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7. LOAD FORECASTS

Kentucky Utilities

7.(1) Specification of Historical and Forecasted Information Requirements by Class

The data submissions in the following subsections conform to the specifications provided in Section 7.(1) to the fullest extent possible.

7.(2) Specification of Historical Information Requirements

The data submissions in the following subsections conform to the specifications provided in Section 7.(2) to the fullest extent possible.

7.(2)(a) KU Average Number of Customers by Class, 2000-2004

	2000	2001	2002	2003	2004
Residential Heating (FERS)	150,837	155,883	161,258	166,578	172,465[1]
Residential Non-Heating (RS)	228,778	227,921	226,942	225,355	224,485[1]
	---------	---------	---------	---------	---------
Total Residential	379,615	383,804	388,200	391,933	396,950
Commercial	75,633	77,598	79,897	81,193	82,931
Industrial	1,870	1,859	1,852	1,815	1,768
Utility Use & Other*	3,337	3,206	3,186	3,167	3,179
Virginia Retail	29,329	29,521	29,562	29,629	29,811
Req. Sales for Resale	13	13	13	13	13
Total Customers	489,797	496,001	502,710	507,750	514,652

* Includes Lighting

[1] FERS/RS split differs from presentation in FERC Form 1

7.(2)(b) KU Recorded and Weather-Normalized Annual Energy Sales (GWh) & Energy Requirements (GWh)

	2000	2001	2002	2003	2004
SYSTEM BILLED SALES:					
Recorded	18,612	18,618	19,488	19,463	20,074
Weather Normalized	18,735	18,639	19,114	19,694	20,458
SYSTEM USED SALES:					
Recorded	18,818	18,478	19,558	19,496	20,178
Weather Normalized	18,939	18,500	19,186	19,803	20,534
ENERGY REQUIREMENTS:					
Recorded	20,056	19,710	20,751	20,654	21,317
Weather Normalized	20,178	19,733	20,379	20,961	21,673
SALES BY CLASS (recorded):					
Residential Heating (FERS)	2,722	2,729	2,964	2,978	3,058
Residential Non-Heating (RS)	2,581	2,537	2,799	2,594	2,682
	--------	--------	--------	--------	--------
TOTAL RESIDENTIAL	5,303	5,266	5,763	5,572	5,740
Commercial	4,726	4,751	4,952	5,004	5,156
Industrial	5,983	5,648	5,933	6,027	6,312
Utility Use and Other*	83	83	82	84	85
	--------	--------	--------	--------	--------
KENTUCKY Retail	16,095	15,748	16,730	16,687	17,293
Requirement Sales for Resale	1,843	1,842	1,926	1,903	1,959
	--------	--------	--------	--------	--------
TOTAL KENTUCKY	17,938	17,590	18,656	18,590	19,252
VIRGINIA Retail	880	888	902	906	926
TOTAL KU SALES	18,818	18,478	19,558	19,496	20,178
SYSTEM LOSSES	1,238	1,232	1,193	1,158	1,138
ENERGY REQUIRMENTS	20,056	19,710	20,751	20,654	21,317

* Includes Lighting

7.(2)(c) KU Recorded and Weather-Normalized Peak Demands (MW)

	2000	2001	2002	2003	2004
SUMMER					
Recorded	3,775	3,699	3,899	3,810	3,744
Weather- Normalized	3.772	3,714	3,870	3,836	3,800
	99/00	**00/01**	**01/02**	**02/03**	**03/04**
WINTER					
Recorded	3,665	3,748	3,491	3,944	3,768
Weather- Normalized	3,975	3,886	3,660	3,930	3,771

7.(2)(d) KU Energy Sales and Peak Demand For Firm, Contractual Commitment Customers

	2000	2001	2002	2003	2004
Energy Sales (GWh)	16,690	16,395	17,213	17,016	17,420
Coincident Peak Demand (MW)	3,775	3,644	3,844	3,810	3,744

7.(2)(e) KU Energy Sales and Peak Demand for Interruptible Customers

	2000	2001	2002	2003	2004
Energy Sales (GWh)*	1,248	1,195	1,443	1,574	1,832
Coincident Peak Demand (MW)**	N/A	55	55	0	0

* The figures shown for energy sales are the total annual energy sales to the curtailable customers. Curtailable energy is not recorded separately. Foregone sales due to curtailments are presumed to be small.

** This is the actual load served for customers under an interruptible service rider.

7.(2)(f) KU Annual Energy Losses (GWh)

	2000	2001	2002	2003	2004
Annual Energy Loss	1,238	1,232	1,193	1,158	1,138
Loss Percent of Energy Requirements	6.2%	6.2%	5.8%	5.6%	5.3%

7.(2)(g) Impact of Existing Demand Side Programs

Impacts of the existing demand-side programs on energy and demand requirements are estimated in Table 8.(3)(e)(3).

7.(2)(h) Other Data Illustrating Historical Changes in Load and Load Characteristics

Actual sales and customer data as reported in tables 7.(2)(a-f) above are calculated using the Company's FERC Form 1 filings as the basis for class segmentation. These numbers are not weather normalized. KU's energy forecasting process is predicated primarily on rate code and Standard Industrial Classification ("SIC") Code criteria, and is based on sales as billed rather than sales as used (before any unbilled adjustment).

Historical actual calendar (not weather normalized) average energy use-per-customer by class is shown in Table 7.(2)(h)-1. Historical percentage share of class sales (not weather normalized) to total energy sales is presented in Table 7.(2)(h) 2.

Table 7.(2)(h)-1
KU Average Annual Use-per-Customer by Class (kWh)

	2000	2001	2002	2003	2004
Residential Heating (FERS)	18,043	17,507	18,380	17,878	17,731
Residential Non-Heating (RS)	11,283	11,131	12,335	11,511	11,949
	------------	------------	------------	------------	------------
Total Residential	13,969	13,721	14,846	14,217	14,461
Commercial	62,480	61,232	61,985	61,633	62,163
Industrial	3,199,259	3,038,235	3,203,299	3,321,521	3,570,187
Utility Use and Other*	24,818	25,923	25,712	26,478	26,779

* includes Lighting

Table 7.(2)(h)-2
KU Percentage of Class Sales to Total Energy Sales

	2000	2001	2002	2003	2004
Residential Heating (FERS)	14.5%	14.8%	15.2%	15.3%	15.2%
Non-Heating (RS)	13.7%	13.7%	14.3%	13.3%	13.3%
	----------	----------	----------	----------	----------
Total Residential	28.2%	28.5%	29.5%	28.6%	28.4%
Commercial	25.1%	25.7%	25.3%	25.7%	25.6%
Industrial	31.8%	30.6%	30.3%	30.9%	31.3%
Utility Use & Other*	0.4%	0.4%	0.4%	0.4%	0.4%
Virginia Retail	4.7%	4.8%	4.6%	4.6%	4.6%
Req. Sales for Resale	9.8%	10.0%	9.8%	9.8%	9.7%
Total Company	100.0%	100.0%	100.0%	100.0%	100.0%

* includes Lighting

KU Kentucky Retail Residential Sales

Changes in KU's Kentucky Retail Residential sales are driven by changes in both average use-per-customer and incremental customer growth. Since 2000, total Residential customers have increased at an average annual rate of 1.1 percent, while average annual use-per-customer has remained fairly constant. Customer growth has been dominated by KU's Full-Electric Residential Service ("FERS") class (the number of Residential Service ("RS") customers has actually declined).

Table 7.(2)(h)-3 shows estimates of KU's historical appliance saturation trends in the RS and FERS classes. Increases in RS use-per-customer are likely due to increases in the saturation of air conditioning and electric heating in combination with increased average housing size. This could be offset by more efficient appliances – heat pumps vs. furnace and central air conditioning ("CAC"). The saturation of FERS air conditioning and of several other appliances has also increased while heat pumps have become increasingly prevalent, stabilizing the rate of change in average use-per-customer.

Table 7.(2)(h)-3
KU Electric Appliance Saturations (percent)

APPLIANCE	**RS**			**FERS**		
	1993	**1997**	**2003**	**1993**	**1997**	**2003**
Refrigerator	100	100	100	100	100	100
Freezer	50	44	51	44	45	46
Home Computer	15	33	40	16	32	59
Range	66	72	78	92	93	95
Microwave Oven	83	91	94	88	91	96
Dishwasher	40	59	56	50	59	60
Clothes Washer	85	88	91	78	83	86
Clothes Dryer	71	78	84	76	83	85
Water Heater	37	36	39	98	98	97
Dehumidifier	10	12	16	9	14	15
Air Conditioning	**79**	**84**	**98**	**93**	**97**	**100**
Central A/C*	49	66	76	69	83	84
Room A/C	30	18	21	24	14	16
Primary Home Heating	6	6	10	93	94	95

* includes Heat Pump

KU Kentucky Retail Commercial Energy Sales

KU's Kentucky Retail Commercial class has also experienced growth in its customer base, averaging 2.3 percent on an annual basis. However, use-per-customer over the same time period has declined by -0.3 percent on a weather-normalized basis.

KU Kentucky Retail Industrial Energy Sales

Growth in KU's Kentucky Retail General Industrial class has come entirely from growth in average use-per-customer. The number of customers exhibited almost no growth over the 2000-2004 period (0.02 percent). However, average annual use-per-customer has grown by 2.1 percent on a weather-normalized basis over that same period.

KU Kentucky Retail Mine Power Energy Sales

Mine Power sales declined from 2000 to 2004 at an average annual rate of -3.0 percent. The loss of sales is primarily attributable to a reduced number of customers on the Mine Power rate, with customers falling from 46 in 2000 to 42 in 2004. Use-per-customer in the Mine Power class has also declined slightly -- an average rate of -0.5 percent over the 2000-2004 period.

KU Kentucky Retail Lighting Energy Sales

Lighting sales are a small component of overall energy sales, growing from 108 GWh in 2000 to 117 GWh in 2004. All growth has come in the area of outdoor lighting, which increased from 67 GWh to 73 GWh over the period. Street Lighting sales remained flat at 42 GWh over the period.

KU Virginia Energy Sales

Virginia sales growth has been driven by increases in the number of customers, while use-per-customer has declined. Nonetheless, over the 2000-2004 period, weather-normalized sales increased by 1.8 percent.

KU Wholesale Energy Sales

Wholesale (Municipal) sales have grown at a 1.5 percent annual rate since 2000. Sales to the Wholesale sector divided into four categories: Primary Voltage, Transmission Voltage, the City of Paris and the Borough of Pitcairn, Pennsylvania. The majority (71%) of the sales growth since 2000 has been at transmission level, an annual growth rate of 1.5 percent. The City of Paris has experienced the highest rate of growth over the period; however, this primarily reflects the municipal take-over of much of KU's distribution lines within the city in February, 2002 rather than any fundamental changes in the City's growth rate.

7.(3) Specification of Forecast Information Requirements

The information regarding the energy sales and peak load forecasts in the following subsections conform to the specifications outlined in Section 7.(3) to the fullest extent possible.

7.(4) KU Energy and Demand Forecasts

7.(4)(a) KU Forecasted Sales by Class and Total Energy Requirements* (GWh)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Residential Heating (FERS)	3,133	3,190	3,303	3,417	3,497	3,575	3,701	3,789	3,910	4,014	4,116	4,202	4,304	4,441	4,559
Residential Non-Heating (RS)	2,685	2,677	2,702	2,729	2,737	2,747	2,784	2,801	2,838	2,866	2,895	2,917	2,949	2,997	3,037
Total Residential	5,817	5,867	6,005	6,146	6,235	6,322	6,484	6,590	6,747	6,880	7,011	7,119	7,253	7,437	7,597
Commercial	5,800	5,956	6,207	6,405	6,587	6,760	6,909	7,060	7,216	7,374	7,530	7,687	7,846	8,009	8,176
Industrial	5,871	6,045	6,203	6,345	6,468	6,570	6,670	6,778	6,892	7,010	7,114	7,210	7,317	7,430	7,551
Total C/I	11,671	12,001	12,410	12,749	13,055	13,331	13,579	13,838	14,107	14,383	14,643	14,896	15,163	15,439	15,727
Lighting	117	121	124	127	131	134	137	140	143	146	149	152	155	158	161
Sales for Resale	1,994	2,042	2,090	2,133	2,177	2,221	2,267	2,312	2,358	2,404	2,450	2,495	2,542	2,589	2,636
Total Kentucky	19,599	20,031	20,629	21,156	21,597	22,008	22,467	22,881	23,355	23,814	24,254	24,663	25,113	25,624	26,121
Virginia	907	914	929	946	954	961	976	987	1,002	1,015	1,027	1,034	1,047	1,064	1,077
Total KU															
Billed	20,506	20,945	21,558	22,102	22,551	22,968	23,444	23,868	24,357	24,829	25,281	25,697	26,160	26,687	27,198
Used	20,532	20,967	21,585	22,150	22,577	22,969	23,458	23,887	24,388	24,869	25,305	25,695	26,178	26,711	27,233
Requirements	21,812	22,273	22,930	23,530	23,983	24,399	24,920	25,376	25,909	26,420	26,883	27,298	27,810	28,377	28,933

* Does not include inter-system sales, energy used by the Company or furnished to others.

7.(4)(b) KU Summer and Winter Peak Demand (MW)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Summer	4,067	4,153	4,275	4,387	4,472	4,549	4,646	4,731	4,830	4,925	5,012	5,089	5,184	5,290	5,393
	04/05	**05/06**	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**11/12**	**12/13**	**13/14**	**14/15**	**15/16**	**16/17**	**17/18**	**18/19**
Winter	3,842	3,923	4,039	4,145	4,225	4,297	4,390	4,470	4,564	4,654	4,735	4,808	4,899	4,999	5,097

7.(4)(c) KU Monthly Sales by Class and Total Energy Requirements* (GWh)

	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Residential Heating (FERS)	**2005**	448	367	303	254	172	193	228	235	219	168	216	329
	2006	450	377	309	247	184	205	235	238	218	163	228	336
Residential Non-Heating (RS)	**2005**	247	200	195	190	175	225	296	310	287	189	163	207
	2006	243	201	195	180	182	237	297	304	276	182	173	207
Total Residential	**2005**	695	567	499	444	347	418	525	545	506	357	379	536
	2006	693	578	504	428	365	442	533	542	494	345	401	543
Commercial	**2005**	505	466	441	428	440	502	557	551	542	467	426	474
	2006	519	478	453	439	452	516	572	565	557	480	438	488
Industrial	**2005**	477	477	476	468	487	500	494	499	513	496	485	499
	2006	491	491	490	482	501	515	509	514	528	511	499	514
Total C/I	**2005**	982	943	917	896	927	1,003	1,051	1,050	1,055	964	911	973
	2006	1,010	969	943	921	953	1,031	1,081	1,079	1,085	991	937	1,001
Lighting	**2005**	12	10	10	9	8	8	8	9	9	11	11	12
	2006	12	10	10	9	8	8	8	9	10	11	12	13
Sales for Resale	**2005**	168	148	155	143	155	184	205	204	169	151	146	165
	2006	172	152	159	147	159	188	210	209	173	154	150	169
Total Kentucky	**2005**	1,857	1,669	1,581	1,492	1,437	1,612	1,789	1,808	1,740	1,482	1,447	1,686
	2006	1,887	1,709	1,617	1,504	1,486	1,669	1,832	1,839	1,763	1,501	1,499	1,725
Virginia	**2005**	107	94	84	77	63	63	64	65	66	62	70	91
	2006	107	95	84	75	65	65	65	66	66	61	73	92
Total KU													
Billed	**2005**	1,964	1,763	1,665	1,569	1,500	1,675	1,853	1,873	1,806	1,545	1,517	1,777
	2006	1,995	1,804	1,701	1,579	1,550	1,734	1,896	1,905	1,829	1,562	1,572	1,817
Used	**2005**	1,892	1,645	1,667	1,482	1,561	1,762	1,952	1,939	1,645	1,556	1,595	1,835
	2006	1,932	1,680	1,703	1,513	1,594	1,799	1,993	1,980	1,680	1,589	1,629	1,874
Requirements	**2005**	2,013	1,749	1,772	1,574	1,657	1,870	2,073	2,060	1,747	1,651	1,694	1,951
	2006	2,056	1,786	1,809	1,607	1,692	1,910	2,117	2,103	1,784	1,686	1,730	1,992

* Does not include inter-system sales, energy used by the Company or furnished to others.

7.(4)(d) Forecast Impact of Demand-Side Programs

The impacts of existing and future demand-side programs on both energy sales and peak demands are estimated in Table 8.(3)(e)-3. The energy sales and peak demand forecasts presented in the preceding sections do not include the impacts of those programs. The DSM-related adjustments to summer and winter peak demand and annual energy forecasts were made in Tables 8.(4)(a)-1, 8.(4)(a)-2 and 8.(4)(b) for both LG&E and KU combined.

7.(5) Historical and Forecast Information for a Multi-State Integrated Utility System

7.(5)(a) Historical Information for a Multi-State Integrated Utility System

Virginia energy sales constitute only about 4 percent of total KU sales. Energy sales for Virginia are shown as a separate line item in table 7.(2)(b), while demand is treated as part of KU's overall system demand.

7.(5)(b) Historical Information for a Utility Purchasing More Than 50 Percent of Its Energy Needs

This is not applicable to *KU.*

7.(5)(c) Forecast Information for a Multi-State Integrated Utility System

This applies to KU and Tables 5.(3)-6 and 5.(3)-8 contain the energy and demand forecasts on an annual basis through 2019.

7.(5)(d) Forecast Information for a Utility Purchasing More Than 50 Percent of Its Energy Needs

This is not applicable to KU.

7.(6) Updates of Load Forecasts

Updates will be filed when adopted by KU.

7.(7) Description and Discussion of Data, Assumptions and Judgments, Methods and Models, Treatment of Uncertainty, and Sensitivity Analysis Used in Producing the Forecast

7.(7)(a) Data Sets Used in Producing Forecasts

A first step in the forecast process, described in detail in Technical Appendix 1 of Volume II, involves the gathering of national, state, and service territory economic and demographic data that are used to specify models which describe the electric consuming characteristics of KU's and LG&E's customers.

To ensure consistency within the planning function, KU and LG&E both utilize national economic forecast data from Global Insight ("GI"), a respected and nationally recognized economic consulting firm used by many utilities. Growth prospects in the national economy are important to the projection of energy usage due to the linkage between economic activity and the use of energy.

GI-generated national forecast data is fed to the University of Kentucky Center for Business and Economic Research's ("UK/CBER") State Econometric Model. The UK State Econometric Model produces value-added output forecasts for over 30 industries and employment forecasts for nearly 70 sectors. Income is forecast for five sources of income, and population is forecast for 36 age and gender cohorts. The model has been operated by the Center for Economic Research since 1995. State forecasted data from the State Econometric Model for value-added output, employment, and income as well as national forecasts for total employment and selected Industrial production indices are then fed to the Service Territory Economic Model ("STEM"), which is also a product of UK/CBER. STEM is an employment-driven model in which forecasts of sector level value-added output, employment, income, population and households are generated for five regions and then summed to create service-territory-level class forecast drivers. A copy of the CBER report is contained in Technical Appendix 4, 'Supporting Documents' of Volume II.

Demographic trends are an important part of the forecasting process. Forecasts of population and the number of persons-per-household work together in the STEM model to create a forecast of the number of households, which is a key driver in the development of the Residential customer forecasts. Residential customers are then used to forecast growth in Commercial customers. (For Virginia, Residential customers are forecast in the same fashion as for Kentucky Residential customers, using Virginia data from the STEM model.)

KU's forecast of long-term Residential sales is a function of customers by class and sales-per-customer by class. Total Residential customers are split between FERS customers and RS customers using the Electric Power Research Institute's Residential End-Use Energy Planning System ("REEPS") end-use model. Assumptions regarding electricity and competing fuel price are an important component to the forecast of customers by class. KU develops an internal forecast of electricity prices and uses New York Mercantile Exchange ("NYMEX") Futures (with 1% escalation after 2010) plus an adder for transmission and distribution to forecast the retail gas price as well as oil prices.

Personal income from the STEM model is used as an explanatory variable in KU's long-term forecast of Residential electricity sales-per-customer for both FERS and RS customers. The STEM model forecasts income as the sum of five components: (1) earnings by place of residence; (2) dividends, interest, and rent ("DIR") income; (3) transfer income; (4) farm earnings; and, (5) military earnings.

KU service territory Industrial value-added is a key explanatory variable for Industrial sales. It is comprised of the manufacturing SIC codes 20–39, as well as mining SIC codes 12–14. The Industrial value-added series used in forecasting Industrial sales is the sum of the output estimates for each of these SIC codes.

The forecast of Commercial sales requires both a forecast of Commercial customers and a forecast of sales per customer. The Commercial customer forecast is driven by the forecast of Residential customers, while the sales-per-customer forecast is primarily a function of service territory Commercial employment. The Commercial sector is comprised of SIC codes 15-17 and SIC codes 42-99. The Commercial employment forecast used in forecasting Commercial sales is the sum of the employment estimates for each of these SIC codes.

Mine Power sales are forecast using a coal production forecast for Western Kentucky obtained from Hill & Associates.

Some of the energy forecast class models are sensitive to retail price changes. The retail price series used in developing the sales is based on KU's retail revenue requirements in the short to medium term, escalated by one percent over the longer term (nominal).

Weather records are also a vital input to electricity sales forecasting. KU receives its weather data from the National Climatic Data Center ("NCDC"), a branch of the

National Oceanic and Atmospheric Administration of the U.S. Department of Commerce. For the forecast period (2005-2019), averages of cooling and heating degree days based on the latest twenty years of historical weather data were used in the models. Lexington, Kentucky and Bristol, Tennessee weather station data are used in the KU and ODP models, respectively. Degree-days used in the models are all on a 65-degree base.

KU also relies on company-collected report and survey data as inputs to the forecasting process. Such data enables KU to estimate the percentage of new Residential customers choosing the FERS rate by type of housing, the availability of gas at new hookups, the mix of Residential housing types on the KU system, the approximate saturation level of various appliances, and the sales history by key SIC codes.

7.(7)(b) Key Assumptions and Judgments

Following key economic and demographic assumptions:

- KU's service area population is forecast to increase an average 0.8 percent over the next five years, and to continue to average 0.8 percent growth over the fifteen-year forecast horizon.
- Annual U.S. Real Gross Domestic Product growth is forecast to average 3.4 percent growth over the next five years, and 3.1 percent growth over the next fifteen years.
- Households in KU-served counties are forecast to increase at a 1.3 percent annual average rate over the next five years and at a 1.1 percent rate over the next fifteen years.
- Over the forecast period (2005-2019), weather is assumed to be 'normal' – that is, reflecting average historical conditions of the latest twenty years.
- KU service territory Industrial value-added is forecast to increase at 4.3 percent annual rate for the next five years and 3.4 percent for the next fifteen years.
- KU service territory Commercial employment is forecast to increase at an average annual rate of 2.4 percent for the next five years and 2.1 percent over fifteen years.
- Based on a 2003 study by Hill & Associates, Western Kentucky coal production is predicted to increase at an average annual rate of 3.0 percent for the next five years and to increase at an average annual rate of 2.3 percent for the next fifteen years.

7.(7)(c) General Methodological Approach

The structure of KU's medium-term and long-term energy sales models, customer numbers model, and the peak demand model are explained in detail in Technical Appendix 1 of Volume II. Following is a discussion of the methodology.

KU Energy Forecasts

The KU energy forecast covers customers under three regulatory jurisdictional groups:

i. Retail sales within Kentucky;

ii. Retail sales within Virginia; and

iii. Wholesale sales to municipally-owned utilities in Kentucky.

The distribution of sales by jurisdiction in 2004 was 85.9 percent KY-Retail, 4.4 percent VA-Retail, and 9.7 percent Wholesale (KY-FERC).

The KU energy forecast by jurisdiction was prepared by customer class in order to address the unique characteristics identifiable within each class. Typical classes included Residential, Commercial, and Industrial. For some classes, the sales volume is forecast directly while for other classes the sales forecast is derived from forecasts of the number of customers and use-per-customer. Econometric and end-use modeling techniques are applied wherever possible.

The use of econometric forecasting by KU is consistent with the rationale stated elsewhere throughout this 2005 IRP document. That is, it provided a theoretically sound basis for testing the significance of various economic and demographic factors as explanatory variables of electricity sales, and provided the framework to use these forecasts of explanatory variables to generate forecasts of electricity sales.

The following discussion provides an overview of the methodologies employed for developing the KU energy forecast. Please refer to Technical Appendix 1, *KU 2005-2019 Energy Forecast,* of Volume II for a complete description of the modeling process for each customer class.

KU Residential Forecasts

KU's forecasting process for Kentucky Residential sales is developed in two parts:

(1) a projection of customers by rate class; and

(2) a projection of use-per-customer by class.

KU Residential Customer Forecasts

The 2005 KY Residential customer forecast is developed using a combination of medium-term (5-year) and long-term (15-year) modeling. The primary drivers for each model are the KU service territory population forecast and the conversion of population into a service territory household forecast. The forecast is developed by application of a statistical regression of the number of customers against the number of households.

The forecast of total Residential customers begins with a county-level population forecast generated by the STEM. The medium-term model employs a customer/household regression projection. For the long-term forecast, an annual customer to service territory household regression is utilized, with the incremental growth after 2009 applied to the forecast for 2009 and beyond.

These projected customers are apportioned between the All-Electric (FERS) and Non All-Electric (RS) rate classes through the use of a customer allocation model. The discrete choice logic embedded in Electric Power Research Institute's REEPS model is used to forecast FERS customers. This discrete choice methodology specifically enables the Company to account for multiple factors such as:

- influence of space cooling preferences on heat equipment choice;
- impact of capital and operating costs on HVAC system choice; and
- impact of changing efficiency standards.

The results are then calibrated to the actual net annual change in FERS customers. The net annual change in RS customers is calculated by subtracting the FERS customer forecast from the total Residential customer forecast.

KU Residential Use-per-Customer Forecast

A statistically-adjusted end-use ("SAE") model is used to estimate monthly use-per-customer for each Residential class. The model combines the rigor of an econometric model (relating monthly use-per-customer to weather, seasonal variables, and economic conditions) with the accessibility of the traditional-end use approach. In the SAE model, monthly use-per-customer is related to heating use, cooling use, miscellaneous use, and seasonal binary variables. Heating use is dependent upon heating degree-days, heating equipment saturation levels, heating equipment operation efficiencies, average household size, household income, and energy prices. Cooling use is constructed similarly in that it is dependent upon cooling degree-days, cooling equipment saturations, cooling equipment operation efficiencies, average household size, household income, and energy prices. Other use is a monthly estimate of non-weather sales and is derived from appliance and equipment saturation levels, appliance efficiency levels, average number of billing days per month, average household size, household income, and energy prices. Finally, seasonal binaries are included to account for consumption not explained by the other variables. For example, the model does not explicitly include lighting and the winter binary variable picks up the extra lighting used during the winter. In addition, the seasonal binaries capture the impact of secondary space heating that is used but not explicitly modeled. The result is a forecast of monthly average use-per-customer. This average monthly usage is then multiplied by monthly class customers and summed annually. The result is a total annual energy forecast for each Residential class.

KU Commercial

The Kentucky Commercial sector sales forecasting process is a combination of medium- and long-term econometric modeling methodologies. Medium- and long-term sales are forecast as the product of customer and use-per-customer forecasts. Additionally, the monthly use-per-customer forecast is the product of a use-per-customer-per-day forecast and an expected number of days per billing month. Commercial customers are forecast as a function of Residential customers and a binary term starting in 1988 to capture the effect of a shift in the historical data to reflect the use of SIC codes to segment Commercial and Industrial customers. The medium-term model forecast monthly use-per-customer-per-day as a function of Commercial service territory employment and monthly weather terms.

The long-term forecast is based on cooling and heating seasonal use-per-customer models. For the cooling season model, the explanatory variables are service territory Commercial employment, cooling degree days, the real average Commercial price of electricity, and an interaction term between Commercial employment and the binary variable. For the heating season model, the explanatory variables are service territory Commercial employment, heating degree days, the real average Commercial price of electricity lagged one year, and a binary term designed to smooth out the effects of an unusually high use-per-customer value in 1996.

KU Industrial

The forecast for sales to the Kentucky Industrial sector is produced using a medium-term monthly econometric model and a long-term annual econometric model, along with a small number of individual customer forecasts. The growth rate from the annual model is applied to the end of the medium-term series in order to generate a forecast for the long term.

The monthly model uses monthly energy sales as the dependent variable. The explanatory variables are service territory Industrial value-added, a seasonal binary for January, June cooling degree-days, July cooling degree-days, August cooling degree-days, and September cooling degree-days. Included in the model is a binary term starting in 1999 to represent the removal from the historical data series of several large customers, which are forecast separately.

The dependent variable in the annual model is annual energy sales. The explanatory variables are real service territory Industrial value-added, the real average Industrial price of electricity, cooling degree-days, and a reclassification binary for the removal of the individually forecasted customers, starting in 1999.

KU's largest Industrial customers are forecast individually. The forecasts for these customers are developed based on recent history in sales and demand and on communications with each customer regarding its outlook for growth and expansion.

KU Mine Power

The Kentucky Mine Power sales forecast is an econometric model that used Mine Power customers, heating degree-days and a trend term from 1985. The trend term is used to capture the decline in the amount of energy sales to Mine Power customers that has been occurring in recent history. KU Mine Power customers are forecast based on the relationship between the number of Mine Power customers and volume of coal production in the Western Kentucky region.

KU Lighting

Lighting sales are forecast in two groups: outdoor area lighting and street lighting. The outdoor area lighting group is projected using two regression models, one for the number of fixtures and one for the average kW rating per fixture. The fixture count times the consumption rate times hours of use determine the energy forecast. Fixtures are regressed against service territory households, and an AR(1) correction is made for serial correlation. As fixtures are a physical unit, the projected fixture values are adjusted so that the predicted values equaled the last year of known values. Average kW rating per light for outdoor area lighting is held constant at the 2001 annual average.

The Company provides incandescent, mercury vapor and high-pressure sodium ("HPS") street lighting service. Incandescent lights are not available for new installations and the price differential between mercury vapor and HPS lights effectively eliminate requests for new mercury vapor systems. The forecast assumes that all new street lights will be HPS. The street lighting group uses the same methodology as the area lighting group for the fixture forecast. Fixtures are regressed against time. For the average kW rating per fixture, existing fixtures are grouped by type and lumen to identify HPS and Non-HPS weighted averages. The mix of HPS lighting types is then held constant over the forecast period. This establishes an average kW rating for HPS fixtures. All increases of fixtures are assumed to occur in the HPS group. The Non-HPS fixtures are assumed to be retired by 2005.

ODP Sales

The Old Dominion Power Company ("ODP") operating unit of Kentucky Utilities serves five counties in southwestern Virginia. As these sales occur in the Virginia jurisdiction, they are modeled separately from other retail sales. ODP sales are disaggregated to a rate class basis.

ODP Residential

ODP has one Residential rate class for both all-electric and dual energy customers. The forecast for this class is developed in two parts:

(1) a projection of the number of customers; and

(2) a projection of use-per-customer.

ODP Residential: Customers

The forecast of total Residential customers is developed using a regression model based on the number of households. A forecast of county-level population and number of households is generated by STEM. This county level household forecast is summed, and then applied to the coefficients from the regression model to produce a forecast of the number of customers

ODP Residential Use-per-Customer

A SAE model is used to estimate monthly use-per-customer – as described for KU Residential. The model combines the rigor of an econometric model (relating monthly use-per-customer to weather, seasonal variables, and economic conditions) with the accessibility of the traditional-end use approach.

ODP Commercial and Industrial

The model disaggregates the combined rate classes into two portions: SIC Code 12 (Mining) and Commercial/Industrial (Non-Mining). Mining sales are based on the Virginia RGSP for SIC 12, a binary for the year 1995, and an AR(1) term to correct for serial correlation. The Non-Mining Commercial/Industrial sales are modeled as a function of time since 1970.

Small classes in Virginia include Schools and Lighting. School sales are set at a fixed level, while the Lighting sector use the same fixture and average kW-per-fixture approach utilized for KU Kentucky Retail Lighting.

FERC Sales

The forecast of Municipal purchases from KU is developed by analyzing the Company's energy sales to Transmission customers, Primary voltage customers (customers who own their own transformer), and the City of Paris. Primary Municipal customers are Bardstown, Bardwell, Benham, Falmouth, Madisonville, and Providence. The Transmission Municipal customers are Barbourville, Berea, Corbin, Frankfort, and Nicholasville. The dependent variable in the sales forecast equation is total sales for each of the three groups. Common explanatory variables are heating and/or cooling degree-days, county-level real Industrial value-added, county-level household forecast, and time. The county-level real Industrial value-added and household forecasts are developed from the STEM database.

7.(7)(d) Treatment and Assessment of Forecast Uncertainty

Section 5.(6) summarizes the uncertainties that could affect the load forecasts of KU and LG&E. Across forecast cycles, forecast uncertainty is dealt with by review and revision of model specifications to ensure that the relationships between variables are properly quantified and that the structural relationships remain valid.

Within each forecast cycle, there is uncertainty in the forecast values of the independent variables. To address this uncertainty, the company develops high and low scenarios to support sensitivity analysis of the various resource acquisition plans being studied.

7.(7)(e) Sensitivity Analysis

For the 2005 IRP, high and low scenarios are prepared based on probabilistic simulation of the historical volatility exhibited by each utility's weather-normalized year-over-year sales trend (see KU or LG&E Technical Appendices for a complete description). The high and low forecasts of KU's energy sales are presented in Tables

7.(7)(e)-1 and Graph 7.(7)-1. The associated forecasts of annual peak load are shown in Table 7.(7)(e)-2.

The latest forecast does not explicitly incorporate potential impacts of increasing competition. Integrated Resource Planning is based on the assumption of an obligation to serve a specifically defined service territory.

KU updates its load forecasts on an annual basis which captures the impact of new appliances, technologies, and regulations as they emerge and penetrate into the energy market. The impacts of existing and future demand-side programs on both energy sales and peak demands are shown in Tables 8.(3)(e)-3, 8.(4)(a)-1, 8.(4)(a)-2 and 8.(4)(b).

Table 7.(7)(e)-1
KU Base, High and Low Forecasts of Billed Energy Sales (GWh)

YEAR	BASE	HIGH	LOW
2005	20,506	20,683	20,307
2006	20,945	21,218	20,638
2007	21,558	21,965	21,099
2008	22,102	22,628	21,508
2009	22,551	23,176	21,846
2010	22,968	23,685	22,160
2011	23,444	24,264	22,518
2012	23,868	24,781	22,837
2013	24,357	25,378	23,205
2014	24,829	25,954	23,561
2015	25,281	26,505	23,901
2016	25,697	27,012	24,214
2017	26,160	27,577	24,563
2018	26,687	28,219	24,959
2019	27,198	28,842	25,344

Graph 7.(7)(e)-1
KU Base, High and Low Energy Sales Forecasts

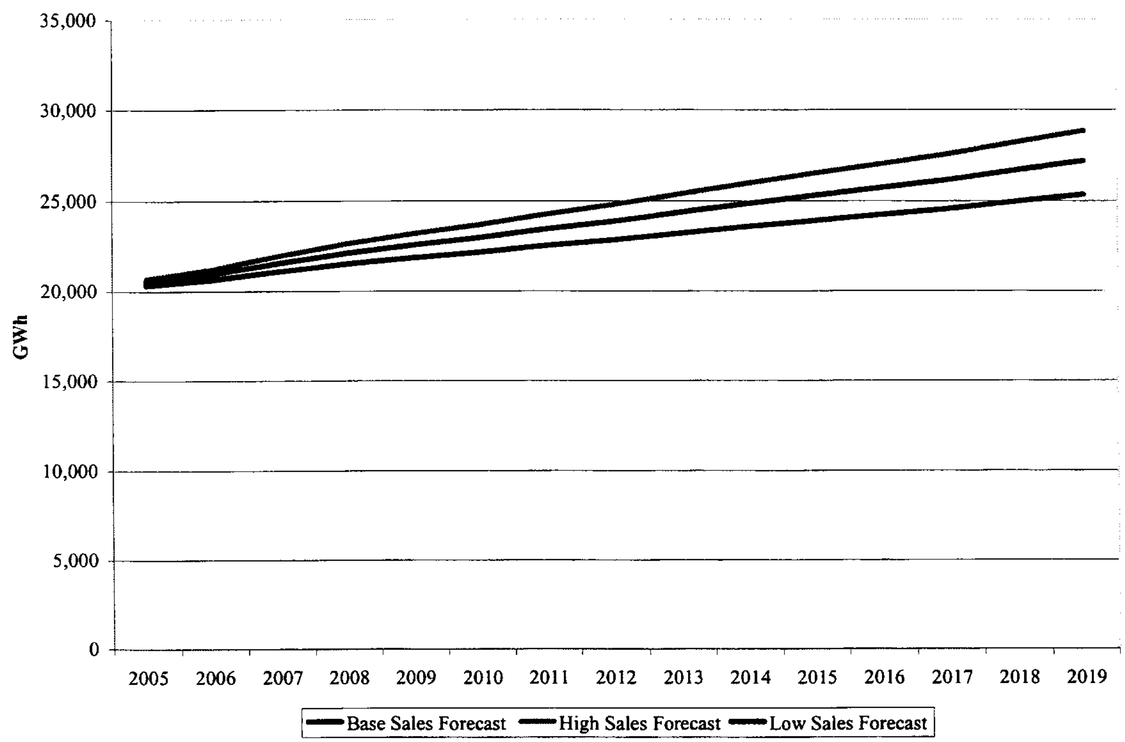

Table 7.(7)(e)-2
KU Base, High and Low Forecasts of Peak Demand (MW)

YEAR	BASE	HIGH	LOW
2005	4,067	4,093	4,017
2006	4,153	4,198	4,081
2007	4,275	4,347	4,173
2008	4,387	4,481	4,258
2009	4,472	4,586	4,321
2010	4,549	4,681	4,379
2011	4,646	4,798	4,451
2012	4,731	4,901	4,515
2013	4,830	5,022	4,590
2014	4,925	5,137	4,662
2015	5,012	5,244	4,727
2016	5,089	5,338	4,784
2017	5,184	5,454	4,856
2018	5,290	5,582	4,936
2019	5,393	5,708	5,014

7.(7)(f) Research and Development

The forecasting processes for KU and LG&E are basically the same. There are some differences solely due to data issues. On the KU side, for future forecasts, sales will no longer be segmented by SIC code, as the Company is adopting historical data series in the Commercial and Industrial sectors that more closely align with data reported on a bill code basis. This will simplify data manipulation and eliminate reliance on an external classification variable that has been discontinued at the national level.

The Companies remain committed to understanding customer usage trends at an end-use level as a basis for predicting future consumption. A Residential SAE model has been developed for LG&E in addition to those already in place for KU and ODP. In the 2005 IRP forecast, the REEPS end-use model served a supporting role in the development of the structural terms rather than as a direct model of Residential use-per-customer.

The 2005-2019 Demand Forecast is based on the Companies' forecasted energy requirements and the Companies' typical monthly load shapes (10-year average). Peak demand is then derived from the hourly demand forecast. An enhancement since the 2002

IRP is related to the process of converting the monthly energy forecast into an hourly load curve. In the 2002 IRP, the load shape for each month of the forecast was determined by reference to the pattern of a particular historical month. In the latest Load Forecast an "average" normalized load duration curve based on ten years of history is used to distribute monthly energy across individual hours in the month. The use of a representative load duration curve removes the risk – inherent in the application of any single historical year – of replicating an anomalous pattern over the forecast period and results in a more consistent relationship between monthly peak demands. The use of average values over the last ten years also captures the impact of the existing trend in system load factor. A calendar-matched particular month is used only to sort the hourly loads chronologically.

7.(7)(g) Development of End-Use Load and Market Data

In October 2003, a standardized Residential appliance saturation survey was undertaken. The data collected from this survey assisted in supporting the SAE methodology now employed in the Residential energy forecasts. The Companies also participate in an Energy Forecaster's Group ("EFG") managed by Itron in which collaborative efforts with other utilities provide the development of regional end-use saturation and efficiency data for the various classes of service.

Louisville Gas & Electric

7.(1) Specification of Historical and Forecasted Information Requirements by Class

The data submissions in the following subsections conform to the specifications provided in Sections 7.(1) to the fullest extent possible.

7.(2) Specification of Historical Information Requirements

The data submissions in the following subsections conform to the specifications provided in Sections 7.(2) to the fullest extent possible.

7.(2)(a) LG&E Average Customers by Class, 2000-2004

	2000	2001	2002	2003	2004
Residential Heating	40,942	40,817	40,794	40,942	41,031
Residential Non-Heating	284,715	289,214	293,534	296,826	301,157
Total Residential	325,658	330,031	334,329	337,768	342,188
Small Commercial	38,320	39,455	40,462	40,488	40,312
Large Commercial	2,357	2,525	2,616	2,706	2,736
Industrial	471	457	458	462	445
Street Lighting	3,522	3,476	3,494	3,514	3,516
Total Customers	370,327	375,944	381,358	384,938	389,196

7.(2)(b) LG&E Recorded and Weather-Normalized Annual Energy Sales, Energy Requirements & Sales by Class (GWh)

	2000	2001	2002	2003	2004
SYSTEM BILLED SALES:					
Recorded	11,209	11,360	11,798	11,448	11,698
Weather Normalized	11,289	11,335	11,456	11,655	11,735
SYSTEM USED SALES:					
Recorded	11,329	11,377	11,810	11,503	11,724
Weather Normalized	11,409	11,352	11,436	11,715	11,744
ENERGY REQUIREMENTS:					
Recorded	12,003	12,038	12,503	12,123	12,480
Weather Normalized	12,083	12,013	12,129	12,335	12,500
SALES BY CLASS:					
Residential					
Heating	732	724	732	723	740
Residential					
Non-Heating	2,990	3,058	3,303	3,111	3,184
	---------	---------	---------	---------	---------
TOTAL RESIDENTIAL	3,722	3,782	4,036	3,835	3,924
Small Commercial	1,364	1,388	1,404	1,379	1,395
Large Commercial	2,855	2,904	2,987	2,995	3,028
Industrial	3,318	3,253	3,314	3,225	3,308
Street Lighting	70	70	69	69	69
	---------	---------	---------	---------	---------
TOTAL LG&E SALES	11,329	11,397	11,810	11,503	11,724
SYSTEM LOSSES	674	641	692	620	756
ENERGY REQUIREMENTS	12,003	12,038	12,503	12,123	12,480

7.(2)(c) LG&E Recorded and Weather-Normalized Peak Demands (MW)

	2000	2001	2002	2003	2004
SUMMER					
Recorded	2,542	2,522	2,623	2,583	2,485
Normalized	2,542	2,525	2,559	2,612	2,562
	99/00	**00/01**	**01/02**	**02/03**	**03/04**
WINTER					
Recorded	1,670	1,818	1,660	1,824	1,750
Normalized	1,724	1,838	1,691	1,818	1,683

7.(2)(d) LG&E Energy Sales and Peak Demand for Firm, Contractual Commitment Customers

	2000	2001	2002	2003	2004
Energy Sales (GWh)	10,583	10,698	11,138	10,874	11,251
Coincident Peak Demand (MW)	2,542	2,490	2,568	2,530	2,458

7.(2)(e) LG&E Energy Sales and Peak Demand for Interruptible Customers

	2000	2001	2002	2003	2004
Energy Sales (GWh)*	746	699	672	629	473
Coincident Peak Demand (MW)**	N/A	27	27	26	27

* The figures shown for energy sales are the total annual energy sales to the curtailable customers. Curtailed energy is not recorded. Foregone sales due to curtailments are presumed to be small.
** This is the actual load served for customers under an interruptible service rider.

7.(2)(f) LG&E Annual Energy Losses (GWh)

	2000	2001	2002	2003	2004
Annual Energy Loss	674	661	692	620	756
Percent of Energy Requirements	5.6%	5.5%	5.5%	5.1%	6.1%

7.(2)(g) Impact of Existing Demand Side Programs

Impacts of the existing demand-side programs on energy and demand requirements are estimated in Table 8.(3)(e)-3.

7.(2)(h) Other Data Illustrating Historical Changes in Load and Load Characteristics

Actual sales and use-per-customer data as reported in tables 7.(2)(a-f) above are calculated using the Company's FERC Form 1 filings as the basis for class segmentation. A historical trend of actual (not weather normalized) average energy use-per-customer by class is shown in Table 7.(2)(h)-1.

Table 7.(2)(h)-1
LG&E Average Annual Use-per-Customer by Class (kWh)

	2000	2001	2002	2003	2004
Residential Heating	17,878	17,750	17,954	17,667	18,039
Residential Non-Heating	10,501	10,573	11,254	10,482	10,572
	-----------	-----------	-----------	-----------	----------
Total Residential	11,429	11,461	12,071	11,353	11,467
Small Commercial	35,597	35,184	34,703	34,054	34,611
Large Commercial	1,211,499	1,150,004	1,141,613	1,106,948	1,106,888
Industrial	7,050,591	7,115,262	7,243,074	6,980,471	7,432,668
Street Lighting	19,831	20,024	19,777	19,773	19,625

A history of the percentage share of actual class sales (not weather normalized) to total energy sales is presented in Table 7.(2)(h)-2.

Table 7.(2)(h)-2
LG&E Percentage of Class Sales to Total Energy Sales

	2000	2001	2002	2003	2004
Residential Heating	6.5%	6.4%	6.2%	6.3%	6.3%
Residential Non-Heating	26.4%	26.8%	28.0%	27.0%	27.2%
	----------	----------	----------	----------	----------
Total Residential	32.9%	33.2%	34.2%	33.3%	33.5%
Small Commercial	12.0%	12.2%	11.9%	12.0%	11.9%
Large Commercial	25.2%	25.5%	25.3%	26.0%	25.8%
Industrial	29.3%	28.5%	28.1%	28.0%	28.2%
Street Lighting	0.6%	0.6%	0.6%	0.6%	0.6%
Total Company	100.0%	100.0%	100.0%	100.0%	100.0%

LG&E Residential Sales

Changes in actual LG&E Residential energy sales are driven by changes in customers and the average use-per-customer. Since 2000, total number of Residential customers have increased at an average annual rate of 1.2 percent, while average annual use-per-customer has risen 0.3 percent on a weather-normalized basis.,

Table 7.(2)(h)-3 shows estimates of LG&E's historical appliance saturation trends. Increases in use-per-customer are likely due to increases in the saturation of air conditioning and electric heating in combination with increased average housing size. This could be offset by more efficient appliances – heat pumps vs. furnaces and CAC.

Table 7.(2)(h)-3
LG&E Electric Appliance Saturations (percent)

APPLIANCE	RS RATE (%)			
	1993	1995	1999	2003
Refrigerator	100	100	100	100
Freezer	45	-	42	45
Video Recorder	91	118	-	-
Home Computer	21	34	-	62
Range	65	71	-	79
Microwave Oven	91	95	-	93
Dishwasher	51	53	61	66
Clothes Washer	92	85	-	88
Clothes Dryer	71	62	-	76
Water Heater	25	29	-	29
Dehumidifier	16	17	-	14
Air Conditioning	94	97	-	100
Heat Pump	-	8	-	13
Central A/C	77	78	81	81
Room A/C	40	36	-	13
Primary Home Heating	14	23	-	25

* includes Heat Pump

LG&E Commercial Energy Sales

Commercial sales have grown primarily because of the addition of new customers, having grown from 40,676 customers in 2000 to 44,054 in 2004 – an average annual growth rate of 1.5 percent.

LG&E Industrial Energy Sales

Energy sales to LG&E's Industrial class have remained fairly constant over the 2000-2004 period. The decline in the number of industrial customers over this period was offset by an increase in average use-per-customer.

7.(3) Specification of Forecast Information Requirements

The information regarding the energy and demand forecasts in the following subsections conform to the specifications outlined in Section 7.(3) to the fullest extent possible.

7.(4) LG&E Energy and Demand Forecasts

7.(4)(a) LG&E Forecasted Sales by Class (GWh) and Total Energy Requirements (GWh)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Residential	3,949	4,018	4,122	4,228	4,312	4,387	4,505	4,595	4,715	4,813	4,920	5,017	5,128	5,267	5,396
Small Commercial	1,450	1,477	1,506	1,536	1,566	1,597	1,628	1,659	1,693	1,726	1,759	1,791	1,825	1,860	1,896
Large Commercial	3,155	3,220	3,282	3,343	3,418	3,489	3,556	3,626	3,700	3,774	3,846	3,918	3,991	4,066	4,143
Industrial	3,358	3,402	3,350	3,371	3,397	3,444	3,496	3,553	3,617	3,684	3,742	3,798	3,857	3,917	3,978
Street Lighting	70	71	71	71	71	72	72	72	72	72	73	73	73	73	74
Total LG&E															
Billed	11,982	12,188	12,331	12,549	12,764	12,989	13,257	13,505	13,797	14,069	14,340	14,597	14,874	15,183	15,487
Used	11,991	12,193	12,337	12,566	12,766	12,997	13,270	13,514	13,812	14,079	14,349	14,605	14,881	15,197	15,506
Requirements	12,657	12,870	13,024	13,266	13,478	13,722	14,011	14,269	14,584	14,865	15,151	15,421	15,713	16,047	16,374

7.(4)(b) LG&E Summer and Winter Peak Demand (MW)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Summer	2,629	2,673	2,705	2,756	2,800	2,850	2,910	2,964	3,029	3,088	3,147	3,203	3,264	3,333	3,401
	04/05	**05/06**	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**11/12**	**12/13**	**13/14**	**14/15**	**15/16**	**16/17**	**17/18**	**18/19**
Winter	2,099	2,135	2,160	2,200	2,236	2,276	2,324	2,367	2,419	2,466	2,513	2,558	2,606	2,661	2,716

7.(4)(c) LG&E Monthly Energy Sales by Class (GWh) and Total Energy Requirements (GWh)

	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Residential	**2005**	349	303	275	247	241	358	469	469	429	267	241	302
	2006	358	309	277	250	251	366	482	477	437	271	238	302
Small Commercial	**2005**	121	115	110	105	108	129	147	146	140	113	103	113
	2006	123	117	112	107	111	132	150	148	142	115	105	115
Large Commercial	**2005**	249	245	239	234	248	282	313	307	295	257	236	252
	2006	255	250	244	238	253	288	320	313	302	261	240	256
Industrial	**2005**	276	265	267	276	279	292	293	292	298	277	276	269
	2006	280	269	271	280	283	296	296	296	301	280	279	272
Street Lighting	**2005**	7	6	5	6	5	5	5	5	6	6	7	7
	2006	7	6	5	6	5	5	5	5	6	6	7	7
		====	====	====	====	====	====	====	====	====	====	====	====
Total LG&E Billed	**2005**	1,001	933	897	868	881	1,065	1,226	1,219	1,167	920	862	943
	2006	1,023	951	910	881	902	1,086	1,253	1,240	1,188	934	869	952
Used	**2005**	989	876	906	848	951	1,128	1,279	1,251	1,015	901	879	970
	2006	1,006	890	921	862	967	1,147	1,300	1,272	1,032	916	894	986
Energy Requirements	**2005**	1,044	924	956	894	1,003	1,191	1,351	1,322	1,072	950	927	1,023
	2006	1,062	940	972	909	1,020	1,211	1,374	1,344	1,090	966	943	1,040

7.(4)(d) Forecast Impact of Demand-Side Programs

The impacts of existing and future demand-side programs on both energy sales and peak demands are estimated in Table 8.(3)(e)-3. The energy sales and peak demand forecasts presented in the preceding sections do not include the impacts of those programs. The DSM-related adjustments to summer and winter peak demand and annual energy forecasts were made in Tables 8.(4)(a)-1, 8.(4)(a)-2 and 8.(4)(b) for both LG&E and KU combined.

7.(5) Historical and Forecast Information for a Multi-State Integrated Utility System

7.(5)(a) Historical Information for a Multi-state Integrated Utility System

This is not applicable to LG&E.

7.(5)(b) Historical Information for a Utility Purchasing More Than 50 Percent of Its Energy Needs

This is not applicable to LG&E.

7.(5)(c) Forecast Information for a Multi-state Integrated Utility System

This is not applicable to LG&E. A Combined Company forecast including ODP is provided in this section of the KU discussion.

7.(5)(d) Forecast Information for a Utility Purchasing More Than 50 Percent of Its Energy Needs

This is not applicable to LG&E.

7.(6) Updates of Load Forecasts

Updates will be filed when adopted by LG&E.

7.(7) Description and Discussion of Data, Assumptions and Judgments, Methods and Models, Treatment of Uncertainty, and Sensitivity Analysis Used in Producing the Forecast

7.(7)(a) Data Sets Used in Producing Forecasts

Please refer to KU section 7.(7)(a).

7.(7)(b) Key Assumptions and Judgments

The following key economic and demographic assumptions were made for the primary drivers of LG&E's energy forecast:

- LG&E service area population is forecast to average 0.5 percent growth over the next five years, and to average 0.6 percent over the fifteen-year forecast horizon.
- LG&E service territory households are forecast to average 0.8 percent growth over the next five and fifteen year horizons.
- Real per capita personal income in the Louisville MSA is forecast to increase at an average annual growth rate of 3.5 percent through 2019.
- Commercial industry employment in the Louisville MSA is forecast to grow at an annual average rate of 2.3 percent over the fifteen year horizon
- Over the forecast period (2005-2019), weather is assumed to be 'normal' – that is, reflecting average historical conditions of the latest twenty years.

7.(7)(c) General Methodological Approach

The structure of LG&E's medium-term and long-term energy sales models, customer numbers model, and the peak demand model are explained in detail in Technical Appendix 2 of Volume II. Following is a discussion of the methodology.

LG&E Energy Forecasts

LG&E Residential Customers

As explained in section 7.(7)(b), the annual total number of Residential customers is forecast based on the household projections provided by UK/CBER and LG&E's projected number of households per Residential customer.

LG&E Residential Energy Sales

Please see section 7.(7)(c), KU Residential Use-per-Customer Forecast for a description of the SAE model.

LG&E Retail Small & Large Commercial Energy Sales

Both Commercial sectors, Small and Large, are forecast using a combination of medium- and long-term models. In the medium term, an additional distinction is made for revenue forecasting purposes between Public Authority and non-Public Authority sales. The medium-term Commercial sales forecast (for both Public Authority and non-Public Authority) is performed as follows:

1. Forecast of commercial customers; and
2. Forecast of energy use-per-customer

The primary driver for the number of Small Commercial customers (over the medium-term forecast period) is the number of LG&E service territory Residential customers forecast. A simple regression model is performed, where the number of Small Commercial customers is regressed on the LG&E service territory Residential customers. Similarly, for the Large Commercial class the primary driver for the medium-term forecast period is the number of LG&E service territory Small Commercial customers. Once again a simple regression model is performed, where Large Commercial customers are regressed on the LG&E service territory Small Commercial customers. On the other hand, the customer forecast for Public Authority (Small and Large Commercial) is based on historical growth rates.

Commercial sales (for both Public Authority and non-Public Authority) are forecast first on a per-customer basis, and then multiplied by monthly customers to determine total monthly sales. A multiple regression model using six years of historical data is specified. In addition, two large customers, UPS and Fort Knox, are forecast individually based on inputs from the respective account managers.

Beyond 2009, the sales forecast for the Commercial class (Small and Large) does not differentiate between non-Public Authority and Public Authority. The underlying assumption is that the economic and demographic impacts on the Commercial class, as a whole, are the same. The forecasted sales are a function of weather, economic and demographic variables that pertained to the LG&E service territory provided by the STEM.

LG&E Retail Industrial Energy Sales

Industrial sales are forecast using a combination of medium- and long-term models. In the medium term, an additional distinction is made for revenue forecasting purposes between Public Authority and non-Public Authority sales. In the long-term, the economic and demographic impacts on the Industrial sector are assumed to be the same between the non-Public Authority and Public Authority sectors.

The largest Industrial LG&E customers are individually forecast. The forecasts for these customers are developed based on recent history in sales and demand and on communications with each customer regarding its outlook for future operations.

The Residual Industrial customers' (the remaining industrial customers) energy is forecast using an econometric model where Residual Industrial sales are regressed on weather variables and the U.S. Industrial Production Index.

The Public Authority Industrial load is forecast by applying the five-year annual compound growth rate to each year of the forecast.

Beyond 2009, the sales forecast for the Industrial class did not differentiate between the non-Public Authority Industrial and Public Authority Industrial. Long-term, the economic and demographic impacts on the Industrial class as whole are assumed to be the same. The sales forecast is based on the annual U.S. Industrial Production Index. The Large Industrial customers are forecast based on inputs from the account managers responsible for the respective companies.

LG&E Retail Street Lighting Energy Sales

The Street Lighting load is forecast by applying the five-year annual compound growth rate to each year of the forecast. Beyond 2009, the rate of increase in Street Lighting energy sales is projected by using the ratio of the Street Lighting energy sales growth rate to the Residential customer growth rate averaged over five years. Future annual growth rates for Street Lighting energy sales are estimated by multiplying the projected annual growth rates of Residential customers by the Street Lighting growth ratio.

7.(7)(d) Treatment and Assessment of Load Forecasting Uncertainty

Please refer to KU Section 7.(7)(d)

7.(7)(e) Sensitivity Analysis

To address uncertainty, the company develops high and low scenarios to support sensitivity analysis of the various resource acquisition plans being studied. For the 2005 IRP, these scenarios are based on probabilistic simulation of the historical volatility exhibited by each utility's weather-normalized year-over-year sales trend (see Technical Appendices for a complete description). High and low forecasts of LG&E energy sales are presented in Table 7.(7)(e)-1 and Graph 7.(7)-2. High and low forecasts of LG&E annual peak load are shown in Table 7.(7)(e)-2.

The latest forecast does not explicitly incorporate potential impacts of increasing competition. Integrated Resource Planning is based on the assumption of an obligation to serve a specifically defined service territory.

LG&E updates its load forecasts on an annual basis which captures the impact of new appliances, technologies, and regulations as they emerge and penetrate into the energy market. The impacts of existing and future demand-side programs on both energy sales and peak demands are shown in Tables 8.(3)(e)-3, 8.(4)(a)-1, 8.(4)(a)-2 and 8.(4)(b).

Table 7.(7)(e)-1
LG&E Base, High and Low Billed Sales Forecasts (GWh)

YEAR	BASE	HIGH	LOW
2005	11,983	12,097	11,880
2006	12,188	12,374	12,021
2007	12,330	12,566	12,119
2008	12,549	12,861	12,269
2009	12,765	13,152	12,417
2010	12,988	13,453	12,570
2011	13,258	13,817	12,755
2012	13,506	14,151	12,925
2013	13,796	14,543	13,125
2014	14,069	14,911	13,312
2015	14,339	15,275	13,497
2016	14,597	15,623	13,674
2017	14,874	15,997	13,865
2018	15,183	16,414	14,076
2019	15,488	16,825	14,285

Graph 7.(7)(e)-1
LG&E Base, High, and Low Energy Sales Forecasts

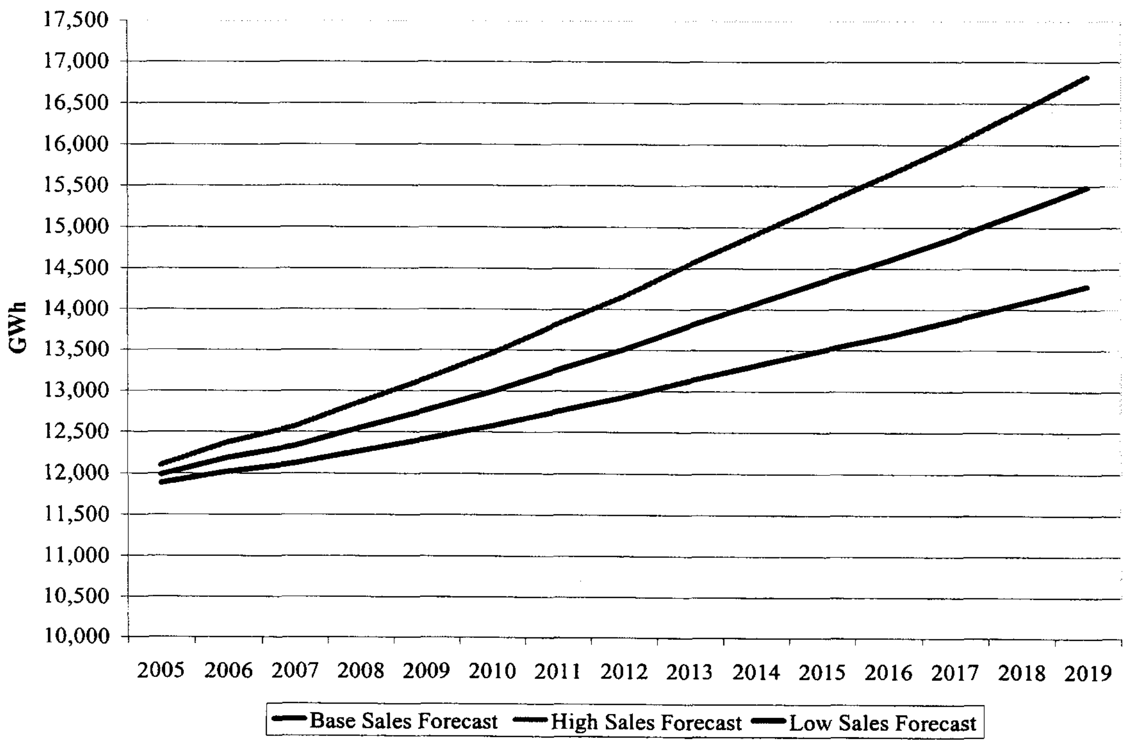

Table 7.(7)(e)-2
LGE Base, High and Low Forecasts of Peak Demand (MW)

YEAR	BASE	HIGH	LOW
2005	2,629	2,655	2,606
2006	2,673	2,715	2,636
2007	2,705	2,757	2,659
2008	2,756	2,825	2,694
2009	2,800	2,885	2,723
2010	2,850	2,953	2,759
2011	2,910	3,033	2,799
2012	2,964	3,106	2,836
2013	3,029	3,193	2,880
2014	3,088	3,273	2,921
2015	3,147	3,353	2,962
2016	3,203	3,430	3,001
2017	3,264	3,512	3,043
2018	3,333	3,604	3,089
2019	3,401	3,694	3,135

7.(7)(f) Research and Development Efforts to Improve the Load Forecasting Methods

Please refer to Section 7.(7)(f) under the KU portion of Section 7.

7.(7)(g) Future Efforts to Develop End-Use Load and Market Data

Please refer to Section 7.(7)(g) under the KU portion of Section 7.