PUBLIC VERSION

ATTACHMENT 9 and 3: RES RETAIL RATE IMPACT

2022 RES Retail Rate Impact ("RRI") Filing

The Empire District Electric Company – Liberty Utilities Central ("Liberty-Empire") intends to file its 2022 Missouri triennial Integrated Resource Plan compliance filing ("2022 IRP") on April 1, 2022 in File No. EO-2021-0331. The 2022 IRP represents Liberty-Empire's most recent electric utility resource planning analysis. Pursuant to 20 CSR 4240-22.100 (the "Rule"), Liberty-Empire used the 2022 IRP analysis to develop the assumptions regarding projected renewable energy resource additions.

Liberty-Empire's 2022 RES RRI analysis contained herein calculates the retail rate impact ("RRI") on an incremental basis for each planning year based on procurement or development of renewable energy resources averaged over the next ten (10) years. The RES RRI is calculated by subtracting the total retail revenue requirement incorporating an incremental non-renewable generation and purchased power portfolio from the total retail revenue requirement including an incremental RES-compliant generation and purchased power portfolio.

Section 5(B) of the Rule states that the non-renewable generation and purchase power portfolio shall be determined by adding, to the utility's existing generation and purchased power resource portfolio excluding all renewable resources, additional non-renewable resources sufficient to meet the utility's needs on a least-cost basis for the next ten (10) years. Consistent with the Rule, Liberty-Empire defined the non-renewable generation and purchased power portfolio ("Plan 1 – No RES") as the utility's existing generation and purchased power resource portfolio excluding all renewable resources except those owned or contracted prior to September 30, 2010,[1] plus additional non-renewable resources sufficient to meet the utility's needs on a least-cost basis for the next ten years. To develop the Plan 1 – No RES portfolio, Liberty-Empire removed the following renewable resources from Liberty-Empire's existing portfolio:

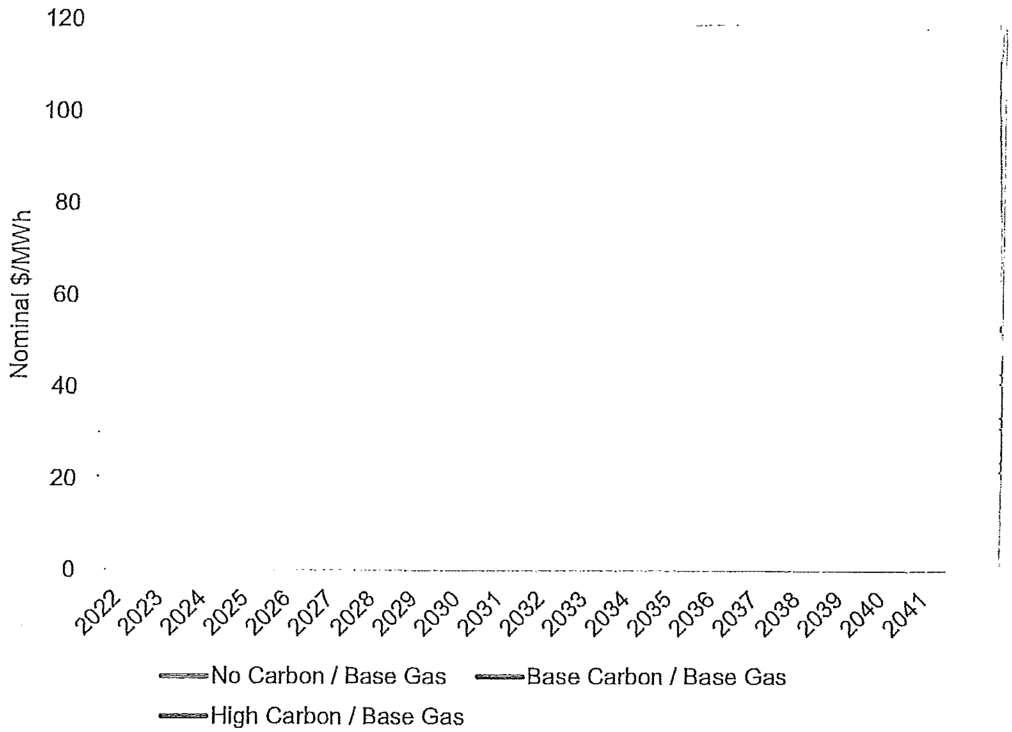
Resource Name	Resource Type	ICAP MW by 2041
Neosho Ridge	Wind	301
North Fork Ridge	Wind	149
Kings Point	Wind	149
Prosperity Solar	Dist. Solar	2.5

To maintain a minimum capacity margin of 12% over the modeling horizon, 60 MW natural gas reciprocating engine ("RICE") was added in 2022, 30 MW RICE was added in 2025, 180 MW RICE was added in 2035, 30 MW RICE was added in 2037, and 240 MW of a natural gas combustion turbine ("CT") frame was added in 2039.

Rule 5(B) states that the RES-compliant portfolio shall be determined by adding to the utility's existing generation and purchased power resource portfolio an amount of least cost renewable resources sufficient to achieve RES requirements and an amount of least-cost non-renewable resources, the combination of which is sufficient to meet the utility's needs for the next ten (10) years. Because Liberty-Empire's existing portfolio including all renewable resources already more than achieves RES requirements, Liberty-Empire added to the current existing portfolio a least-cost amount of non-renewable resources ("Plan 1"). To maintain a minimum capacity margin of 12% over the modeling horizon, Plan 1

[1] Pursuant to Rule Section 5(A), because the Ozark Beach hydro facility, the Meridian Way Windfarm PPA and the Elk River Windfarm PPA were all owned or contracted prior to September 30, 2010, they were kept in the non-renewable generation and purchase power portfolio.

Exhibit 2 EDE_EDE Annual Average Power Prices (Nom$/MWh) *CONFIDENTIAL INFORMATION*



adds 30 MW RICE in 2025, 150 MW RICE in 2035, and 240 MW CT Frame. Relative to Plan 1 – No RES, Plan 1 also includes 600 MW wind in 2020-2021 related to the Customer Savings Plan.

Rule Section 5(B)4 states that the assumptions for this filing should utilize the most recent elecricity utility resource planning analysis. Liberty-Empire used power market prices, natural gas fuel prices, and emissions prices from its most recent electric utility resource planning analysis assumptions. Consistent with the 2022 IRP, a 20% probability weighting was given to the Low carbon emissions cost scenario and a 40% probability weighting was given to both the Base and High carbon emissions cost scenarios.

Table 1 includes the expected value of costs associated with carbon emissions used in this analysis. Figure 1 includes forecast power prices for the EDE_EDE load node with and without the impact of a carbon tax.

Table 1: Expected Value of Carbon Tax (Nom$/Short Ton)

	Carbon Tax ($Nom/Short Ton)			
	No Carbon - 20%	Base Carbon - 40%	High Carbon – 40%	**Expected Value**
2021	-	-	-	-
2022	-	-	-	-
2023	-	-	*	*
2024	-		*	*
2025	-	*		*
2026	-	*		*
2027	-	*		*
2028	-	*		*
2029	-	*		*
2030	-	*		*
2031	-	*		*
2032	-	*		*
2033	-	*		*
2034	-	*		*
2035	-	*		*
2036	-	*		*
2037	-	*		*
2038	-	*		*
2039	-	*		*
2040	-	*		*

Results:

The following table shows the calculation for the average 10-year compliance spend over the 10-year period (2022-2031) as required by Rule 5(B). The RRI Budget is calculated as 1% of the Plan 8 Revenue Requirement. Actual Compliance Spend is calculated as the difference between the PVRRs of Plan 1 – No RES and Plan 1 in each year. The average Actual Compliance Spend for the 10-year period exceeds the budgeted 1% RRI for the 10-year period due to the addition of 600 MW already existing wind related to the Customer Savings Plan in Plan 1 relative to Plan 1 – No RES.

Exhibit 3: 2022-2031 Annual Revenue Requirements and RES Compliance Spend

Dollars in millions	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
RRI Budget (2022-2031)	*										*
Actual Compliance Spend (2022-2031)	*										*
Revenue Requirement (2022-2031)	*										*
Budget (% of RR)	*										*
Actual Compliance Spend (% of RR)	*										*

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The following tables summarize the Retail Rate Impact calculation, including the annual carry-forward amount required by Rule 5(G).

Exhibit 4 2022-2031 RRI Calculation Period

2022-2031 RRI Calculation Period	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	10-Year	Cumulative
Baseline Revenue Requirement ($MM)												
Annual 1% ($MM)												
Actual Costs of Compliance												
Annual Over (Under)												
Plus Prior Carryover												
Cumulative Carryover												

Exhibi

2023-2032 RRI Calculation Period
Baseline Revenue Requirement ($MM)
Annual 1% ($MM)
Actual Costs of Compliance
Annual Over (Under)
Plus Prior Carryover
Cumulative Carryover

Exhibi

2024-2033 RRI Calculation Period
Baseline Revenue Requirement ($MM)
Annual 1% ($MM)
Actual Costs of Compliance
Annual Over (Under)
Plus Prior Carryover
Cumulative Carryover

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2025-2034 RRI Calculation Period	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	10-Year	Cumulative
Baseline Revenue Requirement ($MM) *												*
Annual 1% ($MM) *												*
Actual Costs of Compliance												* *
Annual Over (Under) *												*
Plus Prior Carryover *												*
Cumulative Carryover *												*

Exhibit

2026-2035 RRI Calculation Period												
Baseline Revenue Requirement ($MM) *												*
Annual 1% ($MM) *												*
Actual Costs of Compliance												
Annual Over (Under) *												*
Plus Prior Carryover *												*
Cumulative Carryover *												*

Exhibit

2027-2036 RRI Calculation Period												
Baseline Revenue Requirement ($MM)												*
Annual 1% ($MM)												*
Actual Costs of Compliance												*
Annual Over (Under) *												*
Plus Prior Carryover *												*
Cumulative Carryover *												

Exhibit

2028-2037 RRI Calculation Period												
Baseline Revenue Requirement ($MM) *												*
Annual 1% ($MM) *												*
Actual Costs of Compliance												*
Annual Over (Under) *												*
Plus Prior Carryover *												*
Cumulative Carryover *												

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Exhibit 11 2029-2038 RRI Calculation Period

2029-2038 RRI Calculation Period	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	10-Year	Cumulative
Baseline Revenue Requirement ($MM)												
Annual 1% ($MM)												
Actual Costs of Compliance												
Annual Over (Under)												
Plus Prior Carryover												
Cumulative Carryover												

Exhibit

2030-2039 RRI Calculation Period
Baseline Revenue Requirement ($MM)
Annual 1% ($MM)
Actual Costs of Compliance
Annual Over (Under)
Plus Prior Carryover
Cumulative Carryover

Exhibit

2031-2040 RRI Calculation Period
Baseline Revenue Requirement ($MM)
Annual 1% ($MM)
Actual Costs of Compliance
Annual Over (Under)
Plus Prior Carryover
Cumulative Carryover