



INTEGRATED RESOURCE PLAN

2017

LOCKHART POWER COMPANY

INTEGRATED RESOURCE PLAN

1. STATEMENT OF OBJECTIVE

Lockhart Power Company's (LPC) objective in developing an Integrated Resource Plan (IRP) is to minimize our long run total costs and produce the least cost to our customers consistent with the availability of an adequate and reliable supply of electric energy while maintaining system flexibility and considering environmental impacts. We intend for the plan to also improve customer service, offer additional customer options, and improve efficiencies of energy usage.

2. RELEVANT SUPPORTING DOCUMENTATION

a. See ATTACHMENTS

1 --- SUPPLY RESOURCES

2 --- DEMAND FORECAST

3 --- SUPPLY AND SALES FORECAST

4 --- LOCKHART POWER COMPANY ENERGY SOURCES

5--- MAINTENANCE COST

3. SUPPLY RESOURCES

LPC presently utilizes ten sources of supply, including nine generation stations and purchases from Duke Energy (See Attachment 1). More than 99% of the power LPC self-generates is renewable energy. LPC utilizes a firm wholesale PPA with Duke Energy to provide its generation needs beyond the amount it self-generates. Duke Energy's rates to LPC are presumptively just and reasonable, having been permitted by the FERC. We plan to continue to use Duke Energy to provide a firm load-following supply for the

1 foreseeable future. However, LPC intends to investigate other sources to determine if the
2 costs and benefits, both short run and long run, meet the objectives of our IRP. The
3 sources we intend to investigate include, but are not limited to the following:

4 **GENERATION** --- Additional cost effective renewable energy generation resources;
5 cost effective natural gas generation resources.
6

7 **4. VARIOUS ENERGY AND DEMAND ALTERNATIVES, EFFICIENT ENERGY**
8 **CHOICES AND PROPER PRICING SIGNALS**

9 LPC has done and continues to do the following:

10 A. Designed its rates to economically encourage improved load factors and to
11 reduce monthly demands by:

12 1. Incorporating a demand penalty by use of a demand ratchet
13 in its residential rates. This encourages peak shaving.

14 2. Dividing its commercial and industrial rates into a first 200
15 hours use of billing demand rate and an over 200 hours use of
16 billing demand rate with the rates in the latter considerably less
17 expensive than the first 200 hours use block. This encourages peak
18 shaving.

19 3. Incorporating conservation requirements in its Residential -
20 All Electric and General Service - All Electric rates. This
21 encourages conservation.

22 4. Designing its Residential and Residential - All Electric
23 rates such that they are identical during the summer months, the
24 season of LPC's system peak. This encourages peak shaving and
25 conservation.

26 5. Designing its General Service Commercial and General
27 Service - All Electric rates such that they are identical during the

1 summer months, the season of LPC's system peak. This
2 encourages peak shaving and conservation.

3 6. Converting its Residential rate and Residential - All
4 -Electric rate (summer months) from a declining block rate to an
5 inverted rate. This encourages conservation.
6

7 **5. EVALUATING POTENTIAL OPTIONS**

8 LPC will employ unbiased analysis techniques for potential options included in its IRP.
9 LPC will evaluate each option by including all appropriate costs and benefits and will
10 provide a detailed explanation with supporting evidence for our choice.
11

12 **6. EVALUATING THE COST EFFECTIVENESS OF SUPPLY-SIDE AND** 13 **DEMAND SIDE OPTIONS**

14 LPC has adopted an interruptible service demand-side management program offered by
15 Duke Energy. Currently approximately one third of LPC's industrial customers are
16 enrolled in the program. This program encourages peak shaving.
17

18 **7. MEASURE OF NET BENEFITS**

19 LPC will provide the net benefits resulting from the options chosen for use, keeping
20 within the objective stated in Section 1. Benefits are considered to be, but are not limited
21 to, cost savings, peak load shaving, conservation, load shifting, valley filling,
22 environmental concerns, improvement of customer service, offering of additional
23 customer options, improved efficiencies of energy usage, and improved outage times and
24 reliability, and economic development impact on the community.
25

26 **8. ENVIRONMENTAL COSTS**

27 LPC will consider environmental costs on a monetized basis where reasonable and
28 sufficient data is available in its planning process and evaluation of options. Those

1 environmental costs that cannot be monetized will be addressed on a qualitative basis
2 within the planning process and evaluation of options. The environmental costs referred
3 to here are those costs associated with demand or supply side options which impact the
4 customer directly or indirectly.

5
6 **9. DEMAND AND ENERGY FORECAST**

7 See Attachments 2 and 3

8
9 **10. EVALUATION AND REVIEW OF EXISTING DEMAND-SIDE OPTIONS**

10 See Section 4 Above

11
12 **11. FUTURE STUDIES**

13 LPC continues to evaluate potential renewable energy initiatives and other potential
14 supply-side opportunities. In particular, as the cost of solar generation equipment
15 continues to drop, potential opportunities to cost-effectively provide smaller utility-scale
16 solar power for our customers will continue to be studied.

17
18 **12. FLEXIBILITY AND QUICK RESPONSE**

19 LPC intends to remain flexible enough to react quickly to changes in a manner consistent
20 with minimizing costs while maintaining reliability.

21
22 **13. MAINTENANCE**

23 Maintenance is a continuous process at LPC. Actual maintenance costs for rate base
24 assets in 2015 and 2016 are shown in Attachment 5 as well as the forecast of maintenance
25 costs for 2017 through 2031.

26
27 **14. THIRD PARTY POWER PURCHASES**

1 LPC will investigate other purchase sources if the occasion arises and is willing to pursue
2 any other purchase sources to determine if the costs and benefits, both short run and long
3 run, provide our customers with the options consistent with our IRP objective.
4

5 **15. NEW TECHNOLOGIES**

6 LPC will continuously evaluate, pursuant to its IRP objective, new technology for both
7 demand-side and supply-side options. In addition to advances in solar generation
8 technology, Lockhart Power Company keeps up-to-date on advances in hydrokinetic and
9 similar technologies that could one day be cost effectively deployed in existing water
10 conveyances.
11

12 **16. FUTURE SUPPLY-SIDE OPTIONS**

13 LPC presently has no certain scheduled supply side options other than those described in
14 Section 3. LPC is monitoring development of the solar generation market in South
15 Carolina, including proposed legislative changes, and will respond to any changes in a
16 manner that is cost effective and appropriate for its customers.
17

18 **17. CAPTURING LOST OPPORTUNITY RESOURCES**

19 LPC gives attention to capturing lost-opportunity resources which include cost-effective
20 energy efficiency savings such as in new construction, renovation, and in routine
21 replacement of existing equipment. In routine replacement of any and all equipment,
22 LPC includes energy and efficiency savings as a component of evaluation.
23

24 **18. DYNAMICS OF IRP PROCESS**

25 LPC realizes that the IRP process is dynamic and that modifications may be necessary
26 over time. As new issues arise, existing issues or components of the plan change in
27 significance and improved analysis techniques developed; LPC intends to file revisions to
28 its IRP with The Public Service Commission of South Carolina and request that the

1 Commission incorporate the revision into LPC's IRP or approve it as a separate
2 consideration.

Supply Resources

Facility Name	Location	Nameplate Capacity	Rate Base?	Fuel Source
Lockhart Hydro	Lockhart, SC	18 MW	Yes	Water (Non-Consumptive)
Lower Pacolet Hydro*	Pacolet, SC	0.8 MW	Yes	Water (Non-Consumptive)
Pacolet Diesel	Pacolet, SC	5.5 MW	Yes	Diesel
Union Diesel	Union, SC	7.3 MW	Yes	Diesel
Wellford Renewable Energy Facility*	Wellford, SC	1.6 MW	Yes	Landfill Gas
Upper Pacolet Hydro*	Pacolet, SC	1.1 MW	Yes	Water (Non-Consumptive)
Lockhart Minimum Flow Hydro*	Lockhart, SC	0.8 MW	Yes	Water (Non-Consumptive)
Lockhart Bio-Energy, LLC Union Renewable Energy Facility*	Union, SC	3.2 MW	No	Landfill Gas
Columbia Hydro*	Columbia, SC	10.6 MW	Yes	Water (Non-Consumptive)
Purchases from Duke Energy (as Firm Customers)	N/A	Load Following	N/A	N/A

*Notes: Power generated from these facilities is currently sold off-system under contracts. Revenues from the facilities in rate base flow to Lockhart Power Company's customers.

LOCKHART POWER COMPANY

DOCKET NO. 2017-11-E
ORDER NO. 94-348

SUMMER DEMAND FORECAST

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
SYSTEM SUMMER PEAK DEMAND IN MW'S															
SYSTEM PEAK DEMAND	69.3	70.0	70.7	71.4	72.1	72.8	73.6	74.3	75.0	75.8	76.6	77.3	78.1	78.9	79.7
DEMAND SOURCES															
LOCKHART HYDRO GENERATION	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
PACOLET DIESEL GENERATION	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
UNION DIESEL GENERATION	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
PURCHASES FROM DUKE ENERGY	38.8	39.5	40.2	40.9	41.6	42.3	43.1	43.8	44.5	45.3	46.1	46.8	47.6	48.4	49.2
TOTAL DEMAND SOURCES	69.3	70.0	70.7	71.4	72.1	72.8	73.6	74.3	75.0	75.8	76.6	77.3	78.1	78.9	79.7

WINTER DEMAND FORECAST

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
SYSTEM WINTER PEAK DEMAND IN MW'S															
SYSTEM PEAK DEMAND	66.8	67.5	68.1	68.8	69.5	70.2	70.9	71.6	72.3	73.1	73.8	74.5	75.3	76.0	76.8
DEMAND SOURCES															
LOCKHART HYDRO GENERATION	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
PACOLET DIESEL GENERATION	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
UNION DIESEL GENERATION	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
PURCHASES FROM DUKE ENERGY	36.3	37.0	37.6	38.3	39.0	39.7	40.4	41.1	41.8	42.6	43.3	44.0	44.8	45.5	46.3
TOTAL DEMAND SOURCES	66.8	67.5	68.1	68.8	69.5	70.2	70.9	71.6	72.3	73.1	73.8	74.5	75.3	76.0	76.8

Note: LPC generation resources that provide off-system sales per long-term contracts are excluded.

LOCKHART POWER COMPANY

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Order NO. 94-348 & 98-502

SUPPLY AND SALES FORECAST (MWH)

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
System Requirements															
Metered Sales	335,361	338,715	342,102	345,523	348,978	352,468	355,992	359,552	363,148	366,779	370,447	374,152	377,893	381,672	385,489
Company Use	803	803	803	803	803	803	803	803	803	803	803	803	803	803	803
Losses	20,866	21,075	21,285	21,498	21,713	21,930	22,150	22,371	22,595	22,821	23,049	23,280	23,512	23,747	23,985
Required System Input	357,030	360,592	364,190	367,824	371,494	375,201	378,945	382,727	386,546	390,403	394,299	398,234	402,209	406,223	410,277

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Supply Sources															
Lockhart Hydro Generation	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Pacolet Diesel Generation	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Union Diesel Generation	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Purchases from Duke	297,012	300,574	304,172	307,806	311,476	315,183	318,927	322,709	326,528	330,385	334,281	338,216	342,191	346,205	350,259
Total Supply	357,030	360,592	364,190	367,824	371,494	375,201	378,945	382,727	386,546	390,403	394,299	398,234	402,209	406,223	410,277

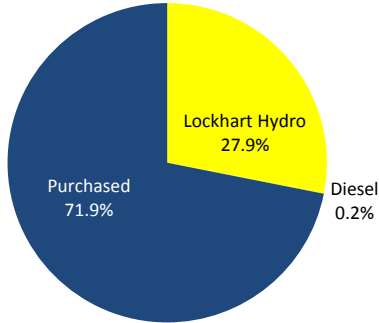
Note: Under the current Duke Energy PPA, the Pacolet and Union Diesel Generation stations are only operated in emergency situations.

Energy Sources in Percent of MWH's Input

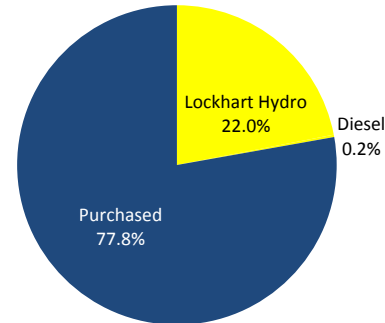
Inputs	2013	2014	2015	2016
Lockhart Hydro	91941	74933	60264	61049
Diesel	598	812	641	18
Purchased	236669	265493	262401	261786
Total	329208	341238	323306	322853

Note: Purchased Power obtained from Duke Energy

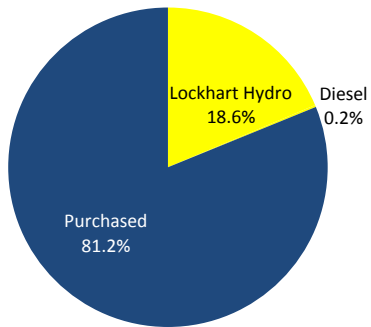
LOCKHART POWER COMPANY ENERGY SOURCES IN PERCENT OF MWH'S INPUT



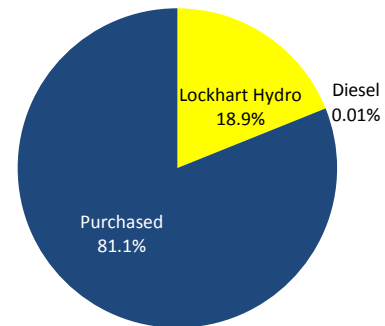
2013



2014



2015



2016

Note: Purchased Power obtained from Duke Energy

YEAR	MAINTENANCE COST	YEAR	MAINTENANCE COST
2015	\$2,588,953	2024	\$3,552,282
2016	\$2,804,204	2025	\$3,658,850
2017	\$2,888,330	2026	\$3,768,616
2018	\$2,974,980	2027	\$3,881,674
2019	\$3,064,229	2028	\$3,998,124
2020	\$3,156,156	2029	\$4,118,068
2021	\$3,250,841	2030	\$4,241,610
2022	\$3,348,366	2031	\$4,368,858
2023	\$3,448,817		