	31.15	11.28
Total	55.15	62.80	(7.65)	46.50	8.65
Revenue - Thousands of \$					
Rural	69,186	66,624	2,562	42,821	26,365
Large Industrial	20,299	21,863	(1,564)	14,137	6,162
Smelter	15,983	14,523	1,460	119,818	(103,835)
Off-System/Other	81,670	21,314	60,356	21,324	60,346
Total	187,138	124,324	62,814	198,100	(10,962)

**Revenue Price / Volume Analysis
April 2014**

	<u>Price / Volume</u>		
	<u>Price</u>	<u>Volume</u>	<u>Total</u>
Rural	(6,614)	9,176	2,562
Large Industrial	(1,649)	85	(1,564)
Smelter	48	1,412	1,460
Off-System/Other	17,831	42,525	60,356
	9,616	53,198	62,814



Your Touchstone Energy[®] Cooperative 

Financial Report

May 2014

(\$ in Thousands)

Board Meeting Date : July 18, 2014



Your Touchstone Energy Cooperative


**Revenue
YTD May**

	<u>Actual</u> 2014	<u>Budget</u> 2014	<u>Variance</u>	<u>Actual</u> 2013	<u>2013</u> <u>Variance</u>
MWh Sales					
Rural	1,036,024	922,462	113,562	973,368	62,656
Large Industrial	399,546	399,366	180	411,154	(11,608)
Smelter	284,900	259,661	25,239	3,081,496	(2,796,596)
Off-System/Other	2,255,284	816,138	1,439,146	866,273	1,389,011
Total	3,975,754	2,397,627	1,578,127	5,332,291	(1,356,537)
Revenue - \$/MWh					
Rural	80.16	89.88	(9.72)	53.06	27.10
Large Industrial	63.53	69.93	(6.40)	44.47	19.06
Smelter	56.10	55.93	0.17	48.93	7.17
Off-System/Other	41.62	32.79	8.83	31.97	9.65
Total	54.90	63.45	(8.55)	46.58	8.32
Revenue - Thousands of \$					
Rural	83,048	82,914	134	51,645	31,403
Large Industrial	25,383	27,927	(2,544)	18,286	7,097
Smelter	15,983	14,523	1,460	150,767	(134,784)
Off-System/Other	93,870	26,764	67,106	27,694	66,176
Total	218,284	152,128	66,156	248,392	(30,108)

**Revenue Price / Volume Analysis
May 2014**

	<u>Price / Volume</u>		
	<u>Price</u>	<u>Volume</u>	<u>Total</u>
Rural	(10,074)	10,208	134
Large Industrial	(2,557)	13	(2,544)
Smelter	48	1,412	1,460
Off-System/Other	19,913	47,193	67,106
	7,330	58,826	66,156



Your Touchstone Energy® Cooperative 

Financial Report
June 2014
(\$ in Thousands)

Board Meeting Date: August 15, 2014

Revenue YTD June

	Actual 2014	Budget 2014	Variance	Actual 2013	2013 Variance
MWh Sales					
Rural	1,237,107	1,119,291	117,816	1,169,490	67,617
Large Industrial	481,567	480,041	1,526	505,365	(23,798)
Smelter	284,900	259,661	25,239	3,686,464	(3,401,564)
Off-System/Other	2,515,538	948,578	1,566,960	1,014,139	1,501,399
Total	4,519,112	2,807,571	1,711,541	6,375,458	(1,856,346)
Revenue - \$/MWh					
Rural	80.49	92.02	(11.53)	53.27	27.22
Large Industrial	63.41	70.80	(7.39)	44.42	18.99
Smelter	56.10	55.93	0.17	49.00	7.10
Off-System/Other	41.04	32.37	8.67	31.54	9.50
Total	55.18	64.90	(9.72)	46.64	8.54
Revenue - Thousands of \$					
Rural	99,578	102,999	(3,421)	62,300	37,278
Large Industrial	30,538	33,989	(3,451)	22,447	8,091
Smelter	15,983	14,523	1,460	180,620	(164,637)
Off-System/Other	103,248	30,705	72,543	31,991	71,257
Total	249,347	182,216	67,131	297,358	(48,011)

Revenue Price / Volume Analysis June 2014

	Price / Volume		
	Price	Volume	Total
Rural	(14,263)	10,842	(3,421)
Large Industrial	(3,559)	108	(3,451)
Smelter	48	1,412	1,460
Off-System/Other	21,820	50,723	72,543
	4,046	63,085	67,131