



INTEGRATED RESOURCE PLAN

2020

LOCKHART POWER COMPANY

INTEGRATED RESOURCE PLAN

1 **1. STATEMENT OF OBJECTIVE**

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

8

9 **2. RELEVANT SUPPORTING DOCUMENTATION**

10 a. See ATTACHMENTS

11 1 --- SUPPLY RESOURCES

12 2 --- DEMAND FORECAST

13 3 --- SUPPLY AND SALES FORECAST

14 4 --- ENERGY PRODUCED FROM ALL ENERGY RESOURCES

15 5--- PLANNED ELETRICAL TRANSMISSION INVESTMENTS

16

17 **3. SUPPLY RESOURCES**

18 LPC presently utilizes eight sources of supply, including seven generation stations and
19 purchases from Duke Energy (See Attachment 1). More than 99% of the power LPC self-
20 generates is renewable energy. LPC utilizes a firm wholesale PPA with Duke Energy to
21 provide its generation needs beyond the amount it self-generates. LPC generates
22 approximately one-quarter of its own load with renewable energy with the remainder
23 purchased from Duke Energy (See Attachment 4). Duke Energy's rates to LPC are

1 presumptively just and reasonable, having been permitted by the FERC. We plan to
2 continue to use Duke Energy to provide a firm load-following supply for the foreseeable
3 future. However, LPC intends to investigate other sources to determine if the costs and
4 benefits, both short run and long run, meet the objectives of our IRP. The sources we
5 intend to investigate include, but are not limited to the following:

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

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

11 LPC has done and continues to do the following:

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

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

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

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

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

1 5. Designing its General Service Commercial and General
2 Service - All Electric rates such that they are identical during the
3 summer months, the season of LPC's system peak. This
4 encourages peak shaving and conservation.

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

8 7. Designing a Solar rider for its residential customers
9

10 **5. EVALUATING POTENTIAL OPTIONS**

11 LPC will employ unbiased analysis techniques for potential options included in its IRP.
12 LPC will evaluate each option by including all appropriate costs and benefits and will
13 provide a detailed explanation with supporting evidence for our choice.
14

15 **6. EVALUATING THE COST EFFECTIVENESS OF SUPPLY-SIDE AND**
16 **DEMAND SIDE OPTIONS**

17 LPC has adopted an interruptible service demand-side management program offered by
18 Duke Energy. Currently approximately one-fourth of LPC's industrial customers are
19 enrolled in the program. This program encourages peak shaving.
20

21 **7. MEASURE OF NET BENEFITS**

22 LPC will provide the net benefits resulting from the options chosen for use, keeping
23 within the objective stated in Section 1. Benefits are considered to be, but are not limited
24 to, cost savings, peak load shaving, conservation, load shifting, valley filling,
25 environmental concerns, improvement of customer service, offering of additional
26 customer options, improved efficiencies of energy usage, and improved outage times and
27 reliability, and economic development impact on the community.
28

1 **8. ENVIRONMENTAL COSTS**

2 LPC will consider environmental costs on a monetized basis where reasonable and
3 sufficient data is available in its planning process and evaluation of options. Those
4 environmental costs that cannot be monetized will be addressed on a qualitative basis
5 within the planning process and evaluation of options. The environmental costs referred
6 to here are those costs associated with demand or supply side options which impact the
7 customer directly or indirectly.

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9 **9. DEMAND AND ENERGY FORECAST**

10 See Attachments 2 and 3

11
12 **10. EVALUATION AND REVIEW OF EXISTING DEMAND-SIDE OPTIONS**

13 See Section 4 Above

14
15 **11. FUTURE STUDIES**

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

20
21 **12. FLEXIBILITY AND QUICK RESPONSE**

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

24
25 **13. PLANNED ELECTRICAL TRANSMISSION INVESTMENTS**

26 LPC is committed to maintenance and improvement of the transmission system by making
27 investments in short and long term capital budgeted projects as seen in ATTACHMENT
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14. THIRD PARTY POWER PURCHASES

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

15. NEW TECHNOLOGIES

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

16. FUTURE SUPPLY-SIDE OPTIONS

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

17. CAPTURING LOST OPPORTUNITY RESOURCES

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

18. DYNAMICS OF IRP PROCESS

LPC realizes that the IRP process is dynamic and that modifications may be necessary over time. As new issues arise, existing issues or components of the plan change in

1 significance and improved analysis techniques developed; LPC intends to file revisions to
2 its IRP with The Public Service Commission of South Carolina and request that the
3 Commission incorporate the revision into LPC's IRP or approve it as a separate
4 consideration.

Supply Resources

Facility Name	Location	Age	License/ Permit Expiration	Nameplate Capacity	MWH/Year	Fuel Source
Lockhart Hydro	Lockhart, SC	1920	2039	18 MW	70,000	Water (Non-Consumptive)
Lower Pacolet Hydro ¹	Pacolet, SC	1938	2051	0.8 MW	4,000	Water (Non-Consumptive)
Pacolet Diesel ^{3,4}	Pacolet, SC	2006	N/A	6 MW	N/A	Diesel
Union Diesel ^{3,4}	Union, SC	2005	N/A	8 MW	N/A	Diesel
Wellford Renewable Energy Facility ^{1,4}	Wellford, SC	2011	N/A	1.6 MW	10,000	Landfill Gas
Upper Pacolet Hydro ¹	Pacolet, SC	2013	2052	1.1 MW	5,000	Water (Non-Consumptive)
Lockhart Minimum Flow Hydro ¹	Lockhart, SC	2012	2039	0.8 MW	5,000	Water (Non-Consumptive)
Purchases from Duke Energy (Firm)	N/A	N/A	N/A	Load Following	Load Following	Various

Note 1: Power generated from these facilities is currently sold off-system under contracts. Revenues from the facilities in rate base flow to Lockhart Power's customers.

Note 2: Expected life of all generation facilities exceeds the IRP forecast horizon.

Note 3: Diesel facilities do not serve load. They are available at Duke Energy's request only during NERC Level II emergency conditions.

Note 4: Diesel and Landfill Gas facilities have operating permits that do not have a pre-determined expiration date.

LOCKHART POWER COMPANY

SUMMER DEMAND FORECAST

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
SYSTEM SUMMER PEAK DEMAND IN MW'S															
SYSTEM PEAK DEMAND	67.4	68.1	68.8	69.4	70.1	70.8	71.5	72.3	73.0	73.7	74.5	75.2	75.9	76.7	77.5
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	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
PURCHASES FROM DUKE ENERGY	37.6	38.3	39.0	39.6	40.3	41.0	41.7	42.5	43.2	43.9	44.7	45.4	46.1	46.9	47.7
TOTAL DEMAND SOURCES	67.4	68.1	68.8	69.4	70.1	70.8	71.5	72.3	73.0	73.7	74.5	75.2	75.9	76.7	77.5

WINTER DEMAND FORECAST

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
SYSTEM WINTER PEAK DEMAND IN MW'S															
SYSTEM PEAK DEMAND	62.6	63.2	63.9	64.5	65.1	65.8	66.5	67.1	67.8	68.5	69.1	69.8	70.5	71.2	72.0
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	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
PURCHASES FROM DUKE ENERGY	32.8	33.4	34.1	34.7	35.3	36.0	36.7	37.3	38.0	38.7	39.3	40.0	40.7	41.4	42.2
TOTAL DEMAND SOURCES	62.6	63.2	63.9	64.5	65.1	65.8	66.5	67.1	67.8	68.5	69.1	69.8	70.5	71.2	72.0

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

LOCKHART POWER COMPANY

Docket NO. 2019-227-E & 2020-11-E
Order NO. 94-348 & 98-502

SUPPLY AND SALES FORECAST (MWH)

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
System Requirements															
Metered Sales	339,277	342,670	346,096	349,557	353,053	356,584	360,149	363,751	367,388	371,062	374,773	378,521	382,306	386,129	389,990
Company Use	852	852	852	852	852	852	852	852	852	852	852	852	852	852	852
Losses	19,165	19,357	19,550	19,746	19,943	20,143	20,344	20,547	20,753	20,960	21,170	21,382	21,596	21,812	22,030
Required System Input	359,294	362,878	366,499	370,155	373,848	377,578	381,345	385,150	388,993	392,875	396,795	400,754	404,753	408,792	412,872

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Supply Sources															
Lockhart Hydro Generation	76,121	76,121	76,121	76,121	76,121	76,121	76,121	76,121	76,121	76,121	76,121	76,121	76,121	76,121	76,121
Pacolet Diesel Generation	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
Union Diesel Generation	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Purchases from Duke	283,118	286,702	290,323	293,979	297,672	301,402	305,169	308,974	312,817	316,699	320,619	324,578	328,577	332,616	336,696
Total Supply	359,294	362,878	366,499	370,155	373,848	377,578	381,345	385,150	388,993	392,875	396,795	400,754	404,753	408,792	412,872

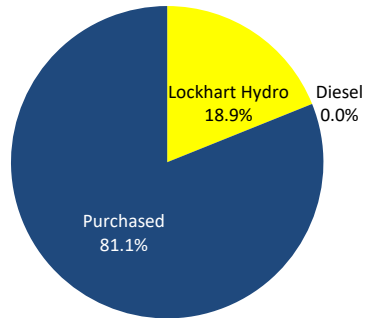
Note: Under the current Duke Energy PPA, the Pacolet and Union Diesel Generation stations are only operated in emergency situations.

Energy Sources in Percent of MWH's Input

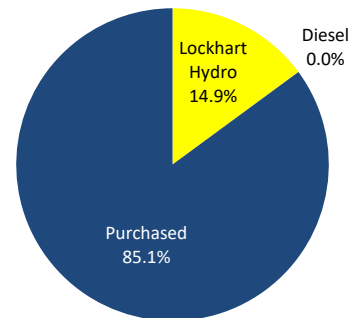
Inputs	2016	2017	2018	2019
Lockhart Hydro	61049	47046	88030	93285
Diesel	18	89	32	45
Purchased	261786	268921	240723	234099
Total	322853	316056	328785	327429

Note: Purchased Power obtained from Duke Energy

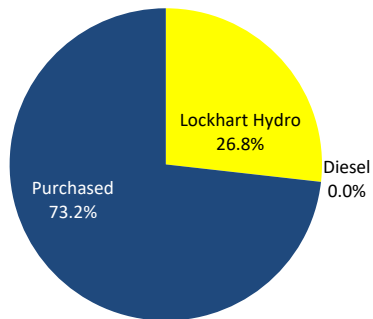
LOCKHART POWER COMPANY ENERGY SOURCES IN PERCENT OF MWH'S INPUT



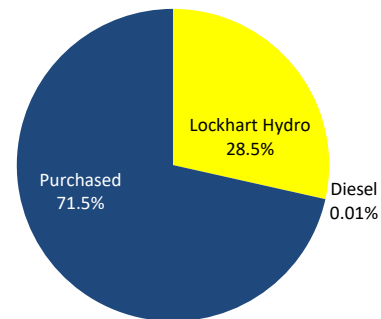
2016



2017



2018



2019

Note: Purchased Power obtained from Duke Energy

Electrical Transmission Investments Planned

- Replace 34 kV Transmission Line Fault Indicator System
- Replace 34 kV Transmission Breaker at Duke–Lockhart Tie Station
- Replace 100 kV Transformer at Duke-Lockhart Tie Station