



Staff-OPC Scenario Analysis Results  
June 6, 2024

# CCN Analysis Requirements



- Ameren Missouri agreed to certain analysis for future CCN applications as part of its settlement of the 4-project solar CCN case.
  - For each CCN:
    - Run the Company’s IRP preferred plan with specific project assumptions instead of generic assumptions for the project for which a CCN is being requested
    - Run the Company’s IRP preferred plan with the project for which a CCN is being requested is removed (without replacing the resource)
  - For the next CCN application (Castle Bluff), run three alternative resources plans as specified by Staff and OPC. Run the Company’s IRP preferred plan with:
    - Plan 1 - The 2028 simple cycle removed
    - Plan 2 – Same as Plan 1 plus no batteries or renewables after those already approved and Reform, 2033 NGCC moved to 2028 and 2040 NGCC (“clean dispatchable”) moved to 2037
    - Plan 3 – No batteries or renewables after those already approved and Reform, 600 MW simple cycle in 2028, another 600 MW simple cycle in 2029, and both 600 MW simple cycles converted to NGCC (total capacity of 1,800 MW)

# CCN Analysis Results – Cost and Rates



Difference from Preferred Plan	Low	Base	High	PWA
Staff/OPC Scenario 1 (PRP w/o the Project)	(832)	(768)	(837)	(795)
Staff/OPC Scenario 2	(1,096)	(601)	(8)	(527)
Staff/OPC Scenario 3	3,004	3,143	3,388	3,183

Levelized Rates	cents/kwh	% vs. PRP	Abs. vs. PRP
PRP	20.9	N/A	N/A
Scenario 1	20.7	-1.0%	(0.2)
Scenario 2	20.8	-0.6%	(0.1)
Scenario 3	21.7	3.9%	0.8

- NPVRR is lower without Castle Bluff – this scenario (Scenario 1) results in deteriorated reliability (see next slide)
- Staff scenarios without batteries and further renewables result in higher costs than Scenario 1
- Including Castle Bluff results in a 1% rate “premium” for reliability
- See work paper “PVRR 05-31-24.xlsx” for detailed model financial results in folder RevReq/Results.
- See work paper “Emissions-Generation 05-31-24.xlsx” for detailed model production/emissions results in folder Rev/Req/Results.
- See 2023 IRP workpapers for any detailed assumptions not altered for this analysis

# CCN Analysis Results – Reliability



2030

Case	Base	1	2	3
Battery Storage	400	400	-	-
Castle Bluff	800	-	-	800
CCGT	-	-	1,200	1,800
CT Gas Existing	2,058	2,058	2,058	2,058
Labadie	2,372	2,372	2,372	2,372
Sioux	974	974	974	974
Solar	1,400	1,400	1,180	1,180
Wind	1,700	1,700	700	700
LOLE	0.24	2.08	0.45	0.01
Long/(Short) MW	(284)	(1,027)	(607)	667

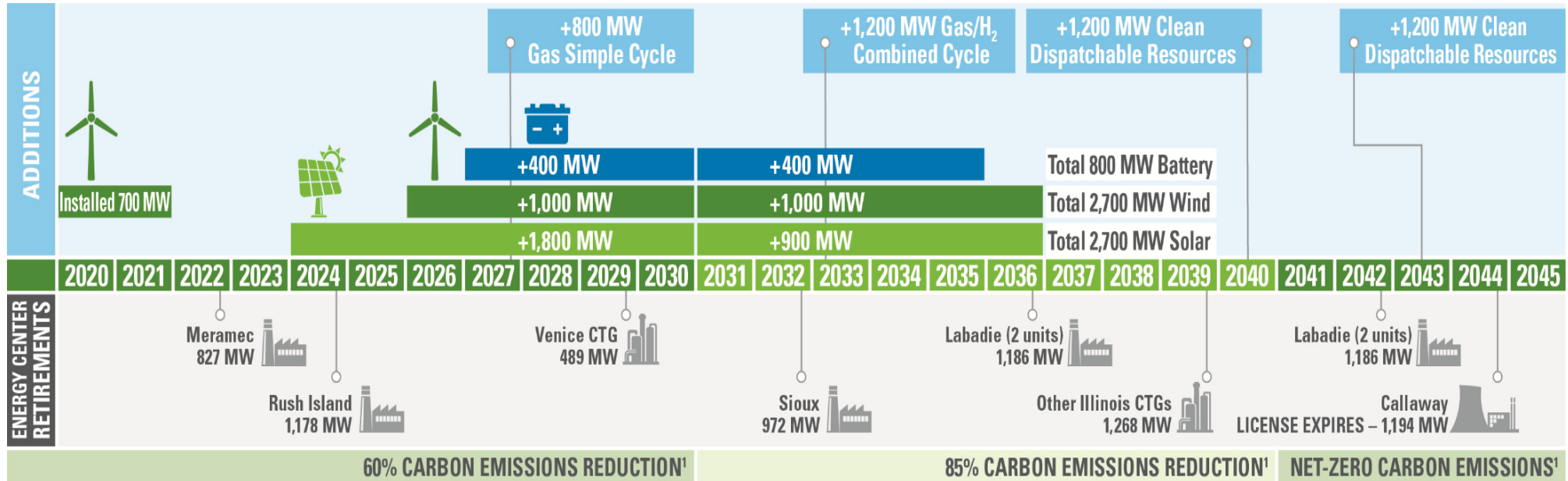
2037

Case	Base	1	2	3
Battery Storage	800	800	-	-
Castle Bluff	800	-	-	800
CCGT	1,200	1,200	2,400	3,000
CT Gas Existing	1,918	1,918	1,918	1,918
Labadie	1,186	1,186	1,186	1,186
Sioux	-	-	-	-
Solar	2,700	2,700	1,180	1,180
Wind	2,700	2,700	700	700
LOLE	0.10	1.26	1.52	0.02
Long/(Short) MW	22	(782)	(893)	363

- Only Staff-OPC Scenario 3 (at \$3 billion greater cost) provides better reliability
- Staff-OPC Scenario 2 reliability deteriorates between 2030 and 2037
- Above tables represent Ameren Missouri system with no external market support

# APPENDIX

# 2023 IRP Preferred Plan



**NOTE:** Final timing of Rush Island retirement is dependent on a revised order from the U.S. District Court. The company continues to evaluate the potential for additional energy efficiency and demand response programs. Reductions are presented as of the end of the period indicated and based off 2005 levels. Wind and solar additions, energy center retirements by end of indicated year.

**1.** Ameren's goals encompass both Scope 1 and 2 emissions including other greenhouse gas emissions of methane, nitrous oxide and sulfur hexafluoride. This goal is dependent on a variety of factors including cost-effective advancements in innovative clean energy technologies as well as constructive federal and state energy and economic policies.



# Supply-Side Resource Analysis

## New Resource Characteristics

Resource Option	Net Plant Output (MW)	Overnight Capital Cost (\$/kW)	First Year Fixed O&M Cost (\$/kW)	First Year Variable O&M Cost (\$/MWh)	Assumed Annual Capacity Factor (%)	Heat Rate (Btu/kWh)
Wind	-	\$1,979	\$36	-	42%	N/A
Solar	-	\$1,925	\$14	-	26%	N/A
CC	1,200	\$1,115	\$62	\$2.67	40% / 80%	6,148
CC with 98.5% CCS	1,135	\$2,096	\$107	\$4.11	40% / 80%	7,138
SC	230	\$885	\$8	\$5.22	5%	9,895
Nuclear (Conventional)	1,100	\$9,859	\$151	\$3.64	94%	10,443
Nuclear (SMR)	864	\$8,183	\$122	\$3.86	94%	11,991
Hydro	50	\$5,586	\$99	-	40%	N/A
Pumped Storage	600	\$1,891	\$4	\$3.63	25%	N/A
Battery (4 hour)	-	\$1,717	\$33	-	17%	N/A
Battery (8 hour)	-	\$3,373	\$50	-	17%	N/A

Transmission interconnection costs not added yet except for renewables.

# Wind and Solar Capital Costs

