COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In Matter of:

AN ASSESSMENT OF	)	
KENTUCKY'S ELECTIRC	)	ADMINISTRATIVE
GENERATION, TRANSMISSION	)	CASE NO. 2005-00090
AND DISTRIBUTION NEEDS	)	

RESPONSE TO ORDER FOR INFORMATION

DATED MARCH 10, 2005

CASE NO. 2005-00090

SHELBY ENERGY COOPERATIVE, INC.

Witnesses who will be available to respond to questions concerning the information requested:

Dudley Bottom, Jr., President & CEO

Don Turner, Senior Vice-President of Operations

Wayne Anderson, Vice-President of Plant Engineering & Technology

1. *Provide a summary description of your utility's resource planning process. This should include a discussion of generation, transmission, demand-side, and distribution resource planning.*

Shelby Energy Cooperative (Shelby Energy) prepares a Twenty-Year Power requirements Study in association with East Kentucky Power Cooperative (EKPC) every two years. This demand-side study provides the basis for Shelby Energy's distribution planning process.

The consumer and electrical loading projections from the Power Requirements Study are the input for the Long Range System Plan. This plan develops the distribution system model that will serve new plant additions, uprating of existing plant, and a scheduled replacement of the distribution system.

Two or Four Year Work Plans are developed to provide for system growth and modification involving specific projects with detailed cost estimates and current system needs.

The entire planning process is subject to Rural Utilites Service (RUS) input and approval.

Exhibit A, pages (1) through (10) provide an overview of the planning process.

East Kentucky Power Cooperative is responding on behalf of Shelby Energy Cooperative concerning the generation and transmission.

Introduction

Executive Summary

Shelby Energy Cooperative, Inc., (Shelby Energy), located in Shelbyville, Kentucky, is an electric distribution cooperative that serves members in ten counties. This load forecast report contains Shelby Energy's long-range forecast of energy and peak demand.

Shelby Energy and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the national and local economy, population and housing trends, service area industrial development, electric price, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Shelby Energy for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the manager and staff of Shelby Energy. Key assumptions are reported beginning on page 22.

Executive Summary *(continued)*

The load forecast is prepared biannually as part of the overall planning cycle at EKPC and Shelby Energy. Cooperation helps to ensure that the forecast meets both parties' needs. Shelby Energy uses the forecast in developing two-year work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of marketing analysis, transmission planning, generation planning, demand-side planning, and financial forecasting.

The complete load forecast for Shelby Energy is reported in Table 1-1. Residential and commercial sales, total purchases, winter and summer peak demands, and load factor are presented for the years 1990 through 2024.

Table 1-1

Shelby Energy Cooperative

2004 Load Forecast

MWh Summary

Year	Residential Sales (MWh)	Seasonal Sales (MWh)	Small Comm. Sales (MWh)	Public Buildings (MWh)	Large Comm. Sales (MWh)	Other Sales (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
1990	106,787	102	30,260	0	57,281	70	194,500	359	4.1	203,097
1991	116,303	102	34,392	0	66,686	71	217,554	397	5.3	230,197
1992	115,434	96	38,662	0	74,643	71	228,906	375	5.0	241,237
1993	127,884	95	38,996	0	84,827	70	251,872	404	5.2	266,114
1994	129,002	85	46,641	0	98,982	38	274,748	229	4.9	289,280
1995	139,454	101	48,181	0	109,589	40	297,365	0	6.1	316,629
1996	151,904	289	48,824	0	117,243	48	318,309	0	4.4	333,011
1997	154,886	254	42,481	0	130,728	47	328,396	408	4.6	344,483
1998	160,145	244	51,463	0	136,010	48	347,911	0	4.3	363,461
1999	171,819	276	52,630	0	143,726	67	368,519	0	4.2	384,630
2000	178,985	296	55,147	0	155,300	74	389,802	0	5.4	412,170
2001	187,641	0	62,077	0	151,961	79	401,757	0	2.9	413,690
2002	202,023	0	54,282	0	165,004	89	421,398	0	3.4	436,248
2003	203,175	0	56,043	0	158,524	136	417,877	0	4.1	435,574
2004	217,240	0	58,922	0	164,078	134	440,373	0	4.3	460,160
2005	225,521	0	61,664	0	168,923	134	456,242	0	4.3	476,742
2006	234,276	0	64,355	0	175,840	134	474,605	0	4.3	495,930
2007	244,069	0	67,009	0	184,509	134	495,720	0	4.3	517,994
2008	253,345	0	69,650	0	190,888	134	514,016	0	4.3	537,112
2009	262,363	0	72,332	0	204,624	134	539,454	0	4.3	563,692
2010	270,513	0	75,009	0	208,252	134	553,908	0	4.3	578,796
2011	278,160	0	77,660	0	210,758	134	566,712	0	4.3	592,175
2012	288,081	0	80,119	0	216,088	134	584,422	0	4.3	610,681
2013	298,690	0	82,486	0	222,756	134	604,065	0	4.3	631,207
2014	308,878	0	84,897	0	229,671	134	623,580	0	4.3	651,599
2015	319,192	0	87,379	0	236,393	134	643,098	0	4.3	671,994
2016	329,624	0	89,767	0	242,504	134	662,028	0	4.3	691,774
2017	341,123	0	92,143	0	250,411	134	683,811	0	4.3	714,536
2018	353,489	0	94,547	0	259,245	134	707,415	0	4.3	739,200
2019	367,087	0	96,939	0	269,538	134	733,697	0	4.3	766,664
2020	380,674	0	99,277	0	279,756	134	759,841	0	4.3	793,982
2021	393,895	0	101,547	0	289,118	134	784,693	0	4.3	819,951
2022	407,313	0	103,727	0	297,816	134	808,990	0	4.3	845,340
2023	421,383	0	105,919	0	307,544	134	834,980	0	4.3	872,497
2024	435,916	0	108,211	0	318,264	134	862,525	0	4.3	901,280

Table 1-1 (continued)
Shelby Energy Cooperative
2004 Load Forecast Peaks Summary

Noncoincident Peak Demand (MW)				Purchased Power		Load Factor
Season	Winter	Year	Summer	Year	(MWh)	(%)
1989 - 90	45.4	1990	39.4	1990	203,097	51.1%
1990 - 91	45.9	1991	45.3	1991	230,197	57.3%
1991 - 92	51.3	1992	46.8	1992	241,237	53.7%
1992 - 93	53.5	1993	51.4	1993	266,114	56.8%
1993 - 94	63.8	1994	60.8	1994	289,280	51.8%
1994 - 95	71.2	1995	62.1	1995	316,629	50.8%
1995 - 96	72.8	1996	69.0	1996	333,011	52.2%
1996 - 97	69.2	1997	66.4	1997	344,483	56.8%
1997 - 98	75.4	1998	73.3	1998	363,461	55.0%
1998 - 99	80.9	1999	76.9	1999	384,630	54.3%
1999 - 00	83.1	2000	78.4	2000	412,170	56.6%
2000 - 01	95.1	2001	81.8	2001	413,690	49.7%
2001 - 02	85.0	2002	83.8	2002	436,248	58.6%
2002 - 03	96.1	2003	81.3	2003	435,574	51.7%
2003 - 04	96.5	2004	85.3	2004	460,160	54.4%
2004 - 05	103.1	2005	88.5	2005	476,742	52.8%
2005 - 06	107.1	2006	91.8	2006	495,930	52.9%
2006 - 07	111.7	2007	95.6	2007	517,994	52.9%
2007 - 08	115.6	2008	98.6	2008	537,112	53.0%
2008 - 09	121.2	2009	103.5	2009	563,692	53.1%
2009 - 10	124.6	2010	106.1	2010	578,796	53.0%
2010 - 11	127.7	2011	108.4	2011	592,175	52.9%
2011 - 12	131.4	2012	111.3	2012	610,681	53.1%
2012 - 13	136.3	2013	115.0	2013	631,207	52.9%
2013 - 14	140.7	2014	118.5	2014	651,599	52.9%
2014 - 15	145.2	2015	122.0	2015	671,994	52.8%
2015- 16	149.1	2016	125.0	2016	691,774	53.0%
2016 - 17	154.4	2017	129.3	2017	714,536	52.8%
2017 - 18	159.7	2018	133.5	2018	739,200	52.8%
2018 - 19	165.5	2019	138.2	2019	766,664	52.9%
2019-2020	171.0	2020	142.5	2020	793,982	53.0%
2020-2021	177.0	2021	147.2	2021	819,951	52.9%
2021-2022	182.6	2022	151.5	2022	845,340	52.9%
2022-2023	188.4	2023	156.1	2023	872,497	52.9%
2023-2024	194.0	2024	160.6	2024	901,280	53.0%

LOAD FORECAST SUMMARY	
1. Borrower Designation	KY 30
2. Name of Borrower	Shelby Energy Cooperative
3. Date	May 21, 2004

CLASS OF CONSUMER	NO. OF CONSUMERS			AVG. MONTHLY KWH USAGE		
	2003	2008	2013	2003	2008	2013
4. Residential	13,185	15,173	17,312	1,284	1,391	1,438
5. Seasonal						
6. Irrigation						
7. Commercial & Industrial 1000 kVa or less	517	572	632	9,033	10,147	10,876
8. Commercial & Industrial over 1000 kVa	8	9	10	1,651,288	1,767,483	1,856,296
9. Public Street & Highway Lighting	17	17	17	665	656	656
10. Other Sales to Public Authorities						
11. Sales for Resale - REA Borrowers						
12. Sales for Resale - Others						

TOTAL SYSTEM POWER REQUIREMENTS

ITEM	2003	2008	2013
13. Annual MWh Requirements	435,574	537,112	631,207
14. Including Losses @	4.1%	4.3%	4.3%
15. Annual Load Factor (Based on maximum monthly system peak demand)	51.7%	53.0%	52.9%
16. Maximum Monthly System Peak Demand (MW) Noncoincident	96.1	115.6	136.3

17. Source(s) of Supply: East Kentucky Power Cooperative, Inc.

18. Previous Power Requirements Study Dated: August 2002

19. Comments (Use an additional sheet if more space is needed)

Borrower's General Manager (Signature)	Date	RUS General Field Representative (Signature)	Date
Dudley Bottom, Jr.	07-22-04	[signature]	11-2-04

RUS Form 341

Long Range Planning Study

A Long Range engineering analysis has been performed for the entire SEC system and two Long Range Plans (LRP)'s have been developed. The Plans are named "A" and "B." The preferred plan will be called Plan A and the alternative plan will called Plan B.

Both plans were designed to meet the projected requirements that are consistent with the System Planning Criteria outlined on page V-1. The plans are divided into five load levels or "blocks."

The "A" block spans 1999-2000 and corresponds exactly with the final two years of the present SEC 4-year Construction Work Plan. The "B" block spans 2002-2004. The "C" block spans 2005-2009. The "D" block spans 2010-2014. The last block, "E" spans 2015-2019.
These blocks should be considered as loading levels and not exact time frames. The farther into the future of a system that one looks, the less certain the actual time frame. However, load levels are not time-dependent.
The exact time of each improvement will be dictated by actual load growth. The LRP is reviewed before each construction work plan and generally must be followed - although with considerable flexibility at times.

Existing system facilities have been utilized as much as possible in both plans.
The 2019 system will have adequate capacity and will provide excellent reliability to more than 20,000 members over 2,200 miles of line at 2.4 times the existing system peak load level.

The projections used to grow the existing system out to the 2019 load level are consistent with the 1996 Power Requirements Study (PRS). This study is performed every two years in conjunction with EKP. The study is based on detailed distribution system information as well as regional demographic and energy usage data.

Growth Method

The future system was "grown" based on the EKP Power Requirements Study. However, in order to apply detailed growth patterns to the system, further investigation was needed. The comprehensive plans for Henry and Shelby counties were consulted. The land-use portion of these reports were extensively reviewed. Water districts in Carroll, Trimble and Henry counties were visited and future expansion plans were noted.
The State of Kentucky highway planning group KIPDA was consulted about the current transportation plans in the SEC service area. Areas of future highway construction or expansion were grown accordingly.
A SEC system map was then color coded based on relative levels of projected system growth for the twenty year period. With this map and the PRS data, specific areas of the system could be "grown" at different rates on the distribution system analysis software (Windmill by Milsoft). The result is system computer models with very site specific load growth levels.

Growth Areas

Over the past ten years, the vast majority of system growth has been Shelby County. The Shelby Industrial Park and its nearby surroundings contain an area where Industrial & Commercial growth has been consistent and substantial. This area is intersected by Interstate 64 and is 30 miles from downtown Louisville, Kentucky. The Budd Plant, Bekaert, Omega Plastics and Lawson Mardon are the four largest industrial loads on the system. All four are served by substations located in and around the Industrial Park area. Further expansion is projected in this area due to available land that is favorably located.
Norfolk Southern railroad operates a vehicle shipping terminal in this area. With a large amount of available land at this site, it is anticipated that a major automotive producer will locate an assembly plant at or in this vicinity.

The northwestern tip of Shelby County is another area that has and will continue to see substantial growth in the residential category. The Long Run area is a dynamic residential growth area near the Jefferson County line. This location, with its easy access to Louisville, will continue to expand in the years to come. The proposed Long Run Substation is discussed in this report. The planned construction of Long Run in 2000 will improve voltage, greatly reduce line exposure and provide a higher quality of service to a vast area in western Shelby County.

The Pendleton area of western Henry County is another pocket of substantial future growth. Interstate 71 exits at this site have already made it a significant commercial area. With Cincinnati, Ohio one hour to the north and Louisville, Kentucky one-half hour to the south, commercial and residential growth is projected to continue at a steady rate.

A small area in and around Milton Substation has been projected to grow at a significant level. A good highway and water and sewer in this immediate area will promote residential growth.

Several other small pockets of strong future growth exist throughout the system. However, in general, all of Carroll County and the eastern half of Henry County were projected to have light growth due to the proposed land uses which are affected by soil, topography and reduced highway and water systems. Much of rural Shelby County is also restricted to low density development which was outlined in its comprehensive plan.

SUMMARY OF SYSTEM PLANNING REPORT

SYSTEM DESIGNATION: KY 30 SHELBY

PLANNING ENGINEER: JAMES BRIDGES, P.E

DATE PLANNING REPORT COMPLETED: JULY 1998

PART I GENERAL DATA

ITEMS 1.	2. LINE MILES TRANS. a.	2. LINE MILES DISTR. b.	3. NO. OF CONSUMERS ALL TYPES (Including special loads) c.	3. NO. OF CONSUMERS SPECIAL LOADS d.	TOTAL SYSTEM LOAD (kW) 4.	TOTAL SPECIAL LOADS (kW) 5.	TOTAL YEARLY SALES kwh 6.	7. PAST PEAK LOAD kWh/CONS./MOS. a.	7. PAST PEAK LOAD DATE b.	DESIGN LOAD kWh/CONS./MOS. PEAK MO. 8.
PRESENT SYSTEM AS OF 12/31/97	0	1,786	11,290	10	69,831	26,500	328,396,178	2,858	1-97	2,858
LONG RANGE PLAN	0	2,220	20,000	15	174,000	40,000	665,000,000			3,266

PART II LINE MILES

ITEMS 1.	2. DISTRIBUTION 12.5/7.2 KV a.	2. DISTRIBUTION 24.9/14.4 KV b.	2. DISTRIBUTION ___ kV c.	2. DISTRIBUTION ___ kV d.	3. TRANSMISSION ___ kV a.	3. TRANSMISSION ___ kV b.	3. TRANSMISSION ___ kV c.	3. TRANSMISSION ___ kV d.
PRESENT SYSTEM AS OF	1,691	95	0	0	0	0	0	0
LONG RANGE PLAN	1,989	211	0	0	0	0	0	0

PART III SUBSTATIONS AND METERING POINTS

NAME OF LOCATION* 1.	POWER SUPPLIER 2.	3. PRESENT SYSTEM MVA a.	3. PRESENT SYSTEM kV PRIMARY b.	3. PRESENT SYSTEM kV SECONDARY c.	4. LONG RANGE PLAN MVA a.	4. LONG RANGE PLAN kV PRIMARY b.	4. LONG RANGE PLAN kV SECONDARY c.
Logan I	EKP	18.1	69	25	18.1	69	25
Clay Village	EKP	15.7	69	12.5	18.1	69	12.5
NewCastle	EKP	15.7	69	12.5	15.7	69	12.5
Campbellsburg	EKP	15.7	69	12.5	18.1	69	12.5
Bedford	EKP	15.7	69	12.5	18.1	69	12.5
Southville	EKP	7.4	69	12.5	15.7	69	12.5
Milton	EKP	4.1	69	12.5	15.7	69	12.5
Budd	EKP	18.1	69	13.2	18.1	69	13.2
Bekaert I	EKP	18.1	69	25	30.0	69	25
Logan II	EKP	15.7	69	25	30.0	69	25
Jericho	EKP	15.7	69	12.5	18.1	69	12.5
Bekaert II	EKP	15.7	69	25	30.0	69	25
Bluegrass Tie	Bluegrass EGY	1.8	25	12.5	1.8	25	12.5
Long Run	EKP	--------	--------	--------	5.6	69	25
Todds Point	EKP	--------	--------	--------	15.7	69	25
Clay Village II	EKP	--------	--------	--------	15.7	69	25
Bedford II	EKP	--------	--------	--------	15.7	69	25

PART IV INVESTMENT IN PLANT (*Thousands of Dollars*)

ITEMS 1.	TRANSMISSION LINES 2.	ALL SUBSTATIONS 3.	DISTR. TRANSFORMERS METERS 7 SERVICES 4.	ALL OTHER DISTR. FACILITIES 5.	TOTAL T & D PLANT 6.	GENERAL & PROD. PLANT 7.
PRESENT SYSTEM AS OF	0	0	$10,388,798	$23,856,863	$34,245,661	0
LONG RANGE PLAN	0	0	$35,633,598	$38,574,208	$74,207,806	

* *Include those furnished by Power Supplier and designate with asterisk.*

PURPOSE OF REPORT

This report documents the engineering analysis of, and summarizes the proposed construction for Shelby Energy Cooperative, Inc.'s (SEC) electric distribution system for the four-year planning period of 2001-2004.

The report also provides engineering support in the form of descriptions, costs and justifications of the required new facilities for a loan application to RUS in order to finance the proposed construction program.

GENERAL BASIS OF STUDY

The winter 2003 and winter 2005 projected total peak system loads were taken from the SEC 2000 Power Requirements Study (PRS) as approved by RUS. Residential and small commercial loads were grown at rates consistent with the PRS.

From 1994-1999, the annual increase in residential energy sales was 5.9%. This rate is projected to be 4.1% over the next four years. Small commercial sales are projected to increase at 2.9% over the next four years. There is a 5.7% projected increase in large commercial energy sales over the next four years.

System analysis models are based on ten-year, non-coincidental (NC) system peaks that are outlined in the PRS. The projected winter 2005 NC peak (based on PRS and GFR meeting) is 112,000 kW. The system annual load factor is projected to average 54.6% over the next four years.

Existing winter and summer growth models were examined for what is a winter-peaking system. The existing summer model was reviewed to ensure that any system deficiencies for the cooling load closely tracked the winter model. This was determined to be the case.

The SEC 1999-2018 Long Range Plan (LRP) load projections and improvement recommendations were reviewed and they generally agree with scope of the 2001-2004 CWP recommendations. A review of the LRP is included in this report.

A RUS Operations and Maintenance Survey (FORM 300) has been completed with the RUS GFR. This survey is used to determine portions of the construction required to replace physically deteriorated equipment and material, upgrade areas of the system to conform to code or safety requirements, and improve the reliability and quality of service. A copy of the survey is included in the Appendices of this report.

GENERAL BASIS OF STUDY (cont.)

A system analysis using RUS guidelines and the SEC Design Criteria was performed on all of the substations and distribution lines of the system. Milsoft Integrated Solutions' PC-Based Distribution Analysis Program – "Windmil" was used to analyze the existing system configuration that was modeled with the projected load growth.

For each deficiency that was found, alternate solutions were considered and economically evaluated.

SUMMARY - RESULTS OF PROPOSED CONSTRUCTION

Upon completion of the proposed construction, the system will provide adequate and dependable service to 13,770 residential customers as well as 12 large power loads and 381 small commercial loads. Average monthly residential usage is projected to be 1,263 kWh. It is estimated that there will be 1,300 idle services.

There are no new substations or existing station upgrades proposed during the construction work plan period.

A majority of this plan deals with the replacement of single-phase conductor. There are several three-phase conductor replacements. 133 circuit miles of conductor replacement and conversion will take place in the four-year plan period. Conductor replacement line sections were selected based on conductor condition, operational experience and the number of customers served.

Feeders out of Campbellsburg, Logan II, Clayvillage and Southville will be rebuilt or rehabilitated in order to further strengthen the backbone of the system.

The largest system improvement is a three-phase express feed from the Jericho substation into the growing Pendleton/I-71 area.

SUMMARY OF CONSTRUCTION PROGRAM AND COSTS

Shelby Energy Cooperative's distribution system was analyzed in order to identify the construction requirements needed to adequately serve the projected CWP load of 112 MW. Improvements were identified based on voltage drop, conductor loading, system reliability improvement, economic conductor analysis and operational experience. A narrative list of system improvements is located in Section IV.

A breakdown of proposed construction projects by RUS 740C codes is listed below in Table I-C-1.

Table I-C-1
System Additions and Improvements Summary

RUS Form 740C Category	Category Name	Estimated Cost
100	New Distribution Line	$4,600,000
300	Line Conversion & Replacement	$3,584,130
600	Misc. Equip & Poles	$3,263,735
700	Security Lights/SCADA	$278,270
	2001-2004 CWP TOTAL	$11,726,135

100 – New Construction planned to serve 2,300 new services.

300 – 152 miles of conductor upgrading, replacement and feeder rehabilitation.

600 – Miscellaneous distribution equipment and pole changes. This includes voltage regulators, capacitors, sectionalizing, meters, transformers, auto-transformers, pole changes and increased service capacity upgrades.

700 – Other Distribution Items - Security Lights 702 & SCADA 703.

2. *Are new technologies for improving reliability, efficiency and safety investigated and considered for implementation in your power generation, transmission and distribution system?*

Safety, reliability and efficiency are hallmarks of Shelby Energy's commitment to its member/owners. Toward fulfilling this commitment the Cooperative is continually reviewing industry applicable technologies that will enhance these vital elements of service. In our most recent four year construction work plan (CWP 2001-2004) the cooperative committed to begin installation of system control and data acquisition (SCADA) on each of its distribution feeder circuits. To date, approximately eighty percent (80%) of Shelby's distribution system SCADA is complete. Plans are to have entire SCADA coverage of the distribution system by 2006. Presently, Shelby is partnering with neighboring cooperative Owen Electric to provide 24 hour seven days a week monitoring of the SCADA system.

Additionally, Shelby along with ENVISION Energy Services has installed I-grid technology, power quality monitors in substations that serve particularly sensitive commercial and industrial loads. With this technology, the cooperative is able to respond promptly to system events that cause power quality issues.

In 2003, Shelby embarked on a project to convert its paper based mapping system to a fully digital based system. This project is scheduled for completion in 2005. It will feature open architecture with "multi-speak" capability that will enable this seamless, sub-meter accurate map of the distribution system to become a platform for distribution system modeling, plant record maintenance and outage and work management systems.

Shelby is also employing remote metering reading technology to collect monthly meter readings at remote and/or difficult to access consumer sites. While the cooperative is continuing to utilize contracted meter reading services, it is also evaluating not only the remote read ERT technology, but also the implementation of system-wide automated metering reading (AMR) technology.

East Kentucky Power Cooperative is responding on behalf of Shelby Energy Cooperative concerning the generation and transmission.

5. *Provide actual and weather-normalized annual coincident peak demands for calendar years 2000 through 2004 disaggregated into (a) native load demand, firm and non-firm; and (b) off-system demand, firm and non-firm.*

The numbers below represent firm, native load.

	Actual coincident peak demand (MW)	Temp Coef	Min. Peak Day Temp (Degrees F)	Seasonal Profile Temp (Degrees F)	Weather-normalized coincident peak demand (MW)
Dec. 2000	81	-0.64	10	2	86
Jan. 2001	82	-0.74	6	2	85
Mar. 2002	79	-0.73	11	2	85
Jan. 2003	89	-0.74	6	2	92
Jan. 2004	89	-0.72	-1	2	87

Based on Louisville Weather Station Data and Shelby Energy Hourly Load Data

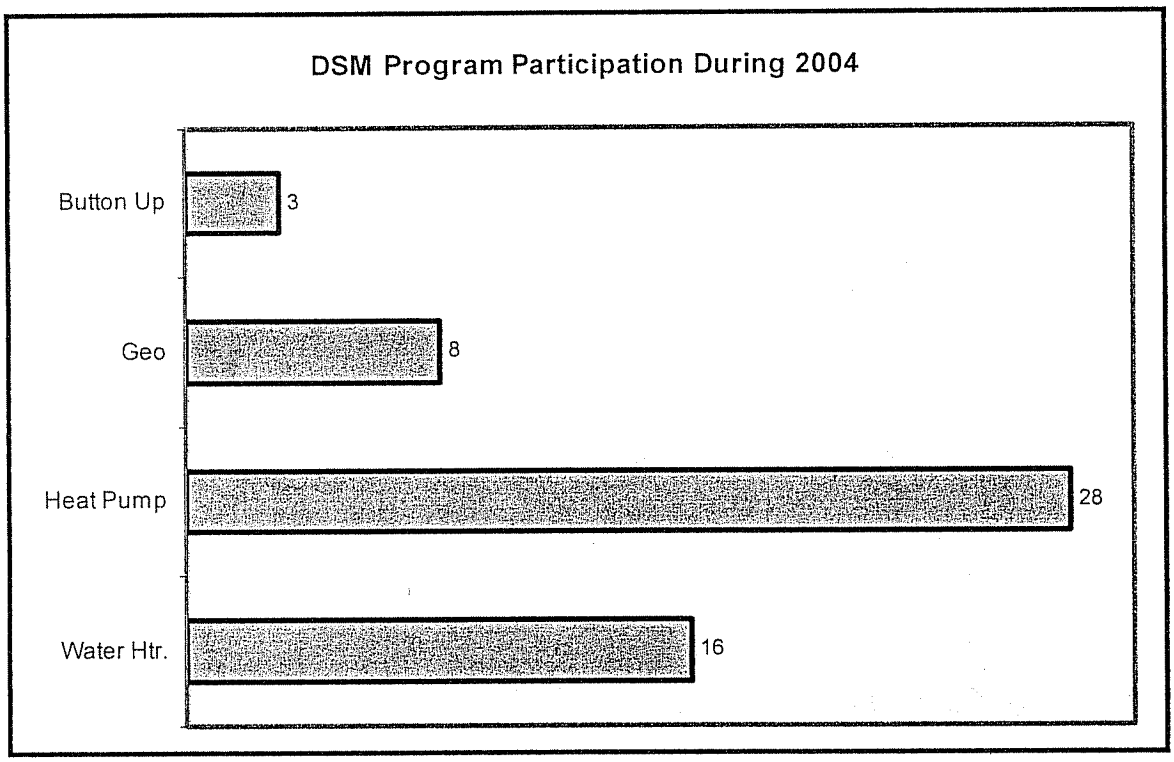
17. *Provide a summary description of your utility's existing demand-side management ("DSM") programs, which includes:*
    a. *Annual DSM budget,*
    b. *Demand and energy impacts,*
    c. *The currently scheduled termination dates for the programs.*

Shelby Energy and East Kentucky Power Cooperative work together to design DSM programs. Program implementation is done by Shelby Energy, with support by EKPC. DSM programs are exclusively residential in nature, and almost always involve HVAC or water heating efficiency measures.

DSM programs currently in place are as follows:

1. Air-Source Heat Pump Incentive
2. Button Up Weatherization
3. Electric Water Heater Incentive
4. Geothermal Heating and Cooling

In 2004, Shelby Energy had the following number of participants.



The next page summarizes the programs.

Button Up Weatherization Program

The program requires the installation of insulation materials or the use of other weatherization techniques to reduce heat loss in the home. Any retail member living in a stick-built or manufactured home that is at least two years old and which uses electric as the primary source of heat is eligible.

Air-Source Heat Pump Incentive

This program promotes efficient air-source heat pumps. The primary targets for this program are retail members building new homes in areas where natural gas heat is an option. An important secondary target is the HVAC retrofit market, offering incentives to retail members to replace electric furnaces and gas or propane heat with high-efficiency electric heat pumps.

Electric Water Heater Incentive

The electric water heater incentive is designed to encourage residential customers engaged in new construction to choose a high-efficiency electric water heater over other available options. It is also designed to encourage conversion from a fossil-fuel water heater to a high-efficiency electric water heater.

Geothermal Heating and Cooling

Traditional air-source heat pumps remove heat from the air. Geothermal heating is a heat pump that removes heat from the ground. It is a very efficient heating and cooling appliance. EKPC and its member systems pioneered the development and implementation of geothermal heating and cooling during the eighties and nineties.

Demand / Energy Impacts And Annual Budget

The table below reports program impacts. Note that this data is per installation.

	Energy Impact (kWh)	Impact On Winter Peak (kW)	Impact On Summer Peak (kW)
Button Up	(2,700)	(2.7)	(1.0)
Geothermal	(6,000)	(3.5)	(1.5)
Efficient Heat Pump In New Construction	(925)	2.5**	(1.0)
Efficient Water Heater	700**	0.2**	0.1**

** Impacts are positive due to customers who normally would have chosen natural gas

Annual budgets are a function of administrative cost and incentive payments. The table below reports EKPC administrative costs, and typical administrative costs and incentive payments by EKPC member distribution cooperatives.

	EKPC Administrative Costs	Distribution Cooperative Administrative Costs*	Incentive Payment
Button Up	$32	$163	Up to $600
Geothermal Energy Home	$17	$254	$900
Efficient Heat Pump In New Construction	$13	$182	$300
Efficient Water Heater	$8	$61	$200

*These costs are averages of all participating member distribution cooperatives, and vary by distribution cooperative.

For a more in depth discussion of EKPC and member distribution cooperative DSM programs, please see Administrative Case No. 2003-00051, Appendix II.

18. *Provide your utility's definition of "transmission" and "distribution".*

Transmission is power lines operating at voltages in excess of 25KV.

Distribution is power lines operating at voltages of 25KV or less.

Distribution for Shelby Energy is defined as those facilities we own beyond the low-side of EKPC's distribution substation.

19. *Identify all utilities with which your utility is interconnected and the transmission capacity at all points of interconnection.*

Shelby Energy has a distribution tie with Bluegrass Energy system. Since each utility is served by EKPC there is no interconnection with other utilities.

East Kentucky Power Cooperative is responding on behalf of Shelby Energy Cooperative concerning the transmission.

20. *Provide the peak hourly MW transfers into and out of each interconnection for each month of the last 5 years. Provide the date and time of each peak.*

East Kentucky Power Cooperative is responding on behalf of Shelby Energy Cooperative.

21. *Identify any areas on your utility's system where capacity constraints, bottlenecks or other transmission problems have been experienced from January 1, 2003 until the present date. Identify all incidents of transmission problems by date and hour, with a brief narrative description of the nature of the problem. Provide the MW transfers for each of your utility's interconnections for these times.*

East Kentucky Power Cooperative is responding on behalf of Shelby Energy Cooperative.

22. *Provide details of any planned transmission capacity additions for the 2005 through 2025 period. If the transmission capacity additions are for existing or expected constraints, bottlenecks, or other transmission problems, identify the problem the addition is intended to address.*

East Kentucky Power Cooperative is responding on behalf of Shelby Energy Cooperative.

23. *Is your utility researching or considering methods of increasing transmission capacity of existing transmission routes? If yes, discuss those methods.*

East Kentucky Power Cooperative is responding on behalf of Shelby Energy Cooperative.

24. *Provide copies of any reports prepared by your utility or for your utility that analyze the capabilities of the transmission system to meet present and future needs for import and export of capacity.*

East Kentucky Power Cooperative is responding on behalf of Shelby Energy Cooperative.

25. *Provide the following transmission energy data forecast for the years 2005 through 2025.*

a. *Total energy received from all interconnections and generation sources connected to your transmission system.*

b. *Total energy delivered to all interconnections on your transmission system.*

c. *Peak demand for summer and winter seasons on your transmission.*

East Kentucky Power Cooperative is responding on behalf of Shelby Energy Cooperative.

26. *Provide the yearly System Average Interruption Duration Index ("SAIDI") and the System AverageInterruption Frequency Index ("SAIFI"), excluding major outages, by feeder for each distribution substation on your system for the last 5 years.*

Refer to attachments 26.1 and 26.2

26.1

2000-2004 Entire System
MAJOR STORMS NOT INCLUDED

YEAR	SAIDI	SAIFI
2000	3.68	1.69
2001	2.32	1.27
2002	1.61	0.85
2003	1.30	0.76
2004	1.10	0.80

Outages by feeder for each distribution substation are not available for years 2000-2003.

Refer to 26.2 for outage by feeder for each distribution substation for year 2004.

26.2

2004
MAJOR STORMS NOT INCLUDED

SUB	FEEDER	SAIDI	SAIFI
1	2	2.15	1.42
1	3	4.22	2.59
1	4	0.10	0.14
2	1	0.37	0.38
2	2	2.90	1.32
2	3	0.77	1.74
2	4	1.20	0.66
2	5	0.18	0.11
3	1	0.31	0.28
3	2	1.81	1.55
3	3	0.56	0.58
4	1	1.47	0.61
4	2	1.52	0.61
4	3	0.39	0.28
4	4	0.58	0.40
5	1	1.30	0.88
5	2	0.90	0.54
5	3	0.54	0.48
5	4	1.51	0.83
6	1	1.15	1.33
6	2	1.15	0.62
6	3	0.55	0.23
7	1	1.45	0.61
7	2	0.53	0.32
7	3	1.17	0.63
7	4	5.48	2.11
8	1	1.84	2.00
9	1	0.00	0.00
9	2	0.75	1.00
10	1	0.15	0.16
11	1	1.09	0.57
11	2	0.54	0.42
11	3	0.42	0.37
12	1	0.00	0.00
12	2	0.00	0.00
12	3	0.00	0.00
13	1	0.00	0.00
13	2	2.45	2.95
BG FEED	1	3.46	2.38

27. *Provide the yearly SAIDI and SAIFI, including major outages, by feeder for each distribution substation on your system for the last 5 years. Explain how you define major outages.*

Refer to attachments 27.1 and 27.2.

Major outages are outages with consumer hours greater than 10,000 or declared by FEMA.

27.1

2000-2004 Entire System
MAJOR STORMS INCLUDED

YEAR	SAIDI	SAIFI
2000	3.68	1.69
2001	3.28	1.42
2002	1.61	0.85
2003	3.57	1.09
2004	3.99	1.16

Outages by feeder for each distribution substation are not available for years 2000-2003.

Refer to 27.2 for outages by feeder for each distribution substation for year 2004.

27.2

2004
MAJOR STORMS INCLUDED

SUB	FEEDER	SAIDI	SAIFI
1	2	5.58	1.92
1	3	4.70	2.67
1	4	1.24	0.50
2	1	0.58	0.43
2	2	6.21	1.73
2	3	11.05	3.45
2	4	10.37	1.41
2	5	44.58	6.11
3	1	1.74	0.41
3	2	5.17	1.79
3	3	2.05	0.79
4	1	3.13	0.78
4	2	2.33	0.73
4	3	5.24	1.67
4	4	1.61	0.55
5	1	1.60	0.91
5	2	2.00	0.68
5	3	2.74	0.70
5	4	4.23	1.18
6	1	4.09	1.49
6	2	13.19	1.66
6	3	10.25	0.88
7	1	1.45	0.61
7	2	0.53	0.32
7	3	1.66	0.69
7	4	5.54	2.11
8	1	1.84	2.00
9	1	0.00	0.00
9	2	0.75	1.00
10	1	0.44	0.25
11	1	2.35	0.74
11	2	7.63	1.56
11	3	2.05	0.63
12	1	0.00	0.00
12	2	0.00	0.00
12	3	0.00	0.00
13	1	0.00	0.00
13	2	3.19	3.01
BG FEED	1	37.08	4.45

28. *What is an acceptable value for SAIDI and SAIFI? Explain how it was derived.*

Refer to attachments 28.1 – 28.3.

28.1

Shelby Energy Cooperative Inc. has not formally defined acceptable values for SAIDI and SAIFI.

The attached EPRI and Cooper Power Systems information has been reviewed in the past.

total number of customer interruptions

approaches 8 to 10MVA, outage rates increase to unsatisfactory levels.

COOPER POWER SYSTEMS

Reclosers

Reference Data

R280-90-7

Analysis of Distribution System Reliability and Outage Rates

RELIABILITY ANALYSIS

Reference Data R280-90-7 provides information on methods to measure and improve distribution system reliability and outage rates. Standard indices are described that are used to measure distribution system reliability and calculate improvements. Outage rates goals are discussed and examples of various types of distribution systems are provided, showing logical switchgear applications that will reduce outage rates and improve overall system operation.

Transient and permanent faults are defined and discussed. Transient fault protection schemes including reclosers and fuses for sectionalizing feeder lines and taps are discussed. The difference in fault protection philosophy for overhead versus underground systems is examined. Additional reliability improvements are discussed that can be obtained through system automation by remote identification of faulted sections, coupled with remote switching to isolate the fault and restore service to the rest of the line.

PERFORMANCE INDICES

For discussion of outage rates, performance indices are frequently used as described in the EPRI report EL-2081, Volume 2, Project 1356-1, pages 3-3 and 3-4. Use of these "standard" indices will permit meaningful comparison between utilities or between different divisions of a given utility, and perhaps most importantly, allow evaluation of system changes by a direct comparison of past and future performance of a feeder or system as changes are made. These standard indices are defined as follows:

System Average Interruption Frequency Index (SAIFI)

Defines the average number of times that a customer's service is interrupted during a year. A customer interruption is defined as one interruption to one customer.

$$\text{SAIFI} = \frac{\text{total number of customer interruptions}}{\text{total number of customers served}}$$

System Average Interruption Duration Index (SAIDI)

Defines the average interruption duration per customer served per year.

$$\text{SAIDI} = \frac{\text{sum of customer interruption durations}}{\text{total number of customers}}$$

Customer Average Interruption Frequency Index (CAIFI)

Defines the average number of interruptions per customer interrupted per year.

$$\text{CAIFI} = \frac{\text{total number of customer interruptions}}{\text{total number of customers affected}}$$

Customer Average Interruption Duration Index (CAIDI)

Defines the average interruption duration for those customers interrupted during a year.

$$\text{CAIDI} = \frac{\text{sum of customer interruption durations}}{\text{total number of customer interruptions}}.$$

Average Service Availability Index (ASAI)

Defines the ratio of the total number of customer hours that service was available during year, to the total customer hours demanded. (customer hours demanded = 24 hours/day x 365 days = 8760 hours)

$$\text{ASAI} = \frac{8760 - \text{SAIDI}}{8760}$$

For example, a SAIDI of 1.0 hours per year.

$$\text{ASAI} = \frac{8760 - 1.0}{8760} = 99.989\%$$

OUTAGE RATE GOALS

For the purposes of this discussion an outage is defined as any loss of service for more than a normal reclosing interval. Many utilities define an outage as loss of service for more than two minutes.

Urban and Rural Systems

Outage rate goals will vary depending upon the nature of the distribution system. Urban systems typically have less line exposure than rural systems. As a result, urban systems experience fewer outages per year than rural systems.

Typical outage rate goals for urban and rural distribution systems are to limit outages to an average of 1.0 (urban) and 1.5 (rural) outages per year (SAIFI). With each outage lasting an average duration of 1 hour (CAIDI), the average annual interruption is 1.0 hours for urban systems and 1.5 hours for rural distribution systems.

Table 1
Typical Utility Outage Rate Goals

Index	System Type	Operating Goal
SAIFI	Urban	1.0 Outages Per Year
SAIFI	Rural	1.5 Outages Per Year
CAIDI	Rural/Urban	1.0 Hours Per Outage
SAIDI	Urban	1.0 Outage Hours Per Year
SAIDI	Rural	1.5 Outage Hours Per Year
ASAI	Urban	99.989% Annual Service Availability
ASAI	Rural	99.983% Annual Service Availability

Many utilities have found that their service reliability deteriorated significantly when they converted to a higher distribution voltage (for example; 4kV to 13kV). The higher distribution voltage allowed them to service longer feeder lengths and more customers with a given feeder. However, each outage that occurred affected more customers and the longer feeders required more patrol time to locate the fault.

To restore service reliability, the first step is to sectionalize each feeder into smaller sections, limiting the number of customers affected by a given outage and reducing the patrol time needed to locate and repair the fault. Operating experience of a number of utilities that have adopted this sectionalizing practice has suggested that an optimum feeder segment is 3 to 5 MVA. As the load of a line segment approaches 8 to 10 MVA, outage rates increase to unsatisfactory levels.

28.3 reliability indices from a number of sources, including the Internet, utilities, and public service commissions. Next, they analyzed the data in order to evaluate long-term trends, year-to-year variability, and the impact of major events on SAIFI and SAIDI values.

*

1.78 hrs

Results

Data from 24 states and 65 utilities, spanning from 1992 to 2001, was analyzed to track the trend of distribution reliability in the United States. Key findings from this analysis follow:

- The 10-year average of SAIDI for all the utilities that exclude major events in their reporting is 107 minutes. This signifies that on average, a customer is expected to experience 107 minutes of sustained interruptions in a given year. Inclusion of major events increases the SAIDI indices on average by 100 percent to a maximum of 1200 percent.

- The 10-year average of SAIFI for all the utilities that exclude major events in their reporting is 1.1. This signifies that on average, a customer is expected to experience 1.1 sustained interruption events in a year. Inclusion of major events increases the SAIFI indices on average by 23 percent to a maximum of 109 percent.

A trend analysis was conducted using data from 1997 to 2001. In this analysis, the 75th percentile showed a decreasing year-to-year trend of SAIFI from 1998 to 2001, but an increasing year-to-year trend of SAIDI from 1997 to 2000 that was reversed in 2001. No noticeable upward or downward trend appeared for the 50th percentile of either SAIFI or SAIDI.

Year-to-year variability of a utility's reliability indices was quantified using the normalized standard deviation index, which is the ratio of standard deviation to mean. In this analysis, the median value of normalized standard deviation for SAIDI is 20.8 percent. Inclusion of major events in the reporting increased this variability to 65.4 percent. Moreover, the median value of normalized standard deviation for SAIFI is 16.6 percent. Inclusion of major events in the reporting increased this variability to 22.3 percent.

EPRI Perspective

Distribution reliability indices are universally used as a performance measure for distribution service quality. EPRI's distribution reliability tracking project is helping to explain the trend and evaluate the variability of these performance indicators, while examining the impact of major events on such indicators. EPRI is leading the effort through its Security, Quality, Reliability, and Availability (SQRA) Program to establish future performance indicators that more closely resemble customer perception of service quality.

Program

2004 Program SST501 Strategic Science & Technology
2004 Program 003.0 Power Quality Solutions for Transmission and Distribution

History

2003 Program 003.0 Power Quality Solutions for Transmission and

29. *Provide the yearly Customer Average Interruption Duration Index ("CAIDI") and the Customer Average Interruption Frequency Index ("CAIFI"), including and excluding major outages, on your system for the last five years. What is an acceptable value for CAIDI and CAIFI? Explain how it was derived.*

Refer to attachment 29.

29.

YEAR	CAIDI (Inc. Storm)	CAIFI (Inc. Storm)	CAIDI (No Storm)	CAIFI (No Storm)
2000	2.18 hours	N/A*	2.18 hours	N/A*
2001	2.31 hours	N/A*	1.83 hours	N/A*
2002	1.88 hours	N/A*	1.88 hours	N/A*
2003	3.27 hours	N/A*	1.69 hours	N/A*
2004	3.45 hours	N/A*	1.38 hours	N/A*

*- "Total Number of Customers Affected is Not Computed by Shelby Energy Cooperative Inc.

The Cooper Power Systems Reference R280-90-7 indicates that 1.0 Hours per Outage is a typical goal for CAIDI.

30. *Identify and describe all reportable distribution outages from January 1, 2003 until present date. Categorize the causes and provide the frequency of occurrence of each cause category.*

See attached letter of notification sent to the Public Service Commission on July 14, 2004 for a major wind storm that occurred July 13 and 14, 2004.

Shelby Energy Cooperative, Inc.

Your Touchstone Energy® Partner

To: Gary Grubbs
PSC

From: David Graham
System Technical Engineer

Date: July 14, 2004

Total 591 members without power. 274 members without power for over 4 hours.

www.shelbyenergy.com
620 Old Finchville Road • Shelbyville, Kentucky 40065-1714
Shelby Co. (502) 633-4420 • Trimble Co. (502) 255-3260 • Henry Co. (502) 845-2845

31. *Does your utility have a distribution and/or transmission reliability improvement program?*

- *a.* *How does your utility measure reliability?*
- *b.* *How is the program monitored?*
- *c.* *What are the results of the system?*
- *d.* *How are proposed improvements for reliability approved and implemented?*

While Shelby Energy does not have a distribution reliability program in "title", never the less the cooperative has many initiatives that are targeted at tracking and improving the reliability of its distribution system. Again, these initiatives are summarized and coordinated through the cooperative's system planning efforts, namely the long range plan and construction work plan documents.

Reliability is tracked and measured through careful analysis of system outage reports, feedback from operations and engineering personnel as well as the use of "event recorders" at each of the cooperative's critical substations. Consumer feedback is useful in this area as well. Shelby Energy has an active key accounts program where communication with commercial and industrial consumers is valued and is considered vital not only to the success of the cooperative, but also and even more importantly to the success of the consumer.

Repeated events (oil circuit recloser operations, blown fuses, etc.) are investigated and targeted for corrective action. Corrective action can vary depending upon the situation, but can range from "hot spot" tree trimming, protective device maintenance, replacement and/or repair to full scale conductor replacement. Again, each event is evaluated as a function of the cooperative's engineering planning process with replacement projects scheduled such that a balance is struck as much as possible between degree of reliability enhancement for the dollars spent.

32. *Provide a summary description of your utility's:*

a. Right-of-way management program. Provide the budget for the last 5 years.

b. Vegetation management program. Provide the budget for the last 5 years.

c. Transmission and distribution inspection program. Provide the budget for the last 5 years.

a. Right-of-way management program.

2000	$437,343.43
2001	$385,844.81
2002	$412,749.00
2003	$430,792.29
2004	$523,218:29

b. Vegetation management program.

2000	$42,134.00
2001	$29,510.00
2002	$36,414.00
2003	$25,276.61
2004	$3,283.20

c. Distribution inspection program. (Ground Patrolling and Pole Treating)

2000	$29,891.88
2001	$24,767.00
2002	$22,844.00
2003	$68,709.48
2004	$29,496.53

East Kentucky Power Cooperative will be responding to the transmission inspection program on behalf of Shelby Energy Cooperative.

33. *Explain the criteria your utility uses to determine if pole or conductor replacement is necessary. Provide costs/budgets for transmission and distribution facilities replacement for the years 2000 through 2025.*

A number of factors enter into the criteria that Shelby uses in determining when replacement and improvement of existing distribution plant facilities are necessary. Input is received from operations personnel, annual ground and aerial patrol reports, analyses of outage records and annual operations and maintenance reviews with RUS field representative(s). All of this information on system performance is distilled into a design criteria that becomes the basis for project evaluation and planning in the Cooperative's 20 year, long range plan, and subsequent four year construction work plans and annual work plans and budgets. An example of this criteria found in the Cooperative's 1997-2000 four year construction work plan included the following:

"Conductors and associated poles and hardware will be considered for replacement if any of the following conditions exist:

a. More than 3 outages or 10 outage-hours per year (excluding major storm and power supplier) for two out of the past three years.
b. Conductors with an average of greater than one splice per phase conductor per span in one mile increments.
c. Ordinary replacement of old, deteriorated conductor on a systematic basis.
d. A significant amount of load that is served by aged, faulty conductor will be considered for re-feeding if a more efficient route on existing right-of-way can be found.
e. Poles and/or crossarms to be replaced if found to be physically deteriorated by visual inspection and/or other testing methods."

(SEE ATTACHED SUPPORTING DOCUMENTS - EXHIBIT "A")

East Kentucky Power Cooperative is responding on behalf of Shelby Energy Cooperative concerning the transmission.

SPECIFIC SYSTEM CRITERIA
SHELBY RECC
CONSTRUCTION WORK PLAN
1997 - 2000

1. The minimum primary voltage on the system - referred to the 120 volt secondary - is 118 volts. Downline voltage regulation will be limited to one set of regulators for any given circuit.

2. Primary conductors will not be loaded over 75% of their thermal rating.

3. The following equipment will have a minimum loading not to exceed the nameplate percentages below:

a.	Distribution Transformers	130% winter; 100% summer
b.	Regulators	130% winter; 100% summer
c.	Step Voltage Transformers	130% winter; 100% summer
d.	Reclosers	80% winter; 80% summer
e.	Line Fuses	80% winter; 80% summer

4. Conversions to multiphase are to correct voltage drop and phase balance. Line sections operating at 12.5/7.2 kV with load currents exceeding 40 amps, 24.9/14.4 kV lines with load currents exceeding 35 amps and lines sections with greater than 60 customers will be considered for multiphasing. Operating and engineering practices used to develop the loading criteria are based on a single phase line interruption that may cause operation of the ground trip relay on three phase oil circuit reclosers.

5. Three phase tie points between substations should be equipped with air break switches.

6. Conductors and associated poles and hardware will be considered for replacement if any of the following conditions exist:

   a. More than 3 outages or 10 outage hours per year excluding major storms and power supplier for two out of the past three years.

   b. Conductors with an average of greater than one splice per phase per span in one mile increments.

   c. Ordinary replacement of old, deteriorated conductor on a systematic basis.

   d. A significant amount of load that is served by aged, faulty conductor will be considered for refeeding if a more efficient route on existing right of way can be found.

7. Poles and/or crossarms to be replaced if found to be physically deteriorated by visual inspection or testing.

8. Standard conductor sizes evaluated by economic conductor analysis. The standard conductor sizes include the following:

OVERHEAD	UNDERGROUND
#2 ACSR	1/0 ALUG
1/0 ACSR	4/0 ALUG
4/0 ACSR and 336.4 ACSR	

9. All new primary construction is to be overhead except where underground conductor is required to comply with governmental or environmental regulations, local restrictions, design necessities, or favorable economics.

10. All new construction is to be designed and built according to RUS standard construction specifications and guidelines.

11. Capacitors placed on the system to maintain 90% power factor during system peak with an emphasis on correction to 95% correction as economics dictate.

12. Conductors and associated poles and hardware will be rebuilt or relocated if they present a potential hazard, are found to be unsafe, or fail to meet the applicable NESC requirements.

13. Consider the installation of dual voltage, 7.2 X 14.4 kV transformers on all new construction in areas that are designated for voltage conversion within the next load block of the Long Range System Plan.

14. Adjoining substations should have reserve capacity equal to the peak projected load transfer between them.

15. All substations should be equipped with a low-side bypassing scheme that will allow any given circuit recloser to be bypassed for maintenance while an adjacent recloser feeds the circuit through the bus system.

16. New substations metering should be equipped with a bypassing mechanism.

17. EKP member distribution cooperatives and other foreign utility interconnections should be considered in fringe areas of the system as an alternative to other types of present and future system improvements. This will be coordinated through East Kentucky Power.

18. A transmission loop through the system should be continuously evaluated based on developing loads and historical power supplier outage data. This will be evaluated with East Kentucky Power.

19. Per the NESC requirements, idle services shall be maintained or retired. Services that have been idle for more than two years should be evaluated for future use. If no use is foreseen, the service should be retired.

20. Fused cutouts and lightning arresters should be added to all existing CSP transformers on the three phase portion of the system between the substation and the first set of downline circuit reclosers.

21. All single phase taps that are between a three phase circuit recloser and the first set of downline, single-phase reclosers should be fused.

22. All outgoing conductor from 12 kV substations will be 336 ACSR or larger.
All outgoing conductor from 25 kV substations will be 4/0 ACSR or larger.

23. When a new substation is constructed or a second substation transformer is placed in an existing substation site, additional circuits will be needed in order to adequately distribute the new and/or additional substation capacity.

FINANCIAL CRITERIA

- *Cost of Capital = 4.98%*
- *Inflation = 3.5%*
- *Compound Annual Load Growth = 6.0%*
- *Increase in Cost of Power = 2.8%*
- *Present Worth Discount Factor = 4.98%*
- *Depreciation = 3.08%*
- *O & M = 4.87%*
- *Tax & Ins = 1.15%*
- *TOTAL ANNUAL FIXED CHARGE RATE = 14.08%*

SYSTEM CRITERIA DEFICIENCIES

SUBSTATION	CIRCUIT	SECTION	DEFICIENCY #	CORRECTIVE ACTION
Logan I	3	727	4	Convert to 3ph 1/0 conductor.
Logan I	4	451-455	1	Add 3 voltage regulators (VR) to 462.
Clayvillage	3	369, 374,128	1 and 4	Vph 1.1 mi of 128 and Vph 375 and 897 and refeed sections 374 and 369.
Clayvillage	4	414-417	1	Add (1) VR on 417 defer Vph conv.
New Castle	1	244-251	1	Add (2) VRs on 141.
New Castle	2	826, 273, 277	1	Move (2) VRs from 827 to 826 (add 3rd).
New Castle	2	295	1	Add (1) VR on 297.
New Castle	3	333	1 and 4	3ph 2ACSR 333.
Campbellsburg	1	208-210, 212	1 and 4	Vph 2ACSR 210, refeed 211 from 212
" "	"	765, 211-214	" "	and add (1) VR on 766.
Campbellsburg	2	139-141	1	Add (1) VR on 141.
Campbellsburg	2	238-240 & 861	1	Add (1) VR on 243.
Campbellsburg	2	129, 131, 136	1	Add (1) VR on source of 131.
Bedford	1	49	1 and 4	Vph 2ACSR 1.1 mi of 49.
Bedford	1	55-57, 62	1 and 4	3ph 1/0ACSR 62 & 63, Vph 2ACSR 747 refeed 61 to relieve 65.
Bedford	4	99-101	1	Refeed from 98 out of Milton Sub.
Bedford	4	80-84	1	Add (3) VRs on 635.
Milton	4	28 & 30	4	No changes made. Discussed with Operations and no problems with overload.
Bekaert I & II	3 & 5	955, 956, 957 & 960	23	Build 0.6 miles of DCT Bundled 4/0 conductor and 0.6 miles of single CKT Bundled 4/0 conductor both on existing structures to distribute the Bekaert II capacity upgrade.

SUBSTATION	CIRCUIT	SECTION	DEFICIENCY #	CORRECTIVE ACTION
Jericho	1	179, 166, 180	1	Add (3) VRs to 796.
Jericho	1 & 2	964 & 965	23	Convert 1.0 mile to 336 ACSR DCT out of Jericho sub toward toward the Pendleton load center.
Jericho	3	320 & 821	22	Build 1 mile of 336 ACSR along with the above VR on 796 and defer 8 miles of 336 ACSR construction. This will begin a 336 link between Jericho & Logan L

*NOTE: Category 6 deficiencies are outlined in the Cost Summary. They are discussed in the Aged Plant Report in section III-G.

DISTRIBUTION SYSTEM DESIGN CRITERIA 2001 - 2004 CWP

Each of the following criteria items were reviewed and accepted by the RUS General Field Representative on October 19, 2000.

1) The minimum voltage on primary distribution lines is 118 volts (120 volt base, 126 volts at source) after re-regulation. Cascading of distribution voltage regulators is not an acceptable improvement.

2) Primary conductors are not to be loaded over 75% of their thermal rating.

3) The following equipment will not be thermally loaded by more than the percentage shown:

a) Distribution Transformers	130% winter; 100% summer
b) Voltage Regulators	130% winter; 100% summer
c) Step Voltage Transformers	130% winter; 100% summer
d) Reclosers and Fuses	80% winter; 80% summer

4) Conversions to multiphase are to correct voltage drop and phase balance. Line sections operating at 12.5/7.2 kV with load currents exceeding 45 amps will be considered for multiphasing. 24.9/14.4 kV lines with load currents exceeding 40 amps will be considered for multiphasing. Line sections with greater than 60 customers will be considered for multiphasing. Operation and engineering practices used to develop the loading criteria are based on a single phase line interruption that may cause an operation of the ground trip relay on three phase oil circuit reclosers.

5) Three phase tie points between substations should be equipped with air break switches.

6) Conductors and associated poles and hardware will be considered for replacement on a priority basis as defined below:

   1. Replace all 8 ACWC.
   2. Replace 6 ACWC and #4 ACSR.
   3. URD cable as needed.

7) Poles and/or crossarms are to be replaced if found to be physically deteriorated by visual inspection or testing.

8) Primary distribution lines are to be rebuilt and/or relocated if they are found to be unsafe or fail to meet applicable National Electric Safety Code standards.

9) All new construction is to be designed and built according to RUS standard construction specifications and guidelines.

10) Capacitors are placed on the system to maintain 90% power factor during system peak with and emphasis on correction to 95% as economics dictate.

11) New primary conductor sizes are to be determined on a case by case basis using the Economic Conductor Analysis method. The proposed conductor sizes may be modified to conform to the cooperative's standard sizes and recommendations of the Long Rang Plan. The standard Overhead conductor sizes are #2 ACSR, 1/0 ACSR, 4/0 ACSR and 336.4 ACSR. The standard Underground conductor sizes are 1/0 ALUG, 4/0 ALUG, and 500 MCM ALUG.

12) Substation feeders will be limited to a 250 amp loading level. Feeders reaching this limit shall have load switched or an additional substation feeder will be installed.

13) All outgoing feeders from 12.5 kV substations will be 4/0 ACSR or larger. All outgoing feeders from 25 kV substations will be 4/0 ACSR or larger.

2005 Work Plan

Shelby Energy Cooperative, Inc.
Shelbyville, Kentucky

Section 1

Additions to Distribution Plant - 2005

		Quantity	Cost/Unit	2005 Estimate		Percent of Total
A.	**New Member Extensions**					
	Residential and Commerical Customers	500	$2,000	$1,000,000		
	Distribution Transformers	350	550	192,500		
	Meters and Meter Sockets	500	60	30,000		
					$1,222,500.00	**42.33%**
B.	**Increased Service Capacity**					
	Service and Secondary Upratings	50	1,000	50,000		
	Distribution Transformers	125	550	68,750		
					$118,750.00	**4.11%**
C.	**Poles Added for Clearance and Reliability Initiative**					
	Poles	25	1,100	27,500		
					$27,500.00	**0.95%**
D.	**Line Conversions, Conductor Replacements and Feeder Rehabs**					
	See Next Page for Details...			1,231,985		
					$1,231,985.00	**42.66%**
E.	**Ordinary Replacements**					
	Pole Changes	90	1,400	126,000		
					$126,000.00	**4.36%**
F.	**Other Equipment**					
	Security Lights	120	400	48,000		
	Single Phase Oil Circuit Recloser (OCR)	20	2,000	40,000		
	Fused Cutouts & Lightning Arresters	100	250	25,000		
	SCADA	4	12,000	48,000		
					$161,000.00	**5.58%**
	Total Additions to Distribution Plant - 2005				**$2,887,735.00**	**100.00%**

2005 Work Plan

D. Line Conversions/Conductor Replacements - RUS Code 300

Project No.	Line Section(s)	Substation	Total Length	Description	Total Est. Cost	Comments
315	477	Logan 1	1.00	1 Ph./2 Ph. Conversion-#2 ACSR	27,700.00	Figgs Store Rd. Shelby (C/O fm 03)
316	473	Logan 1	0.60	1 Ph./2 Ph. Conversion-#2 ACSR	16,620.00	Locust Grove Rd. Shelby (C/O fm 03)
316	473	Logan 1	1.50	1 Ph.Conductor Rplcmt.-#2 ACSR	27,750.00	Locust Grove Rd. Shelby (C/O fm 03)
317	476	Logan 1	2.10	1 Ph. Conductor Rplcmt.-#2 ACSR	38,850.00	Donahue&HaleyRd. Shelby (C/O fm 03)
320	489	Logan 1	3.00	1 Ph./2 Ph. Conversion-#2 ACSR	85,500.00	KY Hwy. 148W, Fisherville Rd. Shelby
322	393	C-Village	0.60	1Ph./ 2Ph. Conversion-#2 ACSR	17,100.00	Christianburg-Cropper Rd. Shelby
326	341, 342	C-Village	1.70	1 Ph. Conductor Rplcmt.-#2 ACSR	32,300.00	Moody Pike Shelby
327	364	C-Village	2.50	1 Ph. Conductor Rplcmt.-#2 ACSR	47,500.00	KY Hwy. 395N, Elmburg Rd. Shelby
328	757	C-Village	1.20	1 Ph.Conductor Rplcmt.-#2 ACSR	22,800.00	Bob Rogers Rd. Shelby
365	366	C-Village	3.40	1 Ph. Conductor Rplcmt.-#2 ACSR	64,600.00	Vigo Rd., Consolation to Hatton Shelby
332	232, 235	C-Burg	3.60	3 Ph. Circuit Rehab.-#2 CU	36,000.00	KY55N-KY316, Providence, Henry&Trimble
333	150, 153, 154, 158	C-Burg	4.20	3 Ph. Circuit /Rehab.-#2 CU	42,000.00	Orem Lane Henry
334	234	C-Burg	2.00	1 Ph. Conductor Rplcmt.-#2 ACSR	37,000.00	Providence-Louden Rds. Trimble (C/O fm 03)
343	55, 59	Bedford	7.50	1 Ph. Conductor Rplcmt.-#2 ACSR	142,500.00	Mt. Herman Ch.&Wrights Ridge Rds. Trimble
348	506	Southville	4.30	1 Ph. Conductor Rplcmt.-#2 ACSR	79,550.00	Backcreek Rd. Shelby (C/O fm 03)
357	449	Logan 2	1.40	1 Ph. Conductor Rplcmt.-#2 ACSR	26,600.00	Hinkle Ln. Shelby
368A	548, 504...499	Southville	9.30	1 Ph. & 2 Ph. Cond. Rplmt.-#2 ACSR	188,610.00	Pearidge to Catridge Shelby (C/O fm 03)
TOTALS:			**49.90**	miles	**$932,980.00**	

All projects listed herein are carried over from prior years of 2001-2004 four-year Construction Work Plan.
'A' Denotes amendment to Construction Work Plan

2004 Work Plan

Shelby Energy Cooperative, Inc.
Shelbyville, Kentucky

Section 1

Additions to Distribution Plant - 2004

		Quantity	Cost/Unit	2004 Estimate		Percent of Total
A.	New Member Extensions					
	Residential and Commerical Customers	500	$2,000	$1,000,000		
	Distribution Transformers	275	650	178,750		
	Meters and Meter Sockets	500	60	30,000		
					$1,208,750.00	36.81%
B.	Increased Service Capacity					
	Service and Secondary Upratings	50	1,000	50,000		
	Distribution Transformers	150	650	97,500		
					$147,500.00	4.49%
C.	Poles Added for Clearance and Reliability Initiative					
	Poles	100	1,100	110,000		
					$110,000.00	3.35%
D.	Line Conversions, Conductor Replacements and Feeder Rehabs					
	See Next Page for Details...			1,567,305		
					$1,567,305.00	47.72%
E.	Ordinary Replacements					
	Pole Changes	150	450	67,500		
					$67,500.00	2.06%
F.	Other Equipment					
	Security Lights	150	300	45,000		
	Single Phase Oil Circuit Recloser (OCR)	20	2,000	40,000		
	Fused Cutouts & Lightning Arresters	200	250	50,000		
	SCADA	4	12,000	48,000		
					$183,000.00	5.57%
	Total Additions to Distribution Plant - 2004				$3,284,055.00	100.00%

2004 Work Plan

D. Line Conversions/Conductor Replacements - RUS Code 300

Project No.	Line Section(s)	Substation	Total Length	Description	Total Est. Cost	Comments
315*	477	Logan 1	1.00	1 Ph./2 Ph. Conversion-#2 ACSR	27,700.00	Figgs Store Rd. Shelby (C/O fm 03)
316*	473	Logan 1	0.60	1 Ph./2 Ph. Conversion-#2 ACSR	16,620.00	Locust Grove Rd. Shelby (C/O fm 03)
316*	473	Logan 1	1.50	1 Ph.Conductor Rplcmt.-#2 ACSR	27,750.00	Locust Grove Rd. Shelby (C/O fm 03)
317*	476	Logan 1	2.10	1 Ph. Conductor Rplcmt.-#2 ACSR	38,850.00	Donahue&HaleyRd. Shelby (C/O fm 03)
320	489	Logan 1	3.00	1 Ph./2 Ph. Conversion-#2 ACSR	85,500.00	KY Hwy. 148W, Fisherville Rd. Shelby
322	393	C-Village	0.60	1Ph./ 2Ph. Conversion-#2 ACSR	17,100.00	Christianburg-Cropper Rd. Shelby
326	341, 342	C-Village	1.70	1 Ph. Conductor Rplcmt.-#2 ACSR	32,300.00	Moody Pike Shelby
327	364	C-Village	2.50	1 Ph. Conductor Rplcmt.-#2 ACSR	47,500.00	KY Hwy. 395N, Elmburg Rd. Shelby
328	757	C-Village	1.20	1 Ph.Conductor Rplcmt.-#2 ACSR	22,800.00	Bob Rogers Rd. Shelby
365	366	C-Village	3.40	1 Ph. Conductor Rplcmt.-#2 ACSR	64,600.00	Vigo Rd., Consolation to Hatton Shelby
332*	232, 235	C-Burg	3.60	3 Ph. Circuit Rehab.-#2 CU	36,000.00	KY55N-KY316, Providence, Henry&Trimble
333	150, 153, 154, 158	C-Burg	4.20	3 Ph. Circuit /Rehab.-#2 CU	42,000.00	Orem Lane Henry
334	234	C-Burg	2.00	1 Ph. Conductor Rplcmt.-#2 ACSR	37,000.00	Providence-Louden Rds. Trimble (C/O fm 03)
340*	90, 91, 92	Bedford	7.00	1 Ph. Conductor Rplcmt.-#2 ACSR	129,500.00	Perkison Ln.-BareboneRd. Trimble (C/O fm 03)
341	912	Bedford	2.00	1 Ph. Conductor Rplcmt.-#2 ACSR	38,000.00	Colbert Ln. Trimble
342	786	Bedford	0.60	1 Ph. Conductor Rplcmt.-#2 ACSR	11,400.00	Cutshaw Ln. Trimble
366	124	Bedford	1.50	1 Ph. Conductor Rplcmt.-#2 ACSR	28,500.00	Pryors Fork Rd. to Mullican Ln. Trimble
343	55, 59	Bedford	7.50	1 Ph. Conductor Rplcmt.-#2 ACSR	142,500.00	Mt. Herman Ch.&Wrights Ridge Rds. Trimble
348*	506	Southville	4.30	1 Ph. Conductor Rplcmt.-#2 ACSR	79,550.00	Backcreek Rd. Shelby (C/O fm 03)
349*	500	Southville	3.70	1 Ph. Conductor Rplcmt.-#2 ACSR	68,450.00	KY Hwy. 395-Catridge Rd. Shelby (C/O fm 03)
350*	497	Southville	3.00	1 Ph. Conductor Rplcmt.-#2 ACSR	57,000.00	Catridge Rd. S & KY Hwy. 53S Shelby
357	449	Logan 2	1.40	1 Ph. Conductor Rplcmt.-#2 ACSR	26,600.00	Hinkle Ln. Shelby
368A*	548, 504...499	Southville	9.30	1 Ph. & 2 Ph. Cond. Rplmt.-#2 ACSR	188,610.00	Pearidge to Catridge Shelby (C/O fm 03)
369A	879...349	Logan/Cvlg	8.00	3 Ph. Conv. w/12kV to 25kV Conv.	301,475.00	Harington Mill-BurksBranch Rds. Shelby
TOTALS:			75.70	miles	$1,567,305.00	

* Project carried over from prior year of 4 year Construction Work Plan, 2001, 2002 or 2003
'A' Denotes amendment to Construction Work Plan

2003 Work Plan

Shelby Energy Cooperative, Inc.
Shelbyville, Kentucky

Section 1

Additions to Distribution Plant - 2003

		Quantity	Cost/Unit	2003 Estimate		Percent of Total
A.	**New Member Extensions**					
	Residential and Commerical Customers	500	$2,000	$1,000,000		
	Distribution Transformers	275	650	178,750		
	Meters and Meter Sockets	500	60	30,000		
					$1,208,750.00	43.24%
B.	**Increased Service Capacity**					
	Service and Secondary Upratings	50	1,000	50,000		
	Distribution Transformers	150	650	97,500		
					$147,500.00	5.28%
C.	**Poles Added for Clearance and Reliability Initiative**					
	Poles	100	1,100	110,000		
					$110,000.00	3.93%
D.	**Line Conversions, Conductor Replacements and Feeder Rehabs**					
	See Next Page for Details...			1,087,715		
					$1,087,715.00	38.91%
E.	**Ordinary Replacements**					
	Pole Changes	150	450	67,500		
					$67,500.00	2.41%
F.	**Other Equipment**					
	Security Lights	150	300	45,000		
	Single Phase"Oil Circuit Recloser (OCR)	30	2,000	60,000		
	Three Phase OCR w/ controls	2	10,500	21,000		
	SCADA	4	12,000	48,000		
					$174,000.00	6.22%
	Total Additions to Distribution Plant - 2003				$2,795,465.00	100.00%

2003 Work Plan

D. Line Conversions/Conductor Replacements - RUS Code 300

Project #	Line Section(s)	Substation	Total Length	Description	Total Est. Cost	Comments
315	477	Logan 1	1.00	1 Ph./2 Ph. Conversion-#2 ACSR	27,700.00	Figgs Store Rd. She;by Co.
316	473	Logan 1	0.60	1 Ph./2 Ph. Conversion-#2 ACSR	16,620.00	Locust Grove Rd. Shelby Co.
316	473	Logan 1	1.50	1 Ph.Conductor Rplcmt.-#2 ACSR	27,750.00	Locust Grove Rd. Shelby Co.
317	476	Logan 1	2.10	1 Ph. Conductor Rplcmt.-#2 ACSR	38,850.00	Donahue & Haley Rd. Shelby Co.
355	437, 732	Logan 1	2.60	1 Ph./2 Ph. Conversion-#2 ACSR	72,020.00	Noland Rd. to Webb Rd. Shelby Co.
323*	849, 370, 372	C-Village	2.40	1Ph./ 3Ph. Conversion-#2 ACSR	82,800.00	Beechridge Rd. to Hatton Shelby Co.
324	404, 545	C-Village	1.30	3 Ph. Dbl. Crt. #2 to 336.4 ACSR	97,500.00	Benson Rd. Shelby Co.
363*	3 Ph. UG Tap RM	C-Village	0.20	3 Ph. UG Cond. Rplcmt.-1/0 AL	26,600.00	Ridgemore Mansion Shelby Co.
330*	300, 302	New Castle	6.30	1 Ph.Conductor Rplcmt.-#2 ACSR	113,400.00	Pt. Pleasant to Russell Br. Henry Co.
334	234	C-Burg	2.00	1 Ph. Conductor Rplcmt.-#2 ACSR	37,000.00	Providence-Louden Rd. Trimble Co.
335*	220, 224	C-Burg	4.75	1 Ph. Conductor Rplcmt.-#2 ACSR	87,875.00	Turkey Run to Long Branch Rd. Henry Co.
362*	3 Ph. UG Tap PP	C-Burg	0.20	3 Ph. UG Cond. Rplcmt.-1/0 AL	26,600.00	Perry Park Air Strip Owen Co.
340	90, 92	Bedford	7.00	1 Ph. Conductor Rplcmt.-#2 ACSR	129,500.00	Perkison, Harley & Bearbone Rds. Trimble Co.
346*	517	Southville	1.50	3 Ph./3 Ph. #2 to 4/0 ACSR	69,000.00	Hempridge Rd. Shelby Co.
348	506	Southville	4.30	1 Ph. Conductor Rplcmt.-#2 ACSR	79,550.00	Back Creek Rd. Shelby Co.
349	500	Southville	3.70	1 Ph. Conductor Rplcmt.-#2 ACSR	68,450.00	Harrisonville HWY 395 Shelby Co.
351	20, 96, 98	Milton	1.50	1 Ph./3 Ph. Conversion-1/0 ACSR	58,500.00	Pecks Pike to Rodgers Rd. Trimble Co.
360	Long Run Woods	Long Run	0.40	1 Ph. UG Cond. Rplcmt.-1/0 AL	18,800.00	Long Run Woods Shelby Co.
361	1 Ph. UG Tap	Long Run	0.20	1 Ph. UG Cond. Rplcmt.-1/0 AL	9,200.00	Dr. Holmes Tap Brooks Ln. Shelby Co.
TOTALS:			43.55	miles	$1,087,715.00	

* Project carried over from prior year of 4 year Construction Work Plan, 2001 or 2002

2002 Work Plan

Shelby Energy Cooperative, Inc.
Shelbyville, Kentucky

Section 1

Additions to Distribution Plant - 2002

		Quantity	Cost/Unit	2001 Estimate		Percent of Total
A.	New Member Extensions					
	Residential and Commerical Customers	500	$2,000	$1,000,000		
	Distribution Transformers	275	650	178,750		
	Meters and Meter Sockets	500	60	30,000		
					$1,208,750.00	43.61%
B.	Increased Service Capacity					
	Service and Secondary Upratings	50	1,000	50,000		
	Distribution Transformers	150	650	97,500		
					$147,500.00	5.32%
C.	Poles Added for Clearance and Reliability Initiative					
	Poles	50	700	35,000		
					$35,000.00	1.26%
D.	Line Conversions, Conductor Replacements and Feeder Rehabs					
	See Next Page for Details...			1,062,160		
					$1,062,160.00	38.33%
E.	Ordinary Replacements					
	Pole Changes	150	1,100	165,000		
					$165,000.00	5.95%
F.	Other Equipment					
	Security Lights	150	300	45,000		
	Oil Circuit Reclosers	30	2,000	60,000		
	SCADA	4	12,000	48,000		
					$153,000.00	5.52%
	Total Additions to Distribution Plant - 2002				$2,771,410.00	100.00%

2002 Work Plan D. Line Conversions/Conductor Replacements - RUS Code 300

CRF Code	County	Substation	Sect. No.	Description	Category	Miles	Cost/Mi.	Extended Cost
323	Shelby	Clay Village	849 370 372	1 Ph. #2 ACSR to 3 Ph. #2 ACSR	Conversion	2.4	34,500	82,800.00
329	Henry	New Castle	333	1Ph. #2 ACSR to 3 Ph. #2 ACSR	Conversion	3.1	30,000	93,000.00
330	Henry	New Castle	300 302	1 Ph. 6A CWC to 1 Ph. #2 ACSR	Replacement	6.3	18,000	113,400.00
331	Henry	Campbellsburg	194 196 852	#2 CU Rehabilitation	Rehab	5.3	10,000	53,000.00
332	Henry	Campbellsburg	232 235	#2 CU Rehabilitation	Rehab	3.6	10,000	36,000.00
335	Henry	Campbellsburg	224 222	1 Ph. 6A CWC to 1 Ph. #2 ACSR	Replacement	3.0	18,000	54,000.00
337	Trimble	Bedford	745 116 117	1Ph. 6A CWC to 3 Ph. #2 ACSR	Conversion	2.2	35,500	78,100.00
339	Trimble	Bedford	725	1 Ph. 6A CWC to 1 Ph. #2 ACSR	Replacement	2.1	18,000	37,800.00
344	Shelby	Southville	534 538 539	3 Ph. #4 ACSR to 3 Ph. 4/0 ACSR	Conversion	3.0	47,380	142,140.00
346	Shelby	Southville	517	3 Ph. #4 ACSR to 3 Ph. 4/0 ACSR	Conversion	1.5	47,380	71,070.00
347	Shelby	Southville	510 511 413	1 Ph. 6A CWC to 3 Ph. #2 ACSR	Repalcement	2.5	34,500	86,250.00
352	Trimble	Milton	9 11	1 Ph. 6A CWC to 1 Ph. #2 ACSR	Replacement	2.9	18,000	52,200.00
354	Shelby	Logan East	465	1 Ph. #4 ACSR to 1 Ph. #2 ACSR	Replacement	3.0	18,000	54,000.00
361	Shelby	Long Run	Tap	1 Ph. URD Cable Replacement	Replacement	0.2	46,000	9,200.00
362	Owen	Campbellsburg	Tap	3 Ph. URD Cable Replacement	Replacement	0.2	133,000	26,600.00
363	Shelby	Clay Village	Tap	3 Ph. URD Cable Replacement	Repalcement	0.2	133,000	26,600.00
-	Shelby	Logan East	Tap	1 Ph. URD Cable Replacement	Replacement	1.0	46,000	46,000.00
Totals:						42.5		$1,062,160.00

2001 Work Plan

Shelby Energy Cooperative, Inc.
Shelbyville, Kentucky

Section 1

Additions to Distribution Plant - 2001

		Quantity	Cost/Unit	2001 Estimate		Percent of Total
A.	New Member Extensions					
	Residential and Commerical Customers	500	$2,200	$1,100,000		
	Distribution Transformers	275	650	178,750		
	Meters and Meter Sockets	500	60	30,000		
					$1,308,750.00	59.86%
B.	Increased Service Capacity					
	Service and Secondary Upratings	50	1,000	50,000		
	Distribution Transformers	150	650	97,500		
					$147,500.00	6.75%
C.	Poles Added for Clearance and Reliability Initiative					
	Poles	100	1,100	110,000		
					$110,000.00	5.03%
D.	Conversions and Tie Lines					
	See Next Page(s) for Details...			28,930		
					$28,930.00	1.32%
E.	Ordinary Replacements					
	Pole Changes	150	450	67,500		
	Ordinary Conductor Replacements, *See Next Page(s) for Details...*			418,500		
					$486,000.00	22.23%
F.	Other Equipment					
	Security Lights	150	300	45,000		
	Oil Circuit Reclosers	30	2,000	60,000		
					$105,000.00	4.80%
	Total Additions to Distribution Plant - 2001				$2,186,180.00	100.00%

2001 Work Plan

D. Conversions and Tie-Lines

CRF Code	*County*	*Sect. No.*	*Description*	*Miles*	*Cost/Mi.*	*Extended Cost*	
311 Bedford Sub							
	Carroll	49	1 Ph. 6A CWC to V Ph. #2 ACSR	1.10	26,300.00	28,930.00	
	Subtotals:			1.10			28,930.00
Totals:				1.10			28,930.00

2001 Work Plan

E. Ordinary Conductor Replacements

CRF Code	County	Sect. No.	Description	Miles	New Installed Cost/Mi.	Original Cost/Mi.	Net Cost/Mi.	Extended Cost	
Clay Village Sub		352	3Ph. #2 ACSR to 3Ph. 336.4 KCM ACSR	3.00	$40,000.00		40,000.00	120,000.00	
606.1	Shelby	350	3Ph. #2 ACSR to 3Ph. 336.4 KCM ACSR	0.40	40,000.00		40,000.00	16,000.00	
	Subtotals:			**3.40**					**$136,000.00**
Campbellsburg Sub		224	1Ph. 8A CWC to 1Ph. #2 ACSR	3.20	$12,500.00		12,500.00	40,000.00	
606.11	Henry	223	" " "	0.90	12,500.00		12,500.00	11,250.00	
		222	" " "	0.70	12,500.00		12,500.00	8,750.00	
		221	" " "	2.00	12,500.00		12,500.00	25,000.00	
		220	" " "	1.80	12,500.00		12,500.00	22,500.00	
		744	" " "	0.80	12,500.00		12,500.00	10,000.00	
		142	" " "	0.40	12,500.00		12,500.00	5,000.00	
		143	" " "	2.40	12,500.00		12,500.00	30,000.00	
	Subtotals:			**12.2**					**$152,500.00**
Southville Sub		511	1Ph. 8A CWC to 1Ph. #2 ACSR	1.70	12,500.00		12,500.00	21,250.00	
606.18	Shelby	510	" " "	1.60	12,500.00		12,500.00	20,000.00	
		413	" " "	0.70	12,500.00		12,500.00	8,750.00	
		411	" " "	1.30	12,500.00		12,500.00	16,250.00	
		412	" " "	2.80	12,500.00		12,500.00	35,000.00	
		898	" " "	0.90	12,500.00		12,500.00	11,250.00	
	Subtotals:			**9.00**					**$112,500.00**
-	Replacement of Phase Conductor from main feeder to first tap line sectionalizing device			**2.50**	7,000.00		7,000.00	17,500.00	**$17,500.00**
Totals:				27.10					$418,500.00

2000 Work Plan

Shelby Energy Cooperative, Inc.
Shelbyville, Kentucky

Section 1

Additions to Distribution Plant - 2000

		Quantity	Cost/Unit	2000 Estimate	
A.	New Member Extensions				
	Residential and Commerical Customers	550	$1,800	$990,000	
	Distribution Transformers	300	600	180,000	
	Meters and Meter Sockets	550	80	44,000	
					$1,214,000.00
B.	Increased Service Capacity				
	Service and Secondary Upratings	50	630	31,500	
	Distribution Transformers	150	690	103,500	
					$135,000.00
C.	Poles Added for Clearance and Reliability Initiative				
	Poles	100	1,000	100,000	
					$100,000.00
D.	Conversions and Tie Lines				
	See Next Page(s) for Details...			151,460	
					$199,690.00
E.	Ordinary Replacements				
	Pole Changes	150	450	67,500	
	Ordinary Conductor Replacements,			250,000	
	See Next Page(s) for Details...				
					$317,500.00
F.	Other Equipment				
	Security Lights	150	220	33,000	
	Oil Circuit Reclosers	30	2,000	60,000	
					$93,000.00

Total Additions to Distribution Plant - 2000 $2,059,190.00

2000 Work Plan

D. Conversions and Tie-Lines

CRF Code	County	Sect. No.	Description	Miles	Cost/Mi.	Extended Cost	
305							
Logan Sub							
	Shelby	727	1 Ph. #4 ACSR to 3 Ph. 1/0 Aerial Cable	0.60	$62,000.00	$37,200.00	
	Subtotals:			0.60			$37,200.00
309							
Bedford Sub							
	Trimble	62	1 Ph. 6A CWC to 3 Ph. 1/0 ACSR	0.30	35,200.00	10,560.00	
		63	1 Ph. 6A CWC to 3 Ph. 1/0 ACSR	1.90	35,200.00	66,880.00	
		747	1 Ph. 6A CWC to V Ph. #2 ACSR	0.30	26,300.00	7,890.00	
	Subtotals:			2.50			$85,330.00
311							
Bedford Sub							
	Carroll	49	1 Ph. 6A CWC to V Ph. #2 ACSR	1.10	26,300.00	28,930.00	
	Subtotals:			1.10			28,930.00
314							
Long Run Sub (New)							
	Shelby		3 Ph. 4/0 Aerial Cable, Dbl. Cir., New Const.	0.20	53,000.00	10,600.00	
	*	425	3 Ph. 4/0 Aerial Cable, Add'l Cir.	0.71	53,000.00	37,630.00	
	Subtotals:			0.91			48,230.00
Totals:				5.11			199,690.00

*Third circuit out of Long Run Substation is optional and may not be constructed at this time. The cost is included in budget in the event that this option is exercised.

2000 Work Plan

E. Ordinary Conductor Replacements

CRF Code	County	Sect. No.	Description	Miles	New Installed Cost/Mi.	Original Cost/Mi.	Net Cost/Mi.	Extended Cost	
Southville Sub									
606.26	Shelby	532	V Ph. #2 ACSR to 3 Ph. 1/0 ACSR	0.60	$26,960.00	$2,700.00	$24,260.00	$14,556.00	
	"	529	V Ph. #2 ACSR to 3 Ph. 1/0 ACSR	1.10	$26,960.00	$2,700.00	24,260.00	26,686.00	
	"	526	V Ph. #2 ACSR to 3 Ph. 1/0 ACSR	0.60	$26,960.00	$2,700.00	24,260.00	14,556.00	
	"	906	V Ph. #2 ACSR to 3 Ph. 1/0 ACSR	0.60	$26,960.00	$2,700.00	24,260.00	14,556.00	
Subtotals:				2.90					$70,354.00
Clay Village Sub		352	3Ph. #2 ACSR to 3Ph. 336.4 KCM ACSR	3.00	$40,000.00	$7,080.00	32,920.00	98,760.00	
606.1	Shelby	350	3Ph. #2 ACSR to 3Ph. 336.4 KCM ACSR	0.40	$40,000.00	$7,080.00	32,920.00	13,168.00	
Subtotals:				3.40					$111,928.00
System-Wide									
-			Replacement of Phase Conductor from main feeder to first tap line sectionalizing device						$67,718.00
Totals:				6.30					$250,000.00

Shelby Energy Cooperative, Inc. Projected Distribution Plant Replacement/Improvement Budget

YEAR	BUDGET AMOUNT	
2005	$1,357,985.00	(Actual)
2006	1,400,000.00	(Projected)
2008	1,450,000.00	
2009	1,450,000.00	
2010	1,500,000.00	
2011	1,500,000.00	
2012	1,550,000.00	
2013	1,550,000.00	
2014	1,600,000.00	
2015	1,600,000.00	
2016	1,650,000.00	
2017	1,650,000.00	
2018	1,700,000.00	
2019	1,700,000.00	
2020	1,750,000.00	
2021	1,750,000.00	
2022	1,800,000.00	
2023	1,800,000.00	
2024	1,850,000.00	
2025	1,850,000.00	