## STITES\&HARBISON ${ }_{\text {pLI }}$

September 11, 2013
Mark R. Overstreet (502) 209-1219 (502) 223-4387 FAX moverstreet@stites.com

## HAND DELIVERED

Jeff R. Derouen

Executive Director
Public Service Commission
211 Sower Boulevard
P.O. Box 615

Frankfort, KY 40602-0615

RE: Case No. 2013-00197
Dear Mr. Derouen:
Enclosed please find and accept for filing the original and ten copies of the following:
(a) Kentucky Power's Response to Staff's Second Set of Data Requests; and
(b) Kentucky Power's Response to Kentucky Industrial Utility Customers, Inc. Initial Data Requests.

Also being filed is an original and ten copies of the Company's motion for confidential treatment of the identified portions of Attachment 1 to its response to Commission Staff Data Request 2-42, and Attachments 1 and 2 to its response to KIUC Data request 1-15.

A copy of this letter, the responses, and the motion are being served by overnight delivery on counsel of record.


MRO
ce: Michael L. Kurtz
Jennifer B. Hans
Don C.A. Parker

# COMMONWEALTH OF KENTUCKY 

## BEFORE THE

## PUBLIC SERVICE COMMISSION OF KENTUCKY

IN THE MATTER OF:

# APPLICATION OF KENTUCKY POWER COMPANY ) FOR ADJUSTMENT OF ELECTRIC RATES ) CASE NO. 2013-00197 

## VERIFICATION

Dr. William E. Avera being duly sworn deposes and says he is the President of FINCAP, Inc., and that he has personal knowledge of the matters set forth in the forgoing data requests and the information contained therein is true and correct to the best of his information, knowledge, and belief.


Dr. William E. Avera

## STATE OF TEXAS

## )

) CASE NO. 2013-00197
COUNTY OF HAYS

Subscribed and sworn to before me, a Notary Public in and before said County and State, by, Dr. William E. Avera this $\qquad$ day of September 2013.


## VERIFICATION

The undersigned, Jeffrey B. Bartsch, being duly sworn, deposes and says he is the Director, Tax Accounting and Regulatory Services for American Electric Power Service Corporation and that he has personal knowledge of the matters set forth in the forgoing responses for which he is identified as the witness and the information contained therein is true and correct to the best of his information, knowledge and belief.


## STATE OF OHIO

County of FRANKLIN )
) Case No. 2013-00197
)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Jeffrey B. Bartsch, this the 3 hd day of September, 2013.


## VERIFICATION

The undersigned, Douglas R. Buck, being duly sworn, deposes and says he is Senior Regulatory Consultant for American Electric Power Service Corporation and that he has personal knowledge of the matters set forth in the forgoing responses and the information contained therein is true and correct to the best of his information, knowledge and belief.


## STATE OF OHIO

County of FRANKLIN
)
) Case No. 2013-00197
)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Douglas R. Buck, this the 29 day of August, 2013.


My Commission Expires: SOup $/ 1 \frac{\pi h}{2016}$

## VERIFICATION

The undersigned, Andrew R. Carlin, being duly sworn, deposes and says he is the Director, Compensation and Executive Benefits for American Electric Power Service Corporation and that he has personal knowledge of the matters set forth in the forgoing responses for which he is identified as the witness and the information contained therein is true and correct to the best of his information, knowledge and belief.


Andrew R. Carlin

## STATE OF OHIO

County of FRANKLIN
)
) Case No. 2013-00197
)

Subscribed and sworn to before me $\propto$ Notary Public in and before said County and State, by Andrew R. Carlin, this the $4 / 2$ day of September, 2013.


## VERIEICATION

The undersigned, David A. Davis, being duly sworn, deposes and says he is the Manager, Property Accounting Policy and Research that he has personal knowledge of the matters set forth in the forgoing responses for which he is identified as the witness contained therein is true and correct to the best of his information, knowledge and belief.


David A. Davis

STATE OF OHIO
County of FRANKLIN
)
) Case No. 2013-00197
)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by David A. Davis, this the $\qquad$ day of September, 2013.


My Commission Expires: Quag 18 20/7

## VERIFICATION

The undersigned, Hugh E. McCoy, being duly sworn, deposes and says he is the Director, Accounting Policy and Research for American Electric Power Service Corporation and that he has personal knowledge of the matters set forth set forth in the forgoing responses for which he is identified as the witness and information contained therein is true and correct to the best of his information, knowledge and belief.


## STATE OF OHIO

## County of FRANKLIN

## )

) Case No. 2013-00197
)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Hugh E. McCoy, this the $\qquad$ day of September, 2013.


My Commission Expires: $\frac{1 / 4 \pi / 8,2017}{}$

## VERIFICATION

The undersigned, Thomas E. Mitchell, being duly sworn, deposes and says he is Managing Director, Regulatory Accounting Services for American Electric Power Service Corporation and that he has personal knowledge of the matters set forth in the forgoing responses and the information contained therein is true and correct to the best of his information, knowledge and belief.

## STATE OF OHIO

County of FRANKLIN

)
) Case No. 2013-00197
)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Thomas E. Mitchell, this the $L_{\text {d }}$ day of September, 2013.


My Commission Expires:


## VERIFICATION

The undersigned, Lila P. Munsey, being duly sworn, deposes and says she is the Manager, Regulatory Services for Kentucky Power, that she has personal knowledge of the matters set forth in the forgoing responses for which she is the identified witness and that the information contained therein is true and correct to the best of her information. knowledge, and belief


## COMMONWEALTH OF KENTUCKY )

) Case No. 2013-00197
COUNTY OF FRANKLIN
)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Lila P. Munsey, this day of September 2013.


## VERIFICATION

The undersigned, Gregory G. Pauley, being duly sworn, deposes and says he is the President and Chief Operating Officer for Kentucky Power Company, that he has personal knowledge of the matters set forth in the forgoing responses for which he is the identified witness and that the information contained therein is true and correct to the best of his information, knowledge and belief


## COMMONWEALTH OF KENTUCKY

)
Case No. 2013-00197

## COUNTY OF FRANKLIN

)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Gregory G. Pauley, this the 4 day of September 2013.


My Commission Expires fawuary $2 \dot{5}, 3017$

## VERIFICATION

The undersigned, Marc D. Reitter, being duly sworn, deposes and says he is the Director, Corporate Finance for American Electric Power Service Corporation and that he has personal knowledge of the matters set forth in the forgoing responses and the information contained therein is true and correct to the best of his information, knowledge and belief.


## STATE OF OHIO

County of FRANKLIN
)
) Case No. 2013-00197
)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Marc D. Reitter, this the $29^{\text {th }}$ day of September, 2013.



My Commission Expires: 09-20-2016

## VERIFICATION

The undersigned, Jason M. Stegall, being duly sworn, deposes and says he is the a Regulatory Consultant for American Electric Power Service Corporation and that he has personal knowledge of the matters set forth in the forgoing response and the information contained therein is true and correct to the best of his information, knowledge and belief.

## STATE OF OHIO

County of FRANKLIN

)
) Case No. 2013-00197
)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Jason M. Stegall, this the $\qquad$ day of September, 2013.


My Commission Expires: Antober 1,2016

## VERIFICATION

The undersigned, Alex E. Vaughan, being duly sworn, deposes and says he is the Manager, Regulatory Pricing and Analysis that he has personal knowledge of the matters set forth in the forgoing responses and the information contained therein is true and correct to the best of his information, knowledge and belief.


## STATE OF OHIO

County of FRANKLIN
)
) Case No. 2013-00197
)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Alex E. Vaughan, this the $10 \not 2 \not \perp$ day of September, 2013.
 My Commission Expires. Shy |lith 2016


## VERIFICATION

The undersigned, Ranie K. Wohnhas, being duly sworn, deposes and says he is the Managing Director Regulatory and Finance for Kentucky Power, that he has personal knowledge of the matters set forth in the forgoing responses for which he is the identified witness and that the information contained therein is true and correct to the best of his information, knowledge, and belief


Ranie K. Wohnhas

## COMMONWEALTH OF KENTUCKY ) <br> COUNTY OF FRANKLIN <br> ) Case No. 2013-00197 <br> )

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Ramie K. Wohnhas, this the $9^{\text {th }}$ day of September 2013.



## Kentucky Power Company

## REQUEST

Refer to page 13 of the Direct Testimony of William E. Avera ("Avera Testimony"). Provide the most current information available to update the "Current" interest rates on 30 -year Treasury bonds, triple-A rated corporate bonds, and double-A rated utility bonds as shown on Figure WEA-2, which is based on monthly average bond yields for the sixmonth period ending February 2013.

## RESPONSE

Please see KPSC 2-1 Attachment 1.

WITNESS: Dr. William E. Avera
(a) (b) (b) (a)

Public Utility Bonds

| Public Utility Bonds |  |  |  | $30-\mathrm{Yr}$. <br> Treas. | $10-\mathrm{Yr}$ 。 <br> Treas. | AAA <br> Corp. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| BBB | A | AA | AVG. |  |  |  |
| 4.72\% | 4.20\% | 3.95\% | 4.29\% | 3.16\% | 1.96\% | 3.93\% |
| 4.49\% | 4.00\% | 3.74\% | 4.08\% | 2.93\% | 1.76\% | 3.73\% |
| 4.65\% | 4.17\% | 3.91\% | 4.24\% | 3.11\% | 1.93\% | 3.89\% |
| 5.08\% | 4.53\% | 4.27\% | 4.63\% | 3.40\% | 2.30\% | 4.27\% |
| 5.21\% | 4.68\% | 4.44\% | 4.78\% | 3.61\% | 2.58\% | 4.34\% |
| 5.28\% | 4.73\% | 4.53\% | 4.85\% | 3.76\% | 2.74\% | 4.54\% |
| 4.91\% | 4.39\% | 4.14\% | 4.48\% | 3.33\% | 2.21\% | 4.12\% |

(a) Moody's Investors Service.
(b) http://www.federalreserve.gov/releases/h 15/data.htm.

## Kentucky Power Company

## REQUEST

Refer to pages $16-17$ of the Avera Testimony. State whether NV Energy should be excluded from the proxy group based on its involvement in an acquisition, as reported by the August 2, 2013 issue of Value Line. If so, provide the Return on Equity ("ROE") analyses based on this exclusion.

## RESPONSE

The data used in Dr. Avera's analyses predated the announcement of the merger with MidAmerican Energy. As a result, there is no basis to conclude that these projections would be distorted by the results of the subsequent merger announcement or to exclude NV Energy from the analyses contained in Dr. Avera's testimony.

WITNESS: Dr. William E. Avera

## Kentucky Power Company

## REQUEST

For each utility covered by Value Line that was excluded from the proxy group, explain why it was not chosen.

## RESPONSE

The four criteria used to create the proxy group are detailed at page 16 of Dr. Avera's testimony. The companies that comprise the proxy group satisfy each of these criteria and are highlighted in green on Attachment 1 to KPSC 2-3. Those companies excluded from the proxy group are not highlighted. The metric resulting in the exclusion of a particular company is illustrated in red on Attachment 1 to KPSC 2-3. For example, CenterPoint Energy (CNP) was excluded because its S\&P credit rating fell outside of the $\mathrm{BBB}+, \mathrm{BBB}$, and BBB - ratings used to define the comparable risk proxy group.

WITNESS: William E. Avera

|  |  |  | (1) | (2) |  | (3) |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | S\&P | Moody's |  | Value Line |  |  |  |
|  | SYM | Company | Credit <br> Rating | Isssuer <br> Rating | Safety <br> Rank | Financial <br> Strength | Beta | Market Cap | Comuments |
| 1 | ALE | ALIFTE | BBBt | Baal | 2 | A | 0.70 | \$1968 |  |
| 2 | INT | Alliant Energy | A. | Bal | 2 | A | 0.70 | \$5,803 |  |
| 3 | AIE | Ameren Corp. | BBB | Baa3 | 3 | B++ | 0.80 | 58,714 |  |
| $t$ | AEP | American Flec Pwr | BBB | Baa2 | 3 | B++ | 0.65 | 523,838: |  |
| 5 | AVA | Avista Corp. | BIB | Ban2 | 2 | A | 0.70 | \$1,731 |  |
| 6 | 'BKH | Black Hills Corp. | BBB | Baa3 | 3 | B + | 080 | \$2,180, |  |
| 7 | CNP | CenterPoint Energy | A- | Baa 3 | 2 | B+ | 0.80 | \$10,30) |  |
| 8 | CHG | CHI Fnergy Group | A | A3 | 1 | A | 0.60 | \$961 | Acquisition by Fortis |
| 9 | CNI. | Cleco Corp. | B 3 B | Ba3 3 | 1 | A | 0.65 | \$2,869 |  |
| 10 | CMS | CMS Fnergy Corp. | BBB | Baa3 | 3 | B | 0.75 | \$7,615 |  |
| 11 | ED | Consolidated Pdison | A. | Baal | 1 | A + | 0.60 | \$17,625 |  |
| 12 | D | Dominion Resources | A- | 13an2 | 2 | B+ | 0.65 | \$34,880 |  |
| 13 | DIt | DIE Energy Co. | $\mathrm{BBB}+$ | Ban 1 | 2 | $\mathrm{B}+\mathrm{t}$ | 0.75 | \$12,356: |  |
| 1.4 | DUK | Duke Energy Corp. | BBB+ | Bal2 | 2 | A | 0.60 | \$0,097 |  |
| 15 | EXX | Edison International | BBB | Baa2 | 2 | B + | 0.75 | \$15,867 ${ }^{\text {\% }}$ |  |
| 16 | EE | El Paso Electric | BBB | Bas2 | 2 | B++ | 0.70 | \$1,512 |  |
| 17 | FDE | Fmpire District Elec | B3B | Bas2 | 2 | B++ | 0.65 | \$967 |  |
| 18 | EIR | Entergy Corp. | BBB | Baa3 | 3 | B ${ }_{\text {+ }}$ | 0.70 | \$12,388 | Sale of transmission assets to ITC Holdings |
| 19 | ExC | Exelon Corp. | BBB | Bad2 | 3 | B++ | 0.80 | \$29,743. |  |
| 20 | FE | Firstinergy Corp. | $\mathrm{BBI}^{-}$ | Bat3 | 3 | B + | 0,75 | \$18,025 |  |
| 21 | GXP | Great गlains Energy | BBB | Baa3 | 3 | B+ | 0.75 | 53,694 |  |
| 22 | HE | Hawaiam Elec. | BBB- | Baa2 | 2 | B+ | 0.70 | \$2,738 |  |
| 23 | DA | IDACORP, Inc. | BBB | Bra2 | 3 | B+ | 0.70 | 52,474 |  |
| 24 | TEG | Integrys Energy Group | A- | Baa1 | 2 | B++ | 0.90 | \$4,761 |  |
| 25 | TTC | HC Holdings Corp. | BBB+ | Ban2 | 2 | 13++ | 0.73 | 54,6.30 | Purchase of transmission assets from Entergy |
| 26 | MGIE: | MGE Energy | AA- | A1 | 1 | A | 0.60 | 1301.32 |  |
| 27 | NEE | Nextlra Energy, Inc. | A- | Baal | 2 | A | 0.70 | 534,154 |  |
| 28 | NU | Northeast Utilities | A- | Baa2 | 2 | B++ | 0.70 | \$13,377 |  |
| 29 | NWI: | NorthWestern Corp. | BBB | Baal | 3 | B+ | 0.70 | 1592.73 |  |
| 30 | NVE | NVFEnergy, lnc. | BBE | Bal | 3 | $\mathrm{B}+$ | 0.85 | 54,399 |  |
| 31 | OGT | OGE Fnergy Corp. | A- | Baat | 2 | A | 0.75 | \$7,026 |  |
| 32 | OITR | Otter lail Corp. | BBB- | A3 | 3 | B+ | 0.90 | 1067.53 |  |
| 33 | POM | Pepalloldings | $\mathrm{BBB}+$ | 13a3 3 | 3 | B | 0.75 | 55,027 |  |
| 31 | PCG | PG\&E Corp. | BBB | Baal | 3 | Bt | 0.50 | \$20,346: |  |
| 35 | PNW | Pinnacle West Capital | BB13+ | Baa2 | 1 | A | 0.70 | \$6,603 |  |
| 36 | PNM | PNM Resuurces | BB] | Bal | 3 | B | 0.95 | \$1,838 |  |
| 37 | POR | Portand General Elec. | BBB | Baa2 | 2 | B ${ }_{\text {a }}$ | 0.75 | \$2,434 |  |
| 38 | एT, | PrL Corp. | BBB | Baa3 | 3 | Bt+ | 0.65 | \$18,628 |  |
| 39 | PEC | Pub Su Fnterprise Grp | B8B+ | Baa2 | 1 | A | 0.75 | \$17,528 |  |
| - 10 | SCG | SCANA Corp. | $\mathrm{BBB}+$ | Baa3 | 2 | $\mathrm{Bi}+$ | 0.65 | \$6,985 |  |
| 11 | SRE | Sempra Enery | BBB+ | Baal | 2 | A | 0.80 | \$20,191 |  |
| 12 | So | Southern Company | A | Baal | 1 | A | 0.55 | \$40,299 |  |
| 43 | IE | THCO Energy | BBB + | Baal | 2 | B+ | 0.85 | \$ 4,078 |  |
| 4 | UII | UIL Holdings | BBB | Bay ${ }^{\text {a }}$ | 2 | B++ | 0.70 | \$2,097. |  |
| 45 | UNS | UNS Energy | BB+ | Ba1 | 3 | B+ | 0.70 | \$2,07.4 |  |
| 16 | VVC | Vectren Corp. | A- | A3 | 2 | A | 0.70 | \$2,962 |  |
| 47 | WR | Westar Energy | BBB, | Baa2 | 2 | $\mathrm{B}+4$ | 0.70 | \$4,241 |  |
| 48 | WEC | Wisconsin lenergy | A- | A3 | 1 | A | 0.60 | \$9,892 |  |
| 19 | XEL | Xael Fnergy, inc. | A- | Baal | 2 | B++ | 0.60 | \$14,912 |  |

(1) Comporate credit rating from www.standardandpoors.com (retrieved May 14, 2013).
(2) lony-term rating from wiww.modys.com (retrieved May 14, 2013)
(3) The Value Line Investment Survey (Mar. 22, May 3, \& May 2t, 2013).

Criteria
Pay common dividends
S\&P Credit Rating of "BBB-" to "BBB+"
Safety Rank of "2" or "3"
Financial Strength Rating of " $\mathrm{B}+$ " or higher
Market cafitalization of $\$ 1.6$ billion or greater

## Kentucky Power Company

## REQUEST

Refer to page 42 of the Avera Testimony.
a. Explain why a historical risk premium was not calculated as an additional element of the Empirical Capital Asset Pricing Model ("ECAPM") analysis.
b. State whether companies with negative growth rates and excessive growth rates were excluded from the Discounted Cash Flow ("DCF") analysis. If not, explain why.
c. Explain why Earnings Per Share ("EPS") growth projections were not taken from Value Line, which provided the dividend yields.
d. Explain the need for a size adjustment, given that American Electric Power ("AEP"), Kentucky Power's parent company, is sufficiently large as to require a negative size adjustment, as shown on Exhibit WEA-6.

## RESPONSE

a. Dr. Avera did not rely on an historical equity risk risk premium in applying the ECAPM or CAPM approaches. While investors undoubtedly consider historical information as one facet in their evaluation of future expectations, the cost of capital is a forward-looking concept. Because the CAPM is focused solely on the perceptions of today's capital market investors, it should not be applied using historical rates of return. Moreover, the CAPM cost of common equity estimate is calibrated from investors' required risk premium between Treasury bonds and common stocks. In response to heightened uncertainties, investors have repeatedly sought a safe haven in U.S. government bonds and the Federal Reserve has continued to employ various policy measures in order to effect a reduction in long-term borrowing costs. These policy measures and the "flight to safety" have pushed Treasury yields significantly below historical levels. This distortion not only impacts the absolute level of the CAPM cost of equity estimate, but it affects estimated risk premiums. Meanwhile, backward-looking approaches incorrectly assume that investors' assessment of the required risk premium between Treasury bonds and common stocks is constant, and equal to some historical average. At no time in recent history has the fallacy of this assumption been demonstrated more concretely.
b. The growth rates used to apply the DCF model to estimate the cost of equity for the 390 dividend paying companies in the S\&P 500 reflect the published values from the Institutional Brokers Estimate System (IBES). This recognizes the far greater breadth of expectations for the market group versus a narrowly focused proxy group of utilities. Eliminating negative growth rates would increase the market return by 10 basis points. Screening upper-end cost of equity estimates for the market as a whole is complicated due to the wide range of investment risks represented by the individual companies. Based on the $17.7 \%$ upper-end screen used by FERC and the average beta for the electric utility industry of 0.71 , this would imply an upper-end threshold for the market rate of return under the CAPM of $19.3 \%$. [ $(17.7 \%-3.3 \%) / 0.71]$. Consistent with the disparities between the individual firms in the market group, beta values also vary considerably. Based on the 1.85 beta assigned to Bank of America for example, this would imply an upper-end threshold for a firm in the market group of $32.9 \%$. [ $3.3 \%+1.85 *(19.3 \%-3.3 \%)]$. Eliminating companies with negative growth rates as well as cost of equity estimates above $32.9 \%$ would result in a market rate of return of $12.4 \%$. Of course, this would tend to be understated because low-end estimates that do not materially exceed corresponding yields on long-term bonds should also be eliminated. Considering the fact that many firms in the market as a whole have ratings that fall below investment grade, this implies a far higher low-end cut off for illogical results.
c. Dr. Avera relied on the consensus EPS growth projections from IBES because this source is widely referenced in the financial literature in applying a forward-looking DCF approach to estimate the market cost of equity. See, e.g., Robert S. Harris and Felicia C. Marston, "The Market Risk Premium: Expectational Estimates Using Analysts' Forecasts," Journal of Applied Finance (2001). A copy of this article is attached as KPSC 2-4 Attachment 1.
d. The size adjustment required to implement the ECAPM and CAPM approaches is not designed to account for the relative size of AEP versus other firms in the proxy group. Rather, it is necessary to address the findings of empirical research published in the financial literature, which demonstrate that the beta risk measure does not fully capture the relationship between a firm's relative size and investors' required return. The size adjustment modifies the ECAPM and CAPM results in order to account for this increment of return related to firm size that is not captured by beta, and which can be positive or negative. In the case of larger firms, such as AEP, the adjustment has the effect of lowering the indicated ECAPM and CAPM results. The sole purpose of the adjustment is to produced cost of equity estimates that better reflect the true values required by investors.

WITNESS: William E. Avera

# The Market Risk Premium: Expectational Estimates Using Analysts' Forecasts 

Robert S. Harris and Felicia C. Marston


#### Abstract

      


The notion of a market risk promium (the sprad betwen investor required returns on sate and average risk assets) has lone played a cemtal role in linance. It is a key factor inasse allocation decisions to determine the portiolio mix of debt and equity instruments. Moreover. the marke risk premium playe a critical role in the Capital Asset Pricing Model (CAPM), the most widely uned means of estimating equity hurde rates by practitioners. In recent yars. the pratical significance of estimating such a markef premium has inerensed as fimes. financial analysts, and investers employ financial frameworks to analyze corporate and investment performance. For instance. the inereased use of I conomic Value Added (EVA') IO assess corporate performance has pooved anew impetus for estmating capital custs.
The most prevalent approach to estimating the market risk premium relies on some average of the histortal spread between returns on stocks and honds.' This









choice has some appeating characteristics hal is subjee to mans arbitrary assumptions such as the rele ant pertod for taking an aterage Compounding the diftututy of using historical returns is the well noted fact that standird models of eonsuner choice would predict much loser spreads belween equity and debl returns than have wecurred in US markets whe se called equity risk premium purace (see Welch, 2000 and Siegel and Thaler. 1997). In addition. Weory alls for a foward-hoking risk premim that conld well change oner time.
This paper takes an alternate apprath by using expectational data to cstimate the market risk premum. The approach has two major advantages for practitioners First it prosides an independent cetimate tha can be compared to hitarical aterages. At a minmum. this can holp in understanding likely ranges for risk premia. Sceond, expectational data allow insestigation of changes in risk premat oner time. Such time variations in risk premia serve as important signals from investors that should affect a host of limancial decisions. This paper prowides new tests of whether changes in riak prentaner time an linked of forsandlooking masures of risk. Spucifically. we look a the

[^0]
ehatonship between the risk promium and fou examb measume of risk: the spread betheen yields on copporate ad gosermmen bonds. consumer sentiment about future economic conditions, the aberage lese of dispersion across analvsts as they forecast comporate camings and the inplied volatity on the SXPSol Indes derived from optons dam

Secton I provides backeround on the estimation of cumby requined refurms and a bride discussion of current practiee in estimating the nurket risk premium. In hecton It, models and data are discussed. Following a comparison of the results to historical retums in Section Ill, we examine the bime-series chatacteristics of the estmated market premimm ia Section IV. Fantly. conctustons are othered in Section $V$.

## I. Background

The notion of a "marke" required rate of remm is a convenient and widely used construct. Such a rate (h) is the minmma level of expected retum necessary to compensate investors for bearing the aterage risk of equity investments and reenting dollars in the tuture ather than in the present. In gencral, \& will depend on returns avalable on abternative investments (e.g. bonds). To isolate the eftects of risk, it is useful to work in termo of a marke risk premium (rp), defined as

$$
\begin{equation*}
j p=1 \% 1 \tag{11}
\end{equation*}
$$

Where = required return for a perorisk investment.
Lacking a superior attermative investigators often use averages of histurical realizations to estmate a marke rish premium. Bumer. Fides, 1 larris and Hgegins (1998) provide recent survey results on best practices by corporations and finameial advisors. While amos all respondents wied some averate of past data in cstimating a marke risk promimm. a wide range of approaches emerged "While most of our 27 smple companies appear to use a $60+y$ gar historical periond to extmate veturns. one cited a sindor of less than ten jears. Wo cited windows of about len yents, one begem ateraing wity 1900 , and another with 1952 data (p. 22). Sonme used arithmetic aserages, and some used geomethic. This historical appoach repuires the assumptons that past reatizations are agood surmgate for future expectations and, as typically applicd, that the risk pemium 15 eonstan over time. Carletom amd Lakonishok 19851 demonstrate empirically seme of the problems wal such hismoteal premia when they are disageregted for diferent time periods or groups at limms. Siegel ( 1009 ) cites aditional problems of using historkal retums and atyes that equaty promion

clal. (1098) point out. ew respordents cited use of expectational data to supplemen or replace histomeal retums in estimating the marke premiun

Survey evtence also shons suhstantial bariation in empmeal estmates. When responeents gate a precise estimate of the mathe premium. the cited
 quote from a survey tespondent highights the range in practice. "In 1903. we polted tarious investmem banks and acalemic stadies on the issute as to the appopriate rate and got amyhere between 2 and wo. but most were between $6 \%$ and $7.4 \%$." (Bruncrel al. 1998). An informal sampling of current pactice also reveals large differences in assumptions about an appropriate market prenitum. For instance. in a 1090 application of EVA amalysis, Goldman Sachs Incestmen Reseath specifies a marke risk premium of 34 a from 1994-1997 and $3.5 \%$ from 1908 -1999E for the Sep Imdustrials" (Goldman Sachs, 1999) At the same time an April 1900 phone call to Stern Stewart revealed that their own application of EVA Iypically employed a marke risk preminm of $6 \%$. In its application of the CAPM. Wbotson Associates (1998) uses a marked tisk preminm ol $7.8^{\circ}=$ No sumprisingly, acalemics do not agre on the rish premium either. Weleh (2000) surveved leading financial economists at major universities. For a 30-year horizon, he found a mean risk premium of $7.1 \%$ hut a range from 1. F"n $^{\prime}$ to 150 with an interquatile mane of $2.4 \%$ (based on 226 responses).

To provide additional insight on estimates of the market premium, we use publicly availahle expectational data. This expectational approach employs the dividend growth model (heratier mefered to as the discounted cash llow (DCF) model) in which a convensus measure of fmane al andysts forecasts (FAF) of camines is ued as a proxy for investor expectations. Eather worh has used FAF in DCF models: but generally has covered a span of only a few years due tu data avabability

## II. Models and Data

The simplest and most commonly used version of the DCF model is cmplosed so estimate shareholders' required rate of return. $k$ as shown in Equation (2):

 appoate but malysts foresams tha been ased frequenty in

 they do thas as a spatate bethente and mos as part ot the
 for the mothot phetwans

$$
\begin{equation*}
k=\left(\frac{D_{1}}{P_{i}}\right)+g \tag{2}
\end{equation*}
$$

Where $D_{1}=$ dividend per shate expected to be received at time one, $P_{a}=$ current price per share (ime 0 ), and $g$ $=$ expected growh rate in dividends per shate. ${ }^{*}$ A primary dimaculy in using the DCF model is obtaining an estimate of $g$. since it should reflect market expectations of future performance. This paper uses published FAF of long-run growth in eamings as a proxy for g. Equation (2) can be applied for an individual stock or any portfolio of companies. We focus primarily on its application to estimate a market premium as proxied by the $S \& P 500$.

FAF comes from IBES fac. The mean value of individual analysts" forecasts of five-year growth rate in EPS is used as the estimate ol $g$ in the DCF model. The five-year horizon is the longest horizon over which such forecasts are a ailable from IBES and uten is the longest horizon used by analysts. IBES requests "normalized" five-year growh rates from analysts in order to remove short-term disionions that might stem from using an unusually high or low earnings year as a base. Growth rates are avalable on a monthly basis.

Dividend and other firm-specife information come from COMPUSTAT. Dt is estimated as the current indicated ammal dividend times $(/ / g)$. Interest rates (both govermment and corporate) are from Federal Reserve Bulletins and Moody S Bond Record. Exhibit describes key variables used in the study. Data are used for all stocks in the Standard and Poors 500 slock (S\&P500) index followed by IBES. Since fiveyeargrow th rates are hrst available from IBFS beginning in 1982, the analysis covers the period from January 1982-December 1998.
The approach used is generally the same approad as used in Warris and Aarston (1992). For each month.
 (1092) who disuas eather reseatel and the apprath cmployed
 modets. Sine analysts forecost grouth in catamgs por shars. their poustatons should incorporte the anticipated eftees of share repurchase programs. Dusededs per share woult grow it the same rate as FPS as long as compantex manage a colatant tation of dividends ta eamings on a per shame hasis Based on S\& P50h rigutes ste the standard and boor's wehate bor their

 dscusses some tswes if share repurdases destray the tequitakee at 10PS and DPS growth mates Themetically. 1 is a rishtrete rate though its empirical prosy is onf a thast risk"


 volathes, whel womb be eonsintem whit atrop in the cquty marhet prematan.
a marke tequired mate of retum is calculated using each dividend-paying stoch in the S $8 P 500$ index for which data are available. As additional sereens for reliability of data, in a given month we climinate a firm if there are lewer than three andysis forecasts or if the standard devation around the mean forecast exceeds 20\%. Combined, the two screens eliminate fewer han 20 stocks a month. Later we repon on the sensitivity of the results to various sereens. The DCF model in Equation (2) is applied $o$ each stock and the results weighted by market value of equity to produce the market-required return. The risk prentum is constructed by subtacting the interest rate on government bonds.

We weighted 1998 resuls by year-end 1997 markel values since the monthly data on marke value did not extend through this period. Since data on lirm-specilic dividend yields were not avalable for the last four months of 1098 at the tme of this study. the market dividend yield for these months was estimated using the dividend yield reported in the Hall Street , Journal scaled by the average ratio of this figure to the dividend yied for our sample as calculated in the first eight months of 1998 . Adjustments were then made using growh rates from IBES to calculate the market required return. We also estimated results using an average dividend yield for the month that employed the average of the price at the snd of the cursent and prior months. These arerage dividend yield measures led to similar regression coefficients as those reported Jater in the paper.
For short-term horizons (quarterly and annual), past research (Brown. 1993) finds that on average analysts" forecasts are overly optimistic compared to realizations. However, recent research on quaterly horizons (Brown. 1997) suggests that amalysts. forecasts for S\&P500 firms do not have an optimistic bias for the period 1993-1996. There is very litte research on the properties of five-year growth forecasts, as opposed to shorter horizon predictions. Bocbel (1091) and Boebel. Harris and Cultekin (1993) examine possible bias in analysts* five-year growin rates. These studies find evidence of optimism in IBES growh forcoasts. In the most thorough study to date. Boebel (1991) reports that this bias seems to be getiong smaller over time. His forscast data do not extend inte the 1090 s .

Analysts' optimism, if any, is not necessarily a problem tor the analysis in this paper. If in estors share analysts views. our procedures will still yich unbiased estmates of requited returns and risk premia. In light of the possible hias, however. We interpret the estimates as "upper bounds" for the market preminm.

This sthdy alno uses fonr vely dilferen sourees to create ex ante measmes of equity risk at the market

## Exhibit 1. Variable Definitions

| \% | $=$ | Fypity required mat remm. |
| :---: | :---: | :---: |
| $1 \%$ | $=$ | Price per hare. |
| $H_{i}$ | \% | Fivected dividend per thate meatured as emem indicated amual divend hom COMPUSTAT mutiplied be $(1+$ a |
| 4 | $=$ |  per shate (from IBES). |
| $i$ | $=$ |  <br>  |
| ${ }^{\prime \prime}$ | $=$ | Fupity rish preminm caleulatel as ry $=h-i$. |
| BSPREAD | $=$ |  yied to maturity on long-terns corporate bonds (Woody's a erage aters bond rating cateotion) minus $i$. |
| CON | $=$ | Mondyy convamer contidence indsx reported by fe Conterate Buard davided by $100 \%$. |
| DISP | $=$ | Diageram of matyss, forctasts at the market hevel |
| VOL | $=$ | Volaility for the $S+P 500$ inder at implied by uptons data |

level The bers proxy comes from the bond mates and is calculated as the spread belween comporate and gevernment bond ywds (BSPREAD). The rationale is that increases in this spread signal investors perceptions of increased riskiness of comporate activity that would be tramslated to both debt and equity owners. The second measure. CON is the consumer contidence index reported by the Conference Boardat the end of the month. White the reported index tends to be around loo. we rescale CON as the atual index divided by 100 . We also exammed use of CON as of the end of the prior month: however. in regression analysis. this laged measure generally was not statistically sgenificant in explaining the level of the marke risk promium.' The thed measure Disp. measures the dispersion of analysts forecasts. Such amalyst disagremen should be positively related to perceived risk since higher levels of uncertainty would likely generate a wider distribution of eamings forecasts for a given firm. DISP is calculated as the average of limespecifie shandard deviations for cach stock in the S\&P500 cowered by IBES. The fim-specifie standard devation is calculated based on the dispersion of individual amatysts growh forecasts

We examine tho other provis bor Consumbe contidence The Conference Hoard's Comsumer Expectations Inder ytuded sscmially the same results as these repored The Enisersity al Wicheres comemer semiment indies tendel to be less segntiants, bate to the maket roti promam thateh

around the mean of individual forecasts for that company in that monh. DISP also was estmated using a value-weighted measure of analys dispersion for the lims in our sample. The results reported use the equally weighted version but similar patterns were obtained with both constructions. Our fimal measure. VOL. is the impled volatility on the S\&P500 index As of the beginning of the month. a dividend-adjusted Black Scholes Formula is used to estimate the implied volatility in the S\&P500 index option contract. which expires on the third Friday of the month. The call premiom, exereise price and the level of the S\&PS00 indes are taken from the Hall Streit lonmal, and treasury yields come from the Federal Reserve. Dividend yield comes from DRI. The option contat that is closest to being a the money is used.

## III. Estimates of the Market Premium

Exhibit 2 reponts both required returns and risk premia by gear (averages of monthly data). The cstimated risk premia are positive. consistent with equity owners demanding additional rewards over and above retums on debt securtites. The average expectational risk premisun ( 1082 to $100 \%$ ) over

Fur the regressions repurted in atibu 6. the valuewelphed daperston medsure athally cahbiled mose

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KPSC Case No. 2013-00197

Exhibit 2. Bond Market Yields, Equity Required Return, and Equity Risk Premium, 1982-1998


 by price per shate

| Year | Div. Yield | $g$ | $k$ | $i$ | $r p=k-i$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $10 \times 2$ | 6.89 | 1273 | 1962 | 18.76 | 0.86 |
| 1983 | 524 | 1200 | 17.6\% | 11.18 | 6.67 |
| 198.4 | 555 | 12.02 | 17.57 | 12.36 | 5.18 |
| 1985 | 4.97 | 11.45 | 16.42 | 11.70 | 563 |
| 1980 | 4.08 | 11.05 | 15.13 | 7.80 | 73 |
| 1987 | 3.14 | 11.01 | 14.65 | 8.58 | 6.177 |
| 1988 | 4.37 | 11.00 | 15.27 | 8.96 | 6.31 |
| 1989 | 3.95 | 1108 | 15.0. | 8.45 | 6.58 |
| 1900 | 4.103 | 11.09 | 15.72 | 8.61 | 7.11 |
| 1991 | 3.64 | 11.99 | 15.63 | 814 | 7.50 |
| 1002 | 3.35 | 1213 | 15.47 | 7.67 | 7.81 |
| 1993 | 3.15 | 116.3 | 14.78 | 6. 60 | 8.18 |
| 194. | 3.19 | 11.47 | 14.60 | 7.77 | 729 |
| 1995 | 3.04 | 11.51 | 14.53 | 0.88 | 7.67 |
| 1996 | 360 | 11.89 | 14.49 | 6.71 | 7.74 |
| 1997 | 2.18 | 12.60 | 14.78 | $0.61)$ | 817 |
| 1998 | 1.80 | 12.93 | 14.75 | 5.88 | 2.17 |
| trerats | 3.86 | 11.81 | 15.67 | 8.5 | 7.14 |

gotermment bonds is $7.14 \%$, slightly higher than the $6.47^{80}$ average for 1982 to 1001 reported by llarris and Marston (1092). For comparison purposes. Exhibit 3 contains historical returns and risk prenia. The average expectational risk premitm reponted in Exhihit 2 is approximately equal to the arithmetic ( 7.50 ) long-term differential between returns on stocks and long-term government bonds."

[^1]Exhbil 2 shows the estmated risk premium changes over time. suggesting changes in the markets perecption of the incromental risk of imesting fin equty rather than debt securities. Scaming the last column of tixhibit 2. Her risk premitum is higher in the 1990 s then earlier and especially so in late 1907 and 1998. Our DCF results provide no esidence to support the notion of a declining risk premium in the louns as a driver of the strong fun up in equity prices.
A striking toature in lo whin 2 is the relatise bability of the estimates of $k$. Ater dropping tahong whin interest rates) in the emby and mid-19kos the anerage mnual salte of has temaned whina 75 basis point range around lyed for ower a decthe Doteover this sability arises desplte some tariabilits for the

KPSC Case No. 2013-00197

Exhibit 3. Average Historical Returns on Bonds, Stocks, Bills, and Inflation in the US, 1926-1998

| Historical Retum Realizations | Ceometric Mean | Arithmetic Mean |
| :---: | :---: | :---: |
| (immanstahinime (mimaty) | $112^{2}$ | 1,2\% |
|  | 5.1 | 5.7 |
| Inewn (zill | 38 | 3.8 |
| Inlation Rume | 3.1 | 32 |


anderyine dis idend yieh and grow hiompoments of $A$ as Exhibit 2 Mustrates. The resulte suges that $k$ is mate stable than government interest rates. Such relatite stability of $k$ mansates imo parallel changes in the market risk premimm. In a subseqtem section. we cxamine wherher chages in our mate rish preminm estimates appear linked to interest rate conditions and a mumber olproxies for risk.

We explored the sensilivity of the testhte to our screming procedures in sclecting companies. The reponted resalts sereen ont all non-disidend paying stocks an the premise that use of the DCF model is inapproprate in such cases. The disidend sereen eliminates an anerage of 55 companies per momat. In a given mond. We also seren out fims whib tewer than three analssts forecasts or if the standard devintion around the mean forecast enceds $20^{\circ}$. When the analysis is repeated withon any of the three sereens, the aberage rish premium over the sample period increased byonly 40 basis points. from $7.1+t^{\circ}$ in $7.5^{4 \prime}$ a The beta of the sample lirms also was extmated and the sample atrage was whe suggesting that the sereens do mot systematically remove low or high-rish firms. (Spectically, using hems in the serened sample as of December 1007 ( the last date for which we had CRSP return dab, we used ordinary least squares regressions to estimate bea for each stock using the prier 60 months of data and the (RSP retum (SPIRTRN) as the marke index. The value-weighted a erate or the individaal betas was I.00.)
The results reported here use hirms in the S\&PS00 as reported by cOMPUSTAT in September loos. This could erean a survorshophas. espechatly in the chatior months of the smmple. We compared our curent results to those whatied in Hartis and Marston (1999) for Which there was data to update the $S 8.8500$ composition each monh. For the otertappine period. Jontay 1982 Nat 1901 , the woprecedures yod the same areage marke risk premim. $6.47 \%$. This sugecsts that the lims depanting from or cotering the Seproo index do is lor a mumber of reasons with no discemable effed on the uerab estmated sepanm matket rick premum.

## IV. Changes in the Market Risk Premium Over Time

With changes in the economy and finamed markets. Gyuit intestments may be percened to change in risk. For inatance insestor semtiment about future business conditions likely aheets athludes about the riskiness of equity invesments compared " in estments in the bond markets. Morsover, since bonds are risky invesments themselees equity risk prema trelative to bonds) could change due to changes in pereceved rihmess of bonds. even if equites displayed no shifis in risk.

In zarlier woble coserng the 19x2-199| period. Harns and Narston (1902) reported regression results indicating that the mathe gremium decenased whin the level of gosemment merest rates and incrased with the spread between corporate and gobermment bond gields (BSPREAD). This hond yeld spread was interpreted as a time series prosy for equity risk. In has paper. Ne introduce hoce additamal ex amm measures ofrisk shown bis Exhibit I: CON. DISP. and VOL. The three neabures come trom bue independent sets of data and are suppled by diferent agents in the sconomy (consumers, equity analysis. and investors (xia option and share priwe data), Eashibit + provides summary data on afl four of these risk measures.

Exhibit 5 replicates and updates enfier analysis by llarris and Marston (1902). The results contrm the carler pathers. For the entire sample period. Panel A shows that risk premita are negatioly related winterest rats. This negatise remonshap is also the for boh












## Exhibit 4. Descriptive Statistics on Ex Ante Risk Measures





| I'anm 1. Vuruhle are Monimy Levels |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Mean | Standard Deviation | Minimum | Maximum |
| BSPREAD | . 0127 | .00-4) | 0070 | .0234 |
| CON | . 95014 | . 2242 | . 473 | 1.342 |
| D159 | .0.4) | .1077) | 0285 | .00\% 7 |
| VOL | .1599 | .16997 | 17705 | 60 S 5 |


| Panel B. Vatuhes ane Monhly Chunes |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Mean | Standard Deviation | Minimum | Maximum |
| BSPRREAD | -.00001 | .0011 | -0013 | ()1306 |
| CON | 0030 | 0549 | 0.2300 | 2170 |
| Disp | . 00000 | 0024 | - 0160 | 0154 |
| Vol. | . 10008 | (159) | -.2156 | . 4081 |
|  |  |  |  |  |
|  | BSPREAD | CON | DISP | VOL |
| BWPREAD | 1.010 | - $166^{* *}$ | .1054 | 223 |
| CON | $\cdots 16 \times 4$ | 1.00 | .065 | -. 09 |
| DISP | 0.4 | .16,5 | 1.00 | 027 |
| VOL | .23* | -. 09 | 027 | 1. (1) |


"Sigmiambly dfterent from exer at the in kew.
the 1980 s and 1990 as displayed in Patiels 13 and $C^{\circ}$. For the entire 1982 to 1998 period, the addition of the field spread risk proxy to the regressions lowers the magnitude of the coefficient on government hond yields, as can be seen by comparing Equatoms (1) and (2) of Panel A. Furthemore, the coelficient of the yield spread $(0.488)$ is itself signilicmoly positive. This pattern suggests that a reduction in the tisk dimerenital between investman in government bonds and in corporate bonds is uanslated into a lower equity maket risk premiun.

In major respects. the results in lehibit paralled earlier tindings, The market risk premitm changes over time and appears inversely related to govermment interest pates but is positively related to the hond yed spread. which provers for the mermental risk al
investing in equities as opposed to government bonds. One striking leature is the large negative enefficients on government bond yields. The coefficients indicate the equity risk premium declines by over 70 basis points for a 100 basis point increase in govermment merest mus." This inverse relationship suggests …… -...
 from - 1. a stegesting that egmey requied remms do respond
 ancficiens imply only miner sdentments of regured retums to interest rate changes sine the risk prembum dectines. In carler wom (Harris and Abrston, (992) the coeflicient was
 eation whe we repurted resulta asing the Prati-Winstur




Exhibit 5. Changes in the Market Equity Risk Premium Over Time





| Time Period | Intercept | $i$ | BSPREAD | $R^{2}$ |
| :---: | :---: | :---: | :---: | :---: |
| A 1082-100\% | $\begin{aligned} & (0002 \\ & (-1.40) \end{aligned}$ | $\begin{array}{r} 869 \\ (-16.54) \end{array}$ |  | 57 |
|  | $\begin{array}{r} .0002 \\ 1.1 .11 \end{array}$ | $\begin{array}{r} -.749 \\ (-11.37) \end{array}$ | $\begin{array}{r} 4 B 4 \\ (2.94) \end{array}$ | 59 |
| B. 1980 | $\begin{aligned} & .0005 \\ & 1.1 .621 \end{aligned}$ | $\begin{array}{r} -.887 \\ (-10.97) \end{array}$ |  | 56 |
|  | $\begin{aligned} & .0004 \\ & (-1.24) \end{aligned}$ | $\begin{array}{r} -759 \\ (-7.42) \end{array}$ | $\begin{array}{r} .508 \\ (1.90) \end{array}$ | 57 |
| c. $1009 \%$ | $\begin{aligned} & .01000 \\ & 1-0.091 \end{aligned}$ | $\begin{array}{r} 0.3+19 \\ (-1378) \end{array}$ |  | . 6.4 |
|  | $\begin{aligned} & -00010 \\ & 10.01 \end{aligned}$ | $\begin{array}{r} -.757 \\ (-9.85) \end{array}$ | $\begin{array}{r} .347 \\ (1.76) \end{array}$ | .65 |

Exhibit 6. Changes in the Market Equity Risk Premium Over Time and Selected Measures of Risk
The evhinit tepors regression comefoms (matus). Regression estimates use all variables expressed as mombly changes
 is the spreat hetwen yofds on long-rem corporate and govermment bonds. The yeld to matury on tong-fom govermem bonds is dented as i. (ON is the consmer conhdence mdes. DlSp measures the dispersion of analysts forecasts of carming groeth. VOL is the volatity on the SEpson index implite by eptions data. For purposes of the regression.


| Time Period |  | Intercept | $i$ | BSPREAD | CON | DISP | VOL | Adj. $R^{2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A. $1082 \cdot 1494$ |  |  |  |  |  |  |  |  |
|  | (1) | $\begin{array}{r} 0.10002 \\ 1.975 \end{array}$ |  |  | $\begin{aligned} & -0.014 \\ & -3.50 \end{aligned}$ |  |  | 0105 |
|  | (2) | 0.14011 $(.06)$ | $\begin{array}{r} 0.737 \\ (-11.31) \end{array}$ | $\begin{aligned} & 0.453 \\ & 12.761 \end{aligned}$ | $\begin{aligned} & -01017 \\ & (-2 .-48) \end{aligned}$ |  |  | 0.60 |
|  | 43 | 101002 179 |  |  |  | $\begin{aligned} & 0.224 \\ & (2.35) \end{aligned}$ |  | 1012 |
|  | (1) | $\begin{array}{r} -1 .(0) 01 \\ \{-93) \end{array}$ | $\begin{array}{r} 0.733 \\ (-11.49\} \end{array}$ | $\begin{aligned} & 0.433 \\ & 12.69) \end{aligned}$ | $\begin{array}{r} -0.007 \\ (2.77) \end{array}$ | $\begin{aligned} & 0.185 \\ & (5.13) \end{aligned}$ |  | 0.62 |
| B. M6, 198.1934 | 1.51 | (1.16AK) <br> (.0n) | $\begin{gathered} -10.818 \\ 1-11.21\} \end{gathered}$ | $\begin{aligned} & 0.430 \\ & 12.33 \end{aligned}$ | $\begin{aligned} & -0.1405 \\ & (223) \end{aligned}$ | $\begin{aligned} & 0.378 \\ & (3.77) \end{aligned}$ |  | 1.68 |
|  | (6) | $\begin{aligned} & \text { nemel } \\ & 5.51 \end{aligned}$ |  |  |  |  | $\begin{aligned} & 0.011 \\ & (2.89) \end{aligned}$ | 005 |
|  | 178 | $(1, \ldots \mathrm{KM} \mathrm{~K}$ <br> (AL) | $\begin{array}{r} -0.131 \\ 1 \cdot 11.521 \end{array}$ | $\begin{aligned} & 0.386 \\ & 11.951 \end{aligned}$ | $\begin{gathered} -11015 \\ (2.12) \end{gathered}$ | $\begin{aligned} & 0.772 \\ & 1.3771 \end{aligned}$ | $\begin{aligned} & 11000 \\ & 13.069 \end{aligned}$ | (16) |

mueh greater sability in equity nequired retums than is ohen assmmed. For instance. stambat application of the CAPN sugesests a me-to-one change in cyuity relums and gosermmen bond yields.

Exhbit Gintrolues thres additional proxies for rish and explores whether these tariables. either individually or collectisely. are comelated with the narket preminm. Smee the csimates of impled whativy star in May 1986. The exhbit shows results for hoth the entire sample pertod and for the period durng when we can introduce all variables. Entered individually each of the three bariables is significanty linked to the risk premium whith evefleisnt hating the expected siga. For instance in regression (1) the coelhelent on (ON is - 014. which is significantly difterent fom zero (t $=-3.50$ ). The negative coetficient signals that higher consumer confidenes is linked to a lower matet premium. The positite eodheients on VOL and DISP indicate the equity risk premium increases with bot market volathy and disagrement among malysts. The eflews ol the dire variables appear largely unameeted by adding other variables. For instance in regression ( -1 ) the coeflicients on $C O N$ and DISP boh remain significmt and are similar in magntude to the coefletems in single varinble regressions."

Even in the presence of the new risk tariables. Finibit o shous that the market risk pemium is atheted by interest rate conditions. The large negative coefticient on govemment bond rates imples large reductions in the equity premium as interest rates rise. One feature olour data may contribute to the observed negative relationship between the maketrisk premium and the level of interest rates. Specilically, if andysis are slow tor report updates in their grow horecasts. changes in the estimated $h$ would not adjust fally with changes in the interest rate even if the true risk premium were constam. To address the impat of "stickiness" in the measumemen ol $k$, we formed "quarterly" measures of the risk premiun lhan treat $k$ as an anemge over the quater. Specitically, we take the value olk at the end of a quater and subtete from it the aremge value of $i$ for the months ending when $k$ is measurce. For instance, to form the risk premiam for Mareh 1908 .

 that we look at evocotianal roth premis which ate much



 sughticanls mere mechate thecter than the ut hach than a





the avenge value of i for danary. Februry and Narch is subtacted from the Nareh satue of $k$. This appruch assumes that, in Nared. $k$ still reflects salues of $g$ that have now been updated from the prior two months. The guarterly measure of risk premium then is pared Whit the average values of the other varibles for the quater. For instance, the Narch logs "guaterly" risk premium would he paired with meraged vatues of BSPREAD over the Janary through Manch period. To awod oreplaping ohservations for the independent variables, we use only tay hird month Marcl. Jume . September. Decemben in the sample.
As reported in Exhibit 7. semsitivity analysis using "quarterly" observations suggests that delays in updating may be fesponsible for a ponion, but not all, of the obsened negative retationship between the market premium and interest rates. For example, when quarterly obsentions are uste the coetheictit on $i$ in regression (2) of E Whibit 7 is -.527 . Well below the earlier estimates but sill signilicanly negative. ${ }^{\text {a }}$

As an additional test, mowements in the bond risk premium (BSPREAD) are examined. Since BSPREAD is comstructed directly from bond yiold data. It deses not have the putential for repoting lags tha may affee analysts prowth Forecasts. Regression 3 in Rxhibit 7 shows BSPREAD is negatisely linked to govemment nties and signilicantly so." Whike the equity premium nesed not move in the same pattern as the corpoment bond premium, the megative codfeiont on BSPREAD suggests that bur carlier results are not due solely to "stickiness" in measurements of marke required retums.

The results in Exhbit 7 suggest that the inverse relationship betreen imterest rates and the matiot risk premimm may not be as promonnced as suggested in earlier evhibits. Still, there appears to be a signilicam negative link between the equity rish premitum and government interest rates. The quaterly results in Exhbit 7 would sugecst about a 50 basis point change in rish premitm for ench 100 basis poin movement in interest rates.

Overall, the ex ahte estimates of the marke risk premium are significantly linked to ex athe proxies for risk. Such a link suggests that imestors modily their required returns in response to perceived changes in the environment. The thetings proside some comfore that our risk premium estimates are capturing at least










## Exhibit 7. Regressions Using Alternate Measures of Risk Premia to Analyze Potential Effects of Reporting Lags in Analysts' Forecasts

The evhibil reports regression coefficions ( 1 -values). Regression estmates use all ariables expressed as changes (menthy




in pari. underlying changes in the economic ensiromment. Moreover. each of the risk measures appears to contain relevant infomation for investors. The marke risk premium is negatively related to the level of consumer confidence and positively linked to interest rate sprads hetween corporate and govermment debt, disagrement among analysts in their forecasts of eamings growth. and the implice volatility of equity returns as revealed in uptions data.

## V. Conclusions

Shareholder reguired rates of return and risk premia should be based on theories about investors. expectations for the future. In practice. however, risk premia are typically estimated using averages of historical returns. This paper applies an altemate approach we estimating risk premia that employs publicly avalable expectational data. The resutant a erage market equity risk premium over govermment bonds is comparable in magnitude to long-term diftences ( 1926 to 1908) in historical retums between stocks and bonds. As a result. our evidence does mot resolve the equity premium puzele: rather. the results suggest insestors still expect to receive large spreads to invest in equiey versus debe instruments.

There is strong evidence, howeser, hat the marhet resk premimm changes over time. Moreover. these changes appar linked to the level of interest mes as well as es ante proxies for risk dawn from interest me spreads in the bomd maket. eonsumer conlidence in lunure conomic conditions. disagrement among financial andysts in their forecasts and the volathity
of equity returns implied by options data. The significant ecomomic links between the maket promiom and a wide array of risk variables suggests that the notion of a constant risk premium oser time is not an adequate explamation of pricing in equity versus debt matkets.

These results have implications for practice. First. at least on average, the estimates suggest a market premium roughly comparable to long-term historiad spreads in returns between stocks and bonds. Our conjecture is that. If anything, the estimates are on the high side and thus establish an upper bound on the marke promium. Second, the results suggest that use of a constant risk premium will not fully capture changes in investor return requirements. As a specific esample, our findings indicate that common application of models such as the CAPM will overstate changes in shareholder return requirements when government imerest rates change. Rather than a ons-for-one change with interest rates implied by use of constant risk promium. the results indicate that equity required returns for average risk stocks likely change by half (or less) of the change in interest rates. However, the picture is considerably more complicated as shown by the linkages between the risk premium and other atributes of risk.
Ulimately. our researeh does not resolve the answer to the question "What is the right market risk preminm?" Perhaps more importanty, our work suggests that the answer is conditional on a number of leatures in the economy no an absolute. We hope that future researd will hamess ex ante data to provide additonal guidance to best practice in asing a market premium to improse hancial decicions

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## Kentucky Power Company

## REQUEST

Refer to the Avera exhibits containing Mr. Avera's proxy group.
a. Provide the most current ROEs awarded by their respective regulatory agencies and the dates of the awards for Mr. Avera's proxy group, or for their electric utility subsidiaries if the proxy company is a holding company.
b. Explain why it is appropriate to include Kentucky Power's parent company, AEP, in the ROE analysis.

## RESPONSE

a. Dr. Avera has not conducted, nor does he typically conduct, any independent research to identify the most current ROEs awarded to individual utility operating companies by their respective regulatory agencies. Dr. Avera's testimony addresses earned or expected returns, which are different than awarded returns. The awarded ROE information is not necessary to support his analyses and conclusions.
b. Because Kentucky Power obtains its equity capital from AEP, estimates of investors' required return for AEP provide one benchmark, along with estimates for the other proxy companies, to evaluate a fair ROE. Because of the inherent difficulties in estimating the cost of equity and the potential for measurement error, it is important to consider the results of multiple methods for a group of risk-comparable utilities. AEP satisfies the proxy group screening criteria and is properly included in the analyses.

WITNESS: Dr. William E. Avera

## Kentucky Power Company

## REQUEST

Provide an electronic copy of the Excel spreadsheets supporting the Avera Testimony and the responses to items in this request for information for which Mr. Avera is responsible, where appropriate, with the underlying data and formulas intact.

## RESPONSE

Please see the Company's response to KIUC 1-1 Attachment 14.

WITNESS: Dr. William E. Avera

## Kentucky Power Company

## REQUEST

Refer to the Direct Testimony of Jeffrey B. Bartsch ("Bartsch Testimony") at pages 3-4 and Section V, Workpaper S-2, page 2.
a. The KPSC maintenance fee shown on line 4 of the workpaper is 0.15 percent. On June 10, 2013, the Kentucky Revenue Department provided the new assessment rate of 0.1785 percent for state government's 2013-2014 fiscal year to the Commission. Provide a revised gross revenue conversion factor calculation using the new assessment rate.
b. Explain why income tax rates for Illinois and Michigan are included in calculating the gross revenue conversion factor.

## RESPONSE

a. Please see KPSC 2-7 Attachment 1.
b. Kentucky Power files state income tax returns in Illinois and Michigan as a result of off-system sales in these states. As a result of the nexus or business presence in these states, KPCo must pay income tax on each dollar of taxable income earned on an apportioned basis. The apportionment of taxable income between all of the states in which KPCo has a presence has the impact of reducing the statutory Kentucky income tax rate of $6 \%$ to an overall effective state income tax rate of $5.3947 \%$. In addition, KPCo customers share in the benefits of the off-system sales and these other state income taxes are a minor cost of entering into these off-system sale transactions.

WITNESS: Jeffrey B Bartsch

## KENTUCKY POWER COMPANY

## Computation of Gross Revenue Conversion Factor

|  |  | Tax Rates | Percentage of Incremental Gross Revenues |
| :---: | :---: | :---: | :---: |
| 1 | Operating Revenues |  | 100.0000\% |
| 2 | Less: Uncollectible Accounts Expense |  | 0.2500\% |
| 3 | Less: KPSC Maintenance Fee |  | 0.1785\% |
| 4 | Income Before Income Taxes |  | 99.5715\% |
| 5 | Less: State Income Taxes (Line 4 x State Tax Rate) | 5.3947\% | 5.3716\% |
| 6 | Income Before Federal Income Taxes |  | 94.1999\% |
|  | Less: Federal Income Taxes (Line $6 \times$ Federal Tax Rate) | 35.00\% | 32.9700\% |
| - | Operating Income Percentage |  | 61.2299\% |
| 9 | Gross Revenue Conversion Factor (100\%/Line 8) |  | 1.6332 |

## Incremental

$100.0000 \%$
$\begin{array}{lll}2 & \text { Less: Uncollectible Accounts Expense } & 0.2500 \% \\ 3 & \text { Less: KPSC Maintenance Fee } & 0.1785 \%\end{array}$
4 Income Before Income Taxes
5.3947\%
1.6332

## Kentucky Power Company

## REQUEST

Refer to the Bartsch Testimony at pages 5-6 and Section V, Workpaper S-4, pages 63 and 65.
a. Explain why it was determined that an adjustment to Kentucky Power's test year Schedule M removal cost was necessary based on the average amount from the three most recent tax returns.
b. Explain why it was determined that the Mitchell plant test year Schedule M amount was appropriate for ratemaking purposes and did not require an adjustment based on a historical average.

## RESPONSE

a. The removal cost Schedule $M$ can vary significantly from year-to-year on the Federal income tax return. Since this Schedule M adjustment is treated as a flowthru item for Kentucky rate-making purposes (i.e. no deferred income taxes are recorded), it can have a significant impact on the Federal income tax expense computation. The Company believes that a three year average is more representative of what this Schedule M would be in the future when the rates set in this proceeding would be in effect.
b. Unlike removal costs, the Mitchell plant depreciation Schedule M's are not as volatile and are fully normalized for Federal income tax purposes (i.e. full deferred Federal income taxes have been recorded on the books of Ohio Power and will be transferred to KPCo). Therefore, changing the Mitchell plant depreciation Schedule M's would have no impact on the Federal income tax expense computations.

WITNESS: Jeffrey B Bartsch

## Kentucky Power Company

## REQUEST

Refer to the Bartsch Testimony at pages 8-9 and Section V, Workpaper S-4, page 64.
a. Explain why three years was selected as the basis for determining an average amount for the Section 199 Manufacturing Deduction.
b. The three-year period shown in the workpaper ends with the 2011 tax return. Explain when Kentucky Power's 2012 tax return will be filed.

## RESPONSE

a. As shown on Section V, Workpaper S-4, page 64, the Section 199 Manufacturing Schedule M deduction can vary significantly from year-to-year on the Federal income tax return. In fact, this Schedule $M$ deduction was $\$ 42,781$ on a separate stand-alone tax return in 2011. The three year average used by the Company in this proceeding was $\$ 124,538$. Since this Schedule $M$ adjustment is a permanent deduction for Kentucky rate-making purposes (-ie- no deferred income taxes are recorded), it can have a significant impact on the Federal income tax expense computation. The Company believes that a three year average is more representative of what this Schedule $M$ would be in the future when the rates set in this proceeding would be in effect.
b. The 2012 Federal Income Tax Return was filed and accepted by the IRS on August 13, 2013. The 2012 return is available for review at the Kentucky Power office located in Frankfort, Kentucky.

WITNESS: Jeffrey B. Bartsch

## Kentucky Power Company

## REQUEST

Refer to the Direct Testimony of Douglas R. Buck, pages 2-7. For each rate class receiving a proposed change in monthly service charges, energy charges, and demand charges, explain how the changes in the various charges were determined and provide supporting analysis.

## RESPONSE

The cost components developed by Witness Stegall in the Class Cost of Service Study provided the relative amounts of revenue to be recovered from customer charges, energy charges and demand charges for each rate class. Once determined, the initial rates were then compared to the current rates to determine which price changes would need to be moderated to mitigate price impacts on individual bills.

Please see KIUC 1-1 Attachment 12 for workpapers used for the detailed development of each proposed rate charge.

For this proceeding no rate design changes are being proposed, and rates were designed using the methods applied and approved in the previous KPCo rate case before this Commission, Case No. 2009-00459.

WITNESS: Douglas R. Buck

## Kentucky Power Company

## REQUEST

Refer to the Direct Testimony of Andrew R. Carlin at pages 19-28 and pages 28-32 and Section V, Workpaper S-4, pages 35 and 47.
a. Both sections of the testimony, 19-28, which covers annual incentive compensation, and 28-32, which covers long-term incentive compensation, reference the workpaper, pages 35 and 47. Page 35 has the adjustment for Kentucky Power while page 47 shows the calculation of the Mitchell plant adjustment.
(1) Provide a breakdown of the test year actual incentive plan payout for Kentucky Power of $\$ 5,778,275$ (page 35 ) which shows the amounts related to annual incentive compensation and long-term incentive compensation separately.
(2) Provide a breakdown of the incentive plan payout at a 1.0 payout for Kentucky Power of $\$ 3,697,125$ (page 35 ) which shows the amounts related to annual incentive compensation and long-term incentive compensation separately.
(3) Provide a breakdown of the test year actual incentive plan payout for the Mitchell plant of $\$ 1,843,172$ (page 47) which shows the amounts related to annual incentive compensation and long-term incentive compensation separately.
(4) Provide a breakdown of the incentive plan payout at a 1.0 payout for the Mitchell plant of $\$ 1,085,424$ (page 47) which shows the amounts related to annual incentive compensation and long-term incentive compensation separately.

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b. Provide a further breakdown of the amounts provided in response to part a. of this request which shows, for each of the annual incentive payout amounts, the portion related to each component of the annual incentive compensation plan and, for each of the long-term incentive payout amounts, the portion related to each component of the long-term incentive compensation plan.

## RESPONSE

a. For (1) - (4) see KPSC 2-11 Attachment 1.
b. The components and performance measures of AEP's annual and long-term incentive compensation plans are aggregated within these categories in AEP's accounting system and, therefore, a breakdown of these items is not available.

WITNESS: Andrew R Carlin

## Kentucky Power Company

|  | Page $35(\mathrm{KY})$ |  |  | Page 47 (Mitchell) |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |
| LTIP | $1,392,424$ | 802,913 |  | 811,694 | 472,231 |
| $50 \%$ of Mitchell | $\mathrm{n} / \mathrm{a}$ | $\mathrm{n} / \mathrm{a}$ |  | 405,847 | 236,115 |
|  |  |  |  |  |  |
| CIP | $4,385,851$ | $2,894,212$ | $2,874,650$ | $1,698,617$ |  |
| $50 \%$ of Mitchell | $\mathrm{n} / \mathrm{a}$ | $\mathrm{n} / \mathrm{a}$ |  | $1,437,325$ | 849,309 |
|  |  |  |  |  |  |
| Total | $5,778,275$ | $3,697,125$ | $1,843,172$ | $1,085,424$ |  |
| $\quad$ Question | $11 \mathrm{a} .(1)$ | $11 \mathrm{a}.(2)$ |  | $11 \mathrm{a} .(3)$ | $11 \mathrm{a} .(4)$ |

## Kentucky Power Company

## REQUEST

Refer to the Carlin Testimony at page 21 and Exhibit ARC-7, page 10.
a. Explain whether an improvement in Kentucky Power's System Average Incident Duration Index ("SAIDI") results in an increased incentive pay payout for its employees.
b. Explain whether improvements in Kentucky Power's SAIDI result in an increased incentive pay payout for AEP Service Corporation ("AEPSC") employees.
c. If the Commission-approved annual reliability spend were there to be increased by $\$ 10$ million, explain whether Kentucky Power's SAIDI would be expected to improve over time.
d. Explain whether Kentucky Power and AEPSC employees would receive increased incentive pay because of an improved SAIDI if the improvement resulted from the Commission's having authorized an increase in Kentucky Power's annual reliability spend.

## RESPONSE

a. Because SAIDI is a 15 percent component in Kentucky Power's annual incentive plan, an improvement in SAIDI generally results in increased incentive payouts for its employees, assuming earning thresholds are achieved and all else being equal.
b. Because Kentucky Power SAIDI was only a small component of overall AEP SAIDI for 2012 and because SAIDI is not a component of incentive compensation for many AEPSC employees for 2013, an improvement in Kentucky Power SAIDI generally will not result in significant increase in incentive payouts for its employees, assuming earning thresholds are achieved and all else being equal.
c. Generally, yes, depending on weather and other factors.
d. The increase in incentive payouts described for Kentucky Power employees described in response a. above would be expected to occur, assuming earning thresholds are achieved and all else being equal, if the Commission authorizes an increase in Kentucky Power's annual reliability spend. Since the score for each performance measure is capped at 200 percent of the target score for that measure and SAIDI has a 15 percent weight, the maximum impact would be to increase incentive payout for these employees by 30 percent of their target payout.

However, as stated in response b. above, an improvement in Kentucky Power SAIDI generally will not result in significant increase in incentive payouts for AEPSC employees, assuming earning thresholds are achieved and all else being equal. In addition, since AEP's overall incentive funding is determined by other annual incentive measures, any increase in incentive compensation payouts for Kentucky Power employees would be coupled with a reduction in incentive payouts in other AEP incentive groups, including AEPSC employees, if earnings thresholds are achieved and all else being equal.

Furthermore, if only the target level of incentive compensation is included in rates, as requested, then the expense associated with any increase in incentive compensation payouts above the target level would be borne by shareholders, not ratepayers.

WITNESS: Ranie K Wohnhas

## Kentucky Power Company

## REQUEST

Refer to the Direct Testimony of David A. Davis ("Davis Testimony") at page 7. The testimony indicates that Kentucky Power used the Average Remaining Life Method for the individual primary plant accounts. Provide the rational for using that methodology.

## RESPONSE

The Average Remaining Life Method or Remaining Life Method is a widely used methodology for calculating utility depreciation rates. Public utility commissions in Arkansas, Indiana, Michigan, Louisiana, Oklahoma, Texas, Virginia and West Virginia all have accepted AEP operating company depreciation rates calculated using the Remaining Life Method. Kentucky's currently approved depreciation rates from Case No. 91-066 were calculated using the Remaining Life Method.

The Remaining Life Method recovers the original cost of the property, adjusted for net salvage over the remaining life of the investment. As noted by Public Utility Depreciation Practices published by the National Association of Regulatory Utility Commissioners, Page 65: "The desirability of using the remaining life technique is that any necessary adjustments of depreciation reserves, because of changes to the estimates of life or net salvage, are accrued automatically over the remaining life of the property."

WITNESS: David A Davis

## Kentucky Power Company

## REQUEST

Refer to the Davis Testimony at page 10. Mr. Davis recommends that the Commission authorize Kentucky Power to adopt and apply the proposed depreciation accrual rates at the primary plant account level and that accumulated depreciation by primary plant account be established as of the date of this order. Explain whether this approach is current in use by other AEP operating companies.

## RESPONSE

Yes, this approach is currently in use in the following other AEP operating companies:
I. Appalachian Power Company
II. Indiana Michigan Power Company
III. Ohio Power Company
IV. Public Service of Oklahoma
V. Southwestern Electric Power Company
VI. AEP Texas Central Company
VII. AEP Texas North Company

WITNESS: David A Davis

## Kentucky Power Company

## REQUEST

Refer to the Davis Testimony and page 5 of Exhibit DAD-1. Item 1 of the exhibit indicates that Kentucky Power chose to use the group plan for all depreciable property included in the report and that it had previously used the remaining-life method of depreciation.
a. Explain why Kentucky Power chose to change methodologies.
b. Identify and describe the effects that using the group plan will have on the overall depreciation rates, compared with using the remaining life methodology.

## RESPONSE

a. Kentucky Power did not change its depreciation methodology. The remaining life method is still being used to calculate Kentucky Power's depreciation rates as is noted on page 5 of Exhibit DAD-1, item 2. The group plan summarized in item 1 on page 5 of Exhibit DAD-1 notes that depreciation is accrued upon the basis of the original cost of all property included in each depreciable plant account which means that all of the property in each account is taken as a group for depreciation rate calculations. The remaining life method was used to calculate depreciation rates for each plant account considering all of the property in each account as a group.
b. There is no effect on depreciation rates by using the group plan. As explained in the Company's response to item a, above, the remaining life methodology is being used to calculate depreciation rates on each account where all of the property in each account is taken as a group (group plan). This is the same method that was previously used to calculate depreciation rates for Kentucky Power.

WITNESS: David A Davis

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## Kentucky Power Company

## REQUEST

Refer to Exhibit DAD-1, page 8, wherein Mr. Davis indicates that a retirement date of 2015 is applicable for Big Sandy Units 1 and 2.
a. Explain whether Kentucky Power has made a decision to retire both units in 2015.
b. If the study were to be performed based on Big Sandy Unit 1's remaining in service beyond 2015, explain how that would affect the depreciation model runs.

## RESPONSE

a. Kentucky Power has decided to retire Big Sandy Unit 2 in 2015 and Big Sandy Unit 1 as a coal fired unit in 2015.
b. If Big Sandy Unit 1 were to remain in service beyond 2015, the Company's production plant service life would be extended which would decrease annual depreciation expense.

WITNESS: David A Davis

## Kentucky Power Company

## REQUEST

Refer to the Direct Testimony of Hugh E. McCoy ("McCoy Testimony") at page 8 and Exhibit HEM-1.
a. Identify the causes of the increase in annual pension expense from $\$ 3,245,663 \mathrm{in}$ calendar year 2012 to $\$ 4,061,812$ in calendar year 2013.
b. Confirm that the amount shown in Exhibit HEM-1 as pension cost for the 12 months ended March 31, 2013 reflects the sum of nine times the average monthly amount for calendar year 2012 pension cost plus three times the average monthly amount for calendar year 2013 pension cost.

## RESPONSE

a. Pension expense in calendar year 2013 increased versus calendar year 2012 because of (a) increased amortization of 2008 investment losses, which are phased-in as an increase in pension expense over five years, with the full effect first being recognized in 2013, (b) the decline in interest rates, and (c) the lower assumed long-term rate of

* return on plan investments, which reflects a more conservative allocation of trust fund investments.
b. Yes, the pension cost amount shown on Exhibit HEM-1 for the 12 months ended March 31, 2013 reflects nine-twelfths of calendar year 2012 cost plus three-twelfths of calendar year 2013 cost.

WITNESS: Hugh E McCoy

## Kentucky Power Company

## REQUEST

Refer to the McCoy Testimony at pages 17-21, Exhibit HEM-4, and Section V, Schedule 4, page 1. Exhibit HEM-4 shows a prepaid pension balance as of March 2013 of $\$ 26,308,055$. However, Section V, Schedule 4, page 1, shows a March 31, 2013 prepayments balance of $\$ 1,455,069$ and a rate case adjustment which adds the $\$ 26,308,055$ for an adjusted amount of $\$ 27,763,124$. Clarify what the correct March 2013 balance is for prepayments and, if the prepaid pension amount was not included in that balance, explain where and how it was recorded prior to being included as a rate case adjustment.

## RESPONSE

The correct amount of prepayments to be included in rate base as of March 31, 2013 is $\$ 27,763,124$, which includes a prepaid pension asset of $\$ 26,308,055$ plus other prepayments of $\$ 1,455,069$.

The $\$ 26,308,055$ prepaid pension asset is the cumulative amount of additional cash contributions to the pension trust fund beyond the amount of FAS 87 pension cost. This additional cash investment is recorded on the Company's books in Account 1650010. Including this amount in rate base allows ratemaking recognition of the Company's cost of funds on the additional cash contributions, which benefit customers through reduced pension cost as a result of investment income on the additional pension funds.

Not included in rate base is the negative $\$ 26,308,055$ (a credit) recorded in Account 1650014 as a FAS 158 mark-to-market adjustment, a non-cash accrual adjustment. As Witness McCoy discusses at the top of page 19 of his direct testimony, FAS 158 noncash adjustments should be excluded from rate base because they have no effect on the Company's cash pension investment or its FAS 87 pension cost included in cost of service.

WITNESS: Hugh E McCoy

## Kentucky Power Company

## REQUEST

Refer to the Direct Testimony of Thomas E Mitchell ("Mitchell Testimony") at page 5 and Section V, Workpaper S-4, pages 56-59. Most of the adjustments related to the planned acquisition of a 50 percent ownership interest in the Mitchell generating capacity include a step showing a 50 percent calculation. However, the adjustments on pages 56 59 do not contain this step. Confirm that the amounts in these adjustments reflect 50 percent and not 100 percent of the Mitchell-related costs.

## RESPONSE

The Company confirms that the adjustments on pages 56,57 and 59 are at $50 \%$ of the total Mitchell-related costs.

However, the adjustments on page 58 of Workpaper S-4 were inadvertently computed at $100 \%$ of the Mitchell-related costs. Page 58 will be updated to reflect the adjustments on the page at $50 \%$ of the Mitchell-related costs and will be submitted as part of the supplemental response to KIUC 1-1.

WITNESS: Thomas E Mitchell

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## Kentucky Power Company

## REQUEST


#### Abstract

Refer to the Mitchell Testimony at pages 8-12. Kentucky Power proposes to recover the deferred costs shown on page 9 with no carrying charges. However, it is proposing to recover the deferred Big Sandy depreciation expense and operation and maintenance ("O\&M") expense with an 11.66 carrying charge. Explain in detail why different approaches are proposed for the recovery of these deferred costs.


## RESPONSE

Because the proposed deferral of Big Sandy depreciation and O\&M expense was done only for rate mitigation purposes, the Company deemed it appropriate to include a carrying charge on the deferral of Big Sandy depreciation expense and O\&M expense in order to recover the Company's related financing costs of the deferral. In the preparation of this base case, the Company inadvertently did not request a carrying charge on the deferred costs shown in the table on page 9 of Company witness Mitchell's testimony, although the Company believes in general it is entitled to a carrying charge for recovery of deferred costs beyond one year.

WITNESS: Thomas E. Mitchell / Ranie K. Wohnhas

## Kentucky Power Company

## REQUEST

Refer to the Mitchell Testimony at page 11 and Section V, Workpaper S-4, page 61 regarding the depreciation adjustment for the Mitchell plant in service.
a. Confirm tliat the new depreciation rates shown in column 5 of the workpaper are the rates being proposed for Kentucky Power in this case based on the depreciation study performed by Mr. David Davis and discussed in the Davis Testimony.
b. If the answer to part a. of this request is affirmative, explain why it is appropriate to apply these rates to Kentucky Power's investment in the Mitchell plant accounts when the Davis Testimony states that the new depreciation rates reflect changes in average service lives due in large part to "the timing of the planned retirement of the Big Sandy units."

## RESPONSE

a. Yes. The rates used are the rates being proposed for Kentucky Power in this case based on the depreciation study performed by Company witness Davis. See Exhibit DAD-1 pages 20 and 21.
b. As stated in Company witness Davis testimony - page 8 "Production Plant original cost, accumulated depreciation and terminal net salvage by plant account for Big Sandy and Mitchell plants (Mitchell Plant cost included at the proposed $50 \%$ Kentucky share) were combined in the depreciation study. The combined amounts were used to establish production plant depreciation rates by plant account that incorporate the 2015 retirement of Big Sandy Plant and fully depreciate each plant account by Mitchell Plant's estimated 2040 retirement year." Because the rates were combined, it is appropriate to apply these same depreciation rates to the Kentucky's investment in Mitchell plant.

WITNESS: David A. Davis/Gregory G. Pauley

## Kentucky Power Company

## REQUEST

Refer to the Mitchell Testimony at pages 11-12 and Section V, Workpaper S-4, page 66.
a. Explain whether the Big Sandy production depreciation expense that is being removed from the test year is the expense for both units or just for Unit No. 2.
b. Provide the calculation of the $\$ 24,151,805$ in expense shown on line 1 of the workpaper.

## RESPONSE

a. Yes. The depreciation expense removed from the adjustment on Section V, Workpaper S-4, page 67 includes both units.
b. The calculation of the amount was the depreciation expense recorded for the twelve months ended March 31, 2013 of $\$ 20,371,302$ recorded in FERC account 403 plus the depreciation expense adjustment of $\$ 3,780,503$ on Section V Workpaper $\mathrm{S}-4$, page 46 . This total of $\$ 24,151,805$ is the total company depreciation expense that was included in the Company's test year ended March 31, 2013.

WITNESS: Thomas E Mitchell

## Kentucky Power Company

## REQUEST

Refer to the Direct Testimony of Lila P. Munsey ("Munsey Testimony") at page 17 and Section V, Workpaper S-4, page 1.
a. Provide the amount of interest expense on customer deposits recorded by Kentucky Power during the test year and the account(s) in which it was recorded.
b. The reduction in the interest rate on customer deposits to 0.18 percent took effect on January 1, 2013, meaning the historical rate of 6 percent was in effect for the first nine months of the test year. Explain why the proposed adjustment, based on the amount, of $\$ 42,860$, of interest expense on the March 31, 2013 balance of customer deposits, calculated at 0.18 percent, is an addition to the cost of service.

## RESPONSE

a. The amount of interest expense on customer deposits recorded by the Company during the test year was $\$ 395,818.48$ and was recorded in account 4310002 . Because the interest on customer expense is a "below-the-line" expense, the Company showed the customer expense interest amount as an adjustment calculated at the new reduced rate.
b. An adjustment was made to include interest on customer deposits (at the new $0.18 \%$ interest rate) because no customer deposit interest was included in the $\mathrm{O} \& \mathrm{M}$ expenses recorded in Schedule 7.

WITNESS: Lila P. Munsey

## Kentucky Power Company

## REQUEST

Refer to the Munsey Testimony at page 18 and Section V, Workpaper S-4, page 2.
a. Provide the dates of all company-performed audits/surveys of pole attachments performed since calendar year 2000.
b. Provide the date of the next scheduled audit/survey.

## RESPONSE

a. Please see KPSC 2-24 Attachment 1 for the most complete listing of pole audits and surveys available to the Company.
b. KPCo is currently in its third year of a five-year cycle of conducting a system pole audit of its service territory. In a system pole audit the Company inventories all poles and attachments in an identified area. The schedule for the system pole audits is set forth below, with the year the audit is scheduled to begin indicated to the left of the audit area. The Company projects it will complete the system pole audits identified below by the end of 2015 . Beginning in 2016, a new five-year cycle will begin.

2011 Pike County
2012 Floyd, Knott, and Letcher County
2013 Clay, Leslie, Breathitt, Owsley, and Perry Counties
2014 Lewis, Rowan, Carter, Elliott, Morgan, Magoffin, Greenup, and Johnson Counties
2015 Lawrence, Boyd, and Martin Counties

| $\begin{gathered} \text { Agreement } \\ \text { Type } \end{gathered}$ | OpCo | County | District | Agrement | $\begin{gathered} \text { Pos } \\ \text { Code } \\ \hline \end{gathered}$ | $\begin{gathered} \text { Prior fiel } \\ \text { Chock } \\ \text { Years } \\ \hline \end{gathered}$ | $\begin{gathered} \text { Year Ficld } \\ \text { Check } \\ \text { Completed } \end{gathered}$ | Next Agrement Cycle (Yaan) | Next Plamed Inventory Year | Field Check Complefed (Vear) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CATV | KTY | PIKE | PIKEVILE | Altro TV Cable | 3015 | 1999 | 2007 | 2012 | 2011 |  |
| ILEC | KTY | MARTIN | Pikevile | Eell South (Soult Central Bell) | 3002 |  | 2006 | 2011 | 2011 | 2012 |
| LLEC | KTY | Pike | PREVILLE | Ecli South (South Central Bell) | 3002 |  | 2006 | 2011 | 2011 | 2012 |
| ILEC | KTY | PIKE | PIKEVILLE | Coalfiedds (Harodi) | 3003 |  | 2006 | 2011 | 2011 | 2012 |
| Clec | KTY | PIKE | PIKEVILLE | East Kentucky Noterork | 3045 | 2001 | 2006 | 2011 | 2011 | 2012 |
| catv | KTY | PIKE | PikEVLLLE | Inter Mountain Cable Company | 3033 | 2002 | 2008 | 2013 | 2011 | 2012 |
| CATV | кTY | PIIE | PikEVille | Mikrotec Cable LLC - KY NEW in 2007 | 3517 A |  | new |  | 2011 | 2012 |
| Clec | KTY | PIKE | PIKEVILIE | Southeast Telephone (Lightyear) | 3508 |  | new |  | 2011 | 2012 |
| CATV | KTY | PIKE | PIKEVILLE | Sudenink Communications (Cebridge) KY | 3040 | 2001 | 2008 | 2013 | 2011 | 2012 |
| CATV | KTY | Martin | PIKEVILLE |  | 3024 | 2001 | 2008 | 2013 | 2011 | 2012 |
| CATV | KTY | PIKE | Pikeville | Suddenlink Communications (10 \#3600) KY | 3024 | 2001 | 2008 | 2013 | 2011 | 2012 |
| clec | KTY | Martin | Pigevilue | Windstream (KDL-KY 3509) | 3509 A |  | new |  | 2011 | 2012 |
| clec | KTY | PIGE | PIKEVILIE | Windstream (KDL-KY 3509) | 3509A |  | new |  | 2011 | 2012 |
| ILEC | KTY | martin | PIKEVILLE | Windstream Communications (Allef) 3001 | 3001 |  | 2005 | 2011 | 2011 | 2012 |
| ILEC | KTY | PIKE | PIKEVILLE | Wndstram Communcations (Alled) 3001 | 3001 |  | 2006 | 2011 | 2011 | 2012 |
| HEC | KTY | FLOYD | Pikeville | Beil South (South Central Eelf) | 3002 |  | 2005 | 2011 | 2012 | 2012 |
| ILEC | KTY | KNOTT | HAzARD | Bell South (South Central Bell) | 3002 |  | 2006 | 2011 | 2012 | 2012 |
| hec | KTY | Letcher | HAZARD | Bell South (South Central Bell) | 3002 |  | 2006 | 20.11 | 2012 | 2012 |
| catv | KTY | FLOYD | PikEvilie | Big Sandy Eroadband lnc | 3017 | 2001 | 2007 | 2012 | 2012 | 2012 |
| ILEC | KTY | FLoYd | PIKEVILLE | Coalfields (Harold) | 3003 |  | 2006 | 2011 | 2012 | 2012 |
| CATV | KTY | Floyd | PIKEVILLE | East Kentucky Nelwork | 3045 | 2001 | 2006 | 2011 | 2012 | 2012 |
| hec | KTY | FLOYD | PIKEVILLE | Foothils Rurat-no Foothils in $2012 \cdots$-em | 3004 |  | 2006 | 2011 | 2012 | na |
| catv | kTY | FLOYD | PIKEVILLE | Itter Mountain Cable Company | 3033 | 2002 | 2008 | 2013 | 2012 | 2012 |
| catv | KTY | knott | hazard | Inter Mountain Cable Compary | 3033 | 2002 | 2008 | 2013 | 2012 | 2012 |
| CATV | KTY | LETCHER | Hazard | Mikrotec Cable LLC. KY NEWin 2007 -not on 2012 DHH | 3517 A |  | new | 2012 | 2012 | 2012 |
| catv | KTY | FLOYD | PIKEVILIE | Suddenlink Communications (iD \#3600) kY | 3024 | 2001 | 2008 | 2013 | 2012 | 2012 |
| CATV | KTY | LETCHER | HAZARD | Suddenlink Communitations (iD \#3600) KY-not in Letclier | 3024 | 2001 | 2003 | 2013 | 2012 | 2012 |
| HEC | KTY | Flord | PIKEVILE | Thacker-Grigsty | 3007 | 2003 | 2008 | 2013 | 2012 | 2012 |
| ILEC | KTY | KNOTT | HAZARD | Thacker-Grigsby | 3007 | 2003 | 2008 | 2013 | 2012 | 2012 |
| catv | KTY | Letcher | Hazard | Tri-Star Communicatons ing | 3042 | 2001 | 2007 | 2012 | 2012 | 2012 |
| CATV | KTY | FLOYD | Pikeville | TV Service inc. | 3041 | 2002 | 2003 | 2013 | 2012 | 2012 |
| CATV | KTY | KNOTT | Hazard | TV Service ina. | 3041 | 2002 | 2008 | 2013 | 2012 | 2012 |
| catv | KTY | letcher | Hazard | TV Service finc. | 3041 | 2002 | 2008 | 2013 | 2012 | 2012 |
| clec | KTY | FLOYD | Pigeville | Windstream (KDL-KY 3509) | 35008 |  | new |  | 2012 | 2012 |
| nec | KTY | KNOTT | hazard | Windsteam Communications (Altel) 3001 | 3001 |  | 2006 | 2011 | 2012 | 2012 |
| HEC | KTY | letcher | hazard | Windstream Communications (Allef) 3001 | 3001 |  | 2006 | 2011 | 2012 | 2012 |
| catv | KTY | BREATHIT | hazard | Altro TV Cable | 3015 | 1999 | 2007 | 2012 | 2013 |  |
| catv | KTY | PERRY | Hazard | Altro TV Cabla | 3015 | 1999 | 2007 | 2012 | 2013 |  |
| ILEC | KTY | BREATHITT | Hazard | Beil South (South Central Beil) | 3002 |  | 2005 | 2011 | 2013 | 2012 |
| HEC | KTY | Mingo | PIKEVILE | Bell South (South Central Bel) | 3002 |  | 2005 | 2011 | 2013 |  |


| Agreement Type | OpCo | County | District | Agreement | PDS Code | Prior Ficid Check Years | Year Field Check Compleied | Next Agrecment Cycle (rear) | Next Plamed tnventory Year | Field Check Completed (Year) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ILEC | KTY | PERRY | HAZARD | Bell Soutl (South Central Boll) | 3002 |  | 2006 | 2011 | 2013 | 2012 |
| CATV | KTY | LESLE | HAZARD | Bowing Cable TV | 3018 | 2001 | 2007 | 2012 | 2013 |  |
| CATV | KTY | PERRY | HAZARD | Community TV Inc. | 3027 | 2001 | 2007 | 2012 | 2013 |  |
| CATV | KTY | breathit | HAZARD | Crystal Braadband Mindjammer/wiFV/Triax \& Triax SE) | CBNK |  | new |  | 2013 |  |
| CATV | KTY | LESLIE | HAZARD | Crystal Eroadband (Mindjammer/TWIFV/Ttiax \& Triax SE) | CBNK |  | new |  | 2013 |  |
| catv | KTY | PERRY | Hazard | Crystal Eroadband (WindjammerTwiFV/Triax \& Triax SE) | CBNK |  | new |  | 2013 |  |
| CATV | KTY | BREATHITT | HAZARD | East Kenlucky Network | 3045 | 2001 | 2008 | 2011 | 2013 | 2011 |
| catv | KTY | PERRY | HAZARD | East Kenlucky Network | 3045 | 2001 | 2005 | 2011 | 2013 | 2011 |
| catv | KTY | EREATHIT | HAzARD | Ficlds Cable Company | 3029 | 2001 | 2007 | 2012 | 2013 |  |
| catv | KTY | PERRY | HAZARD | Fields Cabla Company | 3029 | 2001 | 2007 | 2012 | 2013 |  |
| ilec | KTY | breathitt | hazard | Foothils Rurat | 3004 |  | 2008 | 2011 | 2013 | 2011 |
| CATV | KTY | clay | hazard | Galaxy Cable Company Inc. | 3031 | 2001 | 2007 | 2012 | 2013 |  |
| caty | kTY | Lesle | HAZARD | Galaxy Cable Company lic. | 3031 | 2001 | 2007 | 2012 | 2013 |  |
| HEC | KTY | BrEATHITT | hazard | Leslie County Telephone | 3005 |  | 2006 | 2011 | 2013 | 2012 |
| HEC | KTY | Clay | hazard | Leslie County Telephone | 3005 |  | 2006 | 2011 | 2013 | 2012 |
| 12EC | KTY | Lescle | HAZARD | Leslie County Telephone | 3005 |  | 2008 | 2011 | 2013 | 2012 |
| HEC | KTY | OWSLEY | Hazario | Lestie County Teiephone | 3005 |  | 2006 | 2011 | 2013 | 2012 |
| HEC | KTY | FERRY | hazard | Leslie County Telephone | 3005 |  | 2006 | 2011 | 2013 | 2012 |
| catv | KTY | mingo | Pikevilue | Suddenlink Communications (ID \%3600) KY | 3024 | 2001 | 2008 | 2013 | 2013 |  |
| ILEC | KTY | BREATHITT | hazard | Thacker Grigsty | 3007 | 2003 | 2003 | 2013 | 2013 | 2012 |
| ILEC | KTY | PERRY | hazard | Thacker-Grigsty | 3007 | 2003 | 2008 | 2013 | 2013 | 2012 |
| catv | KTY | PERRY | HAZARD | Tri-Star Communications inc | 3042 | 2001 | 2007 | 2012 | 2013 | 2012 |
| CATV | KTY | breathitt | HAZARD | TV Service fin. | 3041 | 2002 | 2008 | 2013 | 2013 | 2012 |
| CATV | KTY | leslie | hazard | TV Service tnc. | 3041 | 2002 | 2008 | 2013 | 2013 | 2012 |
| CatV | KTY | PERRY | HAZARD | TV Service inc. | 3041 | 2002 | 2008 | 2013 | 2013 | 2012 |
| CLEC | KTY | BREATHITT | hazard | Windetream (KDL. KY 3509) | 3509 A |  | new | n/a | 2013 | 2012 |
| clec | kTY | leslie | Hazard | Windstream (KDL-KY 3509) | 3509 A |  | new | n/a | 2013 | 2012 |
| clec | KTY | ferry | Hazard | Windstream (KDL-KY 3509) | 3509 A |  | new | n/a | 2013 | 2012 |
| ILEC | KTY | Breathit | Hazard | Windstream Communications (Allol) 3001 | 3001 |  | 2006 | 2011 | 2013 | 2012 |
| ilec | KTY | LESLIE | HAZARD | Whdstream Communications (Aftel) 3001 | 3001 |  | 2006 | 2011 | 2043 | 2012 |
| HEC | KTY | PERRY | hazard | Windstream Communications (Alled) 3001 | 3001 |  | 2006 | 2011 | 2013 | 2012 |
| CATV | KTY | GREENUP | ASHLAND | Armstrong litities the. | 3016 | 2001 | 2007 | 2012 | 2014 |  |
| CLEC | KTY | CARTER | ASHLAND | ATMT (CLEC) | 3044 | new 1996 | 2007 | 2012 | 2014 |  |
| clec | KTY | ROWAN | ASHLAND | AT\&T (ClEC) | 3044 | new 1996 | 2007 | 2012 | 2014 |  |
| LEC | KTV | JOHNSON | PIKEVILE | Bell South (South Central Eell) | 3002 |  | 2005 | 2011 | 2014 |  |
| ILEC | KTY | Magorfin | PKEVILLE | Bell South (South Central Belif) | 3002 |  | 2009 | 2011 | 2014 |  |
| CATV | KTY | $30 H$ SSON | PIKEVILLE | Eig Sandy Broadband Inc | 3017 | 2001 | 2007 | 2012 | 2014 |  |
| CATV | KTY | morgan | PIKEVILLE | Collins TV | 3026 | 2001 | 2007 | 2012 | 2014 |  |
| HEC | KTY | Elliott | ASHLAND | Foothils Rural | 3004 |  | 2006 | 2011 | 2014 |  |
| HEC | KTY | JOHNSON | PIKEVILLE | Foothils Rural | 3004 |  | 2006 | 2011 | 2014 |  |


| Agreement Type | OpCo | County | Distrid | Agreement | pos <br> Code | Prior Field Check Years | Year Field Check Completed | Nex Agrement Cycle rean | Next Planned Inventory Year | Field Check <br> Completed frear) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ILEC | kTY | magofmin | PIKEVILLE | Foothils Rutal | 3004 |  | 2006 | 2011 | 2014 |  |
| ILEC | kTY | WAYnE. WV | ASHLAND | Foothils Rutral | 3004 |  | 2006 | 2011 | 2014 |  |
| CatV | KTY | Magoffin | PIKEVILLE | Frank Howard TV Cable | 3030 | 1999 | 2006 | 2014 | 2014 |  |
| catv | KTY | MORGAN | PIKEVLle | Frank Howard TV Cable | 3030 | 1999 | 2003 | 2011 | 2014 |  |
| catv | KTY | JOHNSON | fikevile | Inter Mountain Calte Company | 3033 | 2002 | 2008 | 2013 | 2014 | 2012 |
| CATV | KTY | Magoffin | FIkEVILLE | Inter Mountain Cable Company | 3033 | 2002 | 2008 | 2013 | 2014 | 2012 |
| ILEC | KTY | ELIOTT | ASHLAND | Mountain Rurat | 3008 |  | 2006 | 2011 | 2014 | 2012 |
| LLEC | KTY | MORGAN | PIKEVILLE | Mountain Rural | 3005 |  | 2006 | 2011 | 2014 | 2012 |
| catv | KTY | MORGAN | PIKEVILE | Mountain Telecommunication, inc. | MTKY |  | new |  | 2014 |  |
| CATV | KTY | JOHNSON | PIKEVILLE | PRW TV Cable System | 3035 | 2001 | 2007 | 2012 | 2014 |  |
| catv | KTr | JOHNSON | PIKEVILLE | Rick Howard TV Cable | 3037 | 1999 | 2006 | 2011 | 2014 |  |
| CATV | KTY | carter | ASHLAND | Suddenlink Communications (Cebrridge) KY | 3040 | 2001 | 2008 | 2013 | 2014 |  |
| CATV | KTY | JOHNSON | PIKEVILLE | Suddenlink Communications (10 \#3600) KY | 3024 | 2001 | 2008 | 2013 | 2014 |  |
| CATV | kTr | greenup | ASHLAND | Time Warner (Century Ohic) | 3010 | 2001 | 2006 | 2011 | 2014 |  |
| catv | kTY | CARTER | ashland | Time Warner (Frontiervision/Cox) | 3012 | 2001 | 2006 | 2011 | 2014 |  |
| CATV | KTY | greenup | ASHLAND | Time Warner (Frontiervision/Cox) | 3012 | 2001 | 2006 | 2011 | 2014 |  |
| catv | kTY | WAYNE, WN | ASHLAND | Time Warner (Frontervision/Cox) | 3012 | 2001 | 2006 | 2011 | 2014 |  |
| catv | KTY | carter | ASHLAND | Time Warner (Frontiervision/simmons) | 3011 | 2001 | 2006 | 2011 | 2014 |  |
| catV | KTY | Lewis | HAZARD | Time Warner (Fronliervision/Simmons) | 3011 | 2001 | 2006 | 2011 | 2014 | 2012 |
| CATV | KTY | ROWAN | ASHLAND | Time Warner (Fronticrvision/Simmons) | 3011 | 2001 | 2005 | 2011 | 2014 |  |
| CLEC | KTY | carter | Ashland | Windstream (KDL-KY 3509) | 3500 A |  | now |  | 2014 |  |
| Clec | KTY | SOHNSON | PIKEVILLE | Whastream (KDL-kY 3509) | 3509 A |  | new |  | 2014 |  |
| mec | KTY | carter | ASHLAND | Windstream Communications (Alled) 3001 | 3001 |  | 2006 | 2011 | 2014 |  |
| llec | KTY | ELLIOTT | ASHLAND | Windstream Communications (Allel) 3001 | 3001 | , | 2006 | 2011 | 2014 |  |
| Heec | kTV | greenup | ASHLAND | Windstream Communications (Allel) 3001 | 3001 |  | 2006 | 2011 | 2014 |  |
| HEC | KTY | LEWIS | hazard | Windstream Communications (Alte) 3001 | 3001 |  | 2006 | 2011 | 2014 | 2012 |
| Llec | KTY | ROWAN | ASHLAND | Windstream Communications (Alliel) 3001 | 3001 |  | 2006 | 2011 | 2014 |  |
| LIEC | KTY | WAYne, wh | ASHLAND | Windstream Communications (Alitel) 3001 | 3001 |  | 2006 | 2011 | 2014 |  |
| Clec | KTY | BOYD | ASHLAND | Amtrak | 3514 |  | 2007 | 2012 | 2015 |  |
| CATV | KTY | BOVD | ASHLAND | Amstrong Uutilies he. | 3016 | 2001 | 2007 | 2012 | 2015 |  |
| clec | KTY | EOYD | ASHLAND | AT\&T (CLEC) | 3044 | new 1996 | 2007 | 2012 | 2015 |  |
| Heg | KTY | lawrence | ASHLAND | Bell South (South Central Eed) | 3002 |  | 2006 | 2011 | 2015 |  |
| CLEC | KTY | Boyd | ASHLAND | Fibemet Luc | 3216 |  | new |  | 2015 |  |
| Lec | KTY | BOYD | ASHLAND | Foothils Rural | 3004 |  | 2006 | 2011 | 2015 |  |
| Hec | kTY | lawrence | ASHLAHD | Foolthils Rural | 3004 |  |  |  | 2015 |  |
| catv | KTY | BOYD | ASHLAND | Lycom Comm (Lawtence \& Greentrec) | 3034 | 1999 | 2007 | 2012 | 2015 |  |
| caty | KTY | lanrence | ASHLAND | -ycom Comm (Lawrence \& Greentree) | 3034 | 1939 | 2007 | 2012 | 2015 |  |
| catv | kTY | BOYD | ASHLAND | Suddenlink Communications (Cebridge) KY | 3640 | 2001 | 2008 | 2013 | 2045 |  |
| catv | KTY | Lawrence | ASHLAND | Suddenilink Communications (Cebridge) KY | 3040 | 2001 | 2008 | 2013 | 2015 |  |
| CATV | KTY | lawrence | ASHLAND ${ }^{\text {S }}$ | Sudenliak Communications (iD \#3600) KY | 3024 | 2001 | 2008 | 2013 | 2015 |  |


| Agrement Type | OpCo | County | District | Agrement | PDS <br> Code | $\begin{array}{\|c\|} \hline \text { Pror Field } \\ \text { Check } \\ \text { Years } \\ \hline \end{array}$ | Year Field Check Completed | Next Agreement Cycle (Year) | $\begin{array}{\|c\|} \hline \text { Next Planned } \\ \text { Inventory } \\ \text { Year } \\ \hline \end{array}$ | Feid Check Completed (rear) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CATV | KTY | Bord | ASHLANO | Time Wamef (Frontlervisioncox) | 3012 | 2001 | 2006 | 2011 | 2015 |  |
| CATV | KTY | LAWRENCE | ASHLAND | Time Warner (Frontiervision/Cox) | 3012 | 2001 | 2006 | 2011 | 2015 |  |
| clec | KTY | BOYD | ASHLAND | Windstream (KDL-KY 3509) | 3509A |  | new |  | 2015 |  |
| ILEC | kTY | Boyd | ASHLAND | Windstream Communications (Alte) 3001 | 3001 |  | 2006 | 2011 | 2015 |  |
| LLEC | KTY | LAWRENCE | ASHLAND | Windstream Communications (Altel) 3001 | 3001 |  | 2006 | 2011 | 2015 |  |

## Kentucky Power Company

## REQUEST

Refer to the Munsey Testimony at page 22 and Section V, Workpaper S-4, page 9. On June 10, 2013, the Kentucky Revenue Department provided the new assessment rate of 0.1785 percent for state government's 2013-2014 fiscal year to the Commission. Provide a revised Workpaper S-4 based on the new assessment rate.

## RESPONSE

Please see Attachment 1 to this response for a revised Commission maintenance assessment adjustment.

WITNESS: Lila P Munsey

Kentucky Power Company Annualization of Public Service Commission Maintenance Assessment to Reflect Assessment for

## PSC Fiscal Year July 1, 2012-2013

Test Year Ended 3/31/2013 Revised September 2013

| Line No. <br> (1) | $\frac{\text { Month }}{(2)}$ | $\frac{\text { Year }}{(3)}$ | Restatement of Charges to Reflect Monthly Costs for Fiscal Year 7/1/2012-2013 <br> (4) | Per Books Actual (5) | Difference (C4-C5) <br> (6) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | April | 2012 | \$102,161 | \$68,810 | \$33,351 |
| 2 | May | 2012 | \$102,161 | \$68,810 | \$33,351 |
| 3 | June | 2012 | \$102,161 | \$68,810 | \$33,351 |
| 4 | July | 2012 | \$102,161 | \$85,849 | \$16,312 |
| 5 | August | 2012 | \$102,161 | \$85,849 | \$16,312 |
| 6 | September | 2012 | \$102,161 | \$85,849 | \$16,312 |
| 7 | October | 2012 | \$102,161 | \$85,849 | \$16,312 |
| 8 | November | 2012 | \$102,161 | \$85,849 | \$16,312 |
| 9 | December | 2012 | \$102,161 | \$85,849 | \$16,312 |
| 10 | January | 2013 | \$102, 161 | \$85,849 | \$16,312 |
| 11 | February | 2013 | \$102,161 | \$85,849 | \$16,312 |
| 12 | March | 2013 | \$102,161 | \$85,849 | \$16,312 |
| 13 | Total |  | \$1,225,927 * | \$979,071 | \$246,861 |
| 14 | Allocation F | - SPEC |  |  | 1.000 |
| 15 | Kentucky Ju | tion Am | ht (Ln $13 \times \operatorname{Ln} 14)$ |  | \$246,861 |

* Per Office of the Secretary Memo, dated June 10, 2013.

Witness: L. P. Munsey

## Kentucky Power Company

## REQUEST

Refer to the Munsey Testimony at page 22 and Section V, Workpaper S-4, page 13. The effective date of the postage rate increase was January 27, 2013, yet the increase in the rate is applied to the total number of notices, letters, and bills mailed by Kentucky Power during the test year. Provide the number of notices, letters, and bills mailed from April 1 , 2012 through January 26, 2013 and a revised adjustment based on that number of mailings.

## RESPONSE

Please see Attachment 1 to this response for a revised postage rate increase adjustment.

|  | Kentucky Power Company <br> Adjustment for Postage Rate Increase <br> Effective January 27, 2013 <br> Test Year Ended 3/31/2013 <br> Revised September 2013 | SECTION V WORKPAPER S-4 PAGE 13 |
| :---: | :---: | :---: |
| Line <br> No. <br> (1) | Description <br> (2) | Amount <br> (3) |
| 1 | Number of Bills, Notices and Letters Mailed April 1, 2012 through January 26, 2013 | 1,693,986 |
| 2 | Postage Rate Increase per Mailed Item 1/ | \$0.010 |
| 3 | Adjustment to O\&M for Postage Increase ( $\operatorname{Ln} 1 \times \operatorname{Ln} 2)$ | \$16,940 |
| 4 | Allocation Factor - SPECIFIC | 1.000 |
| 5 | KPSC Jurisdictional Amount ( $\operatorname{Ln} 3 \times \operatorname{Ln} 4)$ | \$16,940 |

1/ Effective Date of Postage Increase was January 27, 2013
Rate of Increase was 2.48\%
Current Average Postage Rate was $\$ 0.364$
Increase Cost was $\$ 0.010$

Witness: L. P. Munsey

## Kentucky Power Company

## REQUEST

## Refer to the Munsey Testimony at page 24 and Section V, Workpaper S-4, page 32.

a. Explain whether the "Property Taxes Charged" for the test year of $\$ 9,502,813$ shown on line 4 of the workpaper is before or after adjustments to the amounts initially assessed by the taxing authorities.
b. If the amount of $\$ 9,502,813$ shown on line 4 is before adjustments to the amounts initially assessed by the taxing authorities, provide the amount charged after adjustments.
c. If the amount of $\$ 9,502,813$ shown on line 4 is after adjustments to the amounts initially assessed by the taxing authorities, provide the amount charged before adjustments.

## RESPONSE

a. KPCo uses accrual accounting, so the amount expensed in a given calendar year represents the amount expected to eventually be paid when all bills are received and paid. Due to the prolonged billing cycle from some of the local Kentucky jurisdictions, there is often a long gap between the normal expense period and when final adjustments to expense are made. The Test Year figure of $\$ 9,502,813$ was primarily expenses from Tax Years 2012 (Apr-Dec) and 2013 (Jan-Mar). KPCo made no adjustments to Property Taxes Charged for either of those Tax Years during the Test Year.
b. There were adjustments made to Tax Years 2011 and 2012 subsequent to the Test Year, in the amount of $\$ 57,547$.
c. The Test Year included Property Tax Charges for Tax Years 2009, 2010 and 2011. The amount included in the $\$ 9,502,813$ that related to prior period charges was (\$228,800).

WITNESS: Lila P. Munsey

## Kentucky Power Company

## REQUEST

Refer to the Munsey Testimony at page 24, Exhibit LPM-3, and Section V, Workpaper S 2, page 34.
a. On Exhibit LPM-3, column 9 is headed "Deferred Fuel." Explain what deferred fuel represents, how long the amount in a given month is deferred, and why there is no deferred fuel amount in either of the first two months of the test year.
b. During the test year customers took service under Tariff R.T.P. who, per the customer migration adjustment, are no longer served under that tariff. Rate R.T.P. is not subject to Kentucky Power's fuel adjustment clause. Explain whether the test yearstatus and current status of these customers have any effect on the proposed fuel over/ (under) revenue adjustment.

## RESPONSE

a. The Company's deferred fuel accounting defers fuel expense from one accounting period to an accounting period when the fuel revenues will be received, two months later. The first two months displayed on Exhibit LPM-3 do not have a deferred fuel amount as the spreadsheet calculates the under/over recovery during the test year only.
b. During the six months the ten customers took service under Tariff RTP, the Company calculated its FAC in the same manner as it would have if no customers had been taking service under Tariff RTP. As a result, the per kWh FAC rate for non-RTP customers during the six months was the same as if no customers had been taking service under Tariff RTP. Thus, there is no effect on the proposed fuel over/ (under) revenue adjustment.

WITNESS: Lila P Munsey

## Kentucky Power Company

## REQUEST

Refer to the Munsey Testimony at pages 26-27, Exhibit LPM-4, and Section V, Workpaper S-4, page 62.
a. The testimony refers to expenses that will no longer be paid due to the termination of the AEP Pool Agreement; however, the proposed adjustment eliminates revenues from the test year. Exhibit LPM-4 shows the expenses being reported in Kentucky Power's monthly envirommental surcharge filings. Explain why termination of the pool agreement does not result in an adjustment to eliminate expenses and identify the account(s) in which the revenues being eliminated were recorded in the test year.
b. Exhibit LPM-4 indicates the adjustment to eliminate $\$ 7,320,077$ in revenues is matched with a comparable reduction to Kentucky Power's environmental base costs. The exhibit also includes an adjustment which increases environmental base costs by $\$ 74,114,113$ due to the proposed Mitchell acquisition. Explain why this increase in costs is not matched by an adjustment to increase revenues similar to the adjustment to decrease revenues related to termination of the pool agreement.

## RESPONSE

a. Termination of the pool agreement does result in an adjustment to eliminate expenses which are identified in Section V, Workpaper S-4, page 60 supported by Witness Vaughan and in Exhibit LPM-4, column 4.
b. The addition to costs by the proposed Mitchell acquisition does result in an adjustment to increase revenues which are identified in Section V, Workpaper S-4, page 60 supported by Witness Vaughan.

WITNESS: Lila P Munsey

## Kentucky Power Company

## REQUEST

Refer to Exhibit LPM-5, page 1, of the Munsey Testimony.
a. Explain how the transportation hourly rate of $\$ 7.91$ was determined.
b. Explain how the fringe benefit rates of 0.4220 and 0.1260 were determined.

## RESPONSE

a. The hourly transportation rate of $\$ 7.91$ was determined by dividing the total budgeted amount for the class of vehicles driven by KPCo meter servicers, $\$ 412,907$, by the total number of vehicles in that class, 45, and then dividing that average cost per vehicle, $\$ 9,176$, by 1,160 hours, the projected number of meter-servicing hours per meter service employee per year.

The budgeted amount includes Lease, Fuel, Maintenance, License, Overheads, and Building Allocation expense.
b. The fringe benefit rate was developed by dividing the total fringe amount for Kentucky, \$13,744,000 Power by the total Kentucky Power labor amount, $\$ 32,536,000$.

The Kentucky Power overtime fringe rate was developed by dividing the total Kentucky Power overtime fringe amount, $\$ 4,089,000$ by the total Kentucky Power labor amount, $\$ 32,536,000$.

WITNESS: Lila P. Munsey

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## Kentucky Power Company

## REQUEST

Refer to the Direct Testimony of Marc D. Reitter ("Reitter Testimony") at page 6, Exhibit MDR-1, page 1, and Section V, Workpaper S-3, page 2.
a. Given the lower annual cost rate of short-term debt as compared with accounts receivable financing, explain why Kentucky Power did not make greater use of short term notes payable during the test period in lieu of some portion of its accounts receivable financing.
b. Identify and describe the circumstances that resulted in Kentucky Power's having no short-term debt balances at month's end for the first eight months of the test year and then having month-end balances for each of the last four months of the test year.

## RESPONSE

a. Kentucky Power utilizes accounts receivable factoring to accelerate its recovery of accounts receivable, and thereby lower cash working capital requirements to the benefit of customers. If working capital requirements exceed the operating cash flows generated from accounts receivable factoring, the company will borrow from the utility money pool as part of the corporate borrowing program to manage working capital requirements. Furthermore, Kentucky Power is limited to $\$ 250$ million dollars of short term debt in accordance with AEP's Utility Money Pool agreement. It would be imprudent to allow short-term debt to reach an elevated level for an extended period of time. Although we have been in a relatively low interest rate environment, it would be irresponsible to overlook in these challenging economic times the importance of liquidity as it allows a company to remain flexible as market conditions change. For example in September of 2008, access to the capital markets was essentially shut down following the collapse of Lehman Brothers.
b. Traditionally, utility companies experience fluctuating working capital requirements. Therefore in some months, the company may rely on the utility money pool to fund working capital needs while other months the company may be in an invested position (i.e. no short term debt borrowings from the utility money pool).

WITNESS: Marc D Reitter

## Kentucky Power Company

## REQUEST

Refer to the Reitter Testimony at pages 7-9 and Section V, Schedule 3 and Workpaper S-3, page 1.
a. The credit spread on the January 2013 debt issued by AEP Texas North Company ("TNC") was 1.45 percent. Explain how TNC's current credit profile compares to Kentucky Power's current credit profile.
b. The answer at the top of page 9 indicates that Kentucky Power will issue new longterm debt associated with the Mitchell acquisition "within approximately six months of the closing of the Transfer and Assumption Transaction if the debt capital markets are available to Kentucky Power." Explain whether there is a concern as to whether the debt capital markets will be available to Kentucky Power.
c. Clarify whether the term "new debt" in the aforementioned answer refers to the $\$ 225$ million described on page 7 at line 6 as "newly issued indebtedness" or if it refers to the total debt amount of $\$ 290$ million shown in column 4 of Schedule 3.
d. Six months after the planned closing on the Mitchell transfer will be approximately 15 months after the end of the test period in this case. The debt related to the Mitchell acquisition has not been authorized by the Commission pursuant to KRS 278.300, and the last sentence in the answer at the top of page 9 indicates that authorization will be sought "subsequent to the Transfer and Assumption Transaction." Given these circumstances, explain why it is appropriate for the cost of this debt to be included in Kentucky Power's revenue requirement at this time.
e. Kentucky Power has made a rate-mitigation proposal to defer and amortize the depreciation expense and operation and maintenance (" $\mathrm{O} \& \mathrm{M}$ ") expense it projects for the period after the Mitchell acquisition but before the retirement of one or both Big Sandy units so that customers would not be paying for the full amount of its Big Sandy-related costs and the full amount of its Mitchell-related costs. Explain why a similar proposal was not made for the financing costs related to the Big Sandy plant.

## RESPONSE

a. AEP Texas North's credit profile is considered slightly favorable compared to Kentucky Power. Moody's states that TNC's rating reflects its relatively low risk business and operating environment as a small, primarily T\&D company.
b. There are currently no concerns that would limit Kentucky Power's access to debt capital markets.
c. The term "new debt" refers to the total debt amount of $\$ 290$ million shown in column 4 of Schedule 3.
d. Upon approval without modification in Case No. 2012-00578 of the Mitchell Transfer (and related requests) the company intends to promptly submit its application pursuant to KRS 278.300 for the required financing authority. The Company anticipates receiving an Order in Case No. 2012-00578 in the third quarter of 2013. As such, the approval for the financing may be received before the requested rates become effective. In any event, the costs associated with the debt to be issued reflect known and measurable changes and result in fair, just and reasonable rates. Further, the pre-asset transfer capital structure of approximately fifty-five percent total debt to total capitalization, and which the proposed debt will restore, is consistent with the credit rating agencies' criteria for investment grade credit ratings. Finally, the recapitalization adjustments to the per books March 31, 2013 capital structure benefit Kentucky Power's customers by lowering the embedded cost of long-term debt by $0.50 \%$.
e. The deferral and amortization of Big Sandy O\&M expenses allows the Company to strike a fair and reasonable balance by providing reasonable rate mitigation for its customers without unduly impinging on the Company's ability to recover its Big Sandy-related O\&M costs. Further rate mitigation in the form of the deferral and amortization of the financing costs for Big Sandy Unit 2 would be both unreasonable and could adversely affect the Company's finances.

WITNESS: Marc D. Reitter / Ranie K. Wohnhas

## Kentucky Power Company

## REQUEST

Refer to the Direct Testimony of Jason M. Stegall at pages 4-6, Exhibit JMS-1, and Section 111, Exhibit K, page 9 of the application. The customer annualization adjustment reflects a revenue reduction of $\$ 6,452,693$. Page 9 of Exhibit K indicates a large portion of the reduction is related to lower revenues from customers served under tariffs "CIP Sub (371)" and "CIP Tran (372)."
a. Describe the changes in customers, demand, or energy usage that result in a reduction of $\$ 1,765,895$ in "CIP Sub (371)" revenues.
b. Describe the changes in customers, demand, or energy usage that result in a reduction of $\$ 4,253,900$ in "CIP Tran (372)" revenues.

## RESPONSE

As discussed in the section of Company witness Stegall's testimony identified in the question, the customer annualization adjustment is the product of three items: customer growth, average kWh per customer and and test year average revenue per kWh . Witness Stegall defines customer growth as the difference between the number of customers in the test year (the sum of the 12 monthly customer counts) divided by twelve and the number of customers at the end of the test year.
a. As a result of the methods used, customer growth is calculated as a reduction of 0.25 customers per month, or three customers for the entire test year. This resulted in a decrease of $35,249,972$ kilowatt-hours of billing energy, a decrease of 60,648 kilowatts of on-peak demand, a reduction of 63,364 kilowatts of off-peak demand and $7,006 \mathrm{kVAR}$ of reactive demand. The specific billing determinants can be seen in Column (15) on Section III, Exhibit K, Page 33 of 67.
b. The primary driver of the reduction in the CIP Tran revenues is the adjustment made for a known and measurable change related to a specific customer. These changes are identified in Columns (6) through (9) of Page 1 of JMS-1, shown in detail in Column (13) on Section III, Exhibit K, Page 34 of 67 and further detailed in KPSC 2-42 Confidential Attachment 1. The result is a decrease of $65,681,838$ kilowatthours of billing energy, a decrease of 227,535 kilowatts of on-peak billing demand, a decrease of $55,291 \mathrm{kVAR}$ of reactive demand and $\$ 4,244,380$ of revenues.

[^2]
## Kentucky Power Company

## REQUEST

Refer to the Stegall Testimony and Exhibit JMS-2. State whether the cost-of-service study ("COSS") filed in this proceeding uses the same methodology and allocation factors as used in the COSS filed in Case No. 2009-00459. ${ }^{1}$ If no, explain the differences.

## ${ }^{1}$ RESPONSE

The COSS filed in this proceeding was designed to replicate the methodology and used the same allocation factors used in the COSS filed in Case No. 2009-00459. This COSS was developed in Excel, however, while the one used in Case No. 2009-00459 was developed using a specialized software package.

WITNESS: Jason M Stegall

[^3]
## Kentucky Power Company

## REQUEST

Refer to the Stegall Testimony at pages 6-7 which discuss an error in the operating ratio used in the customer annualization adjustment. Page 7 states the net impact on adjusted net operating income as $\$ 4,365$. Provide the calculation of the $\$ 4,365$.

## RESPONSE

KPSC 2-35 Attachment 1 on the enclosed CD shows the comparison of the data provided in Section V, Workpaper S-4, Page 23 and the data resulting from the corrected O\&M Operating Ratio discussed in the testimony of Company witness Stegall.

WITNESS: Jason M. Stegall

## Kentucky Power Company

## REQUEST

Refer to the Stegall Testimony at pages 13-14. Starting at the bottom of page 13, it states that the production demand allocation factor assigns costs based on the class contribution to the average of Kentucky Power's 12 monthly peaks on the production facilities. Starting at line 12 of page 14 , it states that the transmission demand allocation factor assigns costs based on the class contribution to the average of Kentucky Power's 12 monthly peaks on transmission facilities. State whether the 12 monthly peaks for the production and transmission facilities would typically be the same or if they would differ. If they would differ, explain why.

## RESPONSE

The 12 monthly peaks for the production facilities and the 12 monthly peaks for the transmission facilities are typically the same.

WITNESS: Jason M Stegall

## Kentucky Power Company

## REQUEST

Refer to the Stegall Testimony at page 14 , line 16 , where it states that distribution plant is classified as demand- and customer-related. Explain in detail how distribution plant was allocated between demand- and customer-related.

## RESPONSE

As shown in Exhibit JMS-2, each FERC Distribution Plant account is allocated individually. Their allocators are identified below. A more detailed description of these allocators was provided in KPSC 2-43 Attachment 1.

FERC 360 (Land and Land Rights) - DIST_CPD
FERC 361 (Structures and Improvements) - DIST_CPD
FERC 362 (Station Equipment) - DIST_CPD
FERC 363 (Storage Battery Equipment) - DIST_POLES
FERC 364 (Poles) - DIST_POLES
FERC 365 (Overhead Lines) - DIST_OHLINES
FERC 366 (Underground Conduit) - DIST UGLINES
FERC 367 (Underground Lines) - DIST_UGLINES
FERC 368 (Transformers) - DIST_TRANSF
FERC 369 (Services) - DIST SERV
FERC 370 (Meters) - DIST METERS
FERC 371 (Installations on Customer Premises) - DIST_OL
FERC 372 (Street Lighting) - DIST_SL

WITNESS: Jason M Stegall

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## Kentucky Power Company

## REQUEST

Refer to the Stegall Testimony at page 16. Starting at line 5, Mr. Stegall states that the first component of cash working capital is related to system sales and is split between demand and energy. Explain how the allocation between demand and energy was calculated.

## RESPONSE

The split between demand and energy was provided in Schedule 15 of Section $V$ of the Company's filing. The total Kentucky jurisdictional values from Schedule 15 were included in the O\&M Expense section of Exhibit JMS-2, the Class Cost-of-Service Study, and $12.5 \%$ of those values are included in the Working Capital - Cash section of JMS-2.

WITNESS: Jason M Stegall

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## Kentucky Power Company

## REQUEST

Refer to the Stegall Testimony at page 18. Beginning at line 13, Mr. Stegall states that Accounts 581 and 582 were allocated using the distribution demand allocation factor. Explain in detail how this factor was calculated.

## RESPONSE

The distribution demand allocator is based on each class' contribution to the 12 monthly coincident peaks on the primary distribution system. This factor was calculated by determining each individual class' loss adjusted demand at the time of each monthly peak during the test year. The twelve monthly values were averaged and the allocator is calculated for each class by taking the ratio of the class' average to the primary distribution system average.

WITNESS: Jason M Stegall

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## Kentucky Power Company

## REQUEST

Refer to the Stegall Testimony at page 19. Starting at line 11, Mr. Stegall states that Account 598, Maintenance of Miscellaneous Distribution Plant, was directly assigned to the outdoor lighting class. Explain why this was done.

## RESPONSE

In regards to Account 598, the FERC Uniform System of Accounts states, "This account shall include the cost of labor, materials used and expenses incurred in maintenance of plant, the book cost of which is recorded in accounts 371, Installations on Customers' Premises, and 372, Leased Property on Customers' Premises, and any other plant the maintenance of which is assignable to the distribution function and is not provided for elsewhere." The Class Cost-of-Service study assigned this account to the outdoor lighting class to be consistent with the assignment of the balance of FERC 371 to the outdoor lighting class. The Company did not report a balance in FERC 372.

WITNESS: Jason M Stegall

## Kentucky Power Company

## REQUEST

Refer to the Stegall Testimony at page 22. Starting at line 5, when asked to explain the guidelines followed in allocating the proposed revenue increase among the tariff classes, Mr. Stegall states that "as discussed by Company witness (Rainey K.) Wohnhas, the Company opted not to equalize returns across tariff classes."
a. Explain whether the discussion to which Mr. Stegall refers is at page 7 of Mr. Wohnhas' testimony which states, "While it is the Company's intention to gradually, over time, move towards equalized rates of return across customer classes, the Company is not proposing to make any progress towards that goal for the purposes of this proceeding to mitigate rate impacts on the residential customer class."
b. If the Stegall Testimony is referring to another part of Mr. Wohnhas' testimony, identify the part of the testimony to which he is referring.
c. The statement quoted in part a. of this request does not explain how the proposed revenue increase was allocated among the customer classes. If the Stegall Testimony was referring to this statement, explain how the increase was allocated to Kentucky Power's rate classes.

## RESPONSE

a. Yes, the section of Company witness Stegall's testimony identified in the question refers to the section of Company witness Wohnhas' testimony identified in Part A of the question.
b. N/A
c. Exhibit JMS-3 provides the calculation of the allocation of the revenue increase to each customer class.

- The required net operating income, calculated in Section V, Schedule 2, Column (3), Line 3, is allocated to each customer class using the rate base of each class calculated in the class cost-of-service study (COSS). The results are presented in Column (9) on Page 3 of JMS-3.
- The current income for each class is subtracted from the required income to determine an income increase. The results are presented in Column (8) on Page 3 of JMS-3.
- The Gross Revenue Conversion Factor is applied to the income increase to determine the revenue increase for each class. The results are presented in Column (7) of Page 3 of JMS-3.
- The current subsidies, calculated on Page 2 of JMS-3 as the difference between the company's current rate of return of $3.66 \%$ and the rate of return for each class, are subtracted from the revenue increase. The subsidies are shown in Column (12) of Page 3 of JMS-3 and the proposed revenue increase less the subsidy is shown in Column (13).
- Finally, the revenue increases, net of subsidies, are adjusted for the Transmission OATT adjustment. On Page 1 of JMS-3, the revenue increase net of subsidies is shown in Column (9), the Transmission OATT adjustment is shown in Column (10) and the target sales revenue for each class is shown in Column (11).


## Kentucky Power Company

## REQUEST

Refer to Exhibit JMS-1, page 1. Identify the specific customers for whom the adjustments are being made in columns 6-9 and provide support for the amounts included in those columns.

## RESPONSE

The customer's historic and adjusted billing determinant data is provided in KPSC 2-42 Attachment 1. Confidential treatment is being sought for portions of Attachment 1.

WITNESS: Jason M Stegall
Customer Bemove from_ClP Tran
Billing kWh
Metered kWh
Billing kW
On-Peak
Off-Peak
Minimum
Maximum
Billing KVAR
Customer Charge
Number of Customers
Environmental Surcharge

## Add to QP Tran

Billing kWh
Metered Voltage Adjustment
Metered kWh
$\frac{\text { Billing } \mathrm{kW}}{\text { On-Peak }}$
Off-Peak Excess
Billing KVAR
Customer Charge
Number of Customers

NOTE: Customer Services has provided data for an average month

Yentucky Power Company
Historic Customer Data for Kentucky Electric Steel
For the Test Year Ended March 31, 2013
Customer 6ax mand
Source: Utilities International Data


Sentucky Power Company
Historic Customer Data for Kentucky Electric Steel
For the Test Year Ended March 31, 2013

## Customer

Source: Utilities International Data

Billing kWh
Metered kWh

| Billing kW |  |
| :--- | ---: |
| On-Peak | $\$ 10.98$ |
| Off-Peak | $\$ 1.10$ |
| Minimum | $\$ 11.09$ |
| Maximum |  |

Metered KVAR
Billing KVAR
$\$ 0.69$
Customer Charge
$\$ 1,353$
Number of Customers
Environmental Surcharge

Kentucky Power Company
Historic Customer Data for Kentucky Electric Steel
For the Test Year Ended March 31, 2013
Customer
Source: Utilities International Data
Billing kWh
Metered kWh
Billing kW \$0.02880


F. Recommendation for Service:

This load is compensatory. This is an old mine and has been sevved before and the facility has been idte for two years at approximately 70 KW and they have recently increased there demand back to 1200 KW per month

## Kentucky Power Company

## REQUEST

Refer to Exhibit JMS-2, pages 1-9. Explain in detail what the abbreviation of each of the allocation factors listed on these pages stands for.

## RESPONSE

KPSC 2-43 Attachment 1 provides a list of the allocators used in the Class Cost-ofService Study along with a description of each and an indication of whether the data was directly input in the study, calculated using data from a workpaper or calculated internally within the study.

WITNESS: Jason M Stegall

| Cost-of-Service Siudy (COSS) Allocator | Source | Description |
| :---: | :---: | :---: |
| AFUDC_OFF | Internal Calculation | Allocator based on the Total Per Books AFUDC Offset line in the CO |
| BULK_TRANS | Workpapers | Average individual class loss-adjusted demands at the 12 monthly coincident peaks on the transmission system |
| CUST_902 | Workpapers | Customer-based allocator weighted for relative meter reading difficulty and meter location difficulty |
| CUST_903 | Workpapers | Customer-based allocator of activity in FERC 903 weighted for customer call volumes to call centers |
| CUST_DEP | Workpapers | Balances of customer deposits by customer class |
| CUST_DEP_FXNL | Internal Calculation | Balances of customer deposits by customer class furiher allocated to the various utility functions using the RB_GUP allocator |
| CUST_TOTAL | Workpapers | Average monthly Customer Annualization adjusted customers |
| DIST_CPD | Workpapers | Average individual class loss-adjusted demands at the 12 monthly coincident peaks on the primary voltage distribution system |
| DIST_METERS | Workpapers | Customer-based allocator using average Year End Annualization adjusted customers weighted by average installed meter costs |
| DIST_OHLINES | Internal Calculation | Weighted distribution demand allocator where primary voltage overhead lines are allocated using the DIST_CPD allocator and secondary voltage lines are allocated using the DISTSEC allocator. |
| DIST_OL | Direct Input | Customer-based allocator where $100 \%$ of the charges are allocated to the Outdoor Lighting (OL) customer class |
| DIST_PCUST | Workpapers | Average monthly Year End Annualization adjusted customers served by the primary voltage distribution system |
| DIST_POLES | Internal Calculation | Weighted distribution demand allocator where primary voltage overhead lines are allocated using the DIST_CPD allocator and secondary voltage lines are allocated using the DISTSEC allocator. |
| DIST_SERV | Workpapers | Average monthly Year End Annualization adjusted customers served by the secondary voltage distribution system |
| DIST_-SL | Direct Input | Customer-based allocator where $100 \%$ of the charges are allocated to the Street Lighting (SL) customer class |
| DIST_TRANSF | Internal Calculation | Weighted distribution demand allocator where primary voltage overhead lines are allocated using the DIST_CPD allocator and secondary voltage lines are allocated using the DISTSEC allocator. |
| DIST_UGLINES | Internal Calculation | Weighted distribution demand allocator where primary voltage overhead lines are allocated using the DIST_CPD allocator and secondary voltage lines are allocated using the DISTSEC allocator. |
| DISTSEC | Workpapers | Secondary distribution demand allocator calculated using the average of each class' non coincident peak and each class' sigma non coincident peak |
| EXP_OM | Internal Calculation | Allocator based on the Total O\&M Expenses line in the COSS |
| EXP_OM_AG_REG | Internal Calculation | The REVSALES allocator functionalized based on the RB_GUP allocator |
| EXP_OM_CUSTACCT | Internal Calculation | Allocator based on the Total line in the Customer Accounts section of O\&M in the coss |
| EXP_OM_CUSTSERV | Internal Calculation | Allocator based on the Total Customer Services Expenses line in the COSS |
| EXP_OM_DIST | Internal Calculation | Allocator based on the Total Distribution O\&M line in the COSS |
| EXP_OM_SS | Internal Calculation | Allocator based on the System Sales - Demand and System Sales - Energy lines in the O\&M Expense - Production section of the COSS |
| EXP_OM_TRAN | Internal Calculation | Allocator based on the sum of the Total Transmission Expenses and the Regional Market Expenses lines in the COSS |
| EXP_OTHTAX_PSC | Internal Calculation | Allocator based on the Kentucky PSC Maintenance line in the COSS functionalized using the RATEBASE allocator |
| FORF_DISC | Workpapers | The class-by-class revenues earned from forfeited discounts |
| FORF_DISC_FXNL | Internal Calculation | The FORF_DISC allocator functionalized using the RSALE allocator |
| FUELREV | Workpapers | Class-by-class revenues from the FAC |
| LABOR_M | Internal Calculation | Allocator based on the Total line of the O\&M Labor section in the COSS |
| LABOR_PROD | Internal Calculation | Allocator based on the Total Production line of the O\&M Labor section in the COSS |
| PROD DEMAND | Workpapers | Average individual class loss-adjusted demands at the 12 monthly coincident peaks on the generation system |
| PROD_ENERGY | Workpapers | Total loss-adjusted class energy usage during the test year measured at the generation point of the system |


| Costi-fi-Service Siudy (COSS) Allocator | Source | Description |
| :---: | :---: | :---: |
| RATEBASE | Internal Calculation | Allocator based on the Total Rate Base line in the CO |
| RB_GUP | Internal Calculation | Allocator based on the Total Electric Plant in Service line in the COSS |
| RB_GUP_CWIP | Internal Calculation | Allocator based on the Total Adjusted CWIP line in the COSS |
| RB_GUP_EPIS | Internal Calculation | Allocator based on the Total Eleciric Plant in Service line in the COSS |
| RB_GUP_EPIS_D | Internal Calculation | Allocator based on the Total line of the Distribution section in the P-T-D Plant in Service section of the COSS |
| RB_GUP_EPIS_G | Internal Calculation | Allocator based on the General \& Intangible Plant line in the COSS |
| RB_GUP_EPIS_P | Internal Calculation | Allocator based on the Production Plant line in the COSS |
| RB_GUP_EPIS_T | Internal Calculation | Allocator based on the Total line of the Transmission section in the P-T-D Plant in Service section of the COSS |
| REV | Internal Calculation | Allocator based on the Sales of Electricity and Total Other Operating Revenues lines in the COSS |
| REV OTHER | Internal Calculation | Allocator based on the Total Other Operating Revenues line in the COSS |
| REV_SALES | Internal Calculation | Allocator based on the Sales of Electricity line in the COSS |
| REVSALES | Workpapers | Year End Migration Adjusted Revenues |
| REVSALES_FXNL | Internal Calculation | The REVSALES allocator functionalized based on the RSALE allocator |
| REVYEC | Workpapers | The Customer Annualization (Year End Customer) Adjustment assigned to each class. <br> REVYEC EXP OM allocator is the basis to allocate the O\&M portion of the Customer |
| REVYEC EXP. OM | Internal Calculation | Annualization (Year End Customer) Adjustment. It is spread to the functions within each tariff class using total O\&M. |
| REVYEC_FXNL | Internal Calculation | REVYEC_FXNL is a spreading of the REVYEC allocator to each function within the tariff classes using the RSALE allocator. |
| RSALE | Internal Calculation | This allocator is the class-by-class, function-by-function allocation matrix for revenuerelated items developed using a simplified ratemaking formula that draws from various items in the COSS. |
| SUB_TRANS | Workpapers | Average individual class loss-adjusted demands at the 12 monthly coincident peaks on the sub-transmission system |
| TDOMX | Internal Calculation | Allocator based on all Transmission O\&M and all Distribution O\&M (FERC Accounts 560-598) |
|  |  | Total gross transmission and distrubution plant. Allocator based on the HR-J 765 |
| TDPLANT | Internal Calculation | Line - AFUDC line, the Total line in the Distribution section and the Total line in the Transmission section, all of which are in the P-T-D Plant in Service section of the COSS |
|  |  | Distribution Maintenance O\&M excluding Account 590-Supervision \& Engineering. |
| TOTMXEXP | Internal Calculation | This allocator is based on the sum of the lines for the Distribution Maintenance Expenses, FERC 591-598. |
| TOTOHLINES | Internal Calculation | The Total Overhead Lines allocator that combines the lines for FERC 364 - Poles and 365 - Overhead Lines |
| TOTOX234 | Internal Calculation | An allocator that combines Customer Accounts O\&M FERC accounts 902 - Meter Reading, 903 - Customer Records and 904 - Uncollectibles |
|  |  | Distribution Operations O\&M excluding Account 580-Supervision \& Engineering. |
| TOTOXEXP | Internal Calculation | This allocator is based on the sum of the lines for the Distribution Operations Expenses, FERC 581-589. |
| TOTUGLINES | Internal Calculation | The Total Underground Lines allocator that combines the lines for FERC 366 Underground Conduit and 367 - Underground Lines |
| TRANS_TOTAL | Internal Calculation | The total transmission demand allocator developed by using electric plant balances to weight BULK_TRANS and SUB_TRANS allocators. |

## Kentucky Power Company

## REQUEST

Refer to Exhibit JMS-2, pages 10-16. The allocation factors on these pages appear to be all-in factors after functionalization, classification, and allocation to the rate classes. Provide the factors for the functionalization, classification, and allocation steps separately.

## RESPONSE

As indicated in Attachment 1 of the Company's response to KPSC 2-43, allocators fall into three categories: those directly entered into the study because they are $100 \%$ attributable to a customer class; those generated from workpapers; and those generated inside the study using post-allocated data. In those cases where allocators are input, either directly or using the results from a workpaper, the functionalization and classification occurs based on knowledge of the allocator itself. For example, the PROD DEMAND allocator is developed using loss-adjusted demands on the generation system so the allocator is known to apply to the generation function and the demand classification.

Allocators that are generated inside the study are calculated in one of two ways: either using post-allocated data from the study or combining allocators. In these cases, the classification and functionalization are provided from either the post-allocated data or source allocators. For example, the RB_GUP_EPIS_T allocator is based on the Total Transmission Plant line from the Cost-of-Service Study so it proportionally reflects GSU plant, classified and functionalized using the PROD DEMAND allocator, and All Other Transmission Plant, classified and functionalized using the TRANS_TOTAL allocator. Attachment 1 of the Company's response to Question 43 indicates the basis of the functionalization and classification.

In regards to allocation, the sentence begimning on Line 21 of Page 10 of Company witness Stegall's testimony states, "The allocation process involves multiplying the functional and classified costs by the allocation factors, which results in costs assigned to each class." The allocation factors themselves are the means to achieve the allocation process.

WITNESS: Jason M Stegall

## Kentucky Power Company

## REQUEST

Refer to pages 19,21, and 27 of Exhibit JMS-2. Each page appears to be cut off at the bottom of the page. Provide complete pages.

## RESPONSE

In the three instances identified in the question, the data was provided at the top of the following page but the formatting made it appear the data was "cut off". KPSC 2-45 Attachment 1 is new copy of JMS-2 with properly formatted page breaks. The Excel version of JMS-2 was provided as Attachment 6 to KIUC 1-1.

WITNESS: Jason M Stegall



|  |  |  |  | kentucky power company COST-OF-SERVICE STUDY TWELVE MONTHS ENDING MARCH 31,2013 |  | $\frac{5 C S}{3}$ | $\begin{aligned} & \text { Toaf } \\ & M S \end{aligned}$ | $\begin{aligned} & \text { Total } \\ & \hline \text { ces } \end{aligned}$ | Tolaf$\underline{\circ}$ 응 | $\begin{aligned} & \text { Total } \\ & \text { clp.Top } \end{aligned}$ | Case No: 2013-00197 Extibil No.: MS-2 Page 3 of 29 Whoss: J. Slegall |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Labet | Conntan | Allocation Factor | Function | $\begin{aligned} & \text { Tomal } \\ & \text { Bactal } \end{aligned}$ | $\frac{\mathrm{AS}}{2}$ |  |  |  |  |  | $\frac{40}{17}$ | $\frac{91}{18}$ | $\frac{\mathrm{SL}}{19}$ |
| Constuction Woik-m. Proyress |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1,835,278 | RR_GUP_EPIS_P | total | 1,835,278 | 853,891 | 34,275 | 154,519 | 194,664 | 163,638 | 430,739 | 777 | 2,032 | 344 |
| Transmission | 27,690,114 | RB_GUP-EPIS-T | Total | 27,690,174 | 12,743.537 | 510,443 | 2,236,955 | 2.899,785 | 2.525,303 | 5,667,005 | 11.501 | 30.290 | 5.128 |
| Distribution | 11,720,516 | RB CUP EPIS-D | total | 11,720.516 | 7.744.413 | 518.712 | 1,208.520 | 1,197,439 | 380,513 | 15.037 | 5.512 | 582.875 | 85,496 |
| General | 2,035,903 | RB_GUP_EPIS_G | TOTAL | 2,035,903 | 1,169,203 | 69,153 | 182,515 | 202.464 | 123,637 | 254,803 | 889 | 27.655 | 5,579 |
| Total CWIP | 43,281,811 |  | total | 43,201,811 | 22,514,097 | 1,133,588 | 3,842,518 | 4,494,552 | 3,193,291 | 7,368,585 | 18,780 | 642,852 | 76,547 |
| Adis to Ifclude Test Year tichall Plant Oum \& Rate Base | 39,608,974 | pfod_demand | тотal | 39,608,974 | 18,488,676 | 739,719 | 3,334,828 | 4,205,550 | 3,535,943 | 0,295,205 | 16,771 | 43,858 | 7,424 |
| Tolal Adiusled CWIP | 82,890,785 |  | Totai | 82,890,785 | 40,339,773 | 1,873,307 | 7,177,346 | 8,700,102 | 6,729,234 | 16,664,791 | 35.550 | 606,710 | 83,971 |
| Rate Base Onsets |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Accumulatd Dilerrea fit | (235,485,446) | RB_Gup | тоtal | [236,466,446] | (128,077,982) | (6, 8220,967 ) | (21,570,770) | (24,504,102) | (15,919,924) | (34,113,705) | (104,456) | (4,726,218) | (548,622) |
| Customer Advarcos | (57,952) | TDPLANT | TOTAL | (57,952] | (3,334) | $(1,936)$ | (5,482) | (5,983) | (3,319) | (5,939) |  | (1,691) | (192) |
| Customer Deposita | (23,811,14) | CUST_DEP_FXNL | total | [23,817,141] | $(17,974,700)$ | (988, 162) | (2,44, 221) | [1,225,732) | (864,910) | (187,681) |  | (122,735) |  |
| Adjustrents to Rate Base Ofisets |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pension 2 OPEB Expense Adustrent | (9,207,819) | LABORM | TOTAL | [8,2277819] |  | (312,761] | (825,466) | (915.688) | (559,176) | (1,152,402) | (4,021) | \{125,075) | (25,233) |
| Adit to lnct Test Year Michell Plant O8M and Rate Ease | (147,947,146) | RB_GUP_EPIS_P | total | (147,947,146) | ( $08,334,655$ ) | (2,762,992) | (12,456,223) | (15,708,540) | (13,207,427) | (34,723,120) | (62.542) | (163,816) | (27,732) |
| Toial Adjustments to Rats Eass Ollisats | (157,154,965) |  | total | (157,154,965) | [74,122,653) | (3,075,753) | (13,281,689) | (10,624,227) | $(13,766,603)$ | (35,875,522) | (66,663) | (288,891) | (52,964) |
| Total Rate Easp Offels | (417,510,504) |  | total | (417,510,504) | (220,208,719) | (10,886,817) | (37,289,162) | ( $42,460,045$ ) | (30,554,756) | (70,182,847) | [170,845) | (5,145,535) | (601,778) |
| Total Pate Base | 1,526,988,623 |  | total | 1,525,988,628 | 779,489,548 | 30,350,762 | 135,554,227 | 161,359,563 | 114,488,775 | 270,928,270 | 685,463 | 22,463,117 | 2,588,901 |
| goperaling Revenues |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Tolal Revenue | 501,74,552 | AEVSALES FFXNL | TOTAL | 501,174,552 | 20,4035,172 | 16.333,123 | 53,025,262 | 61,261.823 | 43,903.321 | 113.609.507 | 343.165 | 7,335.740 | 1.262.425 |
| Total Revenue Year End Cusiomers | (6,452,693) | REVYEC F-XNL | TOTAL | ( $5,4,452,633)$ | (94,167) | 11.582 | ${ }^{(3881,275)}$ | ${ }^{192,995}$ | (2949,420) | (6,009,799]) | (30.761) | 1900.098 | (21.947) |
| Annualize Envionmental Revonues Adjustmont | (7,320,077) | REVSALES_FXNL | TOTAL | (7,320,077) | (2,980,982) | (23,647) | (774,499) | (894,784) | (544,245) | (11,659,348) | (5,012) | (107, 145) | (18,439) |
| Sales of Electrioliy | 487,401,732 |  | TOTAL | 487,401,782 | 201,020,022 | 16,112,073 | 51,869,568 | 60,560,038 | 42,962,656 | 105,929,360 | 307,392 | 7,48,683 | 1,222,039 |
| Othar Oporating Revenues |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Miscellaneous Service Revenue | 358,931 | RB_Gup_Eplid | TOTAL | 358,931 | 237,166 | 15,915 | 37,010 | ${ }^{36,671}$ | 11,653 | 491 | 169 | 17,850 | 2,006 |
|  | 6, $61.89,1093$ | DISTPOLES | TOTAL | 6,069,109 | 4,679,251 | $\begin{array}{r}217.365 \\ \hline\end{array}$ | 745,285 | 761,37 | ${ }^{222,527}$ |  | 3.591 | 33,774 | $\underset{5}{5,978}$ |
| Fent from Elecricic Prop - Oher Dist | 919.538 | RB_GUP_EPIS_D | TOTAL | 919.538 | 607.591 | 40.774 | 94.815 | 93.946 | 29,853 | 1,258 | 432 | 45,730 | 5.139 |
| Oiher Elictric Faverus - Dist | 157.652 | RB_Gup_EPIS_D | TOTAL | 157,652 | 104,170 | 6,991 | 16,256 | 16,107 | 5.118 | 216 | 74 | 7,840 | 881 |
| Ohar Electric Revenus - Whealing | (447,300) | TPANS TOTAL | TOTAL | (447,300) | (205,794) | (6,243) | (37,039) | (46,824) | (40,8677) | (107,773) | (187) | (489) | (83) |
| Oher Elcatric Fivenues - Prodsction | 42,083 | Prod_energy | TOTAL | 42,033 | 15,047 | 89 | 3,438 | 4,629 | 4,232 | 13,456 | 25 |  | 54 |
| Totai Other Operating Reverues | 10,962,949 | - | total | 10,962,949 | 7,965,569 | 4E3,367 | 1,229,332 | 1,021,002 | 35;,99\% | (61,206) | 4,104 | 123,755 | 13,975 |
| Eliminale Non-Recurrmg CatV Reverues | (1,603,254) | RE_GUP_EPIS_D | TOTAL | (1,083,264) | (715,774) | (48,034) | (111,697) | (110,673) | (35,169) | (1,482) | (509) | (53,872) | \{6,053) |
| Misc. Service Charges Adjustemert | 585,97 | RE_CUP_EPIS-D | total | 585,947 | 387,168 | 25,982 | 60,418 | 59,864 | 19.023 | ${ }^{802}$ | 276 | 29,140 | 3,274 |
| Annualization ol CATV Revenues | (1,282,814) | Rg-GUPEEPISD | total | (1,282.814) | (547,623) | (56,383) | [132,273) | (131,060) | (41,547) | [1755) | (603) | (63,796) | \{7,699\} |
| Customer Migration Adjusiment | (931) | REVSALES_EXNL | TOTAL | (934) | (379) |  |  | (114) | (182) | (211) | (1) | (14) | (2) |
| Totai Ohner Operating Fivarue Acjustments | (1,781,062) | - | total | (1,781,062) | (1,176,613) | (7, 2,255 | (183,650) | (181,933) | (57,874) | (2,647) | (038) | (88,542) | (0,950) |
| Totai Dthor Operating Revenues | 9,181,837 |  | total | 0,181,867 | 6,033,957 | 384,902 | 1,046,241 | 839,019 | 294,176 | (63,853) | 3,267 | 35,274 | 4,025 |
| Total Ongraing Rovenucs | 406,583,669 |  | total | 496,583,663 | 207,658,978 | 16,496,975 | 52,95,749 | 61,393,057 | ${ }_{43,256,772}$ | 105,865,507 | 310,659 | 7,453,907 | 1,226,064 |
| Dporsitin Expense |  |  |  |  |  |  |  |  |  |  |  |  |  |
| oum Expenso Proculction |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Demand | 21,644,400 | PRCD_DEmAND | total | 21,844,480 | 10,163,476 | 407,957 | 1,839,168 | 2,310,375 | 1,956,084 | 5,126,888 | 9,249 | 24,188 | 4,095 |
| Encroy | 5,570,525 | prod energy | total | 5,570,525 | 1,987, 848 | 117,870 | 455,692 | 612,795 | 566,857 | 1,781,132 | 3,303 | 38,455 | 7,173 |
| Fued | 106,945,546 | Prod_eneray | TOTAL | 105,945,546 | 38,163,631 | 2.262.918 | 8,737,072 | 11,764,730 | 10,882,777 | 34,185,007 | 63,420 | 738,275 | 137775 |
| Syatem Sales - Demand | (11,27995934) | Prod demand | TOTAL | ( $3,9799,513$ ) | (11,951,529) | (77,320) | (335,050) | (4222,532) | (355,256) | (933,990) | (1,685) | (14,406) | (746) |
| Syatern Salas - Energy | (112,379,034) | prod enercy | TOTAL | (112,379,034) | $(40,102,577)$ | (2,377,88) | (9,180,968) | (12,362,450) | (11,435,689) | (35,932,323) | ( $6,6,642$ ) | [775,785) | (144,712) |
| Purchased Power - Demand | 64,638,865 | Prod demand | TOTAL | ${ }^{64,688.2855}$ | 30,097,485 | 1,202,099 | 5.446,399 | 0.868.452 | 5.774 .858 | 15,182,448 | 27,390 | 71,628 | 12,125 |
| Purctazed Power - Energy | 180, 112,538 | Prodenergy | TOTAL | 120,812,538 | 64,533,445 | 3,825.902 | 14,771,743 | 19,890,598 | 18,399,481 | 57,813,404 | 107,224 | 1,248,202 | 232,034 |
| System Control Total Frocuution Expenses | ${ }_{380,012,768}^{150,784}$ | prom_demand | ${ }_{\text {TOTAL }}^{\text {TOTAL }}$ | ${ }^{150,794}$ | 70,359 | 2,815 | ${ }^{12,989}$ | 18.011 | 13,462 | 35,391 | 64 | 167 | 23 993,771 |
|  | 300, 12,00 |  |  | 300,02,708 | 145,005,744 | 7,825,570 | 31,262,70 | 4,471,953 | 37,587,517 | 114,134,271 | 210,650 | 2,120,915 | 993,971 |
| Trantamission Agroement Expenses - Production Transmission Agroumont Expenses - Transmiscion | 36,210,239 <br> (51,949,423) | Prod_demand Trans_total | TOTAL | 36,210,239 (51,949,423) | 16,847,363 (23,300,544) | 676,246 <br> (957,302 | $3,04,, 575$ | 3,844,684 (5,430,183) | $3,232,533$ $(4,740,52$ | 8,498,525 (12,516,760) | $15,332$ | $\begin{gathered} 40,094 \\ (56,808) \end{gathered}$ | ${ }_{\substack{\text { c } \\(9,7877 \\(9,67)}}$ |
| Totai Transmission Agreement Expenses | (15,739,184) |  | total | ( $515,739,184$ ) | (7,053,581) | (281,057) | (1,258,864) | (1,53,499) | (1,507,978) | (4,018,235) | (6,427) | (16,714) | (2,829) |
| Treanmission Expenses - Procucilion | 6,027,012 | Prod_omand | total | 5,027,012 | 2,804,59 | 112.558 | 507,437 | 639,923 | 533,039 | 1,444,537 | 2,552 | ¢,673 | 1,130 |










|  |  | $\frac{85}{2}$ | $\frac{595}{3}$ | $\frac{125 s .5 E C}{4}$ | $\frac{109898}{5}$ | $\frac{169598}{6}$ | $\frac{16 S . S E C}{7}$ | $\frac{16 S . p \text { P }}{8}$ | $\frac{10885}{8}$ | $\frac{165.790}{10}$ | $\frac{\text { QP. SEC }}{11}$ | $\frac{\text { Op.ppg }}{12}$ | $\frac{08.5188}{13}$ | $\frac{18.76 n}{14}$ | $\frac{\text { chentopsue }}{15}$ |  | $\frac{15}{75}$ | $\frac{0}{18}$ | $\frac{56}{15}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| AFUDC OFF PRODULTON <br> AFUDC OFF BUKKTAA <br> AFUOC_OFF DSTP箴 <br> AFUDC OFF DSTSEA <br> AFUDCOFF CUSTOMER <br> AFUDG OFF TOTAL |  |  |  |  |  |  | $\begin{aligned} & \text { 1.0.653118 } \\ & 0.01694514 \\ & 0.00757429 \\ & 5.01353834 \\ & 5.50705571 \\ & 0.00011865 \\ & 0.90646129 \\ & 0.95510533 \end{aligned}$ | 000614 ABB 0.00318351 0.00227006 0.02001077 0.005142 F 9 0.01304720 |  | $\begin{aligned} & 0.00081534 \\ & 0.00031092 \\ & - \\ & 0.0000100 \\ & 0.00054000 \\ & 0.00087744 \end{aligned}$ | $\begin{aligned} & 0.00045105 \\ & 0.00023355 \\ & 0.00000417 \\ & 0.00017870 \\ & 0.00010543 \\ & 0.0000171 \\ & 0.00000173 \\ & 0.00106374 \end{aligned}$ |  | $\begin{aligned} & 0.07768538 \\ & 0.00914212 \\ & 0.00507205 \\ & - \\ & - \\ & 0.00655755 \\ & 0.0063 \times 65 \\ & 0.03228594 \end{aligned}$ | $\begin{gathered} 0.00197312 \\ 0.0010465 \\ - \\ \vdots \\ 0.0 .00005516 \\ 0.00008069 \\ 0.00305416 \end{gathered}$ |  | $0.0140 \% 03$ <br> 0.0075546 <br> 0.0000 en 2 0.0000508 0.0222721 |  | $\begin{aligned} & 0.00048193 \\ & 0.00024833 \\ & 0.00010102 \\ & 0.00059161 \\ & 0.00076587 \\ & 0.0000939 \\ & 0.01081703 \\ & 0.01263542 \end{aligned}$ |  |
| BaLK.trans Procuction |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| duk thans duitan | 1.06003090 | 0.95522518 | 0.011887535 | 0.001102575 | 0.0 .60248845 | a.coscres | 0.03467839 | 0.0141285 | 0.0065379 | 0.0944518 | 0.00109633 | 0.04313462 | $0.04055 c 50$ | 0.00953836 | 0.20917768 | 0.033253 | 0.0088823 .3 | 0.00119725 | 0.00981874 |
|  | - |  |  |  |  |  | : | : |  | : |  |  |  |  |  |  |  |  |  |
|  | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| EUKK.thans Emeray |  |  |  |  |  |  |  |  |  |  |  | : |  |  |  |  |  |  | : |
| cuk_rımaj fotal | 1.00003000 | 0.4582554 | 0.0188755 | 0.081812375 | 0.60288845 | 0.00057954 | 0.08468783 | 0.01412254 | 0.00659378 | 0.00141518 | 0.00918333 | 0.004319452 | 0.0665683 | 0.009533849 | 0.23176086 | 0.03352353 | 0.080234 | 0.0019725 | 0.0801374 |
| Cust goo probuchow | - | . | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| cust $\operatorname{cosez}$ Susiman | - | - | . |  |  |  |  | - |  | . |  | - |  | . | . | . | . | . |  |
|  | - | . |  |  |  |  |  |  |  | - |  | - |  |  |  |  |  |  |  |
| cust joz Elieray |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CUST ODO2 Custicher CUSI_Ma2 Totil | $\text { B.i.ex } 1 .$ | ${ }^{0.7820 .559} 0$ | ${ }^{\text {Q.i3. }}$ | 0.8614431 | $0.060 a s 971$ 0.0013957 | 0.00129293 <br> 9.05312353 | Conscesz 4 <br> 0.0035224 | 200116300 <br> 0.0011630 | ${ }^{0.000238159}$ | $0.0 \times 82 a 37$ | 0 anconaz3e | 0.00072675 | 0 | 0.00055070 | 0.0 .0221972 | $0.0 \times 050770$ | ${ }^{2.0 n c s a t i g 7}$ | - | . |
| custmaz pronuction | - |  |  | - |  |  |  |  |  | - |  | . |  | - |  |  |  |  |  |
| Cust masuebtran |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| cusio mis istpli | : | : | : | : |  |  |  |  |  | : |  | : |  | - |  |  |  |  | : |
| cust mas uistec | : |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cust_ras Customen | i.oscmasao | -.esstiz72 | 0,ss366552 | 0.05383541 | ¢.00035224 | 0.00055410 | 0.00322017 | a.cons3324 | 0.amasa | -0,0xnes3 | acsacasa | 0.00012852 | O,0091482 | ancantraso | a.coscssta | O.ansoresa | Dimeonas | . | 0,50302323 |
| Cust ge3 motal | :030cama | 0.04562725 | 0.053384502 | 0.03035341 | 6.000c5324 | 0.00653519 | 0.0032347 | 4.00035334 | 0.00700530 | 0.005080559 | 0.00300259 | 0.500013302 | 0.00011462 | 0.00301208 | 0.0 .800556 | 0.00081283 | 0.00086891 |  | 0.0.3023324 |
| Cust pep productios | - | - | - | - | - |  |  | - |  | - |  |  |  |  |  |  |  |  |  |
| CUST OEP SLISTRAM |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cust-gep dispal | - | : | . | . |  | - | : | - |  |  |  |  |  |  |  |  |  |  |  |
|  | : | - |  |  |  |  |  |  |  | - |  |  |  | - | . |  |  | - | - |
| CUSTDEPCUSTOMER <br> CUST DEP TOTAL | ${ }^{1.6,60 c a c o c o c} 0$ | ${ }_{0}^{0.7554889612}$ | 0.0410337 <br> 0.04415327 | 0.0 .0363453 | ${ }_{0}^{0.008979963}$ | 0.0 .582032233 | 0.03720530 0.3205520 0 | 0.01653313 0.0155239 | 0.001224047 0.009065457 | 0.03102779 |  | 0.01045221 0.01645221 | 0.0 .117 Pss 0.0113750 0.0 | n.00792023 <br> 0.0783530 | 0.00129554 <br> $0.002 x a 524$ | ${ }^{0.0 .09535354}$ |  | $0.065+0.551$ $0.054 \times 51$ | . |
| Cust isp ixm prouction | 0.235535376 | 0.214835337 |  | 0.02593es | 0.01228371 |  | 0.00103583 |  |  |  |  | 0.00685475 |  | 0.001985 | 0.50657713 | 0.02319543 |  |  |  |
| Cust eep rix buctak | $0^{0.177021771}$ | 0.12338234 | 0.00512295 | 0.0143319 | ${ }^{0.02761773}$ | 0.00158 | 0.0 .05353585 |  | ${ }^{\text {o.cexsisil1 }}$ | 0.00833223 |  | 0.003030255 | 0.00331792 | 0.00377895 | 0.0.023900 | 0.0023 253 |  | ${ }^{\text {ajecsabs7 }}$ | : |
| custociraxio Disipal | 0.2.3523621 |  | ${ }^{0.00278445853}$ | ${ }^{0.0 .0535355505}$ | 0.60328303 | 0.003036337 | ${ }^{\text {and }}$ |  | 0.0082893 |  |  |  | 0.0012478 |  | 0.50820335 |  |  |  |  |
| Cust jep ExM | ${ }^{0.165577465}$ | 0.13786525 | 0.007839450 | 0.01427893 |  |  | 0.02032335 |  |  |  |  |  |  |  |  |  |  | 0.00039674 |  |
| CuStoep exil cusiomie |  |  | ${ }^{0.0 .00355532929}$ | ${ }^{0.0 .00213035}$ | ${ }^{0.0 .0502042555}$ | 0, | ${ }^{0}$ | 0.0003337 | ${ }^{0.0000030}$ | 0.asters |  | g.veos317 | ${ }^{\text {a, }}$ | 0.20303 | 0.cosexatis | E.0.2033 |  |  |  |
| CUSTOEPP Pxal total |  | 0.75483512 | 0.94168937 | 0.003636363 | 0.0978953 | 0.03020323 | 0.03205359 | 0.01653219 | 0.0012647 | 0.0030273 |  | 0.01645221 | 0.014875 | 0.00733625 | 0.cinasis 4 | 0.005535 |  | 0.0 .0546355 |  |
| Cusitiotal production | - | - | - | - | - | - | - | - | - | - |  | * | - | - |  |  |  | . |  |
| Clist |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cust-Iothi isprel | : | : |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| custiotalistecg | . | - | . | . |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Custiotal customer |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| custrotationit | ${ }^{1.6523003093}$ | 0.63344i23 | 0.1637754 | 0.6335653 | 0.00337805 | 0.c00 0.535 | 0.00344683 | 0.50337763 | 0.00008508 | 0.0000303 | 2.0020essa | 0.20015335 | ${ }^{2.00061235}$ | 0.00301535 | 2.0305530 | 0.00393153 | 0.0030437 |  | 2.ansezsti |
| dist_cpa production | - | . |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Dist cro subram |  | - |  |  |  | - |  | - |  |  |  |  | \% |  |  |  |  |  |  |
| Distcra distref | 1,68003aso | 0,6732073 | 0.02538729 | 0.10936:23 | 0.00336533 | - | 0.1023464 | 0.1932117 |  | - | 0.09144775 | 0.0555525 | . | - | - | - | 0.200ss325 | 0.09154580 | 0.00026778 |
| dist cmad istac |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| detcrab cusiomer |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Oist cratotal | 1.0ccama 0 | 0.08739478 | 0.82357729 | 0.10358129 | 0.00332593 |  | 0.1023364 | 0.001832117 |  | - | 0.00144175 | 0.65538025 |  |  |  |  | 0.00058385 | 0.00155530 | 0.00085670 |
| usisyeters prountion | . | - | - | - | - | * | . | - | - | - | - | - | - | - | - |  |  | - | - |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| aisteteras digtat | - | - | . |  | . |  |  | : |  |  |  |  |  | . | . |  |  | : | - |
| Dist Lemers igsec |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| oistminters total | 1.,0000000 | 0.4 | 0.24883382 | 0.07644445 | ${ }_{0}^{0.0423175}$ | ${ }^{0.016203525}$ | 0.04445 | 0.0 | 0.0 | 0.0 | 0.0.031830 | 0. 23375 | ${ }^{0.041}$ | 0.50631824 | 0.0.amelis | C.00097124 | 0.00311292 | : |  |
| Oist orlises ppoduction | - | - | - | - | - |  |  |  |  |  |  | . | . |  |  |  |  | . | . |
| OIST OMLNES PuLititan |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Distomlies ibspal | O. 66100050 | 0.145053245 | 2.0168938 | 0.07295732 | 8.aczi 1337 |  |  | 0.0121030 |  | - |  | 0.0376412 |  |  |  |  | 0.20395513 |  | a.conruas |
| - | 0.3.350c000 | ${ }^{0.250775056}$ | 0.012106537 | 0.0 .0374637 |  |  | 0.03237247 |  |  |  | 0.0004251 |  |  | - | - |  | 0.000163335 | 0.03327715 | 0.c0067397 |
| distonimes cusiomer |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| obt-onlues total | 1.cecemsas | a.cssers | 0.3810230 | 0.tamatra | 0. 020219347 |  | 0.1050\%55 | 0.02121830 |  | . | 0.00037811 | 0.30776412 | - | - | - | . | 0.000 888 | 0.0092000 | 0.ccarsess |

```
MEN
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline  & \[
\begin{aligned}
& \text { yorant } \\
& \frac{\text { anant }}{1}
\end{aligned}
\] & \(\frac{85}{2}\) & \({ }_{565}^{3}\) & \(\frac{1358555}{4}\) & \(\frac{1959.98}{5}\) & \(\frac{\text { Nass．gua }}{6}\) & \(\frac{165.55 C}{7}\) & \(\frac{[65.98]}{8}\) & \(\frac{1 . \operatorname{sis} 5(y)}{9}\) & \(\frac{16.5 .7 p / ~}{10}\) & \(\frac{\text { pp．scc }}{14}\) & \(\frac{\text { Qap Pp }}{12}\) & \(\frac{\text { pe．gus }}{13}\) & \(\frac{\mathrm{pa} .7 \mathrm{tan}}{14}\) & \(\frac{519.700: 518}{15}\) & TOOMTP & \(\frac{14}{7}\) & \(\frac{2}{18}\) & \(\frac{88}{18}\) \\
\hline \begin{tabular}{l}
AruCC off phoouction \\
MyDC OR ZuLGTRAN \\
AFUDCOFF DETPRI \\
AFUDC＿OFF DISTSEC \\
AFUDC OFFCUSTOMER \\
ALUCEOEFTOTA
\end{tabular} &  &  & 0.00312826 \(0.0016 x 953\) 0.00313203 0．0000297\％ 0.02423506 &  &  & \[
\begin{aligned}
& 0.60023570 \\
& 0.60015414 \\
& 0.00008195 \\
& - \\
& 0.0000091 \\
& 0.00014809 \\
& 0.00057540
\end{aligned}
\] &  &  & \[
\begin{aligned}
& 0.00255593 \\
& 0.00147921 \\
& 0.00076118 \\
& - \\
& 0 . \\
& 0.00002914 \\
& 0.00027181 \\
& 0.00539013
\end{aligned}
\] & \begin{tabular}{l}
0.60 cs 153.4 0.00031692 \\
 0.00004000
0.00037744 0 0．0N0374
\end{tabular} &  &  &  & \[
\begin{aligned}
& 0.00197312 \\
& 0.00102164 \\
& - \\
& - \\
& 0.00006250 \\
& 0.00100693 \\
& 0.00306415
\end{aligned}
\] &  &  &  &  &  \\
\hline \begin{tabular}{l}
m？O PRODUCTHON \\
DST－OL SUBTHAN \\
DET OL DISTPPI \\
DST OL DSTETC \\
DISTOL EMEACY \\
DETOLTOTAL
\end{tabular} &  & \(\vdots\) & \(\square\)
\(\vdots\)
\(\vdots\) &  &  &  &  &  &  &  &  &  &  &  &  &  &  & \(1.0000 \%\) OD &  \\
\hline \begin{tabular}{l}
DIST PCUST PRONUCTON \\
DIS：FCUST EUKKTRAN \\
DET PGUST DISTRA！ \\
DFT－PCUST DESTSEC \\
DIST PCUST ERERGY
DIST FCUST CUSTOSEP \\
DETTPCUST TOTAL
\end{tabular} &  & \({ }^{0.65367998}\) & \({ }^{0.1064179}\) & \[
\begin{aligned}
& 0.0 .33072+5 \\
& 0.03302546
\end{aligned}
\] & \(\frac{0.0033722}{20.00037722}\) &  & \[
\dot{0.0 .0343550}
\] & 0. &  &  & \({ }^{-2}\) &  0.00010543 &  &  &  &  & 0.8204739 0.000040932 & \begin{tabular}{l}
9.21612311 \\
0.216123
\end{tabular} &  \\
\hline \begin{tabular}{l}
DIST POLES PRODUCTM男 \\
DIST POLES EULKTRAN \\
DIST PDEES DSTPRI \\
DIST FOLES DETEEC \\
DIT POLES ENERGY
DIT POLES CUSTOWER \\
Dist poces TOTAL
\end{tabular} &  & \begin{tabular}{l}
0.37235358 0.32325503 \\
0.70160062
\end{tabular} & \begin{tabular}{l}
0.01442913 \\
0.01816050 \\
0.05253270
\end{tabular} & 0.09146105 0.04242153 0.10028263 & \[
\begin{aligned}
& \vdots \\
& 0.00106320 \\
& \vdots \\
& 0.00+83220
\end{aligned}
\] & & \begin{tabular}{l}
0,06123587 \\
0.04247232 \\
0.10305226
\end{tabular} & \begin{tabular}{l}
0.0102 WE 50 \\
0.01029650
\end{tabular} &  &  &  & \[
\begin{aligned}
& 0.032020644 \\
& \vdots \\
& 0.032000044
\end{aligned}
\] &  &  &  &  & 0.00332745 0.00021105 E．0053351 & \begin{tabular}{l}
0．00\％2879 \\
0．024 5355 \\
0.00508424
\end{tabular} &  \\
\hline \begin{tabular}{l}
DST SERV PAODUCTO \\
 \\
OISTSENV DISTPGU \\
わGI＿SERV DIGTGEC \\
DISTSEFV CUSTOMEM \\
DIST＿SERV TOTAL
\end{tabular} & 1．200cccovas & \({ }^{\text {a }}\) & 2． 2.185851237 & \({ }^{0.003316391}\) &  &  & 0.0035578 0.0333527 &  &  &  & \[
0.00000319
\]
\[
0.60040910
\] &  &  &  &  &  & \[
\dot{.}
\] &  & \({ }^{0.0 .02355775} 0\) \\
\hline \begin{tabular}{l}
BIST＿SL FRODUCTION \\
DIST．SE BULKTAAN \\
Dist Si DISTPR \\
DIST SE DSTSEC \\
DISTSE EHEAGY
DIST SL CuSTCMEF \\
DISTESE TOTAL
\end{tabular} & 1．00cocoms & \(\vdots\) & \(\vdots\)
\(\vdots\)
\(\vdots\) &  &  &  &  &  &  &  &  &  &  & &  &  &  &  &  \\
\hline \begin{tabular}{l}
diet tianse provuction \\
pist transe subitan \\
Dist－Ttume disipal \\
DGTTRANF ENERGY \\
DSTTTMSSF CUSTOMER \\
dist＿tramse tota．
\end{tabular} &  &  &  &  & a．0020393133
\(\vdots\)
0.00083139 &  & 0.02357718 0.07127216 0.1002103 A & a．004s5511
\(\vdots\)
0.00485511 &  &  & 0.00038203 0.00032337 0.0013359 & \begin{tabular}{l}
0.0153102 \\
\(0.010^{2} 0512\)
\end{tabular} & ： & \(\vdots\) &  &  &  & 0.00040282 0.00704030 0.00744247 &  \\
\hline \begin{tabular}{l}
DST UOLRES MODNCTION \\
 \\
DITTGGLEES DISTPAI \\
DEST UCLNCS DETSEC \\
DETHMLNES CLETOMEA \\
DISTHMENES TOTAL
\end{tabular} &  & 0.42031353 0.27674232 0.69756532 &  & \begin{tabular}{l}
acoensort 0.04145683 \\
0.10980764
\end{tabular} & 0.002027874
\(\vdots\)
0.00277874 & \(\vdots\)
\(\vdots\) & 0．0cb271cs 0.06536335 0.30459500 & 0.01148573
\(\vdots\)
0.01148073 & \(\vdots\)
\(\vdots\) & \(\vdots\)
\(\vdots\)
\(\vdots\) & \[
\begin{aligned}
& \text { 0.00033110 } \\
& 0.0087150 \\
& 0.00137246
\end{aligned}
\] &  & \(\vdots\)
\(\vdots\)
\(\vdots\) & \(\vdots\) &  &  & \begin{tabular}{l}
0.06035416 d．analaito \\
0.00054460
\end{tabular} & \({ }^{0.00020538}\) 0.00458958 &  \\
\hline \begin{tabular}{l}
Expom ag heg provuction \\
Expomag．Reg sultran \\
Exp ExP－OM MGRGENEGGY \\
 \\
Exp＿omacineg total．
\end{tabular} &  &  &  &  &  &  &  &  &  & \begin{tabular}{l}
0.00067707 \\
0.0003099 \\
0．000000393 0.00008522
0.00110653
\end{tabular} &  & \begin{tabular}{l}
0.61751450 b．0100． 0.01403330 0.00510057 \\

\end{tabular} &  & \begin{tabular}{l}
0.00125159 0.00372606 \\
a．00ncosy
0.00005372 0．e200 163
\end{tabular} &  & \begin{tabular}{l}
0.02507902 \\
B．014446 \\
0.001027 0.0062248
0.0789294
\end{tabular} &  &  &  \\
\hline \begin{tabular}{l}
EXP－om custracct production \\
Exp om custactiluithan \\
EXP OA＿CUSTACOT DSTPRI \\
EXPOM CUSTACCT DIMTSEC \\
EXP OM CUSTACCT ENEACY
EXP OM CUSTACGT EUSTOEEA \\
EXP OM＿CUSTACGT UUSTO
EXP ORACUSTACST TOFAL
\end{tabular} &  & \begin{tabular}{l}
Oहsestive \\
0.8 .586777
\end{tabular} & 0 & \[
\dot{0} 0.0 \text { ousexicis }
\] &  & \({ }^{2.0 .02006333}\) & 8．00372077 0.00374477 &  & 0．06010098 0.0036030 & \begin{tabular}{l}
0.50001015 \\

\end{tabular} & 0.0000105 a．DE00100 & \begin{tabular}{l}
D．：9nzzas \\
0.0002264
\end{tabular} &  & 6．000055 5日．V0215 &  &  &  & \begin{tabular}{l}
0.00023386 \\
ampa232
\end{tabular} & \[
\begin{gathered}
0.00221123 \\
0.000212533
\end{gathered}
\] \\
\hline
\end{tabular}
```

| KENTHCKY PONER COMPANY COST-OF-SERVICE STUDY : $A$ AFCH 31,2012 | Case No. 2017-0019 <br>  Whanesid, Slota |
| :---: | :---: |


|  |  | $\frac{\mathrm{ESS}^{2}}{}$ | $\frac{595}{3}$ | $\frac{\text { Hes.sec }}{4}$ | $\frac{\text { Mass.ppt }}{5}$ | $\frac{\text { Less.sun }}{6}$ | $\frac{165.5 E C}{7}$ | $\frac{10,58]}{81}$ | $\frac{165.509}{9}$ | $\frac{1657790}{10}$ | $\frac{\text { Qe.sEC }}{11}$ | $\frac{10 . p}{12}$ | $\frac{12}{19}$ | $\frac{\text { DP. } 7 \text { PA }}{14}$ |  | $\frac{\mathrm{cIP} \cdot \mathrm{TOD} \cdot \mathrm{T}}{16}$ | $\frac{149}{7}$ | $\frac{9}{10}$ | $\frac{56}{13}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| aruocomf production | 0.43524107 | 0.20505054 | 0.catrasa | 0.0 .3582573 | 0.00108308 | 0.00029875 | 0.00599 | 0.00314558 | 0.00265683 | 0.00081534 | 0.00095105 | 0.08877396 | 0.017 ess33 | 0.00197312 | 0.087505023 | 0.01455039 | $0.000182 z a$ | 0.00048193 | 0.00083153 |
|  | ${ }_{0}^{0.2025352058}$ | ${ }^{0} 0.104095172$ | (0.0420870 | ${ }^{0.0121225393}$ | ${ }^{0.00205553939}$ | 0.0.0015319 | ${ }^{0.002834545}$ | ${ }^{\text {a.0.0312353 }}$ | ${ }^{0.006147231}$ | 0.00031632 | 0.0.0023355 |  | 0.0394+12 | $0.00162: 54$ | ${ }^{0.0 .64533705}$ | 0.00755451 | (0.0009354z | (0.0024953 | 0.0.0000327 ${ }^{\text {a }}$ |
| AFUDCOFFE ISTPR! | 0.12397735 | 0.1034 .53973 | $0^{0.0233123723}$ | 0.0 .9355532 | $0.603+125$ |  | 8.0135334 | 0.0.0227as |  |  | amearize | 0.09785833 |  |  |  |  |  |  | ${ }^{2}$ |
|  | 235633 | ${ }^{0.0 .050586873}$ | ${ }_{0}^{0.00330022}$ | ${ }^{\text {a }}$ 0.çasarasa | $0.000 \times 0325$ | D.0000ms | ${ }^{0.007909}$ | 0.00001977 | a.cocosen | 0.000500998 | ${ }_{0}^{0.02001031}$ |  |  |  | 0.00035027 |  |  | 0.0 | ${ }^{0.0 .00314230750}$ |
| AFIDCOCOFF CISTO: | 0.03504159 | 0.016192937 | 0.00024239 | 0.00133390 |  | 0.00001359 | 2.06055120 | 0.00014339 | 0.08897781 | 0.08500esa | 0.00000023 | 0.00807767 | ${ }_{0}^{0.00035635}$ | 0.ccemberse | 2.0.092333 | c.0.0305038 | 0.00000103 | ${ }^{\text {a }}$ 0.11031723 | ${ }^{\text {a }}$ |
| Aflucioff total | 1.00c00cce | 0.51146212 | 0.02719358 | 0.03843252 | 0.00271923 | 0.060077645 | 0.0 .0516833 | 0.011387720 | ธ..0553833 | 0.0009374 | 0.501023314 | 0.0320csa | 0.03328539 | 0.0.03056-16 | 0.1578789 | 0.0:2272723 | 0.50043336 | 0.012085692 | 0.01414580 |
| Exp_om_Custernv proouc |  | - | - |  | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| omgastesav |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Expom cisteerv susta |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exp om Cument uis |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exp OM Cuisiserv eneriy |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ExPCOMCUSTSEY Custorer |  | 0.0 .6394488 | ${ }^{0.10353726}$ | 0 | ${ }_{0}^{0.000377039}$ | 0.0 .0005505 | 0.0034482 | ${ }^{0.0003703}$ | 0.0002305 | 0.0000639 | 0.0.000scas | ${ }^{0.0 .0319535}$ | ${ }^{0.000012366}$ | 0 | ${ }^{0.0 .00055039}$ | ${ }^{0.00 \times 09303}$ | (0.00068937 | (0.2160393 |  |
| Houc |  | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ExT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Oxicist Sumb |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| - |  |  |  | 0.083542 | 0.00133 |  | 0.63358 | 0.01656191 |  |  | 0.020323 | 0.0331 |  |  |  |  | $0 . \operatorname{cosax3307}$ | 0.cosespes | ${ }^{0.0 .00315233}$ |
| Expomple | 0.35388593 | 0.2850078 | 0.01409275 | 0.0336379 |  |  | 0.03482255 |  |  |  | 2.0.0a45133 |  |  |  |  |  | 0.00017303 |  |  |
| EXF OM DiSt customen Exp_OMDISTTOTAL | 0.05393593 | 0.02354154 $0.6 \mathrm{mosec}=$ | 0.00755893 <br> 0.077916 | $0.0 \times 250318$ $0.105 \omega^{2}$ 察 | 0.00177040 $0.00311+01$ | 0.00010216 | 6.0.0113332 | 0. 208020573 | 0.0007323 | 0.50210093 | 0.0000330 | 0.00321620 <br> 0.0333520 | 0.0008339 | 0.c0:14483 0.00016438 | 0.00377491 | 0.00014998 <br> 0.0016438 | 0.10000374 | 2.01312184. 0.00746105 | 0.0058253 |
| Exp om_ss phoduction | 0.0032803 .4 | 0.0 .159227 | a,mana | 0.0237712 | 6.0.0885 | acosa | 0.0327728 | 0.00048334 | 0.0 .9322448 | 0.6809440 | 0.02300354 | 0.00147752 | 0.0131374 | ama | 0.00 | 0.00119669 | 0.00 | ¢, 0 | \% |
| OMss |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| -xpens sibin |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ExP OM |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exp-m ssembig | 0.0 .5579358 | 0.34456653 | 0.02043587 | 0.0 .7854823 | 0.00238230 | 0.00004557 | 0.06411843 | 0.01404835 | 0.06647485 | 0.09 | a, 012 | 0.0531412 | 0.06583322 | 0.006812331 | 0.26673371 | (4072 | 0.00057273 | 0.0065 | 0.00124357 |
| ExPOLISS Total | 1.00000050 | 0.508358887 | 0.02107785 | 0.07872034 | 0.002336471 | $0.000 c^{\text {a }}$ 31 | 0.03571085 | 0.01455278 | a.cesters | 0.0031454652 | 0.0002565 | 0.007553334 | 0.0нгzassa | 0.80061975 | 0.20 .3601405 | 0.040427185 | 0.000568721 | 0.00878050 | 0.ç12306a |
|  | ${ }^{\text {a }}$ 0,54297745 | 5ixis2 | ${ }^{0.001114227}$ | ceaz | ${ }^{35142}$ | ${ }_{31989}^{358}$ | 0.0 | 0.07676 | 5ss | 0.0037635 | ${ }^{0} 0.00055851$ | 2342 | 99 | 0.002 | 0.1029 | 0.0 .1282535 | 2023 | 2000 | 123 |
| ExPOM ImM SUITRAN |  | 0 | 0.002810 | ${ }^{0.0212026379}$ | ${ }_{0}^{0.0 .00783933}$ | 0.002111632 |  | ${ }_{0}^{0.0043937600}$ | a |  |  | 0.0 | ${ }^{2.0 .10307307379}$ |  | ${ }^{0.0034687}$ |  | 0.0 | 0.0 | ${ }^{0.1080202923}$ |
| Exp cm_tina dispmi |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| EXP OMmamilitsec |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Expoimman eneag |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1.08008008 | 0.46828343 | 0.001966824 | 0.08003533 | 0.00247133 | 0.000770414 | 0.003457529 | 0.01482835 | 0.20057543 | 0.00123313 | 0.0103 | 0.04283557 | 0.04229253 | $\stackrel{0}{00331819}$ | 0.20955817 | 0.02837339 | 0.00042132 | 0.0011603 | 0.081863 |
| gis proouctio |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| gukfen | 235603 |  | 98423 | [a.00739 | (10.00274 | ¢0. | -10 | tomars | cames | (10.5313 | (1.00310 | , | 0.503 | [0:00946639] | [0.03535327 | [0.63323939 | 10.1030 | [accmamel | (1)cemeibe |
|  | ${ }^{565331}$ | (2sam) | (1) |  | (0.0.0asasas5) |  | [3320927 | (0.00555724) | (0.00353 |  |  | ${ }^{\text {a }}$ |  |  |  |  | co.anesicas | , |  |
| Expem itstic | $0_{0,0,662354}$ | 0.030425458 | 0 |  | a.kozeba |  |  | - |  |  | a.covx |  |  |  |  |  | 0.0000233 | 0.00094463 | 0.000037895 |
| Expom entay |  | ${ }^{\text {S2asespry }}$ | 0.01233584 | ${ }^{\text {a }}$ | 0.0001339 | 0.0093858 | 0.08410773 | 0.0035 | 0.0033243 | 0.002582 | 1.00073 | ${ }^{\text {a.03337 }}$ | 0.02479 | 0.00336 | 0.1555 | 0.0.2as5 | 0.50303773 | 0.0 .80484838 | ${ }^{\text {a }}$ |
| Exp-an Toith |  | ${ }^{0.0 .235757246}$ | ${ }_{0}^{0.0 .2551423}$ | - | (0.0.002654 |  | ${ }^{0.0 .00272324}$ | ${ }_{0}^{0.0 .0055656520}$ |  | ${ }_{\text {a }}^{0}$ |  | ${ }_{\text {a }}^{0}$ | ${ }^{\text {0.0.00012338 }}$ | ${ }^{0.0005022}$ | ${ }_{0}^{0.0 .20033}$ |  | ${ }^{0.0 .000358273}$ | ${ }_{\text {a }}^{0}$ | ${ }^{0.0 .000735359}$ |
|  |  |  |  |  |  |  |  |  |  |  |  |  | 0.02463 |  | 0.1221 | 0.02941635 | 0.8.as3asas |  | 0.00013287 |
| Exp ormix pec blukta | 0.5056175 | 0.0643541 | 0.08296155 | 0.01215372 | 0.020856185 | 0.00015370 | 0.01273435 | 0.03210 | ${ }^{1.00433333}$ | 0.00802335 | 0.00322 | 0.0233 | 0.0.a3as70 | 0.0035271 | 0.03457 | 0.00748332 | 0.00033353 | C.asal4tea | 0.00034365 |
| EXPOCHAX | 0 | 0.0,tiz767 | 0.00019727 | 0.001890cs | ${ }^{0 . c 5034529}$ | 0.000063235 | 0.004848450 | a,ambicie | 0.00035453 |  | 0.000080319 | 030 | 0.003553364 |  |  |  | 0,00032322 | ${ }_{0}^{0.00022072}$ | ${ }^{0.0 .0020353595}$ |
| Exp-othtax Psc distsec | 0.63345359 | 0.0547807 | 0.00234333 | ${ }^{\text {a }}$ | , |  | 0.010 | 0.003 |  |  | 0 |  |  |  |  |  | 0.050307 |  | 2023350 |
| Exportiax Prcemency | 0 | ${ }^{0.0044423519}$ | 0.0013577 | ${ }^{0.00477772}$ | ${ }^{\text {a }}$ | 0.00065ze | ${ }^{\text {a }}$ | a,cenocas | 0.00304 | $0.000 x$ |  | ${ }_{0}^{0.00323}$ | ${ }^{0.002323}$ | 0.000 | 0.0168 | ${ }_{\substack{0 \\ 0.003383377}}^{0.001204}$ |  | ${ }_{\text {a }}^{0.0 .0535323}$ | ${ }^{\text {a }}$ |
| EXPOMTAXPSCTOTAL |  | 0.0072337 | ${ }_{0}$ | ${ }_{0} 0.101372186$ | 0.00080290 | ${ }_{0}^{0.6051273732}$ | ${ }^{\text {a }}$ | ${ }^{0}$ | 0.0000533532 | $0_{0.00516559}^{0.0585}$ | ${ }_{\text {a }}$ | 0.04608233 |  | ${ }_{0}$ | ${ }_{0.15577603}$ | ${ }_{0}^{0.053233838}$ | c.0.0363472 | 0.01455710 | 0.00251893 |
| foit disc productia | 3.couccoso | 0.72as311 | 0.5333239 | 0.31028 | 0.1509450 | 0.0220535 | 0.0355632 | 0.088 | 0.0046 |  |  | 0.07 | 0.012 | 0.863 | 0.0038 |  |  | 0.035 |  |
| Foaff cisc buhima |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| forcosc cieray |  | . | . | . |  | . |  |  |  |  |  | - |  |  |  |  |  |  |  |
| Poffolic iotal | 1.0000c0050 | 0.72883819 | 0.05828739 | 0.11828250 | 0.902u5007 | 0.0020353 | 0.03455392 | 0.6589162 | 0.000405423 |  |  | 0.07472785 | 0.01215083 | 0.0008969 | 0.00054837 |  |  | 0.0057498 |  |
| fohf misc mim Produch |  | 0.2355449 | 0.0 .132086 |  |  |  |  |  |  |  |  |  |  | 0.xazzosest | 0.00acase |  | - | 0.08025593 |  |
|  | (0.0.2835677) |  |  | ${ }^{0.0 .0013353525}$ | ${ }^{\text {0.ane }}$ | ${ }^{0.003172939}$ |  |  |  |  |  |  |  | $10.000393559]$ | ${ }^{\text {a }}$ |  |  |  |  |
| FOAF OLSC ExM Dist ip | 0.12584273 | 0.0.0261239 |  | 0.01561615 | 0.0 .3005536 |  | 6, 0.04453 | 0.0012455 |  |  |  | 0.00321077 |  |  |  |  |  | jabiroszisi | - |
| Foif ilicextm iissec | 0.084573785 | ${ }^{0.005858752}$ | 0.0.030 0.45275 | ${ }^{0.003035454}$ |  |  |  |  |  |  |  |  |  |  |  |  | - | 0.00033155 |  |
|  | 0.066 | 0.cszasai | ${ }^{2.0 .010 .4772733}$ |  | 2.astichic | 0.02344615 | 0.0.031539 | 0.0 .0007857 | 0.050115183 |  |  | 0.0032324 | c.encruss | ${ }_{\text {a }}$ | 0.0.0003553 |  | : | 0.00332279 |  |
|  | 1.0ccosicis | 0.720я4311 | 0.05328593 | 0.11038285 | 0.020845007 | 0.05205035 | 0.03458332 | 0.00031162 | 0.004484843 |  |  | 0.01747208 | 0.01815839 | 0.06 coanto | 0.0055537 |  |  | 0.10557495 |  |
| futarev prodictio | . | . | - |  |  |  |  |  |  |  |  | . |  |  |  | . | . | . | . |
| Flelrev buikfan |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fulinev oistral |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | i.cocssora | 0.3448895 | 9405 | 10630 | 0.020260.35 | 103723 | 375132 | .14225 | 0.00753483 | 1482 | 0.50187213 | 105710 | 0.04689403 | 23027 | b.27804 | 0.05881326 | 0.0096 | 0.9864 | 0.0012 cess |
|  | i.ascosomio | 0.354528089 | a.cranowici | $0.070 \times 10530$ | 0.0005453 | 0.09103129 | 0.03355132 | -0,423532 | 0.06755939 | 0.09148218 | 0.098 | 0.0527116 | 0.0 | 0.00238 | 0.27834 | 2.599 | $0.0 \times 858384$ | 0.0054785 | -..car120ess |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |



| $\begin{gathered} \text { Alocasaion } \\ \substack{\text { Eraciry }} \end{gathered}$ |  | $\frac{68}{2}$ | $\frac{505}{3}$ | $\frac{1659550}{4}$ | $\frac{1353.898}{5}$ | $\frac{106598}{6}$ | $\frac{16595}{7}$ | $\frac{165 . p}{8}$ | $\frac{165854}{9}$ | $\frac{165190}{10}$ | $\frac{\text { Om. SES }}{11}$ | $\frac{\text { an. }}{12}$ | $\frac{\text { cepse }}{13}$ | $\frac{19.580}{14}$ | T00.SUE |  | $\frac{\mathrm{ky}}{17}$ | $\frac{0}{13}$ | $\frac{96}{19}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| afucco off prouuctio | $0^{0.45534197}$ | 0.202503 1 | 0.08312335 | ¢0.0322537 | 0.008103383 | 0.0.aras57 | 0.0355914 | 0.06514285 | 0.002asses | o.asobicas | $0.00 \times 45105$ | a.0197736 | 0.aitess3e | 0.00197312 | 0.03758089 | 0.01450039 | 0.00078428 | 0.008381 | 0.6 crase 188 |
| AFUCCOFF Buikfan | 0.2033505 | ${ }^{0.001035972}$ | 0.03023570 | ${ }^{0.018285383}$ |  | ${ }^{2} \mathrm{CO} \times 15314$ | 0.01894514 | 0.00312351 | ${ }^{\text {0. } 01447929}$ | 0.00031532 | 0.00023355 | ${ }^{1.503720278}$ | 9.03514212 | 0.0010276 | 90453375 | 2077546 | 0.00003585 | 0.005024533 | $0.080 \times 2324$ |
|  | ${ }^{\text {s3 }}$ | ${ }^{0.002823538}$ | ${ }^{0.00163535}$ | ${ }^{0.007351212}$ | 0.c3022 | 0.60003196 | ${ }^{\text {c.0.07357230 }}$ | ${ }^{0.001272749}$ | 0.00073118 |  | ${ }^{0.0080034737}$ | 0.0203674 | 0.0050728 |  | 0.102434632 |  | 0.003 | 0.0802019192 | 0.0802179 |
| AFILCCOEFFIISTSEC | 0. | ${ }_{\text {diole }}$ | ${ }_{0}^{\text {a.0.035 }}$ | ${ }^{0.00123556959}$ | 0.6 .6041225 |  | ${ }^{\text {a }}$ |  |  |  | 0.00031 |  |  |  |  |  | 5003 | 201385 | 0.000332344 |
| afluctoff entech | 0.501355933 | 0.achesas | 0.ne23zar5 | 0.6830163836 | 0.00050325 | ธ. 2 cexmens | 0.00011653 | a,zsoo 197 | 0.femest | a.conosisa | 0.0030 | ${ }^{\text {a }}$ comar | 0.0020575 | 0.08080450 | c.cosescez 7 | a.cosoccaz3 | ${ }_{0}$ | 0.1000323938 | 0.0050175 |
|  | ${ }^{0.53384463}$ | ${ }^{0.0 .1623837 ~}$ | (0.0329653 | ${ }_{\text {a }}^{\text {0.0.733439 }}$ | ${ }^{0.052383492}$ | ${ }^{2}$ | ${ }^{0.00235122}$ |  | 0.0.0277181 | - 0 | \% |  | ${ }^{\text {and }}$ |  | - 0.0 .00383839 | ${ }^{20.002036}$ | 20803 19 | 0.0.019373738 | 0.6011653 |
| LAECR M Productios $^{\text {a }}$ |  | aza33171 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 090 |
| orumulitamy | S6:5013 | ${ }_{0}^{0.20753273}$ | ${ }_{0}^{0.0032302375}$ | 0.0051318 | $0.000 \times 8023$ |  | 0.0013512 | ${ }_{0}^{0.0052327372}$ | 0.00081 | 0,0.000022 | 0.000 |  |  | 0.0 .51953 | 0.003 | 0.31464308 0.0054274 |  |  | 6090 |
| R-4 |  |  |  | 0.00085244 |  |  | 0.000554 |  | 0.00 |  | 0.08300878 | ${ }^{0.0002885}$ | 0.000353 |  | 0.001774098 |  |  | 5.00603726 | 2.09397123 |
| ambis |  | 0.18704 | .00:3zi | 2055 |  |  | 0.034723 |  |  |  | 0.003333538 | 0.013233 |  |  |  |  | 0.00013 | 0.000338535 | 0.0 .0233704 |
| Latcru hichay | 0.50561217 | ${ }_{0.02002350}$ | 0.50112750 | 0.0041350 | O.M0013429 | ¢, manosza | \%.0as8za3 | 0.00031eas | 0.00037804 | 0.9000373 | ${ }_{0}^{0.000007}$ | 0.08284229 | 0.0027683 | 0.00035 | 0.01520085 | 0.00277353 | 0.00003 | ${ }^{0.000173784}$ | ${ }^{0.0 .00228585}$ |
| Lemotal |  |  | ${ }_{0}^{0.002123383585}$ | ${ }^{0.003593291}$ | 0.0.0560553 | 0.0.0016134 | ${ }^{0.00057720}$ | ${ }^{\text {a }}$ | 0.0033323 | ${ }^{0.620204405}$ | 2.03030211 | ${ }^{\text {a/c.0210 }}$ | 0.cesasiper | 0.003806 | ${ }^{0.0002323235}$ |  | 0.0003 | 0.000 | ${ }^{0.002327355}$ |
| prod dimas: pracue | S.casecsas | 0.45525513 | 0.0168753 | 0.0310575 | 0.00248385 | a,ma007554 | 0.03447708 | 0.0141283 | 0.00559379 | 0.00945 | 0.00108337 | 0.00313462 | 0.08055050 | 0.0045 | 0.20177858 | 0.03922253 | 0.0004384 | 0.081 | 0.0088874 |
| ${ }_{P}^{\text {Pro }}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Prooidimal oistral |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Domandistec |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Proomplinad total | 1.505085 | (c526 | 0.0185873 | 0.6810235 | 0.008483 | ascos79 | 0.0.3407cess | 0.014 | 0.005 | 0.06 | 0.00109533 | 0.04313662 | 0.01485630 | 6.00:53 | $2: 201$ | 0.03352253 | 0.0004234 | 0.00110729 | , |
| tnebgy producta |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Froonemeli subital |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Proo energy lespri |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Proo Ember berbiy | 1,00800 | 0.356565105 | $0.021 \times 554$ | 0.07763370 | 39 | a.cracesos | 0.0972359 | 0.0145477 | 0.00077454 | 0.00145023 | 0.09455 | 0.0516323 | 0.04235107 | 0.0003 | 0.27100270 | 0.088780 | 0.008330 | 0.0083 | 0.00128371 |
| PRODENERGY TOTAL | t.000n030 | 253a 106 | 0.0211593 | 0.07853970 | 0.00239138 | 0.000068535 | 0.03728008 | 0.01446777 | 0.0057044 | 0.00145553 | 0.001218556 | 0.05163238 | 0.08835167 | 0.00825579 | 0.27700310 | 0.04878413 | 0.00535301 | 0.05583833 | 0.00123771 |
| labor. prod promigtion | 0.arcoscso | 0.465556 |  | 0.07719637 | 0.00218510 | 0.08085078 | 0.07838231 | 0.01248072 | 0.005773035 | 0.60124255 | 0.0081 | 0.0 .978 | 0.02 | 0.003988 | 0.178 | 0.02 | 0.60 | 0.50 | $0.00816+59$ |
| Labar pros bum |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Litomproo istral |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MEOR PROD ENERGY | 0.12190410 | 0.0935196 | 125793 | 0.00858338 | 0.00022152 | 0.0008312 | j, 0 ros | 0.00177 | 0.00631 | 0.0001763 | 0.00015 | a.cos32 | 0.005 | 0.00376 | 0.033001 | 0.0058 | 0.080072 | 6.c308 | 0.00915638 |
| LAEOR PROD TOTM | ¢.098ccoces | 0,45204305 | 0.01183738 | 0.08877475 | 0.09247763 | 0. $0 \times 0 \times 8793$ | 0.003456442 | 0.01447028 | 0.00055820 | 0.00142820 | 0.00710354 | 0.04482028 | 0.04078 | 0.0047 | 0.208 | 0.03357762 |  | 0.0018 | 0.00032157 |
| fatcrase producto: | 0.4993737 | 0.2389461 | 0.0231555 | 0.0339 | 0.0011928 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | $0.0 .3 x 45$ | 0.018235 | 0.102177 | 0.uns | 2.00817315 | 0.003 | 0.005 | 9.103 | 0.00383813 |  | 0.058 | 0.002 | 0.5831 | 4.00582ta |
| Ratibase suitail | 0, 0.532 mag | 0.02373 | 94633 | 0.00911 | 0.080115 |  |  |  | 0.500848 |  |  |  | 0.0028 |  | 0.0140233 |  |  |  |  |
| PAfeense ibiphy | ${ }_{0}^{0.10962858927}$ |  | ${ }_{0}^{0.003333316}$ | ${ }^{0.001544350}$ | 0.0 .09438385 |  | -0.0.0. |  |  |  |  | 0.0 .38135 |  |  |  |  | 20023 |  |  |
| faterase bizag | 0.0 .55465351 | 0.018:8085: | 0.501037276 | 0.0 .0383536 | 0.00571822 | 0.85cazza | 0.0.04435050 | 0.00074255 | a.corsz | a.cenen | 0.000053 |  |  |  |  |  | 0.000329 | 0.100335450 | 0.005855485 |
| Railuase clistower | 0.0 .423539 | ${ }^{0.0} 0.19545$ | 0.0020833382 | 0.00153508 | 0.000468524 | 0.3002020 | 0.0005325 | 0.00076 | 0.0033 | 0.0000 | 0.00300 | 0.003x | 0.0004 | 0.0000 | 0.0033 | 0.0030 | 0.00000 | 0.01247 | 0.00517731 |
| patebase total | 1.505000830 | 0.5944537 | 0.32287017 | 0.08359774 | 0.65263833 | 0.00053946 | 6.0355060 | 0.01285216 | 0.00515079 | 0.0003a | 0.001093 | 0.04600 | 0.03371 | 0.03317 | 0.1541738 | 0.02325336 | 0.002488 | 0.00187673 | 0.0017574 |
| alp Cwip peomet | TS4 | 2417 | 0.0007704 | 0.04210 | 233: | a,0sses | 0.049585 | 0.20734 | 0.03341 | a.cen7359 | D.maxs | 0.0224 | 0.as: | 0.02325574 | 0.1045 | 0.0774972 | 0.00022002 | 0.0085753 | a.cosara 4 a |
| UP- | 0,228372 |  | 0.00 | 0.001654 |  | 0 | ${ }^{0.018984153}$ | 0.00323238 | 0.00152 | 0.00032350 | 0.0 .00033 | 0 | 0.00322 | 0.00103357 | 0.00538 | 0.00787241 | 0.0002 | 0.000223342 | ${ }^{0.0 .30002380}$ |
|  | ${ }_{0}^{0.00787853537}$ | ${ }^{\text {cosem }}$ | ${ }^{\text {a, }} 0.0072720505727$ | ${ }^{0.0075546588}$ | ${ }^{0.0 .00225931}$ |  | ${ }^{0.00720553515}$ | ${ }_{\substack{0}}^{0.0 .0129314357}$ |  |  | ${ }^{0.00003311}$ | ${ }^{2}$ |  |  |  |  | 0.00000 | 0.00012200 | 0.000052945 |
| Aup chip oistec | 0.0 .51828448 | 0979 | 0.00214095 | 0.0057 |  |  | 0.025 |  |  |  | 1.103005469 |  |  |  |  |  | 0.000022383 | 0.00803743 | 0.00303832 |
|  | ${ }_{0}^{0.0 .0237374264}$ | ${ }^{0.0 .0301413937}$ | ${ }^{0.0002373937}$ | ${ }^{0.0000510350}$ | 0 |  | ${ }^{0.0 .00712033}$ | ${ }^{0.000027205}$ | 0.0080039 | 0.0 | momo | ${ }^{1.003007}$ | ${ }^{0.00000}$ | ${ }^{0.0 .000303623}$ | ${ }^{0.00037335}$ | ${ }^{0.008020718}$ | ${ }^{0.00053039}$ |  | ${ }^{0.000035177}$ |
| mi_cup chir vimi | 1.05030200 | 0.433060017 | 0.02753570 | 0.033zezz | 0.00282843 | 0.cicuasaza | ${ }^{0.80457503}$ | 0.001341397 | ${ }_{0}$ | 0 | 0.000165152 | 0.0060858540 | 0.00350464 | 0.5034839 | 0.17347782 | 0.02519725 | 0.0 .0038 | 0.c.0923451 | 0.09210333 |
|  | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| H3_GUPE-GPISDISTPA! |  |  |  |  | 0.0478330 |  |  | 0.60933317 |  |  | 0.8087 | 0.62916 |  |  |  |  |  |  |  |
|  | 0.3461077 | 0.250532314 | 0.08419860 | 0.03753878 |  |  | 0.03329830 |  |  |  | 0.0.0342 |  |  |  |  |  | 0.08961635 | 0.0032577 | a.00558185 |
| FB_OUP_EPIS_D CUSTOUEA <br>  | 0.44748822 | D.05493787 | 0.08700915 <br> $0.044342:$ | 0.00530505 | -. 00182375 $0.00+5337$ | $0.003 \text { Besti? }$ | 9,00131517 |  | 0.00114280 | 0.0 | 5.000005015 | 0.6 OUN2540 | 0.cals455: | 0.000 | 0.00119124 | cacze | a. Devoracons | 5.04503475 | 0.00487227 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fis cive erig g bukith | 0.01519319 | 0.07733275 | 0.0003323 | 0.00131182 | 0.0 .00884 | 0.00801100 | 0.00135112 | 0.0002337 | 0.00010 | 0.00002291 | 0.0000 | 0.00 | 0.0 .0 | 0.00687349 | 0.0032 | 0.00055274 | 0.00002 | 0.008007793 | 9.00000393 |
|  | 0.0.00353935 | ${ }^{0.0033635398}$ | 0.00012203 | ${ }^{0.0 .00538245}$ | 0.00801 | 0.06080585 | 0.0205464 | 0.00093 |  |  |  | 0.200723901 |  |  |  |  | 000 | .0200 | 0.002006323 |
| Pa-cuiterisocisise | 0.1433283 | ${ }_{0}^{0.1055218939}$ | ${ }^{0}$ | 0.005915 | c.Law |  | ${ }^{0.003357565}$ | 0.0 |  |  | amale |  |  |  |  |  | 0.00005355 |  | 0.0 |
| Hegur fric eneigy | 0.05692121 | 0.028022585 | \% | 41338 | 0.000138 | 0.0003974 | D.Co45sm3 | 0.50021 | 0.008378 | 0.00030 | 8.00007 | 0.0829 | 0.0023 | 0.00035 | 0.01522355 | 0.00273535 | 0.000033 | 0.000338727 | 0.003072729 |
|  |  | ${ }^{0.504729393}$ | ${ }_{0}^{6.0033323838}$ | ${ }^{0.00895323314}$ | 0.0 .000585575 | 0 | 0.0.03370473 | ${ }^{0.0151506514}$ | $0_{0}^{0.0030357575}$ | ${ }^{0.0 .0007604542}$ | 0.0.00702 |  |  | 20, |  | ${ }_{0}^{0.017875445}$ | 0.00038 | 0.001356353 | ${ }^{0.00274035}$ |
| Re. Cup Epis Pmic | 1.00cocraza | 52518 | 0.0106753 | 0.03142575 | 5.00248045 | 0.009795 4 | $0.034070{ }^{\text {a }}$ | 0.0148204 | 0.6555579 | 0.0074518 | 0.00105333 | 0.04313652 | 0.0405sciso | 0.0043336 | 0.20117830 | 0.0355253 | 0.003823 | 0.001 | 0.60167 |
| Rigciup-tisp Sumin |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cuperisp mizar |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| cup cris pautouca | - | - | - | -1020 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| -orsor |  |  |  | 0.0362572 | 0.6024345 | ambuest |  | 0.01478694 | 0.00:35379 | 0.00141518 | 0.001036331 | 0.0.1713462 | 0.68056530 | 0.089453749 | 0.20177636 | 0.03352 | 0.60842 | 0.6010 | 0.00018746 |


|  | $\begin{gathered} \begin{array}{c} \text { Toatal } \\ \text { nexant } \end{array} \end{gathered}$ | $\frac{\mathrm{RS}}{2}$ | $\frac{568}{3}$ | $\frac{125 S S E C}{4}$ |  |  | $\frac{108585}{7}$ | $\frac{165 . p 98}{8}$ | 1,35 | $\frac{168.7 \mathrm{tan}}{10}$ | $\frac{\text { ap．SEC }}{11}$ | $\frac{\text { Op．par }}{12}$ | $\frac{08.54}{13}$ | $\frac{\text { Op，}}{14}$ | $\frac{\text { cip roos Sue }}{15}$ | ${ }^{26} 6$ | $\frac{195}{7}$ | $\frac{96}{18}$ | $\frac{51}{18}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 0.0 .5524507 | 0.202585258 | 0.00912235 | 0.03326573 | 0．0．0193389 | ${ }^{\text {0．ascass78 }}$ | 20．5ssal | 0.03514358 | 0.0823553 | 0.0056534 | 0.00265105 | 0.0187398 | 0.0178 cssa | 0.00197312 | 0.03750403 | 0.01450083 | 0.00011223 | 0.002988183 | 0.00008159 |
|  | ${ }^{0} 0.2 .2535300595$ |  | ${ }^{\text {a．apas2a37a }}$ |  | ${ }^{\text {a }}$ | 0 | ${ }^{0.0181894514}$ | ${ }^{0.00318351}$ | 0．0047722 | 0.00031892 | 0.00023355 | 8．00972078 | 0.00914212 | 0.00112264 | 0.04533795 | 0.0775451 | －0039 | －20032 |  |
| AFlldc orf dispral | 0.123347735 | 0.003453597 | 0.00318273 | 0.0131355504 | 0.00041225 |  | ${ }_{0}^{0.007353334}$ | 0.00227889 | 0.000 |  | 0，002039 | ${ }^{0.0033677}$ |  |  |  |  | C．meas |  |  |
| OCOFF Dist |  | 0.0 .0855493 |  | 0.03507 |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.00078537 | 0.00011039 |
|  |  |  |  |  |  | O．00 |  |  |  | a．caso | 0.500501 | 0.0000 |  | 0．0n0xasso | 9．00935827 | a．tepoxiz3 | a．cezue3： |  | 0.00080175 |
| ，orir total |  | ${ }^{0.5151+26212}$ | 0.024035039 | ${ }^{0.034543532}$ | 0 | 0.0 .0006575 | ${ }^{\text {a }}$ | 0.001304720 | 0.055383 | ${ }^{0.000039}$ | ${ }^{0.0080012}$ | ${ }^{0.0 .0330651}$ | ${ }_{0}^{0.0 .05323}$ | ${ }^{0.0 .0030} 5$ | ${ }^{0}$ | ${ }_{0}^{0.0 .0202203}$ | ${ }_{0}^{0.00503021333}$ | ${ }_{0}^{0.0010317708}$ | ${ }^{0.0 .001120533}$ |
| Fiocup eris Pronction | 0.00710557 |  |  | 0.052195621 |  | $0.00 \times 01842$ | 0．cazzaz5 | 0.05035859 | 9.8009779 | 0.00808335 | 0.85092359 | 0.0096937 | 0.5010358 | aceserzasa | 0.0064539 | 0.0050853 | 0.00001418 | a．c0003501 | $0.000 \times 8503$ |
| RGOUP－EPGET TUTTRAM | ${ }^{3}$ | ${ }^{2.3125353546}$ | 0. | ${ }^{0.105541765}$ | a．ay | ${ }_{0}^{0.0 .8020268774}$ |  | ${ }_{0}^{0.00335659737}$ | 0．0．0443537 | $0.00088{ }^{\text {a }}$ | ${ }^{0.000707039}$ | 0 | ${ }^{0.0 .277454}$ | 0.003180538 | ${ }^{0} 0.173739200$ | 0.0 .0232757 | 0.0 .0023593 | ${ }^{0.0 .0075731}$ | 0．00712320 |
| Re．Gup cris pistpl |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sip EPm Tiste |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| RS Cup cris tustome |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1．000 | 0.480 | 0.011843835 | 0.077388 | 0.00245199 | \％ova | Coz7 | ．013942 | 0.007038 | a，001086 | 0.01010230 | 0.0477080 | 0.0442417 | 0．0932334 | 0.216335 | 0.0239352 | 0.0084163 | 0.00 rasa | 0.00015513 |
|  | 2935 | 4ecsess | 3162a | cester | q，accaztr | 0.003 cess | 0．027864 | 0.004853 | 0.08375 | 0．700etc3 | 0.0003 | 0.014 | 0.01344545 | 0.001508 |  |  | 0.00074 |  |  |
|  |  |  | 355512 | 548 | 2047 | 0.003129 | cas | 0.00258978 | 0.0012539 | 0．08027 | ， |  |  | 0．coss6 |  | 0.0 .1063 |  |  |  |
|  |  | 12323 | 5is | 50， | 0．cosiew |  | 5ibs3 | ${ }^{0.000107}$ |  |  |  |  |  |  |  |  |  |  |  |
| He－ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0．072 | （0x2zes32 |
| SFPrs |  |  |  |  | 0.000089 | e．ss |  | 0．0x |  |  |  | com |  |  |  |  | 0.02009192 | D．ca00 | a．asosazaz2 |
|  | ${ }^{\text {a．0．55555264 }}$ | ${ }^{0.507415353}$ | ${ }^{2}$ | ${ }_{0}^{0.0 .0387857543}$ | ${ }^{0.50371469}$ | 0.00023569 600 | ${ }^{0.0 .0085252535}$ | 0.00024505 0.0124273 | O．OOSN4403 | 0.00000045 0.008016 | ${ }^{0.0 .03002020}$ | 0.00322537 | 0.00050061 | 0.00003305 | 0.00043193 | 0．0．0003939 | ${ }_{0}^{0.0 .00000523}$ | ${ }_{0}^{0.0017712555}$ | ${ }^{0.00992352}$ |
| pag Gup Productow | 0.33443835 | 0.154278035 | 0.00518550 | 0.022685508 |  | 0．120273522 | 0．［2775336 | 0.00448218 | 0.002775 | 0．c3as 5653 | 0.0033353 | 0.0142 | 0.085 | 0.00158055 | D．Recs | 0．0113857 | －．censeas | 0．casascas | ancesozis |
|  |  |  |  |  |  | ${ }^{0.0093127272}$ | 0.016003 | 0.0038 | 0.00012 | 0.00327015 |  | 0.0082 | 0.007 | $0.0 \times 38855$ |  | 0.0563938 |  | 0.0032 | 0.102035378 |
| Riscuip bisipil | 0，20220773 | 6，1．1501220 | 0.00516513 | 0.0 | ${ }^{0.000075107}$ |  | ${ }^{0.0 .02720625}$ | ${ }_{0}^{0.0039770102}$ |  |  | ${ }_{\text {a }}$ | ${ }_{\substack{\text { a }}}^{\text {a．0．03353233 }}$ |  |  |  |  | ${ }^{0.802003283}$ | ${ }^{0.0 .00025333}$ | ${ }^{0.0 .0301645}$ |
| R3，cup disisc | 0．183393980 | 0.03875 | 232 | 0.04779883 |  |  |  |  |  |  | 0.00016819 |  |  |  |  |  | 0．0020 | 0.001 | 0．50022332 |
| miscuip custone | 0.05585254 | 0.0277508 | ${ }_{0}$ | 0.00268245 | ${ }_{0}^{0.0000031}$ | 0．00302115 | 0.000755 |  |  |  |  | 0.0030 |  | Sox |  |  | 0.00000913 | 0.00081199 |  |
| Rs，gip total | 1．00005030 | 0.54458583 | 0．02864205 | 0.0 .307775443 | 0.0023775 | 0.0060005 | ${ }^{\text {a }}$ | 0.0124 | 0.0045 | 0.00080318 | ${ }_{0}$ | 0.0376 | ${ }^{0.02651}$ | 0.00024 |  | ${ }^{\text {a }}$ | ${ }_{0}^{0.0 .0505039323}$ | ${ }^{0.0 .16273}$ | 0 |
| REV OTHER PFODUCTICN | 0.12033250 | ${ }^{37887}$ | 54185 | 372445 | nassase | 0.00033 se | 0.008270 | D．0079 |  |  |  |  |  | 0.0 .00654530 |  |  |  | 2．0．0073530 |  |
| Revoiher buliman |  | （10．02183939 | （0．0．0041503 | 2164 | ［0．0．2077 5 S5 | 0.0003319 | ${ }^{10,0,284322}$ | －15 | 10.00018 | 10．083030 | （1，．0002 | 为 |  | 60．0033 |  | （0．0003753） | yacano | （10．5030312］ |  |
| OTfer Dispert | 退 24.4 | 20．0．0303744 | （1536） | 退 |  | ：．，．ccoin |  | （0．00016159 | （0．0．00538） |  | ${ }_{0}^{12.00005050}$ | 0.005351 B | cooss |  | 10.003148 |  |  | ${ }_{\substack{\text { a }}}^{(0.0 .50012084)}$ |  |
| REV OTHER DETSEEC |  | 0.2491054 | 0.0 .4435 | ${ }^{0.09728541}$ | CCOOS525 |  | 9，asamacte |  |  |  |  |  |  |  |  |  | 0.00314335 | 0．00338833 | 0.50035387 |
| Revorum custo | 0．0．125439 | 0.02137 | ${ }_{0}^{0.0 .094739}$ | ${ }_{0}^{0.00174314}$ |  |  | 0．c50023 |  |  |  |  |  |  |  | 2022 |  |  | ${ }^{2.0033}$ |  |
| mevontertota | 1．60000003 | 0.708123575 | $0.04203122^{4}$ | 0．14303799 | 0．0016438 | ${ }_{0}$ | ${ }^{0}$ | 0．00971595 | ${ }_{\text {a }}^{0.00001037674}$ | （0．0．0020 2 24 | ${ }^{0}$ | ${ }_{0}^{0.0028089}$ | ${ }^{0.003923}$ | ${ }^{0.000063}$ | （0．000 2183 | ${ }^{0.0 .0007}$ | ${ }^{0.0000307435}$ | ${ }^{0.0 .0775150}$ | ${ }^{0.0 .003382323}$ |
| REV SAAES PR | 0.40161653 | 114 | 32373 | 0．0422044 | 0.001245 | 0.500423 | 20， 20.108 | 8．0073 | －．．ax |  | a．coser | 1．083 |  | 0.08154 |  | 0.14142847 |  | 0.0002 | 0.00031233 |
| Sail |  |  | 22xas |  | 0．120021 | 0．00807 | racrazaz | 0．anco | ca．ara | （0．00603757 | a．conos | ［0．002 | 10.8007 | （0．0．80．78744） |  | 0.0822593 |  | 0.00000477 |  |
| REV－SALIS |  | 0.054353505 | 0.003343046 | ${ }^{0.0513583546}$ | ${ }^{\text {a }}$ |  | 隹 | ${ }^{0.0 .002037812}$ |  |  | 2007 | （0．0．00220322） |  |  |  |  | 0.0 .03505351 | 0．0．00000 9 94 | 年 |
| fey Sales distec | 0.05919351 | 0.03724353 | 0.00354278 | 0.0 .03585201 |  |  | 0.0973 |  |  |  | 0.6500 |  |  |  |  |  | 0.00039 | 0.5037 | 0.000077248 |
| REVSLLESEEEAY | 0.42302037 | 0.15202 | 0.0003325037 | ${ }^{0.0334523832}$ | cras | 0.0 | 0.08388 | 0.0 .00522 | C022 | 0.0008 | 2．003314 | 0.022 | 0.0017 | 0．033 | ． 114 | 0.017 | 0.002823398 |  | 23 |
| REVGALES Total | ${ }_{\text {a }}$ | 0.412433106 | ${ }^{\text {a }}$ | ${ }_{0}^{0.1055323}$ |  | 0 | a， | 0.0663839 | 0.005 |  | 0.0000003145 | 0.0 .058564 | ${ }^{0}$ | ${ }^{0.0000292}$ | ${ }^{\text {a }}$ | 0.0037 | ${ }_{0}^{0.0051020235}$ | ${ }^{0.00103832}$ | ${ }^{0.00958517}$ |
| рyouctib | 0.4037875 | 1671597 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TR | 0，02228530 | 532327 | 0.00021575 | 0．10293326\％ | 0.00031659 |  | 10 | 0，0xcma | 10.03030 | \｛0，0．5033 |  | （0．00056572） | 10.00016 | 10.00 | （0．0．53） |  |  |  | 29 |
| 隹 | 退 | Senta | 2832 | Lixisursil | ${ }^{\text {a }}$ | 0.0000379 |  | \％ | ［0．000002288） |  |  |  |  |  |  |  | 0.0030 |  | ${ }^{\text {a }}$ |
| nIsee | 0.0 .0430303 | 0.0498183 | 2，035785s | cas74az |  |  | ${ }^{2.0 .07725577}$ | C．0024 |  |  | 0．00101062 |  |  |  |  |  | 0.0002456 | 0.00034388 | 0.00018033 |
| REVENEPGY | 0.41615033 | 0．149873525 | ${ }^{0.003232332}$ | 0.037401775 | ${ }^{\text {a．uevens }}$ | 0．00012 | 0.0 .3873337 | 0.005407 | 0．1022 | 0.000651 | 0.00056478 | 0.02167 | 0.017 | 0.00375414 | 1202 | 0.0168 | 0.0023343 | 0.00382 | 376s |
| nev Total | 1．0．000casem |  | ${ }^{\text {a }}$ |  | ${ }^{\text {and }}$ | ${ }_{0}^{0.00090393435}$ |  | ${ }^{0.000145500}$ | ${ }_{\text {a }}^{0.00021677}$ | 0.8015 | ${ }^{0.0 .02000125}$ |  | ${ }^{20.0032385}$ |  |  | 0 | ${ }^{2.0 .000032829}$ | ${ }_{\text {a }}^{0.0 .010312628}$ | 0．0．0152334 |
| Revsales productio | 1．06020030 | 2337 | 28013 | \％38： | 0.00322320 | 0.63127332 | 0．108887107 | 7583 | 5332 | 0.00115659 | 0.00176531 | 0.04685323 | a，036 | 0.60200163 | 0.16874533 | 0．c30 | 0.00088472 | ar | 0.0021563 |
| nils subt |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| REVSALES Distrait |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ． |  |  |  |
| sales |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Salis |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| AEVSALLS Lital | 1．0060 $0 \times 0$ | 2．657235 | 0．matates | 0.10132150 | 0．00320220 | 0.6012732 | 7607 | 0.05573337 | 0.00333532 | 0.0816 | 0.0077559 | 0.0665932 | 0.0970 | 0.02080369 | 1057430 | 0.0338 | 0.50853 | 0.0146776 | S．coss |
|  | 1218 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Revsmes mxl suition |  |  | ${ }^{\text {ajurazaza }}$ |  | 209342 |  | 20098532 | conosal | 0．caso 149 | 40．00003709 |  | （10．00255615 | （10．020 7783） | \｛0．0022810） |  | 2．000332020 | 0.000 | 0.0 | cosocses |
|  | $0.03205 c 535$ | 5371234 | 0.003333350 | 0.01377572 | $0.000+1053$ |  |  | 0.00282037 |  |  | ${ }^{2.0 .0202026730}$ | 0．0589379 | 10．00ccosas |  | （10．002830323 |  | 0．00003 | ${ }^{0.00002}$ | ${ }^{0.0 .0200020267123}$ |
| Mtsi－xMM Disist | 5745322 | 1．03372046 |  | 0.000384 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 17322 |
| REVGALS FEFLL CUSTOMER | 2307523 | 0，12：2383238 | p．ienazizs | ${ }^{0.0344113238}$ | 0.000103469 | 0.000185 | 0.0 .375853 | 0.008513 | 0.00239 | ${ }^{\text {a．cenasiz34 }}$ | 0.08057 | n．022 | ${ }^{0.0 .1823}$ | 0.00152 | 0.1515 | 0.0216 | 0.00023 | 0.0030 | 0.0 .0057774 |
| mevsmes．fxil total | 1．0．0．0iseco | ${ }^{0.406723571}$ | ${ }_{0}$ | ${ }_{0}^{2013132185}$ | 0.030320280 | 6．00127732 | ${ }_{0.05627107}$ | 0．0．575931 | ${ }_{0} 0.000333552$ | 0．00116550 | 0.00175 | 0.0460 | 0．007720315 | 0.00808163 | $0.10 .1574 \times 603$ | 0.03023345 | $0.000 \times 634$ | ${ }^{0.044637}$ | 0．0．025i633 |
| Wec pronucto | 500030 | ． 533 | 17809\％ | 0．c0933779 | 5235s | 0.03445532 | 10.041535 | （0．028080393） | 0.0335765 | Seceso | 0．0478： | Miter | 0.14555171 | ［0．223730059 | 9．7738 | ． 68 | 0.0081 | 10.0294002 | 0.00340122 |
| REMEC SLITTMA |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MECC Disipal |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hecois |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| hemectustow |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| feyycc total |  |  | 10.80878491 | 0．6Cx3975 | 0.0152358 | 0.009455 | （0．0．4．4．3574） | \｛0．023ccexas） | $0^{0.033776818}$ | 0．0x831875 | 0.04739359 | 0.8181565 | 0．4．43： | （0．2ersscos） | о．273543 | 0.653244 | 0.00476716 | （9．63246023） | 0．9380 |


| Hibecation <br> Fgis: | $\begin{aligned} & \text { Taxid } \begin{array}{c} \text { cexid } \end{array} \end{aligned}$ | $\frac{\mathrm{R}_{3}}{2}$ | $\frac{509}{3}$ | Nas.sec | $\frac{\text { M } 6 \text { S.P8] }}{5}$ | $\frac{129 s s y s}{6}$ |  |  | $\frac{16598}{8}$ | $\frac{165780}{10}$ | $\frac{\text { Prse }}{11}$ | $\frac{\text { op.pas }}{12}$ | $\frac{60.598}{13}$ |  | $\frac{\text { ciarop } 515}{15}$ |  | $\frac{180}{17}$ | $\frac{96}{13}$ | $\frac{56}{13}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| afude off priouction | 0.4538407 | 0.022550251 | 0.08812835 | 0.03825057 | 0.00103038 | 0.00029576 | 0.0353941 | 0.00614853 | 0.00295523 | 0.0068154 | 0.00845105 | 0.01887735 | 0.07¢Es38 | 0.0 .9197312 |  | 0.01458338 | 2.cosis8ia | 0.00388893 | 0.00808158 |
| AfULCOCFF | 0.2.2535908 | 0.10495372 | ${ }^{0.004282870}$ | ${ }^{0.011283859}$ | 0.0095ccse | 0.c.001534 | 0.0 .183514 | 0.0315351 | 0.0.417929 | 0.00031482 | 0.00023335 | 0.00377278 | 8.00914212 | 0.001122154 | ${ }^{0.0 .4533735}$ | 0.00753484 |  |  | ${ }^{\text {ax }}$ |
| AFLCCCOFF SUSTPR | 520 | 2.0023038 | 2,00615339 | -.0735585 | 0.2022299 | 0.000099156 | \% | 0.0 | 0.0070 |  |  | ${ }_{0}^{0.00785893}$ |  |  |  |  | 0.000307223 | 0.0001968 | 0.00003244 |
| AFUCCCOFF | 0.0 | ${ }^{0.053543537}$ | 0 |  | $0.000+12$ |  | 0.00395537 | $0.02 \times 27005$ |  |  | 0.axificis |  |  |  |  |  | 0.00303 | 0.000678587 | 10.00314038 |
|  | 0.001035 | ${ }^{0} 0.00048$ | 0 | ${ }_{0}^{0.003413}$ | ${ }^{\text {0, }}$ | 0, 0.008080293 | C.009 | ${ }^{\text {a }}$ | 0.0xccoli | ${ }^{0.008003988}$ | 0.0 .00000 | ${ }^{0.0 .08087052}$ | ${ }^{\text {and }}$ | ${ }^{0.0 .020203505093}$ | ${ }^{0.0 .020383827 ~}$ | 0.00000 |  |  | ${ }^{\text {a }}$ |
| AFULCOFFTOTAL | $1.15000 \times 50$ | ${ }_{0} 0.514142312$ | 0.04453503 | 0.034683252 | 0.00271920 | 0.00057585 | 0.03551833 | 0.1034 | 0.0053595 | amom | 0.00105 | 0.03366 | ${ }_{0} 0.0322$ | 0.103030416 | 0.15787533 | 0.0.2ar212 | U.C.0383 | 0.01283 | 0.00145309 |
| mevecemam production | 0.40393235 | $0.03 \mathrm{seg775}$ | [0.03scasa) | D.ca33935 | 0.00823275 | 0.97733248 | (6.0194469) | (10.0128469) | 0.0202755 | 2.ccrapel | ${ }^{\text {0.830x335 }}$ | 0.02523322 | ${ }^{\text {a, } 07559535}$ | (0.0scococze | 0.1145 | 0.20853138 | 0.00183620 | (0.00128539] | ${ }^{2} .8 .0073754$ |
| Revecimil ilitian | (0.0.02499370) | (10.0.3037533) | Soscs | ${ }^{0.0 .000001}$ | 20037 |  | 0.0 | (0.0.03019 | (0.0.0020375] ${ }^{\text {a }}$ |  | 0 | \% |  |  |  |  |  | (0.000x3zis) | d.c.acossoi |
|  | 0.0114653 | 192485 | (0.0.0307620] | 0.0 .01272 | 0.001895770 |  | \%0. | (0.03350374) |  |  | 0.0 | 0.0378190 |  |  |  |  | 0.0 .0567785 | camasza3n | a.accessss |
| Rewcee rme disise |  | 0.03531205 |  | 0.0038 |  |  |  |  |  |  | 0.0.04188 |  |  |  |  | 0.3573 | 0 | (10.04343529) | ${ }_{\text {a }}^{0}$ |
| GEVEC_ENM ENERGY | 5.48233443 |  | 10.50 cosb | -0, | 3505 | ${ }^{57275}$ | (0.01293332] | (0,00022712] | 0.0014819 | ${ }^{\text {a }}$ | 0 | -200m3s81 | S00112511 | (0.0093784 | $0 . \operatorname{cosez405}$ | 0.00297760 | 0.05902332 | (0.02983755) | ${ }^{\text {a,0.02215336 }}$ |
| REWECCKRNL TOTAL | 1.005000000 | ${ }_{0}^{0.014553365}$ | (6.00178431) | 0.8033577 | 0.0 .15235 | 0,0.0445432 | 10.044353 | (0.025ic | 0.033 | 0.000091875 | 0.0778 | 0.08 | 1677 | (0,203397003) |  | 0.6592454 | 0.00478776 | 2466239 | Q:303360122 |
| qevtec_exp omproducion | 9770 | 2042 | (a.ccsincal) | 0.00383539 | 0.cxucssa | 0.00151353 | (0.0771238) | (2.0.102459\% | 0.01815169 | 0.080008 | 0.0 | 0.0227 | 0.08573514 | 23) | 1041532 | 1.22559165 | 0.00915728 | (0.0.043433) | 0.0001535 |
| Revyece expou |  |  | ${ }^{0.0 .00021253525}$ | 10.0 | 180.0 | (2.0.33039 | 103303 | 223 | ${ }^{10.004555}$ | f0.008 |  |  | (0.0.1533 | 0.010 | (10.0.8610 | 10.05 | lo,0 | ${ }_{0}^{0.0 .0935351467}$ |  |
| RENECEEPPOMDISTPR! | 0.007515549 | 0.00167531 | (a,coser353) | 0.00033501 | 0.50155845 |  | (0.0.6272 | (0.0.025333) |  |  | 0.00445 | 0.00578 |  |  |  |  | ${ }^{0.05454014}$ | (20.00333463) | 0.00000865 |
| AEVECEXPOMENERGY | 0.72167025 | ${ }^{\text {a }}$ | (10.00357 | 0.00531356 |  | Q:02277222 | [0.0.55629 | (0.0.157604 | arv | 0.00031277 | 0.30385 | i.0403 | 8.104 | (0.152353 | 0.203545635 | 0.46 | 0.0031 | (0.01338533) | a.30158773 |
| Revece Exp on clusto | 1524 | 0.00933 | (0.0.0331912 | 0.0036778 | 0.0103 | 0.0023 | 10.0031405 | . 20012 |  |  |  | 0.0030685 |  | 10.000 | a. 20312335 |  |  | (50.01331563) | (0.0152033 |
| REVYEC_EXP_OM TOTAL | 1.00000000 | 0.011453345 | 10.001788493 | 0.0093377 | 0.01523565 | 0.033455392 | 10.0443574 | 10.0250850 | 0.03935 | 0.0000 | 0.04 | 0.0565 | 0.14 | 10.2033 | 0.22 | 0.6532 |  |  | 0.030 ${ }^{\text {a }}$ |
| TDO:mproduction | 0.15612394 | .a.7394022 | 0.00233 | 0.0172845 | $0 . \mathrm{cra37728}$ | 0.20310333 | 0,027762 | 0.9292418 |  | ${ }^{0.0 .2021454, ~}$ | 0.108015 | n.asas | ${ }^{0.006315947}$ | 0.0.200883722 | ${ }^{0.032550103}$ | 0.0 | $0^{0.0000664}$ | 0,0xn17820 | ${ }^{\text {ancosens }}$ |
|  | ${ }^{0.053365597}$ | ${ }^{0.0 .04172633}$ |  | ${ }^{0.0 .07325353}$ |  |  | 0.007332 | ${ }^{0.0031223}$ | 0.00003031055 | 0.08012835 | 0.0000 | 0.0935 | ${ }_{\text {a }}^{\text {a }}$ |  | 0.0.003879 |  | ${ }^{0}$ | 0.08304020 | - |
| TDO:Mx 015 PTPA | 0.419465077 | 0.222437 | 0.01077330 | 0.0 .4587753 | 0.00113518 |  | 0.04532 | 0.0 .0788533 |  |  | 0.0006 | 0.02728955 |  |  |  |  |  | 0.00054937 | 0.00071978 |
| todax plissec | 0.285884129 | 0.13101957 | c.0107345 | 0.02885153 |  |  | 0.02583 |  |  |  | 0.cravers3 |  |  |  |  |  | 0.00012883 |  | 0.0 .0334283 |
| trontix clistower | 0.0125435 | -intescrsa | 0.0057803 | - | 8,0.ceasas | c.anazas5 | 0.003163 | 0.80018295 | cincossues | 0.00807 | 0.0 .0083 |  |  | 0 | 0.0 .0095 | 0.00311382 | ${ }_{\text {a }}^{0}$ |  | 何 |
| momic toral |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| topilant Productics | 0.01144597 | 0.10353189 | accer 3 | 0.0.09232a | 0.08032375 | 0.anceover | 0.00036509 | 0.6009614 | 0.08007553 |  | 0.0000 | 0.00848 | 0.000663 | 0.0505 | 0.02238 |  |  | 0.00832 | ${ }^{0.00033214}$ |
| торимит вumi |  | 0.1345838 | 0.065336 | 0.03034238 | 0.0037 |  |  |  |  |  |  |  |  |  |  |  |  |  | ${ }^{0.0 .003554 .19}$ |
| mparsustal | 0.1212657737 |  | 0.aicentuas | 0.0 .0 .32345 | 0.0.asazr7 | 0.000160 | D.aczeas | 0.0 .00163122 | 0.0008 |  | ${ }^{\text {axamata }}$ | 0.0035 | $0.086{ }^{\text {a }}$ |  |  |  |  | 0.00055737 | $0.0000077 \times 2$ |
| topmanticticc | 0.156549397 | 0.14497635 | 0.0081471 | 0.02177785 |  |  | 0.018184354 |  |  |  | 0.10024433 |  |  |  |  |  | 0.0030846 | 0.00153172 | 0.00033303 |
| TOMANT Customea | о.geşa3s | -.18375024 | 0.00337105 | a.003cons 7 | anemesctar |  | a.6010025 | O.coss3aso |  |  |  |  |  |  |  | 0.E02484 |  | 0.0263357 .1 | 0.082881433 |
| topinit total |  | 0.5780 .827 | ${ }^{\text {0.0.03337335 }}$ | 0.050385373 | 0.00307653 | 0.cocssees | ${ }_{0}^{0.06779978 ~}$ | 0.01153938 | 0.00383375 | 0.002554243 | 0.0011835 | 0.0 .0350750 | 0.0 .957581 | 0.00151657 | 0.032abiea | 0.01823242 | 0.00348483 | 0.02981873 | 0.0.33306035 |
| totmexip Priouctiva |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| тоtexexp buithe |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TOTMEXP Distrit |  |  |  |  | 0.002720331 |  | 0.0071627 | 0.0112551 |  |  |  | 0.0899873 |  |  |  |  | 0.0093575 | a,xa33672 | 0.rentart |
| totatexp distsca | 0.373591 | 0.2780751 | 6,9154230 | Qapaicout |  |  | 0.0 .0365689 |  |  |  | 0.080047393 |  |  |  |  |  | 0.00578232 | 0.00352225 | 0.00084659 |
| TOMMX | 0.007891 | O.masamis | D. $2.500 \times 3534$ | 0.00815475 | C.Conemis | acaras3:3 | a, momasass | 0.0003238 | c.asmsass | 0.0038 cas | a,cososa | 0.0080759 | a.canasa62 | 0.5009145 | 0.00858387 | 0.008014 | a.asomasaz | B.0033899 | 0.002cass |
| tomemexp fotal | 1,000000 | 0.63353532 | 0.035193434 | 0.1091459 | $0.028 \times 3 \times 13$ | 0.06503313 | 0.1835633 | 0.01423000 | 2. 208035363 | 0.00300533 | a, 0312351 | 0.0 .3505519 | 0.00088462 | 0.06031405 | 0.00085887 | 0.053914 | 0.00055844 | 0.00788847 | 0.0037735 |
| totohines production | - | . | - |  | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Totill | 0.61079157 |  |  | 0.00678068 | 0.02203143 |  | 0.06571980 | 0.01118042 |  |  |  | 0.0837 |  |  |  |  |  | 0.0003422 | 0.00115334 |
| TGTOMINES DISTEEC | 0.35826843 | 0.28727735 | 0.0161413 | 0.0 .030275 | 0.0020303 |  | 2, | 0.0140012 |  |  | 0.000348522 |  |  |  |  |  | 0.0001875 | a.ca37203 | 0.7036cises |
| Trothmes energ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Totorives fotal | 1.0000c000 | 0.58307820 | 0.03182793 | 0.10982845 | 0.00003714 |  | 0.10846872 | 0.0411932 |  | - | 0.0018023 | 0.04778475 |  |  |  |  | 0 0.6as533 | 0.654 | S.eva |
| totoxza pracuction | . |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - |  |  |
| Toroxma bulkitan |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| тотoxas | . | . |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Totoxiza Disist |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TOTOX234 ERERGY | i, maxames | ${ }^{0.65858729}$ | ${ }_{\text {a }}^{0.10272773}$ | ${ }^{\text {a }}$ | a, | $0^{0 . c a n c o u r i 3 ~}$ | 0.083 | 0 |  | ${ }^{\text {O}}$ | 2.000605t | 0 | 0.00012210 | ${ }_{\text {a }}^{0}$ | 0 |  | 戓 |  | ${ }_{\text {a }}^{0.0 .0821923}$ |
| -0, |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| toroxexp probi | . | . | . | - | . |  | . |  | - |  |  |  |  |  |  |  |  |  |  |
| Totoxexp eititam |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Totoxexp insper |  |  |  |  |  |  |  |  |  |  |  | 0.027767281 |  |  |  |  |  |  |  |
| TOFOXEXP DGSTEEC | 0.3237378 | 0.23238730 |  | 0.033455081 |  |  | 0.020346873 |  |  |  | 0.00238533 |  |  |  |  | - | 0.00031550 | 0.00829838 | 0.0085785 |
| Totoxexp Customer | 0.21150576 | 0,02073477 | 0.0 .03023645 |  |  |  |  |  |  |  |  |  | 9.03sasab | a.cassizas | 0.002035003 | 0.108051295 | c.asalise | 0.0485355 | 0.01617238 |
| Toidexexp total | 1.,.2racess | 0.571939 | 0.50511973 | 0.02807313 | 0.005502035 | $0.001+24$ | 0.0 .0366337 | 0.01048283 | $0.0 .0 \times z 3321$ | 8.00046317 | 0.0016332 | 0.03245338 | 0.00383843 | 0.05001225 | 0.09285309 | 0.0008123 | 0.00204635 | 0.0458023 | 0.01697298 |
| totucheres procuctor: |  |  | * |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - | - |
| Toruaimes buhtany |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| torncilies bisiphi | 0.625xaces | 0.12831859 | 0.01818457 | 0.c633531 | 0.08287837 |  | n.0.9377165 | 0.0114573 |  |  | a.exam ${ }^{\text {a }}$ | 0.03569391 |  |  |  |  | nox | a,cress | 9.00153 |
| toturames distec | 0.37500038 | 0.23877433 | 0.01555183 | 4i4csas |  |  | 0.03353535 |  |  |  | 0.00047135 |  |  |  |  |  |  |  |  |
| torualmes energy |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Totucume botal | $\therefore$ icmacosi | 0.67755592 | 0.09163775 | 0.1090074 | 0.00237874 |  | 0.104538508 | 0.914837 |  |  | 0.0037345 | 0.0 |  |  |  |  | 0.00054685 | 0.084550918 | 0.ccocsta |




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| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| i.1.154.585 |  | $\begin{gathered} 24,553 \\ 0.048753 \end{gathered}$ | $\begin{array}{r} 93,25! \\ 0.09102575 \end{array}$ | $0.020245975$ |  | ${ }^{0.0340760657}$ |  | ${ }_{0}$. | ${ }_{0.0141451518}$ | $0.810^{1,197}$ | ${ }_{0}^{0.48513063}$ |  | ${ }_{0}^{505953534}$ |  | ${ }_{0}^{0.0335272535}$ | 2003 23.129 | ${ }^{1,780}$ |  |
|  |  |  | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| - | - |  | - |  |  |  |  |  |  |  |  |  | : |  | : |  |  |  |
| $\therefore$ |  |  | : |  |  |  |  |  |  |  |  |  |  |  | : | : | : |  |
| 1.00600000 | 0.40558516 | Q0103753 | 0.08102575 | 2.0274845 | a.cocs734 | 0.0408789 | Q.01442c24 | 0.0835673 | 8.034463 | 0.50108533 | 0.4351563 | a, 0 ascasa | 0.80453398 | ¢.2017909 | 0.0355253 | 2.0094334 | 0.0011072 | 8.5016744 |
|  | $2.2815377,54$ | 190.774019 | 554,380,064 | 14,453, 819 | 4,607 | ${ }_{6}^{615,43}$ | 102.554 .585 | 47.203 .014 | 10,2es, 6 cez | 8,83,237 | 355,939.603 | 45 | 27 | 1.980,517.287 | 230,63,377 | . 83.3 | 393 | 36 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | : |  | : | : | : | : |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | $\cdots$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.10308003 | 0.5353505 | 0.0211835 | 0.075 | 0.02927133 | 0. | 0 | 0.01448773 | 0.00578414 | 0.0914563 | 0.00128053 | -.sserzes | 0.04235167 | 0.06065379 | 0.27100278 | 0.009370013 | 0.0005339 | a.008c8028 | Ocanzarn |
| 1.00303020 | 0.35853505 | 0.0211558 | 0.07Tı3a7\% | 0.68238138 | а.скагаззs | 0.038 sas 3 | 0.01454772 | 0.00987414 | 0.58345833 | -i.anza | c.osteras | 0.0423556 | 0.0032559 | 0.27700210 | 0.0887013 | 0.90353231 | 0.00333329 | 0.0012377 |
| 1,154,545 |  | 21,653 | ${ }^{23.551}$ | 2.873 | 735 | ${ }^{\text {97,067 }}$ | 16,a4 | 7.570 | 1,034 | 1,197 | 9,603 | . 433 | 5,3\%4 | 232276 | 275 | 483 | 273 | 215 |
| 1..cosecscos | 2.ec5e5s15 | $0.9800^{-18553}$ | 0.08162575 | accrevoss | 0.conorse 4 | D.03407803 | 0.01414288 | 0.0083373 | 0.03741513 | 0.0080363 | D.04313662 | 0.0040 scsa | $0.004533 \times 0$ | 0.2017785 | 0.0 .3932259 | 0.0002381 | Ocostaza |  |
| - | - |  |  |  |  |  |  |  |  |  |  |  |  |  | : |  |  |  |
| : | $\because$ |  |  |  |  | $\square$ |  |  |  |  |  |  |  |  |  |  |  |  |
| i.poracaso | 0.e\%6zasis | 0.01085753 | 0.6310275 | 0.00288885 | 0.68507554 | D.esserctes | 0.0361289, | 0.8085837 | 0.03541516 | 0.00108333 | 0.as31362 | 0.0435350 | 0.0025338 | 0.2917296 | Q. | 2.0094234 | 0.0030723 | 0.0001374 |
| ${ }^{\text {cew }}$ c23 | ${ }^{33,355}$ | 15,74 | 67,527 | 2.003 | ${ }^{7} 5$ | 70,05t | 1,7¢3 | 7,225 | 0 | ${ }_{80}$ | satar | 4,522 | 0 | 25,593 | - | as9 | ${ }^{32}$ | ${ }_{108}$ |
| 4.cenorace | 0.44791915 | 0.017008 | 0.076859 | 0.0023228 | 0.cxuesma | 0.07735372 | 0.61138630 | a,982043 |  | Q.9033923 | $\overline{0.04163759}$ | 0.0372583 |  | $0.2851 / 55$ |  | 0.00085033 | 0.0108102 | 0.0001785 |
|  | : |  |  |  |  |  |  |  |  |  |  |  | - |  |  |  |  |  |
| - | : |  | - |  |  | . |  |  |  | . |  |  | : | : |  |  |  |  |
| 1.00808 | 2.47731 | 2.0.7834 | c.betsen | 0.0203 | 0.0088 cras | 0.07835372 | 0.atas350 | 0.0035085 | . | 0.00393123 | 0.0416576 |  |  | $0.2857 / 556$ |  | 0.50048083 | 0.00666102 | 0.601789 |
| 5,461.531,503 | 1.066,03.572 | 1909.513 .182 | $480.593,403$ | $12.380,7{ }^{\text {a }}$ | 4,584,023 | ${ }^{451,064,513}$ | ${ }^{75} 53318.639$ | $4_{15.5050 .932}$ | - 0 | [5.515,773 | 283.653.33 | ${ }^{2050435301}$ | 0 | 1.553.332, 012 | 0 | 3.070.325 | ${ }^{35,54,480}$ | 670,003 |
| - | : |  | : |  |  |  |  |  | : |  | : | : | : | : | : | : |  |  |
| : | : | - | : |  |  |  |  |  |  |  |  |  | - | - | . | . | : |  |
| 1.08500850 | 0.3467032 | 0.02021025 | 0.0751120 | 0.00220450 | 0.00034230 | 0.0 .8339005 | - 0.1383873 | D.0044392 |  | 0.0012824 | 0.08288231 | a.83383 | : | 0.332 |  | 0.0005855 | 0.008 | 0.80123197 |
| 1.98200000 | 0.34687232 | 0.02851055 | 0.0731200 | 0,0922340 | 0.0 | 0.00338085 | 0.01853737 |  | - | 0.00127244 | 0.0458231 | 0.5038015 | : | 0.34290 cs | : | $0.0005 c c a 3$ | 0.08068393 | 0.001330 r |
| ${ }^{733,94}$ | 51.648 | 20,872 | ${ }^{\text {co,533 }}$ | 2.620 | 0 | v5,255 | ${ }^{19,467}$ | - 0 | 0 | 1,133 | 14.808 | - 0 | - | - 0 | 0 | ${ }_{4} 8$ | 1,221 | ${ }^{207}$ |
|  | $\vdots$ |  | - |  |  | $\vdots$ |  |  |  |  | : |  |  |  |  |  |  |  |
| 1.830ccisa | 0.07733175 | 0.0235773 | 0.18383129 | 0.00332589 |  | 0.10053484 | 0.0183317 |  |  | 0.0174175 | a.cescossas |  |  |  |  | onassaes | 0.09154sa | 0.5023670 |
| ! |  | $\cdots$ | $\vdots$ | : | . | $\vdots$ |  | . |  | : | : | - | - | . | . |  | : |  |
| 1.00838030 | 0.67338175 | 0.0255779 | 0.10335129 | 0.00332893 | . | 0.100353 | 0.8183217 | - |  | 0.6014173 | 0.0565023 | . | - | - |  | $0.500 s s^{2}$ | 0.50154530 | 0.0082676 |
| , $5.653,015$ | 1,795,608 | 50,675 | 5.742 | 0 | 0 | 141,670 | 0 | 0 | 0 | 1839 | . 0 | - 0 | - 0 | - 0 | - 0 | 7 c | 14.914 | ${ }^{2,553}$ |
| : | : | : | : | : |  |  |  |  |  |  |  | : | : |  |  |  |  |  |
| Tisamasa | 6.7737353 | 0.08487778 | 0.140ssiss | - |  | 0.08085833 |  |  |  | a.porzasy |  |  |  | - |  | 0.5004387 | 0.085785 | D.007700: |
|  |  |  |  | : |  |  |  | : |  |  |  |  |  |  |  |  |  |  |
| 1.00mossa | 0.73797853 | 0.04417778 | a.16555155 | : | - | 0.08850385 | - | : | : | 0.0012 cess |  |  |  | : |  | 0. |  | 0.00871031 |
| 220,13 | 140,750 | ${ }^{23,444}$ | 7:27 | 83 | 13 | 789 | ${ }^{1}$ | zo | : | z | 43 | 27 | - ${ }^{3}$ | 13 | 3 | 11 | 47,554 | ${ }_{56}$ |
| : | : |  | : | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| : | : |  | : | - |  | - | - | . |  | - |  |  |  |  |  |  |  | . |
| $1.0 \times 800000$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.eercosese | 0.683946423 | 6.16337254 | 0.0336023 | ,umarios | 2.0303830 | ${ }^{0.0038346323}$ | (nions |  | 0. WWORK2CL | 0.56700345 | 0. COETYET5 <br> 000135 | 0.0001228 a 0.000122603 | 0.0601503 0.0001353 | 0.00 ergan 0.0005800 | 0.0001353 0.0001323 | 0.003003037 0.0604937 | 0.21001353 0.21104385 | 0.00023441 0.00025441 |
| $2^{230.032}$ | 140,750 | 23.45 | 7.27 | ${ }^{1}$ | - 0 | 753 | 8 | - | 0 | z | 43 | $\bigcirc$ | a | 0 | - | 1 | ${ }^{47,554}$ | 5 |
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| 1.00ccasa | 0.0 .6357730 | 0.1564178 | 0,03333246 | 0.50303772 | - | 2,0034450 | ${ }^{\text {a }}$ | : | . | 0 | 0 | : | . | - | : | 0 | 0.2:1612311 <br> 0.2161231 | 0.062545 <br> 0.0012545 |


| alocator | function | Tad | нs | s6s | ${ }^{1455.5 c i c}$ | ${ }^{2}$ LS.spa | mas.sua | LGS.ESC | L6S.p8 | Lessus | L6S.tia | op.Sce | DP.pal | ap-su3 | Cr.in | ciptoosu3 | CP-TOD-TRA | uw | $\alpha$ | st |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ${ }_{\text {Stccust }}^{\text {SisT }}$ |  | ${ }^{219,823}$ | 10.3 \%00 | 314 | 7.277 | - 0 | - 0 | ${ }^{759}$ | - 0 | - 0 |  | - ${ }^{2}$ | 0 | - |  | 0 | 0 | ${ }^{11}$ | 47.54 | ${ }^{55}$ |
| Dist simy | виектimal |  | : |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Dist SEENV | Susipur | : | : | : | : | : | : | : | : |  | . |  | : | : | : | . |  |  |  |  |
| ${ }_{\text {dist }}^{\text {dist SEAV }}$ |  |  | - |  | . | - |  |  | . |  | . |  |  |  | - | - |  |  |  |  |
|  |  | i.cocosenos | 0 | - 0.110551297 | a |  | - | 0 |  |  |  |  |  |  | : |  |  | 0.0 .0055034 | $0^{2}$ | ${ }_{\text {a }}^{0}$ |
|  |  |  |  | 0.10351297 | 0.03310331 |  | - | $0^{0.003484878}$ |  |  |  | 0.00080311 |  |  | - |  |  | 0.50505354 | 0.21533853 | 0.000025475 |
| Meter |  | ${ }^{365300,180}$ | 15.023379 | 54,48, 123 | 2,697 | 1,740.038 | 575.482 | 1,550,3,4.4 | 587.75 | 1.035,720 | ${ }^{102,46}$ | 1,776 | 503,4022 | 4238774 | 243, ${ }^{3} 8$ | 4,057,103 | 204.053 | ${ }^{3065}$ | . 0 | - 0 |
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| ${ }_{\text {dist }}^{\text {dist }}$ | Eustowis | i,mosacm | : | : | : | . | : | : | : | . |  | - | . |  | - |  |  |  | . |  |
| Ci5TSL | Total | 1.50creces3 | . | . |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1.6050000 |
|  | production | 250,05 | 23163 | 45883 | 22 231 | 21 | . ${ }^{30}$ | 3,416 | 415 | 168 | 19 | - ${ }^{12}$ | 23 | 46 | ${ }^{13}$ | ${ }^{74}$ | ${ }_{13}$ | ${ }^{22}$ | 0 | 0 |
| cust mat | вulitama |  | - | . |  | : |  | : |  | . |  | : |  | : | . |  |  |  |  |  |
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| castisio | custowen | i.concecos | 0.79392659 | -,719¢cas | 0.c6143991 | 0.50099791 | a.conarss | 0.0038240 |  |  |  | 0.cxcosse9 | 0,0p97275 |  | 0.0008578 |  |  |  |  |  |
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| ${ }_{\text {cigea }}^{\text {cisem }}$ |  | 5. | 4,776,602 | 5 | 150333 | ${ }^{1.932}$ | 333 | ${ }^{17,567}$ | 1.932 | 45 | 4 | ${ }^{47}$ | 1,04 | ${ }^{620}$ | ${ }^{70}$ | 303 | ${ }^{70}$ | ${ }^{235}$ | 0 | 1,203 |
| cuattsos | диеттал | - | - | . | : | : | . | - | : |  |  | : | : | - | : |  |  |  |  |  |
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| custesp | total | 1.ascazasa | 0.156452723 | 0.03558502 | 0.0 .35383314 | a, | a,cicossal | 0.00323817 | 0.c.ascsse4 | :1.000cesza | 0.00000853 |  | 0.00311392 | 0.5011682 | 0.0000828 | 0.c.000 $5 \times 5$ | a,ceranam | 0.000049 |  | 0.60383234 |
|  |  | 42,703 | 370,46 | 25710 | 10.028 | ${ }^{21}$ | - | ${ }^{43}$ | ${ }^{35}$ | - | - | - | ${ }^{9}$ | - | - | . |  |  | ${ }^{\text {¢ }}$ 234 |  |
| cisters | вийтяm |  | : |  | : | : | : |  |  |  | : | : | : | : | : |  |  | : | : |  |
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| custersi | custoum | 1.caresses | 0.13739412 | c.asama | 4.084,48220 | g.asmarass |  | 0.0038383 | amomssas |  |  |  | dinsmas | - | - |  |  |  | доггзвсз |  |
| CUST-43t | rotal | 1.50300353 | 0.883723412 | 0.8533371 | 0.08443825 |  | . |  | 0.crevesas |  |  |  | 0.00083299 |  | . |  |  |  | $0.01553 \times 58$ |  |
| ${ }_{\text {Cugitep }}^{\text {Cutiop }}$ | procuction | 22,73, 162 | ${ }^{17,964733}$ | 950.633 | (,924,435 | 222,621 | ${ }^{103,958}$ | ${ }^{72,105}$ | 375,707 | 42405 | 23,78 | - | 374,093 | 280,116 | ${ }^{181,724}$ | ${ }^{23,244}$ | ${ }^{1568030}$ | . | 122,93 |  |
| Custrite | suktana | - |  | . | . | - |  |  |  |  | : | - |  |  |  |  |  | : | : |  |
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| ${ }_{\text {cust dem }}^{\text {cus }}$ |  | ticheraces |  | (0.0147537 | $0_{0}^{0.0843346}$ | ${ }^{\text {acmancas }}$ | O.manmage | ${ }^{0.03200539}$ | 0.0165239 | ${ }^{\text {o.caribagt }}$ | 0.0018275 | : | 0.0146585 | ${ }^{0.001187850}$ | $0^{\text {a.casgrama }}$ | 0.09328524 | 0.00303854 | - | 0.0 .0548535 |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | ${ }_{0}^{[6,452,6809}$ | .$^{(54,167)}$ | 1,532 | (cis, 0.1 ) | (52,31) | (222323) | ${ }^{268 ; 730}$ | 151773 | [255,324) | 123 | (300, 205] | (39882) | [941,70] | 1,240,5 | !1,255,239 | 3, 3 ena | (30,76) | 190,029 | [2,047 |
| bievec | викттани |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SEMEC | Subiach |  |  |  | - |  |  |  |  |  |  |  |  |  |  |  |  | - | - | . |
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| fuwas |  |  | 0.01459535 | ต.0antuan |  |  |  |  |  |  |  |  |  |  |  |  |  |  | (0.02346022) |  |
| REYYEC | rital | 1.003050020 | 0.01449335 | (0.0.077991) | 0.00833773 | 0.0 .153556 | 0.00345532 | (0.044415354) | [a, | 0.0 | 0.0803185 | 0.0778345 | ${ }^{0.0015050514}$ | 0.14525171 | (0.203080x | 0.72736603 | ${ }_{0}^{0.50824454}$ | 0.0477010 | (0.00246625] | ${ }_{0}^{0.0 .03000123}$ |






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                M,
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline alccartor & Function & Tolas & ค & scs & wiss.sec & wes.ppi & 1205.518 & Las.sec & L.G5.pR4 & L.6s.sub & LGS-TRA & arsec & ар-pa & op.sus & op-rra & cip.fobsuz & Clp-T00.tai & \% 2 & on & 56 \\
\hline \({ }_{34}\) Pctios \(^{\text {a }}\) & Promuction & & - & . & & & & & & . & . & & & & . & . & & & & \\
\hline & Sumatan & & & & & & & & & & & & & & & & & & & \\
\hline & \({ }_{\text {chem }}\) &  &  &  &  & 327,64 & : &  & 1685,975 & & : &  & 5,613,576 & & & : & & \({ }_{\text {che }}^{57,382}\) & \({ }^{1223539}\) & 257.75 \\
\hline &  & & & & & & & & & & & & & & & & & & & \\
\hline & TTIA & 18.593,118 & 123,53,773 & 5.771,484 & 19,27,457 & 327,43 & & 18,21,575 & 1.685 .95 & & - & 237.65 & 5,611.576 & . & : & . & & 94,450 & 209.23 & 137.22 \\
\hline 3.55 crentas imas &  & & & & : & & . & & & & : & & & . & - & : & : & & & \\
\hline & sumtran & & & & & & & & & & & & & & & & & & & \\
\hline & Distre & (12, \(7,772,723\) & \({ }^{7}\) & \({ }^{2}\) & \({ }^{12}\) & 3a, 71 & : &  & 2, \({ }^{2061,1039}\) & & - & \({ }^{162,3131}\) & [0,416, 226 & : & - & : & & \({ }_{\substack{\text { che } \\ 26.434}}\) &  &  \\
\hline &  & & & & & & - & & & & - & & & & & & & & & \\
\hline Totomuss & Toia & 170.64.6.54 & 113,85,7\%8 & 5,28,583 & 88,70,932 & 374,714 & . & 17,00, 263 & 2,004,093 & & - & 235.043 & 6,416,128 & . & . & . & & 33,495 & \({ }^{727.15}\) & \({ }^{122,33}\) \\
\hline Toroheras & dujctav & : & & & & & : & & & & : & & & : & , & : & : & & & \\
\hline Totaties & subtaniv & & & & & & & & & & & & & & & & & & & \\
\hline Tobrters & Dismect & 0.0.607915\% & \(\underbrace{0.812,4723}_{0}\) & 0.0 .9158939 & 0.0 .563745 & 0.58533148 & & \({ }_{\text {a }}^{\text {andes7 }}\) & 0.01113842 & & & \({ }^{\text {a }}\) & 0.0377478 & & : & : & & 0.c.esasse & Q.enve4222 & 0.00015se \\
\hline Tatorles &  & & & & & & & & & & - & & & & & & & & & \\
\hline forchives & Total & 1.000ccoso & 0.003877450 & 0.03102103 & 0.10028455 & \(0.00 \times 233418\) & & 2,10446972 & & & & -100 & & & & & & & & \\
\hline 354 remencend & & & & & & & & & & & & & & & & & & & & \\
\hline  & frocuctos & : & . & & & & & - & - & & - & & & & & - & & & & \\
\hline & suzran & & & & & & & & & & & & & & & & & & & \\
\hline &  & \({ }_{\substack{\text { a }}}^{3.750 .879}\) &  & \({ }_{8}^{98,535}\) & \(\underset{\substack{411,273 \\ 26,49}}{\substack{\text { a }}}\) & \({ }^{12203}\) & & \({ }^{4} 810,7806\) & \({ }^{54,000}\) & & . & \({ }_{\substack{\text { c,43 } \\ 2,43}}\) & 234,72 & : & : & & & 2.198 & 5.314 & \({ }^{354}\) \\
\hline &  & & & & & & & & & & & & & & : & . & & 1,987 & \({ }^{21,513}\) & 3,863 \\
\hline 387 underturalimas & Total & c.077,637 & +1.107,254 & 100,123 & \({ }_{\text {ccecora }}\) & 12.533 & & 620.533 & \({ }^{68.300}\) & & - & & 214.372 & & . & & - & 3278 & \({ }^{782}\) & \\
\hline 387 biamytural Lias & (matubition & : & & & & & : & & & & - & & & - & - & & - & & , & 4,3,4+ \\
\hline & slutran & & & & & & & & & & : & & & & & & & & & \\
\hline & Distic & \({ }^{5}\) & \({ }_{2}^{3.577 .536}\) & \({ }^{144,707} 168\) & \({ }^{1239.159}\) & \({ }^{10,36}\) & : & (235,471 & 105.40 a & : & : & \(\underbrace{}_{\substack{8,355 \\ 4,39}}\) & 327,64 & : & : & : & : & \({ }^{3.352}\) & \({ }_{\substack{8.84 \\ 32055}}\) & , \\
\hline & enarg & & & & & & . & & & & & & & & & & & & & \\
\hline totucumes & Trotic & 2.205,43 & B,42,3, & 20, mas & 1,001,8, & 19,156 & - & ¢53.322 & 105.659 & & . & \({ }_{12,384}\) & 327.58 & & & & & 50.0 & (1020 & 741 \\
\hline thatises & gultian & & : & & & & . & & & & & & & & & & & & & \\
\hline tatuaims & \({ }_{\text {subran }}^{\text {sutrain }}\) & & & & & & & & & & : & & & & & & & & & \\
\hline Toluclies & GSTSEG & 20, & 0.0 & 0.0 & 0.0445653 & acamaza & & \({ }^{1.002033155}\) & 0.01445073 & & : &  & 0.03535339 & & & & - &  & 0.conessis & c.anorass \\
\hline Totucimes & zerbay & & & & & & & & & & & & - & & . & & & & & \\
\hline toucirids & Totat & T, monctaso & 0.62755532 & 0.01515784 & 0.isseroza &  & - & 0.10+63500 &  & & . & -canzras & 0.03559318 & & . & & & 0.00054435 & 0.0045518 & 0.02essiz \\
\hline Acese.ss & prosuctow & - & . & . & & - & - & . & & & - & . & . & - & . & & & . & & \\
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\hline &  & \({ }^{3.7773 .529}\) & \({ }^{2.54,757}\) & 9, 97.031 & \({ }_{\substack{413,33 \\ 267,184}}\) & \({ }^{12,571}\) & &  & 652.2.5 & & : & \({ }_{\text {5.4,4 }}^{\text {2069 }}\) & 235.285 & : & : & & : & 2202 & 58.8 & seg \\
\hline & Esprga & & & & 26a, & & & & & & & & & & & & & & & \\
\hline & & \({ }^{1,7,770,151}\) &  & \({ }_{\substack{\text { a }}}^{23,02058}\) & \({ }_{7}^{73,7,787}\) & \({ }_{\text {a }}^{31,021}\) & \({ }^{1212,23}\) & \({ }^{322525}\) & (12.715 & \({ }_{\substack{212,58 \\ 21729}}\) & \({ }^{3.755}\) & & s.aca & \({ }^{\text {aname }}\) & 4,762 & 20,635 & 4.762 & & 326.388 & \({ }^{123,5939}\) \\
\hline troxexer & Probucten & & & & & & & & & & & & & 23,600 & & & 4,762 & & 354,744 & \% \\
\hline Toroxixp & simatai & & & & & & & & & & & & & & & & & & & \\
\hline Totoxexp & \({ }_{\text {cosem }}^{\text {Oisfer }}\) & 0.48591293 & \(0^{0.32715740}\) & 0.91287435 & Dissunas &  & & 0.c307875 & c.0.0esazs & & & 0.50878057 &  & & - & & . & -.xpors312 & 0.3080517 & \%.0x12776 \\
\hline Toroxexp & emergy & - & 0.23232730 & \(0.0 .123 \times 385\) & & & & 0.002384078 & & & & 0.cexa3233 & & & & & & 0.0 .5804459 & & \(0.0 .805178{ }^{\text {a }}\) \\
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0.09342229 \\
0.00607315
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\end{tabular} & 2.00:56b 20.601085 & 0.00273z235 &  & \({ }^{0.0} 0.00302323\) & 0.canzaza 0.0244332 & 0.50382846
0.06382846 & \({ }^{\text {anssalaz5 }}\) &  0, 9265 c & G0M51225
\(0.005122^{5}\) & \({ }_{\text {a }}^{\text {amacolata }}\) & 0.04105935
0.095659313 & \({ }^{0.01617268}\) \\
\hline Astisp:cis & provuction & & & & & & & & & & & & & & & & & & & \\
\hline & Bulstras & : & : & & & : & & & & & & & & & & & & & & \\
\hline & Distral & 15,5e9.52m & 10,43,457 & & & 51,35a & & & 25, 18 & & & & 857,229 & & & & & & & \\
\hline &  & 9,535, 038 & \({ }^{2} .031 .678\) & \({ }^{377.964}\) & 1.008057 & & & 930,517 & & & & \({ }_{12,382}\) & & - & & & & \({ }_{4}^{1.654}\) &  & 40.47 \\
\hline & custailich & \({ }_{25.577 .5677}^{18093}\) &  & ¢12394 &  & \({ }_{\text {2 }}^{2.5478}\) & \({ }_{24}^{24}\) & \({ }_{2635723}^{2323}\) & \({ }^{673}\) & 1.51 & \({ }_{238}^{238}\) & & & \({ }^{2,147}\) & 358 & \({ }_{1}^{1.465}\) & \({ }^{355}\) & & 8,0,30 & \\
\hline fotmexer & prowuctow & & & & & & & & & & & & & & & & \({ }^{336}\) & \({ }^{13,713}\) & 2020263 & \({ }^{72,382}\) \\
\hline Totmexer & Subthav & & & & & & & & & & & & & & & & & & & \\
\hline Tomaxexp &  & (0.0.1/497.4. & \({ }^{0.47356727}\) & \({ }^{\text {O.atit215 }}\) & \({ }^{0.0871023}\) & 20.20201331 & & 0.0851027 & 9.0.122538 & & & 0.00088573 & 0.03838377 & & & & & acmas5 \({ }^{\text {a }}\) & & 9.manerz \\
\hline toturexp & EMEBEY & & 0.0 .7707357 & Oncises &  & & & 0.038605838 & & & & 0.000847333 & & & & & & 0.60218222 & 0.00335223 & 0.00504853 \\
\hline \({ }_{\text {Tonturexp }}^{\text {Tomer }}\) & custower & \({ }_{\text {a }}^{\text {a }}\) &  & 0.0.34944 &  & \({ }_{\text {a }}\) & 0.0 & -.casazazs & ง..2030333 & \(\operatorname{cosemazaz}^{\text {a }}\) &  &  &  & n.acseasas & araserass & 0.anascasa & 2.0800145 & amamaz & а.caszas & \(0.0 .8 z^{2}\) \\
\hline
\end{tabular}
```



[^4]| दLCOMTOA | नинстоя | TGuiid | ns | cos | Lessec |  | mass．sue | Les．sce | LSS．PR｜ | 4cs－5us | Los－min | ap．sec | QP．pp | ap．sua | ap．ina | cip－ToD－SU3 | ＊ | ：$\times 3$ | $o$ | st |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Acat 50.10 css | probuctios |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Evekitan |  |  |  |  |  |  |  |  | ： |  | － |  | － | － | － |  |  |  |  |
|  |  |  | ： |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | ${ }_{\text {disem }}^{\text {Disec }}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Customer |  |  | ${ }^{6010.485}$ | 203376 | 2.447 |  | 23，47 |  |  |  |  |  |  |  |  |  |  |  |  |
| exp，ciacustact | promuctuat |  |  |  | 283.316 | 2．447 |  | 23，47 | ${ }^{2.621}$ |  | ${ }_{6}{ }^{4}$ | ${ }_{6}$ | 1．419 | 200 | 3 | 429 | 9 | 391 | \％ | ${ }^{1,774}$ |
| ExPOMCUSTACCT | RULTFAN |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Expoitcustact | סЕтре¢ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exp－omgisinicct |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Expopancinfect | claztoren | 1．cisamezan | $\frac{9.3587379}{0.2587875}$ | ${ }^{0.102027273}$ | $0.013 \times 379$ | onden | ${ }_{\text {and }}^{\text {andasas }}$ | a．0．337\％77 | 0.0854848 | a．coursose | a．cocopils | nioxarcs | cicenezs | D．00914210 | 2ramas | amoness2 | 0.000958 | ormastar | 0.0022335 | C．002eras |
| Asa Repulationy |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Revenes | Tota | 1．encraxce | 0.4672337 | 0.0320063 | 0．10：321Ea | 0．0323230 | 0.0127732 | 0．5883707 | 0.01575835 | 0．0xa3353 | 0．031605 | 0.00175393 | 0.0458533 | 0.03768318 | 0.008209163 | 0.16677403 |  | 0.00008472 | 0.01146770 | 0.88251693 |
|  | ${ }^{\text {Premphat }}$ |  | ${ }^{0.1585353935}$ | ${ }^{0.00581835050}$ | ${ }^{0.0 .02855308}$ | 0 |  | ${ }^{0.02780,36}$ |  |  | 0．0．0948035 | （0．0033435 |  | ${ }^{0.01234545}$ | ${ }^{\text {and }}$ | aincesires | $0^{0.01411597}$ | 0．ce0 | D．0．0353893 |  |
|  | ${ }_{\text {cisem }}^{\text {Sustrai }}$ |  | ${ }^{0.053653537}$ | ${ }^{0.0 .011435550}$ |  | a， | $\stackrel{0.0806327}{ }$ |  | － | 0.00858523 |  | － $0.000 \times 37975$ | ${ }^{\text {a }}$ | 0.00428275 |  | 0. |  | ${ }^{\text {coucosaza }}$ | D．consesis | －immilat |
|  |  | 0．13529323 | 0．0．93874338 | 0.000354382 | 0.0 .1479223 |  |  |  |  |  |  | 0.00976519 |  |  |  |  |  | ¢， 0 comosas | 0.103123172 | 0.6002793 |
|  | CuSoma | ${ }^{\text {cosem }}$ |  | ${ }_{\text {a }}^{0}$ | ${ }^{0.0020313565}$ | 0.0 | ${ }^{0.00202015}$ |  | ${ }^{0 . c 5032510}$ | 0.0 | 0.008085 | 0.00030273 | 0． 0.00083832 | 0.00807305 | ${ }^{0.0080307979}$ | 0.00896551 | $\mathrm{D}_{\text {a }}$ | 0.00353016 | 0．0850191 | a，crucazez |
|  | Toial | 1.008030208 | 0.54158889 | ${ }^{\text {c．ozaspaza }}$ | 0．．5877543 | n．．332757 | 0.0 .8503035 | 0.005852537 | －09342823 | 0.0 .0153 | 0.00086315 | 0.05103463 | 0.037504 | ${ }_{0} 0.050515038$ | ${ }^{0.002027873}$ | 0.1285 | ${ }_{0}^{6.017235351}$ | 0 |  | ${ }^{\text {a }}$ |
| Ombeg | Buiktan | ${ }_{0}^{0.3027373937}$ |  |  | ${ }^{0.0 .01723835393}$ | ${ }_{\text {a }}^{0.0}$ | ${ }^{\text {a }}$ | ${ }^{\text {and }}$ | ${ }^{0.0 .2037375}$ | ${ }^{0.00393332}$ | ${ }^{0.00057707}$ | ${ }^{\text {a }}$ | ${ }^{0.007514 \times 5}$ | ${ }^{0.001937453}$ | ${ }^{0.001273193}$ | 0．0．2333734 |  |  |  | 0.0 .5085346 |
| －0MAGEES | Sustrat | ${ }^{0.0 .8673745}$ | ${ }^{0.0127293529}$ | ${ }^{0.001512239}$ | 0.0073321 | 0.082727 | 0.05013385 | 0.00737458 | 0.00135583 | Q．c．0383037 |  | 0.0031279 | 0.0 .04197505 | 0.0 .18017393 |  | ${ }_{0}^{0.05935527070}$ |  | 0 nomastirs | $0.00 \times 8853$ | 0.00003505 |
| OMAEREG | Distise | 2．1140372 | 0.07825193 | 0.0 .8837293 | 0.0178535 |  |  | 0.0143837 |  |  |  | 0.00327242 | 0．1463 |  |  |  |  |  | ${ }^{0.0 .000233373}$ | （0．003372 |
| SP OMABREG | Elizay |  |  | ${ }^{0.000004728}$ | ${ }_{0}^{0.0 .00355378}$ | ${ }^{\text {ajomanatig }}$ |  |  | 0 | ${ }^{0.00831613}$ | ${ }^{0.0 .05033353}$ | ${ }^{0.0 .05023532}$ | ${ }^{\text {and }}$ | 0.0030 | ${ }^{0.003053037}$ | ${ }^{0.0 .05083534}$ | ${ }^{0.00071279}$ | ${ }^{\text {a．cosocose }}$ | $0 . .08003$ |  |
| Expoimazata | Toth | 1．00000830 | 0.40723381 | 0.03220153 | 0.10132158 | 0．2azzazes | 0.0012732 | 0.00337707 | 0.0157333 |  | 0.0011835 | 0．contrsa | 0．006 | 0．037 | ${ }^{\text {a }}$ 0．002023 6163 | a， | ${ }^{\text {a }}$ | ${ }^{\text {a }}$ | ${ }^{0.0 .1215737710}$ |  |
| cots | promuctio |  | － |  |  |  |  |  |  |  |  |  |  |  |  |  | － | － | － |  |
|  |  | － |  | － |  |  |  |  | － |  |  |  |  |  |  |  |  |  |  |  |
|  | Disimal | － |  |  | ． |  |  |  | － |  |  |  | ． | － |  |  |  |  |  |  |
|  | disfec | ． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | CuSTCMEF | 2， $2,54.5959$ | 553 | 316，338 | 93 | 1，14 | 昭 | 19.8 | 1914 | 233 | ${ }^{27}$ | 27 |  |  | 40 | 175 | 40 |  | axar |  |
| Exp odiclugarav | procictioy | 2，530．3．3 | \％ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ExT－Caicussern | Eutram | ： |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exp oix custsenv | distrei | ： |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exporicusters | Energay |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Expoomsusigay | custawer | ${ }^{\text {P }}$ | ${ }_{\text {a }}^{0.63535429}$ | ${ }^{0.1060377354}$ | ${ }_{\text {a }}^{\text {a，}}$ | $0{ }^{0.60033703}$ | 0.0035505 | 0.00344833 | 0.0037773 | 0．0masasa | a．arsaccras | acmamana | 0．cocise ${ }^{\text {a }}$ | 0.0007 | 0.000 | 0.680 | 0.0009353 | a．coso | 0．216061383 |  |
| cosmbrana | production | 20，452 | 59364,75 | 2371038 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Dustraw | ［31，93，3，${ }^{\text {a }}$ | （11，677． |  | ［258， | （7asteg | （21，68） |  |  |  | \％ |  |  |  |  |  |  |  |  |  |
|  | Sivitran |  | （5．84，4549） | ［206， 753 | 11，24．780） | （31．899） | （11．653） | （1，873．5s9） | \％12， 623 | （1tacsas |  | （17330） | （5552253） | （blarar） |  |  |  | （5，5，54） | （11，3， 3 4 |  |
|  | distec |  |  |  | ${ }^{2.654,829}$ | ${ }^{81,131}$ |  |  | 47.023 |  |  | 33.154 | 1．328．44 |  |  |  |  | ${ }^{14,223}$ | 27， 638 | 6，333 |
|  | Energy | ${ }^{18,7323,811}$ | 877casizas | 4.094 .806 |  | 453，722 |  | 16.564 .113 |  |  |  | 233，916 |  |  |  |  |  | 112.518 | \％ | 24， 24.380 |
|  | Total | ${ }^{13}$ |  |  |  | ${ }_{8}^{53,3,3154}$ | ${ }^{178538}$ |  |  |  | 4 | ${ }^{2323}$ |  |  |  | 3 30.745 |  | ${ }^{631}$ | 1，34， 6 | ${ }_{23,373}$ |
|  | production | 0.3919235 | 0.121220353 | 0.107373537 | 0.00377733 | $0.0 \times 3 \times 17470$ | 0.0 .0326353 |  | 0.00553338 |  |  |  | － |  |  |  | ${ }^{12.093135351}$ |  | ${ }_{\text {a }}$ |  |
| Exproms |  | ［10．935580］ | 10.04585737 | （10．09184039） | 10．0739545］ | （1．002025833） |  | 10.03838457 | to．00139155 |  |  | ［accoviexas | （10．00423832） | （2， | （0．000464393 | （10．1531827 | ［0． $12 \times 3837389$ | （axcositi | ［0．00315363 | ［1．00098947） |
| Expeot | Dissips | 0.0753185 | 0.02035419 | ${ }^{0.05138237}$ | $\square$ | ¢． |  | 0．03032037 |  |  |  | S000 | 0 |  |  |  |  | comem | ${ }^{\text {a }}$ | ${ }^{\text {a }}$ |
| Exp－a | Emergy | 20．2535643 | ${ }_{0} 0.208337788$ | ${ }_{0}$ | \％oubiza | 0．0015933 | a．masmas |  | 0.0051539 | 0．．0339857 |  | ${ }^{0.0 .000 a s s a s a z ~}$ |  | 0．0247911 |  | 0.1883 |  | ${ }_{\text {a }}^{\text {a，}}$ | ${ }^{\text {a }}$ | ${ }^{\text {a }}$ |
|  | clumamea |  |  | － |  | 0．0．0295E54 | 0.0 | ${ }_{\text {a }}^{\text {a }}$ | $0.0200 \times 623$ 0.01354522 | 0.600989 $0.00 t 50 \$ 16$ | 6.00001450 6.00120204 | 0 | come | 20．0x11332 |  | comele |  | $\frac{1}{\text { amaxazaz }}$ |  | 隹 |
| Otumbe | probuctio： | 9，182351 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | вu．krad． | ${ }^{344.805}$ | ${ }^{150.423}$ | 6,33 | ${ }^{27,335}$ | esa |  | 22，033 | 4，477 | 2，273 | 483 | ${ }_{3}$ | ${ }_{1}^{134,473}$ | 13，393 | ${ }_{1}^{1,53}$ | ${ }_{6} 6.357$ | ${ }^{302,53}$ | ${ }_{168}^{1.852}$ |  |  |
|  | Disprpi | 4，967，691 | ${ }^{2 \times 2.4 .7 .715}$ | \％2， | 3， 3.268 | ${ }_{16,523}$ |  | ${ }^{11,5858}$ | ${ }_{\text {a }}^{\text {a }}$ |  |  |  |  |  |  |  |  |  |  | ${ }^{20}$ |
|  | питsec | 3．055，239 | 2， 262.115 | ${ }_{127,123}$ | 3335.672 |  |  | 297237 |  |  |  | ${ }_{3}$ | 232,533 |  |  |  |  | ${ }^{2,763}$ | ${ }^{7,789}$ |  |
|  | Cusiour | ${ }_{2}^{1,353,2858}$ | 228，5i7 | ${ }_{25,2730}$ | ${ }^{03,512}$ | ${ }^{2} 2858$ | ${ }^{726}$ | 10，4，32 | ${ }^{17397}$ | ${ }^{3.193}$ | 17.41 | ¢，504 | ${ }^{62,294}$ | ${ }^{50.623}$ | ${ }^{7,478}$ | a， | 59.255 | 700 | 8，25！ | i，530 |
|  | total | 21，297294 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | production | 0.4368292 | 0.20033917 | 0.0 .086073 | 0.834725 | 0．50107407 | 20329330 | 0．0352cs92 | C6502747 |  | W66s92 |  |  |  |  |  |  |  |  |  |
| 隹 | duatraiv | 0.087613019 | 0.0807323 | 0.00638235 | 0.0031182 | ${ }^{\text {a．canamaza }}$ | 9．085atime | 0．00313512 | 0．0832a72 | 0．00310297 | 0.0803293 | 0．0．039667a | $0.083 \times 5935$ | 0.020385875 | 0．c．axz73a | 0．60323579 | 0．cxas4274 | 0．crescraz | 0.0030753 | a．manazam |
|  | Distrat | 0.23323274 | 0.150 | ${ }^{\text {ancossamas }}$ | 0， |  |  |  |  |  |  |  |  | 0.00803845 |  | ${ }^{0.001744039}$ |  |  |  | 20， |
| Ligch | distec | $0^{0.149323932}$ | Qinazas | ${ }^{0.005936333}$ | 0.01591153 |  |  | c．ovascea |  |  |  | a，cresta3t |  |  |  |  |  | 0.000035333 | 0.00137234 | 0.000236824 |
| ALOMCM | CuSicmia | 0，1202041 | 0.0070 ereas |  | ${ }^{\text {a }}$ |  | ${ }_{0}^{0.0 .20303740}$ | ${ }^{\text {a }}$ | ${ }^{\text {and }}$ |  | $0.80 \times 38173$ |  | 0.00291 | ${ }^{\text {a，}}$ | 0.0033514 | 0.0 .1520855 | 0 | 0．c0003323 | 0.000397782 | 0．080072727 |
| ： 1808 |  | 1．05000c30 | 0.57429843 | $0.03386 \square^{5}$ | 0.62358324 | 0.0 .0235475 | 0.005050 e3 | 0．0．333072 | 0.017384 | 0.00033545 | 0.003576042 | 0.000165031 | 0.0558050 | 0．0а11360 | $0_{0.052+13872}$ |  | ${ }_{0}^{0.01781465}$ | 0 | 0．015s3i | ${ }^{0.0 .02027263535}$ |




|  |  |  |  |  |  |  |  |  | ITUCKY POWE WELVE WONTT MafCH 31 | f company CE STUDY 2013 |  |  |  |  |  |  |  |  | Case Na．： 2 Exage Winces： |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| nucatoa | netion | Tasa | RS | 568 | ass．sc | mGs．ppit | \％Gs．sus | ．6s．sec | Las．pri | cassus | L．G3．7RA | 0 pasc | QP．pal | op－sua | Q． Prta $^{\text {a }}$ | CPRTOD－SU3 | CPR－TOQ TBA | w | a | $s$ |
| Revemes |  | 50，102，474 | 204．055919 | 10.336783 | 50，772．65 | 1．604．933 | gaves3 |  | 7．402．8．30 |  |  |  |  |  |  |  |  |  |  |  |
|  | Promiction | $1.08503 \times 300$ | 0.46773371 | 0.0328169 | 3．10152163 | 9．00022239 | 0.0012732 | a．cesatiot | ${ }^{\text {a }}$ | 0 |  | 0.60975858 | ${ }^{23.0654 .407}$ |  | （0．023s314 |  | $20.013,271$ 0.03723823 |  | ${ }_{0}^{7.334545}$ |  |
| AEvSALES | Susprit |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $\underset{\substack{\text { Revgile } \\ \text { HeSSALES }}}{ }$ | clistamir |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | 0.46783931 | 0.0 | E |  | 273： | 1．8539707 | 0.01559831 | 0.0003355 | 0.0011655 | n．an7ssar | 9．actozas | $\stackrel{\square}{0.037893: 18}$ | 0.08208163 | Q．evarasas | innaszas | ORMcsama | 0.014453710 |  |
|  | productios | 115，99， 203 |  | 2187719 | 9，467．6ar |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Buetiran |  |  |  | ${ }^{-2573.608}$ | ${ }_{-12,279}$ | ${ }_{6}^{10,6,24}$ | －2，507，072 | ${ }_{\text {cosem }}$ | ${ }_{-108353}$ | ${ }^{1654,609}$ |  |  | －4，79，001 |  | 2a， 38.704 | 202178 | － 4.4 .4898 | \％ 185888 | 21，3615 |
|  | Dispal | 2， 2,327635 | 5 | ${ }_{\text {cosem }}$ | ${ }^{1}$ | ${ }^{-23,293} 7$ | ${ }^{3.34}$ |  | $-183,385$ | －100，331 | ： | ${ }_{\text {cis }}^{6.5857}$ |  | －67．07） |  | －3， $37 \times 3$ | － | －1， | ${ }_{-1,8,8 \times 3}$ |  |
|  | Energi | ${ }^{\text {a }}$ |  |  | ${ }^{1.10,73,0,083}$ | 474.438 | ${ }_{\text {szaga }}$ |  |  |  |  | 8．220 |  | ${ }^{\circ}$ | a |  | ： | coid |  | ${ }^{5} 5.483$ |
|  |  |  |  | 1，1，25．5．53 | 4.53 .375 | 44730 | ${ }_{4}^{4,532}$ | ${ }^{18,750.285}$ |  |  | ${ }_{\text {3 }}^{315.553}$ | ${ }_{106.6 .644}^{108}$ | ${ }^{10,87,5757}$ | 8，5603317 | 1．945．2．53 | 55， 83.7895 | 8，416，773 | ${ }^{113,635}$ | 1．52，4，49 | 23．659 |
|  | Probuctios | cill | ${ }_{\text {a }}^{\text {a }}$ | Siteme | ${ }^{27,1272727}$ | ${ }_{\text {a }}$ | ${ }^{\text {c5is．32 }}$ | ${ }^{23,4,4.5933}$ | 4 testatis | 1，779，739 | 435，430 | 20，359 | ${ }_{152545076}$ | 11，223．57 |  |  | 10，607．738 |  | 3.1878 .95 | 2．354 |
|  | ©UuTtras |  | （ti．2912373 | （0．00072930） |  | （10．crezas5） | ［0．0．02028 | ${ }^{(0.03313314]}$ | （103512035 | ${ }_{\text {a }}^{\text {a }}$ | $\stackrel{10.00513897}{\square}$ |  | $\begin{gathered} 0.01457803 \\ (0.00407535) \\ (0.001063259 \end{gathered}$ | $\begin{gathered} 0.01353514 \\ (0.00180!54) \\ (0.02214976) \end{gathered}$ | ${ }_{\text {a }}^{\text {a }}$ | 0．c．asamas | 0.00712891$(0.00252633)$ |  |  | a，cossali |
| $\underset{\text { Exp }}{\text { Exp }}$ | bispa | （0．0．9832311］ |  |  |  |  |  |  |  | 䢒 |  |  |  |  | （0．0．6asito） | \％ |  |  |  |  |
| ExPO | EMEFCY | ${ }^{0}$ | ${ }_{\text {a }}^{\text {and }}$ | ${ }_{\text {a }}^{0.0 .01773173175}$ | ${ }^{\text {a }}$ |  |  | 0．0841301 |  |  |  | ${ }^{\text {a }}$ |  |  |  |  |  |  |  |  |
|  | Total |  | ${ }^{0.0,28232535}$ |  | 0． 0.013137585 | 0．0．002tisat | acceans |  | $0.0000 \times 517$ | 0.00303843 | 0 | ${ }_{\text {a }}^{0.000005035}$ |  | ${ }^{0.0232333030}$ | 0.0058 | 0．17109327 | ${ }^{0}$ | ${ }^{0.0030333532}$ | 0.0042335 | 0．cocosasis |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  | total | 200000 | 207203311 | -0.6572383 | 0.032ariez | 9,003 | 0.003 | 0.00 | 0.00 | 0.0093 |  |  |  |  | 0.0038 |  |  | : |  |  |
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## Kentucky Power Company

## REQUEST

Refer to the Direct Testimony of Alex E. Vaughan ("Vaughan Testimony"), pages 5-8. Mr. Vaughan states that the adjusted test year Kentucky retail jurisdictional total is $\$ 56,550,649$, the PJM Rider is to be set at $\$ 0$ the first year, and that Kentucky Power proposes an annual true-up.
a. Explain why the PJM Rider true-up would not be more frequent than monthly.
b. Explain whether Kentucky Power intends to notify the Commission of accounts being added to the rider before making a scheduled true-up filing.
c. State whether any PJM charges or credits are recorded in Kentucky Power's fuel adjustment clause ("FAC"). If yes, identify the charges and credits that were recorded through the FAC during the test year, and state whether these items are included in the PJM charges and credits proposed to be tracked by the PJM Rider.

## RESPONSE

a. PJM's monthly billing is not final until month end.
b. Yes.
c. Yes. Besides LSE PJM marginal loss charges and credits, PJM spot market energy purchases used to serve KPCo's native load requirements is included in KPCo's monthly FAC filings. During the test year the PJM spot market energy purchases, as shown in Column 2 of KPSC 2-46 Attachment 1, were $\$ 363,511$. These PJM spot market energy purchases are exclusive of any capacity or demand charges, or other PJM charges or costs that are included in the Company's proposed PJM Tracker. The energy associated with the PJM net energy costs included in the monthly $F \mathrm{AC}$ is purchased on an economic dispatch basis and recorded in FERC Account 151. Other PJM charges included in the FAC are marginal line losses recorded in accounts 4470207 and 4470208 and listed in Column 3 of KPSC 2-46 Attachment 1. Marginal Line Losses are recovered through the FAC as authorized in KPSC Order dated June 12, 2008 in Case No. 2007-00522.

The PJM charges that are included in the FAC will not be tracked in the PJM rider. Please see lines 13 and 14 of page 5 of Company witness Vaughan's testimony.

WITNESS: Ranie K. Wohnhas

Kentucky Power

## PJM Costs Included in FAC

For the Test Year Ended Mareh 31, 2013

| Month/Year <br> (1) | KPCo Full Requirement Customers' PJM Energy Costs (2) |  | KPCo Marginal Line Loss <br> (3) |  |
| :---: | :---: | :---: | :---: | :---: |
| April 2012 | \$ | 38,536 | \$ | 430,527 |
| May 2012 | \$ | 76,853 | \$ | 480,282 |
| June 2012 | \$ | 53,533 | \$ | 566,266 |
| July 2012 | \$ | 8,253 | \$ | 634,697 |
| August 2012 | \$ | 10,895 | \$ | 736,793 |
| September 2012 | \$ | 10,451 | \$ | 519,769 |
| October 2012 | \$ | 27,452 | \$ | 560,332 |
| November 2012 | \$ | 21,167 | \$ | 719,722 |
| December 2012 | \$ | 15,818 | \$ | 731,116 |
| January 2013 | \$ | 22,997 | \$ | 700,879 |
| February 2013 | \$ | 17,005 | \$ | 585,970 |
| March 2013 | S | 60,551 | \$ | 701,321 |
| Total | S | 363,511 | S | 7,367,674 |

## Kentucky Power Company

## REQUEST

Refer to Exhibit AEV-3 of the Vaughan Testimony. Assuming a base amount of $\$ 0$ and using the format of Exhibit AEV-3, provide in electronic format with formulas intact and cells unprotected a schedule showing how the $\$ 56,550,649$ from Exhibit AEV-2 would be allocated to each of the customer classes.

## RESPONSE

Please see KPSC Staff 2-47 Attachment 1 on the enclosed CD.

## Kentucky Power Company

## REQUEST

Refer to the Direct Testimony of Ranie K. Wohnhas ("Wohnhas Testimony") at pages 89, Section V, Workpaper S-2, page 1 and Schedule 3.
a. Given the cost rate thereof, explain whether Kentucky Power considers accounts receivable financing a short-term source of capital. If Kentucky Power does not consider accounts receivable financing a short-term source of capital, provide a detailed explanation for why it does not.
b. If Kentucky Power considers accounts receivable financing a short-term source of capital, explain whether consideration was given to allocating the coal stock adjustments between short-term debt and accounts receivable financing.
c. On page 8 , at lines 17-19, and page 9, at lines $9-10$, the testimony states that "coal inventory is usually financed with short-term debt." Explain the intent of the word "usually" in this context and why coal inventory is not always financed with shortterm debt.

## RESPONSE

a. Accounts receivable factoring may be considered a source of short term capital as it accelerates the recovery of accounts receivable. However, for the purposes of GAAP (Generally Accepted Accounting Principles), Kentucky Power does not recognize the accounts receivable factoring as short term debt; the Company recognizes the carrying cost expense associated with the factoring program.
b. Coal stock is not a qualifying electric receivable and therefore no allocation consideration was given. Kentucky Power's eligible electric receivables are purchased by AEP Credit then sold to and owned by bank sponsored conduits. This includes estimated unbilled revenues as energy is used by customers.
c. In the context of this sentence the term "usually" means "the general practice" is to use short term debt. Funds spent on coal inventory can not be specifically tracked.

In Case Numbers 8429, 8734, 91-066, 2005-00341 and 2009-00459 KPCo consistently reflected adjustments (increase or decrease) in the value of fuel inventory by making an adjustment to the short term debt value at the end of the test year. The Commission at page eight of its June 18, 1982 Order in Case No. 8429 states "the Commission has reduced Kentucky Power's adjustment [to its short term debt] by $\$ 4,108,704$ to reflect the lower level of inventory and the weighted average price".

WITNESS: Ranie K. Wohnhas

## Kentucky Power Company

## REQUEST

Refer to the Wohnhas Testimony at page 12 and Section V, Workpaper S-4, page 10.
a. The test year storm damage expense, excluding in-house labor, as shown on line 1 of the workpaper is $\$ 7,040,572$. Line 5 of the workpaper shows a deferral amount of $\$ 12,146,000$. Explain whether the deferral referenced on line 8 of the workpaper is for an amount other than $\$ 12,146,000$ and, if it is for another amount, explain how the amount was determined.
b. Explain how the amount on line 8, titled "Test Year Storm Damage Expense Less Deferral" was calculated and provide the actual calculation.

## RESPONSE

$\mathrm{a} / \mathrm{b}$. Line 8 was calculated by taking the total Storm Damage Expense incurred for the calendar year of $2012(\$ 13,779,828)$ less the authorized deferral amount for calendar year 2012 in Case No. 2012-00445 (\$12,146,000).

WITNESS: Ranie K Wohnhas

## Kentucky Power Company

## REQUEST

Refer to the Wohnhas Testimony at page 14 and Workpaper S-4, page 19 .
a. Explain how the amount of the annual net line of credit fee is determined.
b. If Kentucky Power recorded an actual net line of credit fee of $\$ 644,071$ for the 12 months ended March 31, 2013, explain why an adjustment to add the jurisdictional portion of the fee to its cost of service is necessary.
c. Provide the annual net line of credit fees recorded by Kentucky Power for the five most recent calendar years.

## RESPONSE

a. AEP allocates all costs associated with its Corporate Borrowing Program (including the cost of credit facilities required to support AEP's commercial paper program) based on the participant's pro rata share of all borrowers' total borrowing basis. For the test year ended March 31, 2013, Kentucky Power's share of the associated fees were $\$ 644,071$.
b. The net line of credit fee recorded by the Company during the test year is a "below-the-line" expense and therefore the Company showed the net line of credit fee amount as an adjustment to the cost of service.
c. Please see the table below for the annual net line of credit fees recorded by Kentucky Power for the past five calendar years.

## Kentucky Power Company

## REQUEST

Refer to the Wohnhas Testimony at page 14 and Section V, Workpaper S-4, page 20.
a. Provide a summary description of Kentucky Power's efforts to comply with the "Vegetation Management" ("MV") component of the settlement in its last rate case from the time of the final order in that case through the end of the test year.
b. Provide a breakdown, by account, of the expenditures made to fulfill Kentucky Power's responsibilities under the MV component of the aforementioned settlement, by calendar year. Include the partial years of 2010 and 2013.
c. If different from what was included in the 2013 VM plan filed it with the Commission on September 28, 2012, describe Kentucky Power's planned efforts for vegetation management through the end of 2013.
d. Explain whether Kentucky Power is on track to finish the line maintenance over seven years in accordance with the settlement of its last rate case.

## RESPONSE

a. In July 2010, Kentucky Power began ramping up its contractor resources to transition its vegetation management program to a four year cycle. KPCo's plan is to completely re-clear its overhead distribution system beginning with an initial seven year cycle that began in July 2010. Once the initial seven year cycle is complete, the Company will develop and implement a four year cycle for maintaining $100 \%$ of its distribution R/W's in the future years.

During 2010, as KPCo increased its base load contractor workforce (from 218 employees to 335 workers), external crews were also brought in to KPCo's territory to accomplish the increase in work load.

Throughout 2011 and 2012 the base load contractor workforce increased from 335 to 384 workers. KPCo also supplemented this workforce with outside resources to accomplish program goals.

In 2013, a second contractor was awarded part of the maintenance work, and the Company total contractor workforce expanded to 411 employees. Since work began in July 2010, and with the exception of a $\$ 200,000$ shortfall in calendar 2012 (that will be made up in 2013), KPCo has met the budget targets associated with its expanded R/W maintenance program. Copies of the Company's 2010 (six months), 2011, and 2012 reports are shown on Attachment 1 to this response.
b. All of the expenditures are recorded in Account 593.

Second half of 2010
2011
2012
YTD August 2013
\$12,650,212
\$17,245,255
\$17,023,685
\$12,331,212
c. When Kentucky Power filed its Vegetation Management Plan information on April 1, 2013, a revised 2013 VM Plan was also filed which differed slightly from the version filed with the Commission on September 28, 2012. Kentucky Power's planned efforts through the end of 2013 do not differ from the revised plan filed on April 1, 2013.
d. The Company is on track to finish the proposed $R / W$ re-clearing over a seven year period that began July 2010 in accordance with the settlement in Case No. 200900459.

WITNESS: Ranie K. Wohnhas

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421 West Main Street

## RECENED

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Public service COMMISSION

Post Office Dox 634 Franktort，KY 40002－0634 ［502］223－3477 ［502］223－4124 Fax wuw．stites．com
Apuil 1，2011

Jeff R．Deronen
Mark R．Overstreet （502）209－1218 （502）223－4387 FAX

Executive Director
Public Service Commission
211 Sower Boulevard
P．O．Box 615
Frankfort，KY 40602－0615

RRE：Kentucley Power Compaxy＇s 2010 Vegetation Management Report Filed H Conformity With Commission＇s Jume 28， 2010 Order in Case Mo．2009－00459

Dear Mr．Derouen：
Please find enclosed and accept for filing the original and ten copies of Kentucky Power Company＇s 2010 Vegetation Management Report．It is being filed in accordance with the Commission＇s June 28， 2010 Order in Case No．2009－0049 and paragraph 5 of the Settlement Agreement approved by that order．A copy is being served on the Atlomer General．

Please do not hesitate to contact me if you have any questiond．


MRO
cc：Dennis G．Howard II（with enclosure）

# COMMONWEALTH OF KENTUCKY <br> BEFORE THE PUBLIC SERVICE COMMISSION 

RESPONSE OF KENTUCKY POWER COMPANY
IN CONFORMITY WITH PARAGRAPH 5(d)
OF THE UNANIMOUS SETTLEMENT AGREEMENT,
APPENDIX A TO THE COMMUSSION ORDER IN
CASE NO. 2009-00459

DATED JUNE 28, 2010

April 1, 2011

KPSC Case No. 2009-00459
In Conformity With Paragraph 5(d) Of the Unanimous Settlement Agreement

Page 1 of 2
Filed April 1, 2011

In accordance with the Public Service Commission's Order dated June 28, 2010, in Case No. 2009-00459, Kentucky Power makes the following report regarding its distribution vegetation management program for the 2010 calendar year:

## System Performance (SAIFI, CADDI, and SAIDI)

The first set of reliability information includes the Kentucky Power System Average Interuption Frequency Index, the Customer Average Interruption Duration Index, and the System Average Interruption Duration Index for the reporting period, known in the industry as SAIFI, CAIDI, and SADI, respectively. Kentucky Power has included these system performance numbers, excluding tmajor events as defined by IEEE standard 1366 , for the pase five years:

| Calendar <br> Year | SAIF | CADDI | SADI |
| :---: | :---: | :---: | :---: |
| 2006 | 2.756 | 182.2 | 502.1 |
| 2007 | 2.276 | 146.9 | 334.2 |
| 2008 | 2.904 | 170.9 | 496.3 |
| 2009 | 2.556 | 194.5 | 497.1 |
| 2010 | 2.470 | 169.4 | 418.4 |

## 2010 Distribution Vegetation Management (VM) Worls by Circuit

See Attachment 1 for vegetation management work performed on each distribution circuit for 2010. The units reported are miles completed, acres of brush cut, acres of brusli sprayed, trees removed and trees trimmed.

## 2010 Distribution Operation \& Maintenance VM Work by Circuit

See Attachment 1 for the total expenditures for vegetation management work on each distribution circuit in 2010. RWM, AEP's software progran for tracking vegetation work and expenditures, does not separate the $08 M$ and Capital expenditures for the circuits worked during the year. Therefore the costs in Attachment 1 represent the total O\&M and Capital expenditures for each circuit in 2010.

Also, expenditures shown in this atdachment do not include all costs associated with the Vegetation Maintenance Program. Expenses associated with Internal Company Labor \& Eleet, unscheduled hotspot and trouble restoration work, incentive program tor

KPSC Case No. 2009-00459
In Conformity With Paragraph 5(d) Of the Unanimous Settlement Agreement

Page 2 of 2
Filed April 1, 2011
tree contractor employees, materials (herbicides for the Spray Program), contract foresters, tree contractor's field supervision, and contract work planners are not allocated to a circuit.

## 2010 Distuibution Vegetation Management Plan-Additional Information

Kentucky Power's Distribution Vegetation Management Prograna changed midyear from a performance-based maintenance program to a full-circuit maintenance prograun aimed at moving our VM Program to a cycle-based approach. Resource augmentation began eardy in July, with the addition of in-house contract tree crews and oulsource crews, open circuit bids, and longer work-weels. The additional resoures were allocated to full-circuik reclearing projects. These circuits were ranked based upon tree outage performance data.

Maintenance was completed on 1,569 miles of line. Our goal was to achieve 1,694 miles of line; however some circuils required more work than anticipated due to the excessive amount of tree growth in the rights-of-way. The accuracy of estimating reclearing costs is expected to improve as the Company gains more experience with fullcircuit maintenance. The Company carmarked 90 miles of line for the acrial saw; inspections showed that many of these lines had been aerially sawn five to eight years earlier and still extibited good clearance. Thirty-eight miles were actually cut with the aerial saw. 2,134 acres were sprayed, which exceeded the compaxy's goal of 2,002 actes.

The total 2010 OgM expenditures for the VM Program were $\$ 12,650,212$, or $\$ 343,754$ above the Settlement amount of $\$ 12,306,458$ for 2010, as shown below.

| Total VMP O\&M | $\$ 12,650,212$ |
| :--- | ---: |
| Settlement Agreement Paragraph 5(a) | $\$ 7,237,965$ |
| Settement Agreement Paragraph 5(b) | $\$ 5,068,493$ |
| Total Settement Agreement | $\$ 2,306,458$ |
| Amount spené above the agreement | $\$ 343,754$ |

The total Forestry Capital expenditures were $\$ 1,180,685$. The total expenditures for the Vegetation Management Program, including the O\&M and the forestry capital, were $\$ 13,830,897$ for 2010 .

| 2010 Ky Forestry-Cost Bt Jnis by Circuit |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | OQMB Gapital | Miles | Brush Cut | Brusli Spray |  |  |
| Circult | Gitcult Desc | Expenditures | Complete | Acres | Acros | Tree Removal | Tree Trim |
| 2160103 | Sprigs -Sprigu | \$4,738.99 | 0.2 | 1.1 |  | 202 | 4 |
| 2206403 | Soulh Neal - Whitus Creek Road | \$33,851,77 | 5.4 | 1.8 | 10.8 | 268 | 1,000 |
| 3000201 | Bly Sandy - Fallsburg Soull | \$523,409.64 | 13.3 | 22.5 | 42.9 | 4,432 | 7,383 |
| 3000202 | Blg Sandy - Burnaugh North | \$81, 978.39 | 14.6 | 8.2 | 41.6 | 371 | 2, 684 |
| 3000301 | Bellefonte - Westwood | \$839.90 |  |  |  |  | 11 |
| 3000302 | Bellefonte - Hatwoods | \$374.12 |  |  |  |  | 6 |
| 3000303 | Belfefonta - Belletonie | \$530.43 |  |  |  | 1 | 1 |
| 3000601 | Gralin- Distribulion | Q9,050.85 | 1 | 0.0 | 5.4 | 2 | 0 |
| 3000701 | Graysbranch - Grayshranch | \$560,975.62 | 47.1 | 26.2 | 20.8 | 4,864 | 2.846 |
| 3000801 | Haward-Halderman | 22,580,06 |  | 0.7 |  | 15 | $\frac{15}{15}$ |
| 3000602 | Hapward Lawton | \$211,192.90 | 11 | 5.8 | 70.8 | 2,580 | 211 |
| 3000901 | Hlghland-Russell | \$41,766.60 | 1.8 | 4.9 | 1.9 | 2.01 | 112 |
| 3000002 | Highand-Flatwoods | \$40,987,58 | 2.2 | 1.7 |  | 364 | 112 |
| 3000803 | Hightand - Wurtand | \$0,950.89 | 0.8 | 0.2 |  | 0 | 10 |
| 3001001 | Hitchins-Damton Branch | \$41,068.63 | 4.1 | 1.8 | 3.1 | 209 | 99 |
| 3001002 | Hilchins - Willard | \$349,564.39 | 27.9 | 10.6 | 11.0 | 4,783 | 1,067 |
| 3001003 | Hilchins-Grayson | \$82,903.50 | 6.4 | 2.6 | B. 5 | 302 | 521 |
| 3001004 | Hitchins - EK Road | \$1,101.94 | 0.9 | 0.0 | 1.3 | 1 | 4 |
| 3001101 | Hoodscreck - Summill | \$889.67 |  |  |  | 3 | 1 |
| 3001102 | Hoodscreek-Rural | \$1,444.90 | 4.8 | 0.1 |  | 11 | 4 |
| 3001201 | Howard Collin - 13 th St. | \$5,330.09 | 0.2 | 0.0 | 0.0 | 99 | 4 |
| 3001203 | Howard Collns - Foyd St. | \$900.94 |  |  |  | 3 |  |
| 3001401 | Loulsa-Cly | \$6,495,35 | 4.3 | 0.2 | 4.3 | 4 | 6 |
| 3001402 | Loulta - High Bultom | \$18,924.60 | 3.3 | 0.7 | 0.8 | 35 | 112 |
| 3002001 | South Shora - Siloam | \$22,135.81 | 29 | 0.6 |  | 109 | 76 |
| 3002002 | Sputh Shore - Disiribution | \$16,803.20 | 1.2 | 0.8 |  | 37 | 67 |
| 3002101 | 10if Streat-613 St. | 81,281,73 | 0.5 |  |  |  | 1 |
| 3002103 | 10th Street-1217 St. | \$151.38 |  |  |  |  | 4 |
| 3002105 | 1 Dill Street - Midlown | \$09218 |  |  |  |  | 2 |
| 3002107 | 1 Dith Street-West Central | \$1,598.09 |  | 0.1 |  |  | 3 |
| 3003701 | Coalton-US60 W | \$86,791.57 |  |  |  | 105 | 1,650 |
| 3003702 | Coalzon-Cammonsburg | \$52,131.66 | 3.5 | 3.9 | 9.2 | 640 | 148 |
| 3003703 | Coalton - Trace Creek | \$50,637,93 | 5.2 | 4.6 | 3.6 | 860 | 316 |
| 3004301 | Slloam - Dlsinbution | 55,291.33 | 2.3 | 0.4 |  | 14 | 36 |
| 3007903 | Bussoyville-Loulsa | 572,702.00 | 9 | 5.2 | 0.7 | 391 | 2,012 |
| 3007004 | Busseyufle - Torchilight | \$118.494.18 | 15.5 | 3.1 | 67.1 | 818 | 4, 369 |
| 9007805 | Busceyvile - Malle | \$34,359.10 | 4.9 | 4.4 | 0.0 | 642 | 60 |
| 3007906 | Busseyville - Walbndgo | S29,884.85 | 3.2 |  | 21.'I | 95 | 1 |
| 3008001 | 47th Sfreel-491. Street | \$4.631.07 | 0.1 |  |  | 8 | 13 |
| 3008002 | 47th Sfreet - 39 h Street | \$952.30 |  |  |  |  | 32 |
| 3008701 | Cannonsburg - Cannonsburg | \$1,978.47 |  |  |  | 4 | 3 |
| 3008702 | Cannonsburg-Rt. 3 | \$17,102.80 | 1.5 | 0.0 | 0.0 | 42 | 1,204 |
| 3010001 | Russell-Kanvood | \$2,010.96 |  |  |  |  | 4 |
| 3010602 | Ruscell - Eear Run | 334,111.72 | 3.1 | 0.9 | 0.1 | 275 | 110 |
| 3103101 | Olive LHil-Globe | \$439,220,17 | 37.3 | 10.3 | 22.7 | 2,991 | 1,929 |
| 3110001 | Wurtand - Watland | \$1,046,52 |  |  |  |  |  |
| 3110902 | Wutland-Graenup | \$816.90 |  |  |  | 2 |  |
| 3110803 | Wutland-R1. 503 | \$20,830.24 | 1.9 | 0.0 | 0.0 | 32 | 2 |
| 3118101 | Grayson-Lansdowne | \$11,385.70 | 12 | 0.3 | 0.0 | 15 | 32 |
| 3116102 | Grayson-Dixle Park | \$9,206.33 | 23 | 0.2 | 0.0 | 17 | 44 |
| 3116701 | Ealhaven-Diedrich | \$11,811.16 | 1.6 | 0.5 | 0.0 | 93 | 39 |
| 3116702 | Belhaven - Indian Run | \$3,931, 34 | 1.3 | 0.3 | 0.0 | 69 | 26 |
| 316703 | Balhaven-Argllifa | \$163,700.07 | 19.9 | 6.6 | 0.0 | 1.125 | 1,168 |
| 3117601 | Princess - Meade Station | 923,933,20 | 6.6 | 1.2 | 2.3 | 76 | 135 |
| 3117602 | Prlicess-13t. 180 | \$38,461.08 | 3 | 3.1 | 1.6 | 546 | 151 |
| 3150501 | Borderland. Nolan-A | \$52,827.83 | 3.9 | 1.2 | 6.4 | 377 | 40 |
| 3150502 | Bordorlatd-Chataroy | \$6,645,51 | 10.7 | 3.4 | 14.8 |  |  |
| 3200201 | Bartenstro-Freobum | \$7,072.85 | 6.3 |  | 11.9 |  |  |
| 3200202 | Barrensia-Vulcan-A | \$3,958.81 | 7.7 |  | 13.1 |  |  |
| 3200204 | Batrensho-Pounding Mill | \$734.67 | 0.8 |  | 1.1 |  |  |
| 3200301 | Belfy-Belfy | \$4, 140.80 | 0.1 |  |  | 3 | 5 |
| 3200302 | Belfry - Toler | \$16,128.93 | 18.8 | 0.1 | 30.5 | 41 | 1 |
| 3201002 | Tom Watkins - DisfributionA | 9205.75 |  |  |  | 11 |  |
| 3202202 | Lavely - Wolf Creek | 43,425.40 | 4.4 |  | 7.6 | 2 | 6 |
| 3202203 | Lavely - Mt. Sterling | \$4.556.51 | 3.6 |  | 16.1 |  |  |


| 2010 Ky Forestry - Cose d Enits by Cilcult |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Oam 8 Caplal | Rifiea | Brush Cut | Erush Spray |  |  |
| Circuit | Cricult Desc | Expenditures | Complete | Acres | Acres | Tree Femoval | Trea Trim |
| 3300601 | Bluegrass - Walkertown | 5119,461,58 | 22.9 | 11.4 | 28.6 | 2,960 | 420 |
| 3300602 | Bluegrass - Hazard | \$16,473.82 | 0 | 7.1 |  | 511 | 29 |
| 3301101 | Cfavies - Chavles | \$168,828.72 | 14.8 | 23,6 | 43.3 | 3,691 | 607 |
| 3301102 | Chavies - Buckhom | \$2,220,35 |  |  |  | 55 | 6 |
| 3301401 | Combs-Combs | \$362.16 |  |  |  |  | 16 |
| 3301402 | Combs - Airpot Garden | \$330.67 |  |  |  |  | 2 |
| 3301701 | Daisy - Leatherwood | \$192,488,38 | 40 | 2.7 | 59.6 | 2,302 | 659 |
| 3302701 | Hazari - Black Gold | \$364,169.61 | 28.7 | 115.9 | 57.1 | 11,380 | 1,164 |
| 3302702 | Hazard-Lothair | \$653,66 |  |  |  |  |  |
| 3302703 | Hazard-Hazard | \$141,781.50 | 10.6 | 16.2 | 9.7 | 2,277 | 1,090 |
| 3302704 | Hazard-Kenmont | \$11,198.18 | 0.2 |  |  | 114 | 51 |
| 3303901 | Leslle - Hyden | \$177,206.49 | 49 | 8.5 | 02.7 | 3,433 | 351 |
| 3303902 | Leslle - Wooton | \$275,628.10 | 55.8 | 12.4 | 138.8 | 3,469 | 618 |
| 3303903 | Lestie-Hals Fork | \$12,491.51 | 4.7 | 0.7 | 8.3 | 126 | 7 |
| 3307301 | Bulan - Ary-Heiner | 87,320,23 | 6.8 | 0.9 | 10.7 | 100 | 10 |
| 3307302 | Bulan-Ajax-Dwaif | \$37,839,16 | 0.9 | 5.3 |  | 628 | 07 |
| 3308001 | Jackson - South Jackoon | \$1,624,27 |  |  |  | 23 |  |
| 3308002 | Jaricson-Panbowl | $661,711.35$ | 1.8 | 6.8 |  | 874 | 122 |
| 3308401 | Becklam - Hindman | \$189,796.91 | 30.4 | 37.8 | 10.5 | 2,350 | 577 |
| 3308402 | Beckham-Carr Creek | \$70,869.27 | 3.5 | 6.3 | 2.1 | 1,315 | 301 |
| 3308403 | Beckitam-Caney | \$5,146.16 |  | 0.5 |  | 72 | 16 |
| 3308502 | Bonnyman-Hazard | \$48,330.42 | 15.9 | 2.7 | 32.6 | 1.061 | 62 |
| 3308503 | Eonnyman-Biga Creek | \$73,226.57 | 26.6 | 8.2 | 40.3 | 1.954 | 56 |
| 3300601 | Collier-Upper Rnckitouse | \$20,775.39 | 1.3 | 0.9 | 1.3 | 889 | 66 |
| 3308602 | Callier - Lovter Rockhoura | 39,604.37 | 0.2 |  | 0,2 | 60 | 11 |
| 3308603 | Collier-Smoot Creek | \$107,659.19 | 19.3 | 18,4 | 29.7 | 3.758 | B14 |
| 3309001 | Jeff-Vper | 623,850.12 | 21.1 | 0.4 | 35.4 | 97 | 2 |
| 3309002 | Jeffrseff | \$3,643.28 |  | 0.1 |  | 32 | 10 |
| 3309101 | Whitesburg - Whilesturg | \$569.76 | 0.1 |  |  |  | 18 |
| 3309102 | Whitesburg - Hospifal | 396,516,67 | 0.7 |  | 0.5 | 1.126 | 92 |
| 3309103 | Whitesburg - Gowan | 67,803.13 | 1.0 |  | 19.5 |  |  |
| 3309104 | Whttesburn - Crafts Colley | \$201,784,41 | 13.3 | 23.8 | 7.0 | 4.658 | 673 |
| 3309301 | Vicco-Red Fox | \$65,473.21 | 12.1 | 5.1 | 36.1 | 906 | 192 |
| 3309302 | Vicco-jelf | \$46,755,64 | 23.8 | 4.0 | 36.5 | 988 | 43 |
| 3309901 | Slemp-Defoated Cr. | \$111,950,68 | 34.4 | 7.9 | 109.1 | 1,047 | 149 |
| 9309902 | Stemp-Leathenvood | 6104,228,74 | 12.1 | 3.5 | 20.4 | 1,521 | 145 |
| 3309903 | Slemp-Beech Fork | \$793.19 |  |  |  |  |  |
| 3309904 | Stemp-Royat Diamond | \$19,462.47 | 1.7 | 3.5 |  | 683 | 52 |
| 3310501 | Haddix - Quctsand | \$93,282,59 | 47.1 | 7.4 | 65.5 | 451 | 34 |
| 3310602 | Haddlx - Canoe | \$120,476,47 | 60.6 | 100.7 | 53.5 | 76 | 3 |
| 3311101 | Sllnnett-Redbra | - \$376.26 |  |  |  | 1 | 2 |
| 3311102 | Stimett-Beceli Fortc | \$202.23 |  |  |  |  | 1 |
| 3311401 | Reedy - Deane | \$15,543.02 | 0.8 |  | 1.4 | 233 | 31 |
| 3311701 | Shamrock - Shamrock | \$29.701.63 | 1.9 | 8.7 |  | 668 | 27 |
| 3312201 | Engle - GrapevIne 34.5 | \$77,249.75 | 10.5 | 41.0 | 16.7 | 761 | 59 |
| 3312202 | Enple-Industhal Park 34.5 | 32,749.18 |  |  |  | 23 | $\bigcirc$ |
| 3312901 | Jonkins-Kont | \$68,067.77 | 14.1 | 9.7 | 13.1 | 908 | 207 |
| 3312902 | denkins - leurkins | \$3,841.61 | 0.3 |  | 3.3 | 2 |  |
| 3314401 | Mayking-Emine | \$458,647.63 | 27.8 | 43.6 | 2.5 | 5. 833 | 2.535 |
| 3314402 | Mayking - Milstore | \$466,021.67 | 35.9 | 69.6 | 4.6 | 5.430 | 1,637 |
| 3400101 | Allen - Distribution | 8221,830.60 | 21.6 | 33.6 | 5.2 | 5.276 | 586 |
| 3400301 | Betsy Layme - Mud Creek | \$310,645,01 | 30.13 | 22.3 | 42.2 | 3,437 | 740 |
| 3400302 | Betsy Layno - Tram 12 KV | \$12,278.56 | 0.7 |  |  | 26 | 17 |
| 3400303 | Betsy Layne - Harold | 93,196.51 | 0 |  | 5.2 | 7 |  |
| 3400501 | Button-Ligon | \$030.71 | 0 |  |  | 1 |  |
| 3400701 | Drafin - Beloher | \$22,567.44 | 7.5 | 0.7 | 11.3 | 239 | 50 |
| 3400702 | Drafin - Yellow Hil! | \$54,391,29 | 6 | 2.3 | 10.0 | 453 | 96 |
| 3400901 | Elkhom Cily - Cliy | \$1,205,30 |  |  |  | 3 |  |
| 3400902 | Fikhom Cly - Grassy | \$658.62 |  |  |  |  |  |
| 3401001 | Elwood-Dorton | \$ $\$ 3,135,40$ | 0.1 | 1.4 |  | 195 |  |
| 3401002 | Elwood-Virgio | \$1,400,47 | 0.1 |  |  | 1 |  |
| 3401101 | Falcon-Oll Springa | \$13.185.44 | 19.9 |  | 32.6 |  |  |
| 3401103 | Falcon-Buming Fork | \$8,802.10 | 14.1 |  | 22.7 | 7 |  |
| $\frac{3401301}{3401302}$ | Fleming - Noon | \$24,630.18 | 2.8 | 0.9 |  | 175 | 102 |
| 3401302 | Fleming-McRobenfs | 943,604.70 | 15.5 | 42 | 22.5 | 394 | 174 |

KPSC Case No. 2013-00197

| 2010 Ky Forestry - Cost \& Units by Circulí |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | O\&M 8 Caplal | milles | Brusit Cut | Erusfi Spray |  |  |
| Circuit | Circuit Dese | Expenditures | Complefo | Actes | Aeres | Tree Removal | Troe Trim |
| 3401702 | Heny Clay - Redina | 9274,076.60 | 19.8 | 17.2 | 26.3 | 3.156 | 678 |
| 3401703 | Henry Clay - Ashcamp | \$210,113.13 | 4.9 | 12.7 | 0.0 | 3,086 | 406 |
| 3401801 | Index - Distribution | \$824.32 | 0.1 |  |  | 1 |  |
| 3401802 | Index - Hospita] | 4793.86 | 0.1 |  |  | 1 |  |
| 3402001 | Keyser - Mullins | \$8,244.84 | 0.1 |  |  | 72 | 17 |
| 3402002 | Keyser - Stonecoal | 823,631,36 | 3.8 | 1.0 | 9.1 | 636 |  |
| 3402202 | Mokimney - Giluson | \$1,075.00 | 0.1 | 0.2 |  | 39 | 1 |
| 3402501 | Mitide Creek - Disfribullon | \$2.093.75 | 4.5 |  | 3.3 |  |  |
| 9402801 | Painisulle - clly | \$2,346,41 | 1.4 |  | 2.5 |  |  |
| 3402802 | Paintsvilia - Nppa | \$3,373.61 |  |  | 4.2 |  |  |
| 3403001 | Plleville-city | \$23,478,73 | 6.7 |  | 10.2 | 34 | 6 |
| 3403002 | Pikeville - Main Streat | - $81,604,20$ | 1 |  | 1.7 |  |  |
| 3403003 | Pleville-faland Creak | \$4,879.60 | 2.4 | 0.2 | 3.4 | 4 |  |
| 3403201 | Beaver Creek - Ligon | 59,265.06 | 0.2 |  | 14.1 |  |  |
| 3403202 | Beaver Creek - Prico | \$5.703.69 | 0.4 |  | 142 | 1 |  |
| 3403301 | Prestonsbura-City | \$239.02 |  |  |  |  | 1 |
| 3409801 | Second Fork - Distribution | 429,662.12 | 7.5 | 0.0 | 4.6 | 0 | 5,600 |
| 3404301 | Sidney - Blo Creok | \$4.035.77 | 0.4 | 0.1 | 0.7 | 92 | 9 |
| 3404302 | Sidney - Cobum Mnn. | \$609,182.11 | 34 | 38,3 | 11.1 | 10,202 | 2,399 |
| 3407102 | Topmost-Caney | \$897.01 | 1.4 |  | 2.5 |  |  |
| 3107108 | Topinost-Kite | \$28.587.07 | 9 | 1.3 | 12.5 | 295 | 63 |
| 3408101 | Sallsbury - Frinter | \$8,207.01 | 11.1 |  | 16.1 |  |  |
| 3408103 | Salishury - Marim | 33,374.46 | 0.2 |  |  | 7 | 9 |
| 3408303 | Colemaln-Peter Creek | 9131.484.65 | 44.2 | 4.2 | 20.4 | 11229 | 412 |
| 3408401 | Kimper-Long Fork | \$0.813.57 | 0.2 |  |  | 59 |  |
| 3408402 | Kimper-Grapevine | \$2.059.91 | 0.1 |  |  | 20 |  |
| 3409001 | W. Patntsville - Paintsville | \$1,832,80 | 0.4 |  | 0.7 |  | 4 |
| 3409002 | W. Palntsville - Staffordsville | 5377,750.34 | 79 | 72.1 | 81.3 | 6,501 | 1,273 |
| 3409003 | West Paintsville - Plaza | 514,745.95 | 20.7 |  | 34.7 | 75 |  |
| 3409301 | Kenwood - W Van Lear | \$5,469.39 | 0.4 | 0.0 |  | 16 | 31 |
| 3409302 | Kenwood - Auxier | \$1,240.58 | 2.2 |  | 3.8 |  |  |
| 3409303 | Kamwood-Hagerhil! | \$8,363.53 | 7.2 |  | 11.9 | 10 | 22 |
| 3409401 | Feds Greek - Feds Creek | 3912.736 .38 | 38.8 | 59.1 | 24.2 | 11,861 | 1.344 |
| 3409402 | Feds Greek - Llok Creek | \$302,463,82 | 17 | 40.7 | 24.3 | 5,210 | 693 |
| 3408502 | Burdine-Levisa Slone | \$13,744.00 |  | 1.0 |  | 237 | 4 |
| 3400503 | Burdine-Jenichs | \$6,569.96 | 6.5 | 0.0 | 10.9 | 0 | 0 |
| 3410502 | So. Plkeville-Istand Creek | 523,954.57 | 2.5 | 0.7 | 3.3 | 611 | 1 |
| 3411401 | Dewey - trez-A | \% $363,164.26$ | 55.1 | 16.2 | 79.3 | 2,899 | 470 |
| 3411804 | Jolms Creek-Meta | 5169,241.91 | 10.1 | 4.6 | 12.4 | 2,201 | 243 |
| 3411002 | Joms Creek-Raccoon | 531,080.61 | 9 | 0.9 | 17.0 | 226 | 48 |
| 3411001 | Fords Branch - Sheiby | \$123,317.94 | 6 | 35.2 | 0.0 | 957 | 395 |
| 3411802 | Fords Branch - Robinson Ck | 3669,338.13 | 30.9 | 33.7 | 33.7 | 10.224 | 1,303 |
| 3412901 | Weaksbury - Distribution | \$830.33 |  |  |  |  | 20 |
| 3413402 | Garrott - Lackey | \$1,015.54 |  |  |  |  |  |
| 3417601 | New Comp-Souln Slde | \$3,698.60 | 5.6 |  | 11.0 |  |  |
| 3417602 | New Camp-Arh-W Wmsn. | \$1,224.92 | 1.7 |  | 2.7 |  |  |
| 3420002 | Softshell-Leburn | \$3,039.68 | 0.5 | 0.9 |  | 111 |  |
| 3451202 | Beefflde - Dunfam | \$14.329.11 | 3.1 | 2.6 | 3,3 | 253 | 83 |
| 3974101 | BigRock - Conaway | \$17,849.87 | 0.90 | 2.0 |  | 105 | 40 |
| 070603 | Hutey - Race Fork | \$2,699.75 |  |  |  |  |  |
|  | O\&M R Caplla Tolals | \$12,638,037 | 1,569.10 | 1181.4 | 2,134.1 | 166,318 | 60,702 |
|  | Misc. VM exp natrecorded by circut | 81,294060 |  |  |  |  |  |
|  |  | \$13,830,897 |  |  |  |  |  |
|  | Lesstotal Forestry Caplat | \$1180685 |  |  |  |  |  |
|  | Total VMP O8M | \$12660212 |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  | Settement Agreemont Paragraph 5(a) | \$7,237,965 |  |  |  |  |  |
|  | Sctlement Agremment Paragraph 5 (b) | 55,060,493 |  |  |  |  |  |
|  | Total Settement Agrement | \$12,306,458 |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  | Amotne spent ahovo the agreenment | \$343,754 |  |  |  |  |  |

## STITES:HARRBISON <br> ATTOANEYS

221 West Main Sireet Pose Office Box ban Frankort, KY 40802-0634 [502] 223-3477 [502] 223-4124 Fax wenfs.stites.com
March 30, 2012

## HAND DRLIVERED

Jeff R. Derouen
Executive Director
Public Service Commission
211 Sower Boulevard
P.O. Box 615

Frankfort, KY 40602-0615

## RECENED

MAR 802012
PUELIC SERVIGE

RE: Case No. 2009-00459
Dear Mr. Derouen:
Enclosed please find the original and ten copies of Kenucky Power Company's 2011
Reliability Report. It is being filed in conformity with paragraph 5 (d) the Commission's June 28, 2010 Order in Case No. 200-00459.

Please do not hesitate to contact me if you have any questions.
Very truly yours,


MRO
cc: Demis G. Howard II (with enclosure)
Michael L. Kurz (with enclosure)

## COMMONWEALTH OF RENTUCKY

## BEFORE THE PUBLIC SERVICE COMMSSION

## RECENED

mAR 302012
PUBLIC SERVICE COMMISSION

# RESPONSE OF KENTUCKY POWER COMPANY <br> <br> IN CONFORMITY WITH PARAGRAPH 5(d) <br> <br> IN CONFORMITY WITH PARAGRAPH 5(d) <br> OF THE UNANIMOUS SETTLEMIENT AGREEMENT, <br> APPENDIX A TO THE COMMISSION ORDER RN 

CASE NO. 2009-004.59
DATED JUNE 28, 2010

In accordance with the Publio Service Commission's Order dated June 28, 2010, in Case No. 2009-00459, Kentucky Power makes the following report regarding its distribution vegetation management program for the 2011 calendar year;

## System Performance (SAIFI, CAIDI, and SAIDI)

The first set of reliability information includes the Kentucky Power System Average Interuption Frequency Index, the Customer Average Interruption Duration Index, and the System Average Interruption Duration Index for the reporting period, known in the industy as SAIFI, CAIDI, and SAIDI, respectively. Kentucky Power has included these system performance numbers, excluding major events as defined by IEEE standard 1366 , for the past five years:

| Calendar <br> Year | SAFI | CADI | SADI |
| :---: | :---: | :---: | :---: |
| 2007 | 2.276 | 146.9 | 334.2 |
| 2008 | 2.904 | 170.9 | 496.3 |
| 2009 | 2.556 | 194.5 | 497.1 |
| 2010 | 2.470 | 169.4 | 418.4 |
| 2011 | 3.085 | 195.4 | 602.8 |

The increase in SAIDI for 2011 is largely attributed to the extraordinary weather experienced during the year. This is evidenced by the fact that 2011 was a record year for precipitation in eastern Kentucky as we experienced a record level of 62.46 inches (NWS at Irmington, WV) or $48 \%$ above the average annal precipitation of 43.1 inches.

Since there was plenty of moisture to support tree growth, we did experience an increase of ontages and SAIDI for "Vegetation Inside R/W" outage cause. With the additional rain saturating the gromd, we also experienced a large increase in trees uprooting and falling into the line as well as trees sliding down the momntain into the line.

In addition, miny weather has an influence on the failed equipment outages. Cutout failures are the biggest contributor to failed equipment. Tt has been demonstrated that most defective cutouts will cause outages after rain has clampened the pole and hardware.

## 2011 Distribution Vegetation Management (VM) Work by Circuit

See Aitachment 1 for vegetation management work performed on each distribution circuit for 2011. The units reported are miles completed, actes of brush cut, acres of brush sprayed, trees removed and trees trimmed.

## 2011 Distribution Operation \& Maintenance VM Work by Circuit

See Attachment 1 for the total expenditures for vegetation management work on each distribution circuit in 2011. RWM, AEP's software program for tracking vegetation work and expenditures, does not separate the O8M and Capital expenditures for the circuits worked duming the year. Therefore the costs in Attachnent 1 represent the total O\&M and Capital expenditures for each circuit in 2011.

Also, expendifures shown in this attachment do not inchde all costs associated with the Vegetation Maintenance Program. Expenses associated with Intemal Company Labor \& Fleet, unscheduled hotspot and trouble restoration work, incentive program for tree contractor employees, materials (herbicides for the Spray Program), contract foresters, tree contractor's field supervision, and contract work planners are not allocated to a circuit.

## 2011 Distribution Vegetation Management Plan-Additional Information

Kentucky Power's Distribution Vegetation Management Program changed midyear 2010 from a perfomance-based maintenance program to a full-circuit maintenauce program aimed at moving our VM Program to a cycle-based approach. The transition to a cycle-based program is estimated to take 7 years.

Maintenance was completed on 1,871 miles of line while our goal was to achieve maintenance on 2,295 miles of line. This goal was not achieved due to underestimating the amount of work required to re-clear some circuits which had not been maintained for a number of years. 2,064 acres were sprayed, which exceeded the company's goal of 2,006 acres.

The total 2011 O\&M expenditures for the VM Program were $\$ 17,245,255$, or $\$ 7,290$ above the Settement amual amount of $\$ 17,237,965$, as shown below.

| Total VMP O\&M | \$ | $17,245,265$ |
| :--- | ---: | ---: |
|  |  |  |
| Settlement Agreement Paragraph 5(a) | $\$$ | $7,237,965$ |
| Settlement Agreement Paragraph 5(b) | $\$$ | $10,000,000$ |
| Total Settement Agreement | $\$$ | $17,237,965$ |
| Amoune spene above the agreement | $\$$ | 7,290 |



## 2011 KY POWER FORESTRY SUMMARY

| Circulter | circullome | Total cost <br> toman | Total - |  |  |  |  | Eribich Mare |  | $\sqrt{4}$ ate thempate | Trating |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2750725 | Sprtge-maieman |  |  | 1 | 9.8 | 0.0 |  |  |  |  |  |  |
| 3200209 | Earrunsto - Freceum | 52435 |  |  |  |  |  |  |  |  |  | Feedier Bratier fetbatigs tiverrad |
| 3200262 | Raranisho - Vilear-1 |  |  |  |  | b.f | 0.40 |  | 17.7 | 4 |  | Eround spray application. |
|  |  |  | 4 | 49 | 32.9 | B | 32.518 | 32.69 | 0.00 | 8.005 | 1.841 | Fuil Circuit Raciar. To be completad ln 2042 |
| ${ }^{3200204}$ | Earrenshe -Pauminty yilil | S5.725 |  |  | 1.3 | 0.0 | 0.30 | 0.30 |  | 58 | 35 | Ground spray applization. |
| 2200302 | Batry-Toier | 32.510 |  |  |  | 0.9 |  |  | 0.70 | 13 |  | CuallysoriSardice Work |
| 32011002 | Tom Watdris- Distribution-A | 51.711 |  |  | 0.1 | 0.0 | 0.18 | 0.00 | 0.00 | 2 | 0 | Quality-0.FServico Wark |
| 3202201 | Lovely -Lowiy-A | 516764 |  |  | 29 | 0.0 | 289 | 0.60 | 0.00 | 133 | 23 | qualliv-of-Servier Work |
| 3202202 | Lovely - Woll Track | S5,009 |  |  | 0.4 | 0.9 | 0.40 | 0.30 |  | 63 | 7 | Gualley-ot-Serilat Work |
| 3300509 | Eluegrass - Warkertawn | ¢89, 630 | 23 | 4 | 3.0 | 4.3 | $\underline{6} 9$ | 8.55 | 0.03 | 1.132 | 810 | Znd Reciaserzone-compleien |
| 3300602 | Sllugress - Hizard | 55,8a7 |  |  |  | 0.0 |  | 0.27 | 0.02 | 144 | 42 |  |
| 330109 | Chavies-Chavles | 57, 256 |  |  |  | 27 | 270 | 220 | 2.49 | 55 | 6 | Grounde spray application. |
| 3351401 | Corith - Cambs | Sub, 522 | 9 | 9 | 8.3 | 9.12 | \$1.10 | 12.43 | 5.17 | 2.138 | 443 | Fail Craul Recioar - Conpleten |
| 3301402 | Combs-Atroutigaridin | S564,652 | 41 | 41 | 41.0 | 2.8 | 43,00 | E5.73 |  | 9.278 | 7.685 | FFufichruli Reclear - COMPLETED |
| 3308701 | Daizy-Lrasiteryacd | 32,057 |  |  |  | 0.0 |  |  |  |  |  |  |
| 3322761 | Hzarct-Bleck Eold | 375319 | 4 | 3 | 2.5 | 35.6 | 41.36 | 11.05 | 75.64 | 7.524 | 265 |  |
| 3302743 | Hazard-Lotalat | S594 |  |  |  | 0.0 |  |  | 0.05 |  |  |  |
| 3382703 | Hazard - Hatand | 514, 248 |  |  |  | 120 | 82.00 | 0.09 | 30.76 | 12 |  | Ground spray zppiliastion |
| 2392704 | Hzzat- Kanmont | 59,751 |  |  |  | 0.0 |  |  | 0.19 | 53 | 6 | Qualty-0.r.Sentice Werk |
| 3303901 | Lashle - Hyden | 510.589 |  |  |  | 0.5 | 0.60 |  |  | 273 |  | Cround Spray appiiction. |
| 3303902 | Lestia- - Waaton | \$11,063 |  | 4 | 0.3 | 0.0 | 0.30 | 0.75 |  | 191 | 31 | Cuatliy-br.Serica Work |
| 3303563 | Lesflo - Hats Fork | st4,454] |  |  | 0.9 | 0.2 | 0.50 | 0.16 |  | 3.328 | 102 |  |
| 3307304 | Eutan - Arystifiner | 36,426 |  |  |  | 0.5 | 0.69 | 0.01 | 0.74 | 55 | 5 | Graurd spray applatiton. |
| 3307202 | Eulan - Alam-Drant | S5,755] |  |  |  | 8.1 | 1.10 | 0.05 | 5.19 | 75 | 2 | Ground spray appication. |
| 3307333 | Bulaz LLals Crapli | 52.280 |  |  |  | 0.0 | 0.00 | 0.00 | 1.02 | 0 | 0 | Quality-reservice Wiors |
| 3300609 | Jackrson-South Jackson | S5,248 |  |  | 0.4 | 0.0 | 0.42 | 0.74 |  | 65 | 89 | Qualitoor.Struce Work |
| 3354491 | Eecibam - Hindman | \$939,032 | 53 | 75 | 55.0 | 3.7 | 58.70 | 18122 | ¢.B6 | 14,868 | 3.453 | Fufl Eirulif Raclear. Ta be completed in 2042 |
| 3308422 | Beethrara - Carr Creat | 545,445 |  |  | 5.3 | 8.0 | 5.30 | 4.77 |  | 1.485 | 412 |  |
| 33005023 | Eomyman-tazard | s47, 346 |  |  |  | 2.5 | 2.50 | 1.35 | 7.85 | 83 | 20 | Ioroumd spray appliation. |
| 3308543 | Boanyman Elg Creak | 525,787 |  |  |  | 3.3 | 3.30 | 0.74 | 0.33 | 79 | 23 | Graund sproy application. |
| 33005509 | Collier-L Lpper Rocthouse | S2198 |  |  |  | 0.3 | 0.30 | 0.23 | 0.65 | 37 | 8 | graund spray application. |
| 3308502 | Collier-LTwer Recthouse | 5501,4631 | 70 | 70 | 24.8 | 0.6 | 24.80 | 101.14 | 16.33 | 7.631 | 1.832 |  |
| 330853 | Collior-Smart Cradk | 33,192 |  |  |  | 0.1 | 0.10 |  | 1.05 | 11 | 2 | Graundi gray application. |
| 3365809 | Jeft-Viper | 5113.545 |  | 7 | 7.0 | 0.4 | 7,40 | 19.32 | 0.07 | 3,700 | 474 | Tree work ta addrts ralichlity 13sues on Maca's Ci- CCOMPLEEED |
| 3309902 | Jeff-Jef | S1,739 |  |  |  | 0. 18 |  |  |  | 5 |  | aublitu-b-Servie worit |
| 2309104 | Whitesturg-Whtanburg | 510.43 |  |  |  | 0.0 |  |  | 1.12 | 5 |  | Qually-ct-Servie Woric |
| 3309102 | Whilesburg-Haspital | ¢52 |  |  |  | 0.0 |  |  | 0.02 |  |  | Guilty-or-Senvice Woris |
| 3309103 | Whitestuty-Caman | 54,2371 |  |  |  | 1.4 | 1.40 | 0.120 | 2.3 ? | 10 | $\checkmark$ | Bround spray gpplication. |
| 3309164 | Whitegbutg-crats colley | S445,241 | 27 | 15 | 15.0 | 0.0 | 15.70 | 62.01 | 0.33 | 5.724 | 2.085 | Full Circuit Raclear-COMPEETED |
| 3308387 | Vitzo- Rad fax | 594,717 |  |  |  | 0.7 | 0.70 | 235 |  | 485 | 103 | Ground spray application. |
| 3303362 | Vicco- - jef | Sx, 240 |  |  | 23 | 0.0 | 2.0 | 717 |  | 78 | E5 |  |
| 3309390 | Slemp - Defarted Cr. | 5752 |  |  |  | 0.0 |  |  |  |  |  |  |
| 3309502 | Stemp Leathennood | S2,575 |  |  |  | 0.0 |  |  |  | 5 | 15 | laualit-of.sprice biorit |
| 3310509 | Hasdix - Quichisand | 5105,165 |  |  |  | 97.2 | 34.20 | 0.77 | 95202 | 147 | 15 | Griound spray application. |
| 3310502 | Haddix- Cance | 541,746 |  |  |  | 0.0 |  | 026 |  | 45 | 12 | Tusalty ari-Service Work |
| 3314101 | Stinnet-mpitima | St, 5772,314 | 115 | 118 | 100.6 | 0.1 | 105.10 | 2555.82 | 25.93 | 32.726 | 7.511 |  |
| 3391702 | 5 Stineetr - Ebecth Fork | 5190, 287] | 10 | 49 | 10.6 | 8.0 | 40.00 | 27.72 |  | 5.654 | 773 | Fuil Cicalk Recleet-COMpleted |
| 3311103 | Stinmat-Mendover 36 KV | 53.204 |  |  | 0.1 | 0.0 | 0.10 |  |  | 4 | 28 | Quatitwor-Service Worl |
| 3374481 | Reedy - Deasie | 5435,6991 | 58 | 11 | 16.0 | 4.5 | 20.50 | 41.59 | 1.85 | 5.332 | 1.267 | Fiul circuil Reciegr: Ta ba complaedin 2012 |
| 3317701 | Shamrock - Shamrock | S2, 380$]$ |  |  |  | 0,3 | 0.30 | 1.20 |  | 187 | 15 | IGround mpray application. |

2011 KY PONER FORESTRY SUMMARY

| chturty | crauthame |  | Staty\| | $\begin{gathered} \text { minices } \\ \text { Panded } \end{gathered}$ |  | $\begin{gathered} \text { complited } \\ \mathrm{S}_{\mathrm{SPRAY}} \end{gathered}$ | Complated <br> 施OTAL | Bushicut | $\begin{gathered} \text { Brus } \\ \text { sprist } \end{gathered}$ | Rmbogis | Trentims |  <br>  +591-4 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 3312201 | Engle -industrat Park 30.5 | 5631 |  |  |  | 0.0 |  |  |  |  |  |  |
| 3312202 | Engla - Grapevine 34.5 | 525,087 |  |  |  | 6.1 | 8.10 | 3.45 | 1247 | 2.5 | 12 | Ground spray application. |
| 3312307 | Jendiss-Koma | 533,842 |  |  | 0.2 | 0.0 | 0.81 | 3.51 |  | 139 | 92 | Began Fullctralk Reclare. To be complited in 2012. |
| 3574497 | iayking -Eritio | S59,124 |  |  |  | 25,9 | 25.90 | 8.55 | 51.72 | 23. | 113 | Grount spray application. |
| 33744812 | Maykify - milisione | 5375,30] | 47 | 3 | 2.2 | 3.2 | 11.20 | 34.37 | 1.53 | 3.895 | 1,213 | FFull Cricul Reflear-COMPLETED. Exgan in 2010 |
| 3400109 | Ailen- - isistinution | 572417 | 27 | 5 | 5.0 | 9.2 | 14.29 | 3,, 4 | 37.50 | 803 | 204 | Full Circuil Reciear - Completen. Exqan in 2010. |
| 3468339 | Eatsy Layne-Mua Creak | 5220,153 |  | 3 | 5.9 | 0.0 | E.90 | 5.77 | 0.63 | 2.640 | 589 | Trier Graak conversion project. Tran work Comeleteo |
| 3460202 | Bxty Layno-Ttam 12 kV | 511.367 |  |  |  | B | 0.73 |  | 14.77 | 14 | 7 | Grount spray zpplicetion. |
| 3600303 | getsy Layne-Marolu | 5429,337 |  | 3 | 3.1 | 0.3 | 9.46 | 2.29 | 0.54 | 961 | 238 | Penhook cgaversion project. Tris work Completeo |
| 34600504 | Eurian-Ligon | 5236 |  |  |  | 0.0 |  |  |  |  | 1 | Quality ors Semice |
| 5469722 | Drathm-Yellow hal | 5346.6513 | 12 | 6 | 8.8 | 6.9 | 14.00 | 14.85 | 0.00 | 3.930 | 297 | Eull Craut Reciear-Completep |
| 39060901 | Eminom City - Cily | 50.774 |  |  |  | 0.2 | 0.20 |  | 0.32 | 6 |  | Grouns spray eqplication. |
| 3400502 | Elkhorn City - Grassy | 592,939 |  | 2 | 2.2 | 0.0 | 220 | 33.12 | 0.90 | 1,759 | 䨐 | \|Fagdar Erazar Zone reclaar - COMFLETED |
| 3401009 | Elimodi- Datan | 5229,370 | 44 | 44 | 4.0 | 0.0 | 44.00 | 55.21 | 0.70 | 459 | 2.378 | Elo JOE. Full Circut Reclaar -COMPEETED |
| 3611002 | Ewact-Virgic | S325,799 | 59 | 65 | 68.9 | 0.0 | 65.00 | 79231 | 0.00 | 8.138 | 3.229 |  |
| 3401401 | Faticon - Oill Springs | 5971 |  |  |  | 0.0 |  | 0.35 |  | 41 | 5 | Qually coi-Service Work |
| 3491102 | Fazcon - Salyersilile | 54.13] |  |  | 0.1 | 0.0 | 0.40 |  |  | 13 | 3 | Cually -ot-Serverework |
| 3467399 | Flaming-Keon | 52.664 |  |  |  | 0.0 |  |  |  | 8 | 12 | Luazity-feservice Wors |
| 34097702 | Heary Ciny - Regina | 359.557] |  |  |  | 26.5 | 25.50 | 1.20 | 44.21 | 531 | ${ }^{86}$ | Emoundspray applicalion. |
| 3467703 | Hency Clizy - Rencamp | 528,135 |  |  |  | 3.2 | 13.30 |  | 18.95 | 3 |  | Garount spray application. |
| 3409809 | Inden-Distribution | 5913 |  |  |  | 0.9 |  |  |  | 20 |  | Lauality-af.Strvice Work |
| 3447802 | budes-Hospital | S985 |  |  | 0.1 | 0.0 | 0.10 |  |  | 2 | 3 | Qualityerf Sarylea Whork |
| 3402009 | Kcystr + Muillin | 53, 595 |  |  |  | 8.3 | 0.39 | 0.14 | 0.40 | 60 | 1 | Ground spray anpllication. |
| 3462632 | Kicyser-Stanecoal | 520,7601 |  |  |  | 21 | 210 | 0.11 | 5.30 | 100 | 2 | Graund spray mpplication. |
| 3402202 | mckimey - Gibsan | \$4,297 |  |  |  | 1.3 | 1.30 |  | 1.99 | 13 | $i$ | Ground spray zpplicalion, |
| 3402204 | [fickingey - Maytovic | 57,753 |  |  |  | 1.7 | 9.70 | 1.58 | 12.83 |  |  | Graund spray zagitation. |
| 2402802 | Pairisulico-kippan | 51,749 |  |  |  | 0.0 |  |  |  | 7 |  | Qually-ors Saruce Wort |
| 3403007 | Plikevills - City | 5785 |  |  |  | 0.0 |  |  |  |  | 2 | Cuasily -orserelce Woris |
| 3403003 | Pikeville - Cedar Cratik | 521.761 |  |  | 0.5 | 0.0 | 0.50 | 0.00 |  | 174 | 30 | Quallyeof-Struicn Woris |
| 3403201 | Ecaver Creek-Ligon | 52,710 |  |  |  | 0.0 |  | 0.00 |  | 0 | 0 |  |
| 3483307 | Frestonstury - City | 5455 |  |  |  | 0.3 |  |  |  |  | 2 | Quatilu-b-Sarvice worl |
| 3463741 | Russoil Foric - Litle Enaver | S450,206 |  |  | 4.8 | 0.0 | 208 | 2.98 | 5.01 | 1.542 | 201 |  |
| 3403391 | Socond Fork- -Dictribution | 527,545 |  | 1 | 1.0 | 1.1 | 2.18 | 5.19 |  | 716 | 1 | Feedar Eraaker Zona -tree work Completen |
| $346430 \%$ | Sitinay - Elg Craek | 52,04.2 |  |  |  | 0.0 |  |  |  | 7 |  | Cually |
| 3404362 | Sithey - Cobuirn pitn. | S220,469 | -49 | 15 | 15.0 | 28.5 | 44.50 | 17.20 | ${ }^{86} 2.3$ | 2,862 | 489 | Fuil Cirauit ratlarr-COMPLETED, Began in 2010. |
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## 2011 KY POHER FORESTRY SUMMARY



## STTTES\&HARBISONnue <br> ATTORNEYS

## REC

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April 1, 2013
Mark R. Overstrect
(502) 209-1219
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Jetf R, Derouen
moverstreetwsites.com
Executive Director
Public Service Commission
211 Sower Boulevard
P.O. Box 615

Frankfort, KY 40602-0615

## RE: Kentucky Power Company's 2012 Vegetation Management Reporé Tiled In Contormity With Commission's June 28, 2010 Order in Case No. 2009-00459

Dear Mr. Derouen:
Please find enclosed and accept for filing the original and ten copies of Kentucky Power Company's 2012 Vegetation Management Report. It is being filed in accordance with the Commission's June 28, 2010 Order in Case No. 2009-0049 and paragraph 5 of the Settement Agreement approved by that erder. A copy is being served on the Attomey General.

Please do not hesitate to contact me if you have ant questions.


MRO
ce: Dennis G. Howard II (with enclosure)

## COMMONWEALTH OP KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSTON

## RESPONSE OF KENTUCKY POWER COMPANY

IN CONFORMITY WITH PARAGRAPI 5(d)
OR THE UNANMMOUS SETTLEMENT AGREEMENT, APPENDIX A TO THE COMMISSION ORDER IN

CASE NO. 2009-00459
DATED JUNE 28, 2010

KPSC Case No. 2009-00459
In Conformity With Paragraph 5(d) Of the Unanimous Settlement Agreement

Page 2 of 4
Filed April 1, 2013

In accordance with the Public Service Commission's Order dated June 28, 2010, in Case No. 2009-00459, Kentucky Power makes the following report regarding its distribution vegetation management program for the 2012 calendar year:

## System Performance (SAIFI, CAIDI, and SAIDI)

The first set of reliability information includes the Kentucky Power System Average Interruption Frequency Index, the Customer Average Interruption Duration Index, and the System Average Intermption Duration Index for the reporting period, known in the industry aS SAIFI, CAIDI, and SAIDI, respectively. Kentucky Power has included these system performance numbers, excluding major events as defined by IEEE standard 1366 , for the past five years:

| Calendar <br> Year | SAFI | CADDI | SADI |
| :---: | :---: | :---: | :---: |
| 2008 | 2.904 | 170.9 | 496.3 |
| 2009 | 2.556 | 194.5 | 497.1 |
| 2010 | 2.470 | 169.4 | 418.4 |
| 2011 | 3.085 | 195.4 | 602.8 |
| 2012 | 2.417 | 189.5 | 458.0 |

## 2012 Distribution Vegetation Management (VM) Work by Circuit

See Attachment 1 for vegetation management work performed on each distribution circtit for 2012 . The units reported are miles completed CUT, Miles Completed SPRAY, Miles Completed TOTAL, acres of brush cut, acres of brush sprayed, trees removed and trees trimmed.

## 2012 Distribution Operation \& Maintenance VM Work by Circuit

See Attachment 1 for the total expenditures for vegetation management work on each distribution circuit in 2012. RWM, AEP's software program for tracking vegetation work and expenditures, does not separate the O\&M and Capital expenditures for the circuits worked during the year. Therefore the costs in Attachment 1 represent the total OsM and Capital expenditures for each circuit in 2012.

## 2012 Distribution Vegetation Manapement Plan - Additional Information

Kentucky Power's 2010 Distribution Vegetation Management Program changed mid-year 2010 from a performance-based maintenance program to a full-circuit maintenance program aimed at moving our VM Program to a cycle-based approach. The transition to a cycle-based program is estimated to take 7 years.

In 2012, maintenance was completed on 2,054 miles of line while our goal was to achieve maintenance on 1,999 miles of line.

The total 2012 O\&M expenditures for the VM Program were $\$ 17,023,685$, or $\$ 214,280$ below the Settlement annual amount of $\$ 17,237,965$, as shown below.

| Total VMP O\&M | $\$$ | $17,023,685$ |
| :--- | ---: | ---: |
| Settement Agreement Paragraph 5(a) | $\$$ | $7,237,965$ |
| Settlement Agreement Paragraph 5(b) | $\$$ | $10,000,000$ |
| Total Seltement Agreement. | $17,237,965$ |  |
| Amount spent below the agreement. | $\$$ | 214,280 |

Although the Company over expended in 2010 and 2011 by $\$ 343,712$ and $\$ 7,290$ respectively, Kentacky Power plans to increase expenditures in 2013 by the under expenditure in 2012 of $\$ 214,280$ to a O\&M Expense target of $\$ 17,452,245$ for its Vegetation Management Program.

KPSC Case No. 2009-00459
In Conformity With Paragraph 5(d)
Of the Unanimous Settlement Agreement
Page 4 of 4
Filed April 1, 2013

## Summary of the 2012 Kentucky Power Distribution Vegetation Management Program


#### Abstract

Kentucky Power's 2012 Distribution Vegetation Management (VM) Progran continued the migration from a performance-based asset management maintenarce program to a full-circuit cycle-based maintenance program. Approximately thirty percent of our distribution system has been recleared since July of 2010. We still estimate that the reclearing of ow distribution system will be completed in about seven years (July 2017). The number of miles recleared per year will increase as we work through the most overgrown, densely vegetated circuits.

Service restoration work associated with five major storms hampered KY Power's vegetation maintenance efforts in 2012. In addition, the projected cost of reclearing some circuits was underestimated. The increased costs were primarily due to the larger than anticipated amount of tree growth encroaching into the primary, and to the amount of slash cleanup. The program identified 1,157 miles for reclearing, and 895 miles ( $77 \%$ ) were recleared. Most of the planned worle that was unfinished in 2012 will be scheduled for completion in 2013. Finally, some planned work was deferred because of shifts in prionities caused by changes in circuit reliability perfornance.


The program also plamed for 2,440 acres to be sprayed and 2,264 (93\%) were accomplished.

Total O\&M expenditures for the VM program were $\$ 17,023,685$ or $98.76 \%$ of the $\mathrm{O} \& \mathrm{M}$ budget target. Forestry capital expenditures were $\$ 2,336,549$ bringing the total expenditures for the VM Program to $\$ 19,360,234$. The Company has added the 2012 O\&M shortfall to the 2013 O\&M budget. Costs that were not allocated to a circuit include; Intemal Labor \& Fleet, unscheduled hotspot maintenance, trouble restoration work, tree ticket investigation, contract foresters, tree contractor's field supervision, incentive program for tree contractor's employees, and materials (herbicides for the Spray program).

2012 KENTUCKY POWER FORESTRY CIRCUT HISTORY



2012 KENTUCKY POWER FORESTRY CIRCUIT HISTORY


2012 KENTUCKY POWER FORESTRY CIRCUIT HISTORY


## Kentucky Power Company

## REQUEST

Refer to pages 24-26 of the Wohnhas Testimony wherein he discusses the proposed Purchased Power Adjustment ("PPA").
a. Explain why the PPA would be needed after the termination of the Pool Agreement but is not currently needed with the Pool Agreement in place.
b. State whether a similar PPA has been approved for an American Electric Power ("AEP") company operating in another jurisdiction. If yes, provide the name of the company and the jurisdiction.
c. Explain, in instances in which Kentucky Power currently purchases power, whether specific percentages are considered fuel cost and non-fuel cost. If yes, provide the percentages.
d. Provide the percentage and amount of Kentucky Power's current purchased power costs that were recovered through its FAC during the test year.
e. If the majority of Kentucky Power's purchased power costs are currently recovered through its FAC, explain why a PPA is necessary.
f. Page 26 indicates that a contract management fee of 8.08 percent would be included in the PPA. Explain the reason for this fee and indicate to whom it would be paid.
g. Provide a sample scenario and workpapers showing how the PPA is intended to work. The response should reflect the exclusion of costs recovered through the FAC and how each of items 1-3 shown on pages 25-26 are calculated.

## RESPONSE

a. As detailed on page 25, lines 12-16 of Wohnhas' Testimony, with the Pool Agreement, the Company had ready access to capacity from other members of the AEP-East Pool. When the Pool Agreement terminates at the end of 2013 the Company will no longer have that ready access to capacity from the AEP-East Pool. As a result, the Company may be required to obtain capacity from the market to meet its PJM capacity requirements.
b. The Oklahoma Corporation Commission has approved a tariff for the Public Service Company of Oklahoma (PSO) to allow for the recovery of non-fuel purchased power.
c. For third party purchases, $100 \%$ of the purchase is considered fuel cost. For purchases through the AEP East System Pool, fuel is not calculated on a percentage basis but is based on actual costs.
d. Please see KPSC 2-52 Attachment 1 of this response.
e. Purchases from third party entities on a day-to-day basis as needed would continue to be recovered through the FAC as we do currently. The PPA is being requested to provide concurrent recovery of (1) non-fuel costs related to specific new purchase power agreements that could stand in place of the Pool, and (2) costs of fuel related to substitute generation less the cost of fuel which would have been used in plants suffering forced generation or transmission outages. Neither of these costs are recoverable through the FAC. These two components are set out in the P.P.A. tariff under the RATE section parts 2 a . and 2 b .
f. The $8.08 \%$ is the weighted average cost of capital as shown in Section V, Workpaper S-2, Page 1 of 3 , column 6, line 5 . This would be applied to the PPA(m) cost as shown on Tariff P.P.A. and be recovered from the ratepayers. The fee would be paid to Kentucky Power. If the Company is to take the risk of imputed debt on its balance sheet as part entering into a PPA, then the Company should also have the ability to earn a return for this risk.
g. Please see KPSC 2-52 Attachment 2 of this response.

WITNESS: Ranie K Wohnhas

Kentucky Power Company Internal Load Purchased Power Costs

Test Year Ended March 31, 2013

| Month | Year | Third Party Purchases* |  | AEP East System Pool Purchases* |  | Purchased Power <br> Costs Recovered |  | AEP East System Other |  |  | Total Charges $(5)+(6)$ | Percentage of Total Purchases Recovered through the FAC (5) / (7) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| (1) | (2) |  | (3) |  | (4) |  | (5) |  | (6) |  | (7) | (8) |
| April | 2012 | \$ | 133,605.96 | \$ | 574,287.82 | \$ | 707,893.78 | \$ | 92,251.88 | \$ | 800,145.66 | 88.47\% |
| May | 2012 | \$ | 184,833.84 | \$ | 5,976,560.40 | \$ | 6,161,394.24 | \$ | 978,872.50 | \$ | 7,140,266.74 | 86.29\% |
| June | 2012 | \$ | 94,259.31 | \$ | 1,214,898.00 | \$ | 1,309,157.31 | \$ | 141,308.00 | \$ | 1,450,465.31 | 90.26\% |
| July | 2012 | \$ | 10,706.43 | \$ | 1,031,482.73 | \$ | 1,042,189.16 | \$ | 96,477.81 | \$ | 1,138,666.97 | 91.53\% |
| August | 2012 | \$ | 12,432.57 | \$ | 2,190,652.16 | \$ | 2,203,084.73 | \$ | 237,709.63 | \$ | 2,440,794.36 | 90.26\% |
| September | 2012 | \$ | 26,133.12 | \$ | 6,447,991.97 | \$ | 6,474,125.09 | \$ | 761,918.89 | \$ | 7,236,043.98 | 89.47\% |
| October | 2012 | \$ | 40,602.29 | \$ | 7,644,582.12 | \$ | 7,685,184.41 |  | 1,073,362.71 | \$ | 8,758,547.12 | 87.74\% |
| November | 2012 | \$ | 30,089.04 | \$ | 7,375,439.43 | \$ | 7,405,528.47 |  | 1,165,487.80 | \$ | 8,571,016.27 | 86.40\% |
| December | 2012 | \$ | 16,862.91 | \$ | 7,801,548.42 | \$ | 7,818,411.33 |  | 1,520,464.78 | \$ | 9,338,876.11 | 83.72\% |
| January | 2013 | \$ | 47,708.26 | \$ | 5,534,224.63 | \$ | 5,581,932.89 | \$ | 650,240.99 | \$ | 6,232,173.88 | 89.57\% |
| February | 2013 | \$ | 46,088.82 | \$ | 4,598,873.43 | \$ | 4,644,962.25 | \$ | 611,701.49 | \$ | 5,256,663.74 | 88.36\% |
| March | 2013 | \$ | 60,906.07 | \$ | 2,952,868.61 | \$ | 3,013,774.68 | \$ | 386,164.54 | \$ | 3,399,939.22 | 88.64\% |
| Total |  | \$ | 704,228.62 | \$ | 53,343,409.72 | \$ | 54,047,638.34 |  | 7,715,961.02 | \$ | 61,763,599.36 | 87.51\% |

*Allocated to internal load and Recovered through FAC
**Fuel handling and $O$ \& $M$, not recovered through FAC

## Kentucky Power Company

Analysis using Proposed PPA Tariff

Scenario - New Wind 100 MW PPA and Mitchell has forced generation outages.

| PPA(m) |  | Total Cost |  | Recovered <br> Thru FAC |  | Recovered Thru PPA |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Rate per MWh | \$ | 70 | \$ | - | \$ | 70 |
| MWh's Generated |  | 21,900 |  | - |  | 21,900 |
| Total Cost |  | 1,533,000 | \$ | - | \$ | 1,533,000 |
| Substitute Generation-RP(m) |  |  |  |  |  |  |
| Rate per MWh | \$ | 35 | \$ | 32 | \$ | 3 |
| MWh's Substituted |  | 5,000 |  | 5,000 |  | 5,000 |
| Total Cost | \$ | 175,000 | \$ | 160,000 | \$ | 15,000 |
| Contract Management Fee - CM $(\mathrm{m})$ |  |  |  |  |  |  |
| WACC |  |  |  |  |  | 8.08\% |
| Total Fee |  |  |  |  | \$ | 123,866 |
| Kentucky Retail to be Recovered - $\mathrm{P}(\mathrm{m})=\mathrm{PPA}(\mathrm{m})+\mathrm{RP}(\mathrm{m})+\mathrm{CM}(\mathrm{m})$ |  |  |  |  | \$ | 1,671,866 |
| Kentucky Monthly Retail Revenue - ( $\mathrm{R}(\mathrm{m}$ ) |  |  |  |  | \$ | 42,000,000 |
| Monthly Purchase Power Adjustment Factor - P(m)/R(m) |  |  |  |  |  | 3.9806\% |

## Kentucky Power Company

## REQUEST

Refer to the Wohnhas Testimony at pages 26-29 regarding emission allowances under the the Cross-State Air Pollution Rule ("CSAPR").
a. Provide the dates on which Kentucky Power purchased CSAPR SO2 Allowances and the number of allowances in each purchase.
b. Explain why five years was selected as the period over which to amortize the cost of these allowances.
c. Given that the U.S. Supreme Court will review the decision to vacate CSAPR, explain why Kentucky Power has made what appears to be a final determination that there will be no consumption of CSAPR allowances and that it should begin to writeoff and recover the costs of its CSAPR allowances in conjunction with this rate case.

## RESPONSE

a. KPCo purchased 1,000 (2012 vintage) CSAPR SO2 allowances for $\$ 350,000$ on December 14, 2011.
b. The five year amortization period allows the Company to recover the cost of the allowances in a reasonable amount of time while mitigating the rate impact to the customer. This amortization period is consistent with that approved by the Commission for storm damage recovery in KPSC Case No. 2009-00459.
c. KPCo has not made a final determination that there will be no consumption of CSAPR allowances, nor is KPCo "writing off" the cost of the CSAPR allowances held.

KPCo is seeking recovery of the prudently-incurred cost of these allowances because there is currently no consumption of the allowances in the Company's forecasts. If granted recovery of the costs associated with these allowances, the Company will decrease the book value of the allowances held by the amount approved for recovery ( $20 \%$ per year for five years per the Company's request). The costs recovered will decrease the book value of the allowances that are held, such that if the CSAPR is reinstated the allowances will be consumed at whatever cost, if any, remains on the Company's books at the time of consumption.

WITNESS: Ranie K Wohnhas

## Kentucky Power Company

## REQUEST

Refer to the Wohnhas Testimony at pages 29-30 concerning the proposed deferral and amortization of Big Sandy plant depreciation and production O\&M expense.

Explain how five years was selected as the amortization period as compared to a shorter or longer length of time.

## RESPONSE

The five year amortization period allows the Company to recover the Big Sandy plant depreciation and production $O \& M$ expenses in a reasonable amount of time while mitigating the rate impact to the customer. This amortization period is consistent with that approved by the Commission for storm damage recovery in KPSC Case No. 200900459.

WITNESS: Ranie K Wohnhas

KPSC Case No. 2013-00197
Commission Staff's Second Set of Data Requests
Dated August 26, 2013
Item No. 55
Page 1 of 1

## Kentucky Power Company

## REQUEST

Refer to the Wohnhas Testimony at pages 30-31 and Section V, Workpaper S-4, page 26.
a. Identify the specific time period and/or calendar years in which the costs of preliminary engineering and development related to an integrated gasification combined cycle ("IGCC") facility were incurred by Kentucky Power.
b. The testimony states that feasibility of the IGCC facility depended on certain legislation being enacted that would support recovery of the facility's costs through rates; however, such legislation was not enacted. Explain why costs incurred prior to, or without, such legislations being enacted should be considered to have been "prudently incurred."

## RESPONSE

a. The costs were incurred by Kentucky Power Company between November 2005 through 2008 totaling $\$ 1,182,935$. In 2011, based on an internal audit, an additional $\$ 64,856$ was allocated to Kentucky Power Company. In 2013, there was an additional reclassification of $\$ 88,020$ to Kentucky Power Company based on a Public Utility Commission of Ohio audit. Both audits found cost charged directly to Ohio Power Company that should have been shared among the various sites that were under consideration for IGCC construction.
b. The IGCC project-related costs for which the Company is seeking to be recovered were allocated to Kentucky Power by AEPSC as Kentucky Power's proportionate share of engineering and development costs incurred by AEPSC in connection with AEPSC's assessment of IGCC technology that was being considered for deployment in at least three jurisdictions, including Kentucky. The Company believed that the prospects for enactment of the necessary legislation by the Kentucky General Assembly were sufficiently good at the time the investigation was undertaken that its participation in the joint project was both reasonable and prudent.

WITNESS: Ranie K. Wohnhas

## Kentucky Power Company

## REQUEST

Refer to the Wohnhas Testimony at pages 31-32 and Section V, Workpaper S-4, page 28.
a. Identify the specific time period and/or calendar years in which the costs of preliminary site design and engineering work related to the Carrs Site were incurred by Kentucky Power.
b. Provide the date on which Kentucky Power decided not to pursue construction of new generation at the Carrs Site and provide documentation of both the decision and date of the decision.

## RESPONSE

a. The Company's current records only show specific costs by month and year back to 2002. There has been no preliminary site design and engineering work back to 2002. The Company's best estimate is that the majority of these costs were incurred prior to 1980.
b. The last time the Carrs site was considered as a generation site was in 2006 for the possible construction of an IGCC facility. Please see the Company's response to KIUC $1-17$ (d) and (e) and KPSC 2-55(b). The Company has no specific documentation of any decision not to proceed with the IGCC facility.

WITNESS: Ranie K Wohnhas

## Kentucky Power Company

## REQUEST

Refer to the Wohnhas Testimony at page 32 and Section V, Workpaper S-4, page 33. Provide a breakdown of the $\$ 28,113,304$ in costs related to Kentucky Power's evaluation of potential flue gas desulfurization ("FGD") systems at its Big Sandy Station which shows the amount incurred by year since 2004 separated by whether it related to a wet or dry FGD system, and, the amount of cost incurred for work done by (a) Kentucky Power, (b) an outside firm or consultant, or (c) a Kentucky Power affiliate.

## RESPONSE

Please see KPSC 2-57 Attachment 1, being provided by the Company on the enclosed CD. This spreadsheet provides the detail of the $\$ 28,113,304$ separated by Dry FGD/Wet $\mathrm{FGD} /$ Landfill, the year of the expense, and the cost component. Outside services include cost components $210,214,260,262,266,285$ and 290 . The service corporation cost component is 780 . Other cost components are listed on the attachment including labor which has not been separated between Kentucky Power and affiliate labor, if any.

WITNESS: Ranie K Wohnhas

## Kentucky Power Company

## REQUEST

Refer to Section III, Exhibit K, pages 10 to 39 and pages 41 to 67 . Explain why the amounts listed for Environmental Surcharge under the column "Revised Revenue" on pages 10 through 39 do not match the amounts listed for Environmental Surcharge under the column "Current Revenue" on pages 41 through 67. [For example, page 10 shows an environmental surcharge of $(\$ 3,689,358)$ while page 41 shows the surcharge as $(\$ 6,665,283)]$.

## RESPONSE

Section III, Exhibit K, pages 10-39 refer to the per books revenue, and do not include an environmental surcharge adjustment for the elimination of the Pool Agreement. Section III, Exhibit K pages 41-67 include the environmental surcharge for the elimination of the Pool Agreement. This additional adjustment of $\$ 7,320,077$ to eliminate environmental costs associated with the pool is shown in Section V, Workpaper S-4, page 62 and is supported by Witness Munsey. This adjustment was allocated to the various classes in the Class Cost-of-Service study and further allocated to the individual tariffs based on the respective per books environmental surcharge.

WITNESS: Douglas R Buck

KPSC Case No. 2013-00197
Commission Staff's Second Set of Data Requests Dated August 26, 2013

Item No. 59
Page 1 of 1

## Kentucky Power Company

## REQUEST

Refer to Section III, Exhibit K, page 41. Confirm that the reason there are Environmental Surcharge costs of $(\$ 6,665,283)$ under the Current Revenue column and no Envirommental Surcharge costs under the Proposed Revenue column is that Kentucky Power is proposing to roll environmental costs into base rates. If this cannot be confirmed, explain the reason for the difference.

RESPONSE
Confirmed.

WITNESS: Douglas R Buck

## Kentucky Power Company

## REQUEST

Refer to Section III, Exhibit K, pages 41 through 65, Current Billing Units columns. Explain why the numbers on the Customer Charge row are often different from the numbers on the Number of Customers row. (For example, page 41 shows 1,677,419 current billing units for Customer Charge, and $1,686,852$ for Number of Customers.)

## RESPONSE

Number of Customers is, as the name implies, the number of customers served by the tariff(s) identified in the page heading. When a new customer begins to take service, regardless of when in the billing cycle that occurs, the customer counts as a single customer. If that customer begins taking service at a date other than the beginning of the billing cycle, that customer will not pay a full customer charge but instead will pay a prorated customer charge based on the number of days service was taken; therefore, the numbers of the two columns are different.

WITNESS: Jason M Stegall

## Kentucky Power Company

## REQUEST

Refer to Section III, Exhibit K, Page 46. Explain why current billing units of 10.92 in the Customer Charge row is not a whole number.

## RESPONSE

Billing units not displayed in whole units include proration for those customers who did not take service at the beginning of a billing cycle.

WITNESS: Jason M Stegall

# Commission Staff's Second Set of Data Requests 

 Dated August 26, 2013Item No. 62
Page 1 of 1

## Kentucky Power Company

## REQUEST

Refer to Section III, Exhibit K, Page 66. Explain why Proposed Billing Units are not whole numbers.

## RESPONSE

These billing units include prorated units for those customers that do not begin service on the first day of the billing cycle.

WITNESS: Jason M Stegall

## Kentucky Power Company

## REQUEST

Refer to Section V, Schedule 1 of the application. Confirm that that the increase in O\&M expenses of $\$ 471,159$ on line 4 of the "Proposed Change" column represents the projected increase in uncollectible accounts expense and the KPSC maintenance fee related to the $\$ 117,789,745$ revenue increase on line 1 of that column.

## RESPONSE

The Company confirms that the $\$ 471,159$ represents the increase in uncollectible accounts expense and the KPSC maintenance fee related to the $\$ 117,789,745$ revenue increase.

WITNESS: Ranie K Wohnhas

## Kentucky Power Company

## REQUEST

Provide the following exhibits in Excel spreadsheet format with the formulas intact and cells unprotected and with all rows and columns accessible:
a. Munsey Testimony - Exhibit LPM - 3 and LPM-5
b. Stegall Testimony - Exhibits JMS-1, JMS-2, and JMS-3
c. Wolnnhas Testimony - Table RWK-1 (page 22)
d. Section III, Exhibit K
e. Section V

## RESPONSE

The requested exhibits can be found electronically on the attached CD as:
a. KPSC 2-64 Attachment 1
b. KPSC 2-64 Attachments 2a, 2b, 2c (requires Excel option "iterations" to be on)
c. KPSC 2-64 Attachment 3
d. KPSC 2-64 Attachment 4
e. KPSC 2-64 Attachment 5

WITNESS: Lila P. Munsey / Jason M. Stegall / Ranie K. Wohnhas


[^0]:    
    
    
    

[^1]:     botacen large company stucks and hag-term gutcmment
    
    
    
    
    

[^2]:    WITNESS: Jason M Stegall

[^3]:    ${ }^{\prime}$ Case No. 2009-00459, Application of Kentucky Power Company for a General Adjustment of Electric Rates (Ky. PSC June 28, 2010)

[^4]:    

