IRP Public Stakeholder Meeting

April 26, 2023

Welcome and Safety Share

Richard Leger
Senior Vice President Indiana Electric

April 26, 2023

Safety Share
Family Emergency Plan

The National Safety Council recommends every family have an emergency plan in place in the event of a natural disaster or other catastrophic event. Spring is a great time to review that plan with family members. Have a home and car emergency kit. The Federal Emergency Management Agency says an emergency kit should include one gallon of water per day for each person, at least a three-day supply of food, flashlight and batteries, first aid kit, filter mask, plastic sheeting and duct tape, and medicines. Visit the FEMA website for a complete list. The emergency plan also should include:

- A communications plan to outline how your family members will contact one another and where to meet if it's safe to go outside
- A shelter-in-place plan if outside air is contaminated; FEMA recommends sealing windows, doors and air vents with plastic sheeting
- A getaway plan including various routes and destinations in different directions
- Also, make sure your first aid kit is updated.

For more information, visit the National Safety Council website at www.nsc.org

Meeting Guidelines, Agenda, and Follow-Up Information

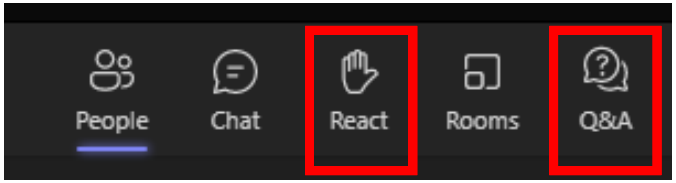
Matt Rice
Director, Regulatory and Rates

Agenda

Time	Topic	Presenter
12:00 – 1:00	Sign-in/Refreshments	
1:00 – 1:10	Welcome, Safety Message	Richard Leger, CenterPoint Energy Senior Vice President Indiana Electric
1:10 – 1:30	Follow Up Information From Third IRP Stakeholder Meeting	Matt Rice, CenterPoint Energy Director Regulatory & Rates
1:30 – 2:00	Preferred Portfolio	Matt Rice, CenterPoint Energy Director Regulatory & Rates
2:00 – 2:25	Risk Analysis Modeling and Portfolios	Drew Burczyk, Project Manager, Resource Planning & Market Assessments, 1898 & Co.
2:25 – 2:45	Risk Analysis Scorecard	Matt Lind, Director, Resource Planning & Market Assessments, 1898 & Co.
2:45 – 3:00	Next Steps	Matt Rice, CenterPoint Energy Director Regulatory & Rates

Meeting Guidelines

1. Please hold most questions until the end of each presentation. Time will be allotted for questions following each presentation. (Clarifying questions about the slides are fine throughout)
2. For those on the webinar, please use the "React" feature in Microsoft Teams (shown at the bottom of this page) to raise your hand if you have a question and we will open your (currently muted) phone line for questions within the allotted time frame. You may also type in questions in the Q&A feature in Microsoft Teams.
3. The conversation today will focus on resource planning. To the extent that you wish to talk with us about other topics we will be happy to speak with you in a different forum.
4. At the end of the presentation, we will open the floor for "clarifying questions," thoughts, ideas, and suggestions.
5. There will be a parking lot for items to be addressed at a later time.
6. CenterPoint Energy does not authorize the use of cameras or video recording devices of any kind during this meeting.
7. Questions asked at this meeting will be answered here or later.
8. We will do our best to capture notes but request that you provide written feedback (concepts, inputs, methodology, etc.) at IRP@CenterPointEnergy.com following the meeting. Additional questions can also be sent to this e-mail address. **We appreciate written feedback within 10 days of the stakeholder meeting.**
9. The Teams meeting will be recorded only to ensure that we have accurately captured notes and questions from the meeting. The public meetings are not transcribed, and the recordings will not be posted to the website. However, Q&A summaries of our public meetings will be posted on www.CenterPointEnergy.com/irp.



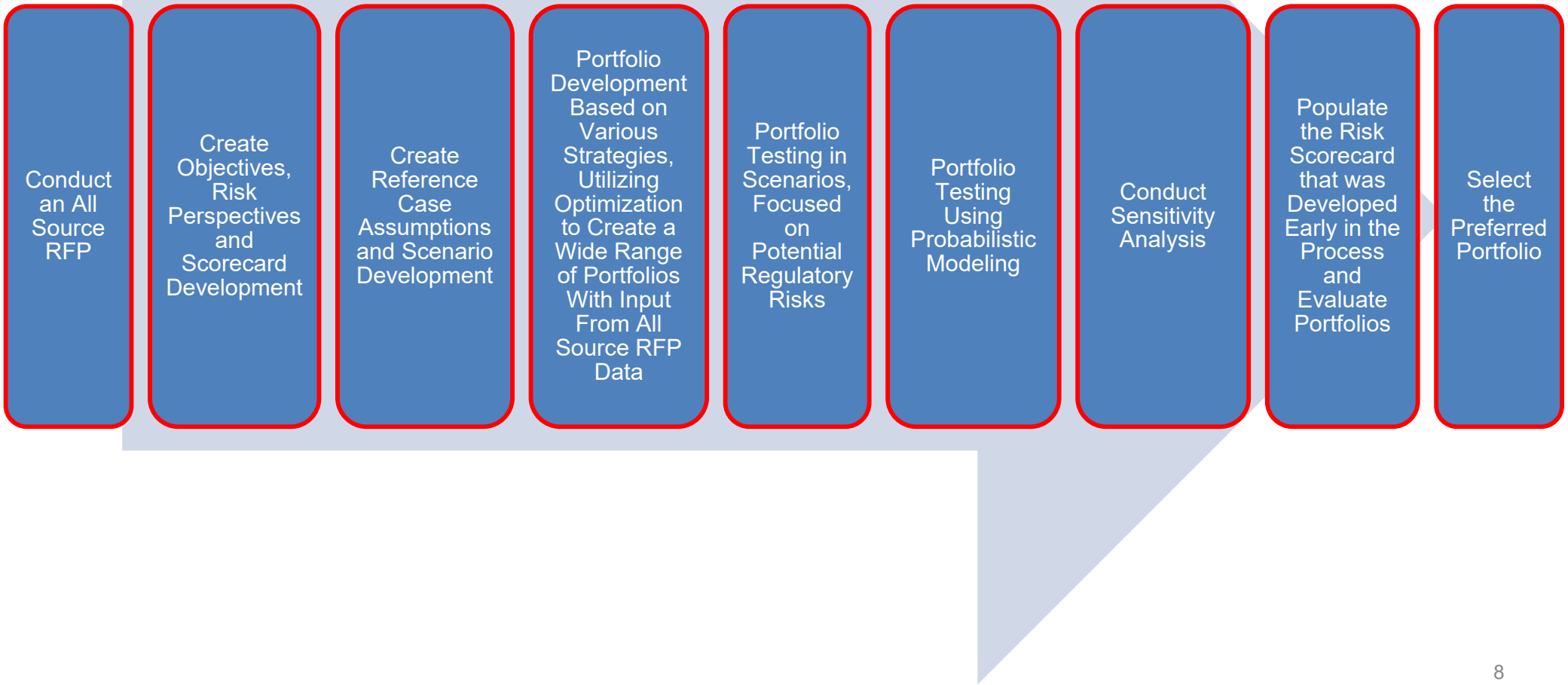
Commitments for 2022/2023 IRP

- ✓ Utilize an All-Source RFP to gather market pricing & availability data
- ✓ Utilize EnCompass software to improve visibility of model inputs and outputs
- ✓ Will include a balanced risk score card. Draft to be shared at the first public stakeholder meeting
- ✓ Will conduct technical meetings with interested stakeholders who sign an NDA
- ✓ Evaluate options for existing resources
- ✓ Will strive to make every encounter meaningful for stakeholders and for us
- ✓ The IRP process informs the selection of the preferred portfolio
- ✓ Work with stakeholders on portfolio development
- ✓ Will test a wide range of portfolios in scenario modeling and ultimately in the risk analysis
- ✓ Will conduct a sensitivity analysis
- ✓ The IRP will include information presented for multiple audiences (technical and non-technical)
- ✓ Will provide modeling data to stakeholders as soon as possible
  - ✓ Draft Reference Case results – October 4th to October 31st
  - ✓ Draft Scenario results – December 6th to December 20th
  - ✓ Full set of final modeling results - March 7th to March 31st*

* Stochastic files to be provided following the final stakeholder meeting

2022/2023 IRP Process

Stakeholder input is provided on a timely basis throughout the process, with meetings held in August, October, December, and April



2022/2023 Stakeholder Process

August 18, 2022	October 11, 2022	December 13, 2022	April 26, 2023
• 2022/2023 IRP Process • Objectives and Measures • Encompass Software • All-Source RFP • MISO Update • Environmental Update • Draft Reference Case Market Inputs & Scenarios • Load Forecast Methodology • DSM MPS/ Modeling Inputs • Resource Options	• All-Source RFP Results and Final Modeling Inputs • Draft Resource Inputs • Final Load Forecast • Scenario Modeling Inputs • Portfolio Development • Probabilistic Modeling Approach and Assumptions • Draft Reference Case Modeling Results	• Draft Scenario Optimization Results • Draft Portfolios • Final Scorecard and Risk Analysis • Final Resource Inputs[1]	• Final Reference Case Modeling • Probabilistic Modeling Results[2] • Risk Analysis Results • Preview the Preferred Portfolio

[1]Provided results to those with an NDA by December 20, 2022 Updated modeling results were provided to stakeholders on March 7, 2023

[2] Stochastic files to be provided following the final stakeholder meeting

Stakeholder Collaboration

During this IRP cycle we have had additional communication with stakeholders through a series of tech-to-tech meetings. These have allowed additional opportunity for stakeholders to provide helpful input and participate in this process

Tech to Tech Modeling Feedback

Meeting Dates	General Notes and Feedback	Data Requested
October 5th, 2022	• Discussed model inputs and assumptions • Evaluated model constraints • Discussed CO_2 forecast assumptions	• Stochastic modeling information • CO_2 price curves
October 31st, 2022	• Discussed Energy Efficiency and Demand Response model inputs • Discussed optimization of conversion options	• Reference case model outputs • Energy Efficiency and Demand Response model inputs
December 7th, 2022	• Reviewed optimized portfolios • Discussed assumptions surrounding optimized model outputs and portfolio buildouts	• Commodity forecasts • RFP PPA and Purchase pricing inputs • Stochastic results • Draft EnCompass model
February 28th, 2023	• Gathered input before running the risk analysis • Discussed accreditation, capital, and O&M projection updates • Evaluated final approach for the risk analysis	• Final capital cost curve estimates • Final IRP resource accreditation • Final near term PPA pricing

Stakeholder Feedback

Stakeholder Feedback	Response
Stakeholder request for continued dialogue following the public stakeholder meeting in December	Held a tech-to-tech meeting on February 28, 2023, to provide updated modeling files, additional input files, and portfolios for consideration in the risk analysis to stakeholders for review and comment
Include full monetization of Investment Tax Credit (ITC) for hydro resources	Included
Include the same style energy and capacity graphs that were included in the final tech-to-tech meeting when displaying risk analysis portfolios	Included
Beyond the near-term modeling, did you include site-specific assumptions to include energy community bonus for the Production Tax Credit and ITC	CEI South ran various resource capital costs and tax credit qualification sensitivities to determine the impact of these changes on future resource decisions

Stakeholder Feedback

Stakeholder Feedback	Response
Please evaluate a portfolio with hydro electric	Hydro was not selected in any of the 5 optimized modeling runs. Several portfolios were considered with hydro. These portfolios resulted in higher costs and were screened out of the risk analysis
Color coding in the score card is not helpful	The color coding is assigned by Excel based on rank order. We believe it is useful in helping discern a lot of information quickly. The scorecard is just a tool used to assimilate trade offs; we use judgement and reason to select a preferred portfolio
Capital costs should not be varied stochastically	An alternate process was used for capital and CO_2. The process will be described today
Adjust the scorecard to include near and long-term energy purchases/sales	Adjusted

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Q&A

Preferred Portfolio

Matt Rice

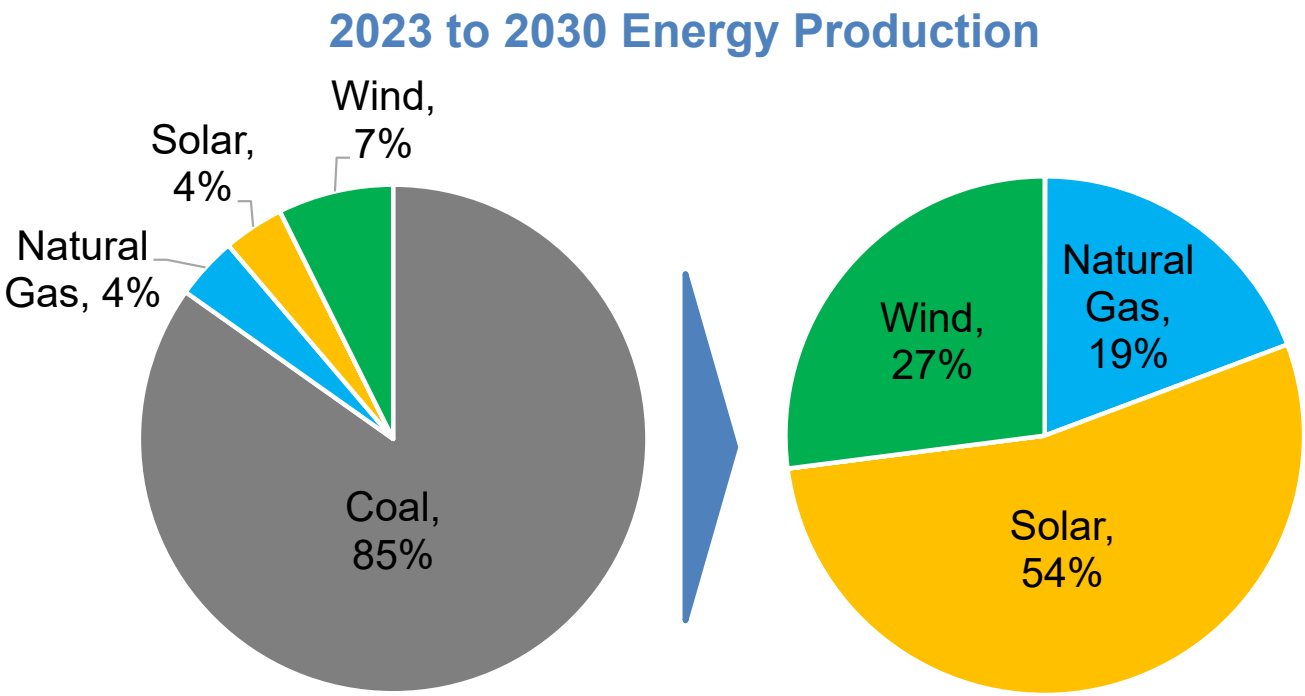
2022/2023 IRP Background

- Since the 2020 IRP, there has been unprecedented change in multiple areas that effect generation planning:
  - Disruption in the solar market (supply chain issues stemming from COVID, threat of tariffs, and an investigation by the Commerce Department on forced labor in China) that has driven costs much higher than expected
  - Dispatchable generation is rapidly retiring and replaced with intermittent generation, causing a capacity shortage in MISO. The market reached the max price of Cost of New Entry (CONE) for the 2022/2023 planning year
  - Passage of the Inflation Reduction Act (IRA) which accelerated the demand for renewables projects at a time of supply chain constrains is fueling near term price increases
  - Rising energy costs that have helped drive high inflation throughout the economy
  - Fundamental changes to MISO rules and mechanisms (to ensure reliability for the worst week across four seasons rather than planning for the one peak hour of the year in summer) results in lower capacity accreditation for solar in the long term, while wind has benefited from these changes
  - EPA continues to ratchet down on air emissions, targeting coal

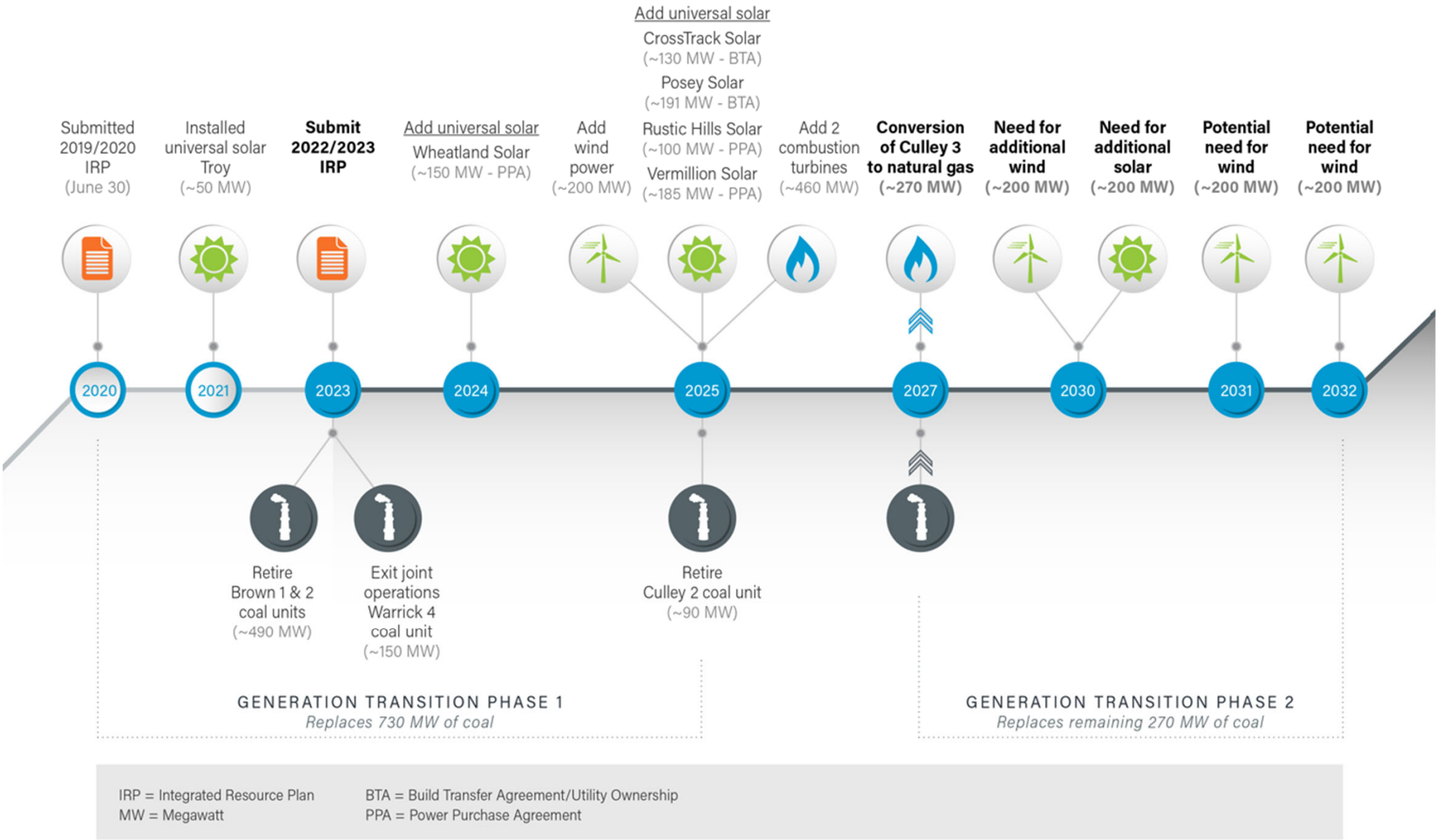
Why Was This Portfolio Chosen?

The preferred portfolio converts FB Culley 3 from coal to natural gas by 2027 and adds 200 MW of solar and 200 MW of wind by 2030. An additional 400 MW of wind is called for by 2032.

- **Preferred Portfolio Benefits**
  - Maintains reliability, preserving 270 MW of capacity
  - Saves customers nearly $80 million vs continuation of F.B. Culley 3 on coal
  - Lowers CO_2 output by more than 95%
  - Avoids future customer cost risk by preserving interconnection at Culley 3
  - Preserves tax base in Warrick County
  - Maintains ability to ramp if needed for economic development



CenterPoint Energy IRP Preferred Portfolio[1]



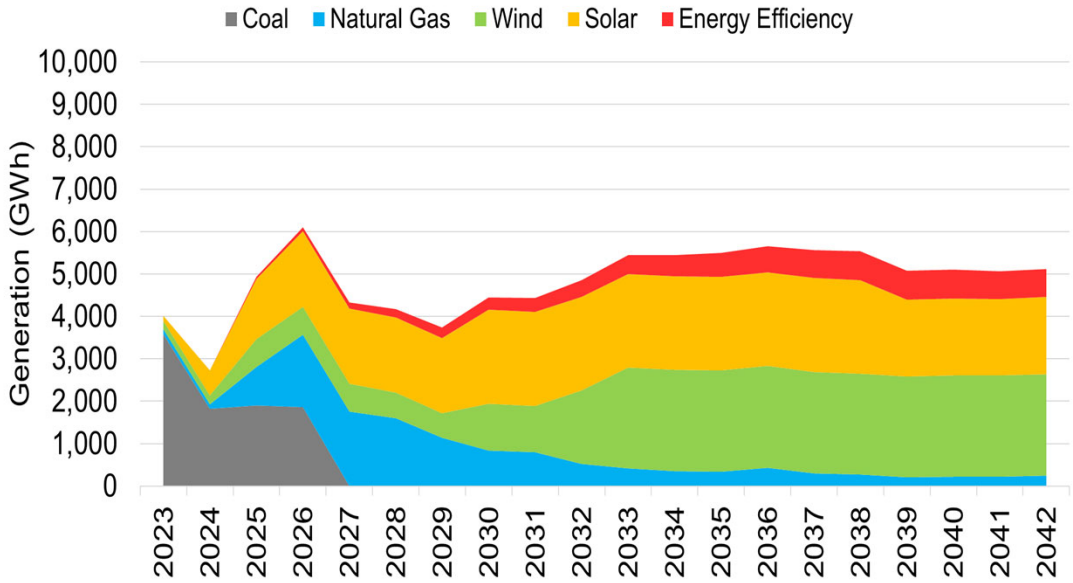
[1] Subject to change based on availability and approval

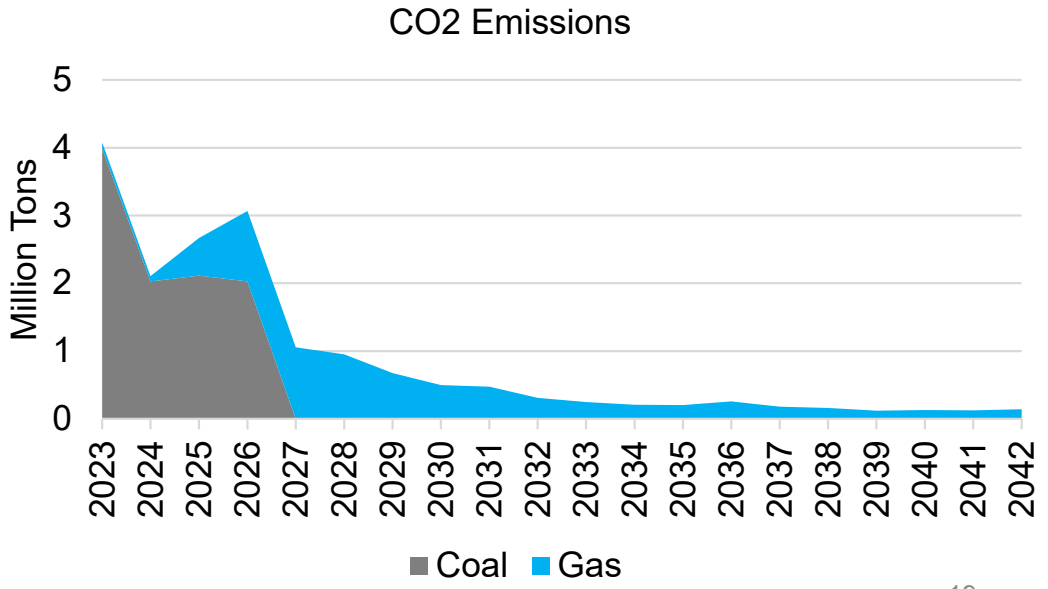
Benefits of FB Culley 3 Conversion

- Reliability and affordability
  - Dispatchable resource supports continued transition to renewable energy by providing energy during peak hours where energy prices are at their highest
  - Hedge against future capacity costs that are expected to remain high in the MISO market
  - Low up front capital cost, reduced O&M and reduced fuel cost results in savings for customers when compared to continuing to run on coal
  - Able to run during times of long duration renewables drought
  - More certainty on future accreditation
- CO_2 emissions nearly the same to storage and renewable portfolios with reduced SO_2 and NO_x emissions
  - Runs approx. 1% of the time
- Provides off ramp in the future
  - Allows for new alternatives to maintain reliability when they become available and affordable in the future
- Maintains existing resource
  - Maintain resource interconnection, reducing future cost and timing risk with MISO interconnection queue
  - Reduces stranded asset cost risk
- Resource diversity
  - Resilient\Diverse firm gas supply to different plants to supporting peaking operation
  - Reduced firm gas cost due to 8-12 hour start time
- Provides ancillary services for stability
- Maintains tax base in community

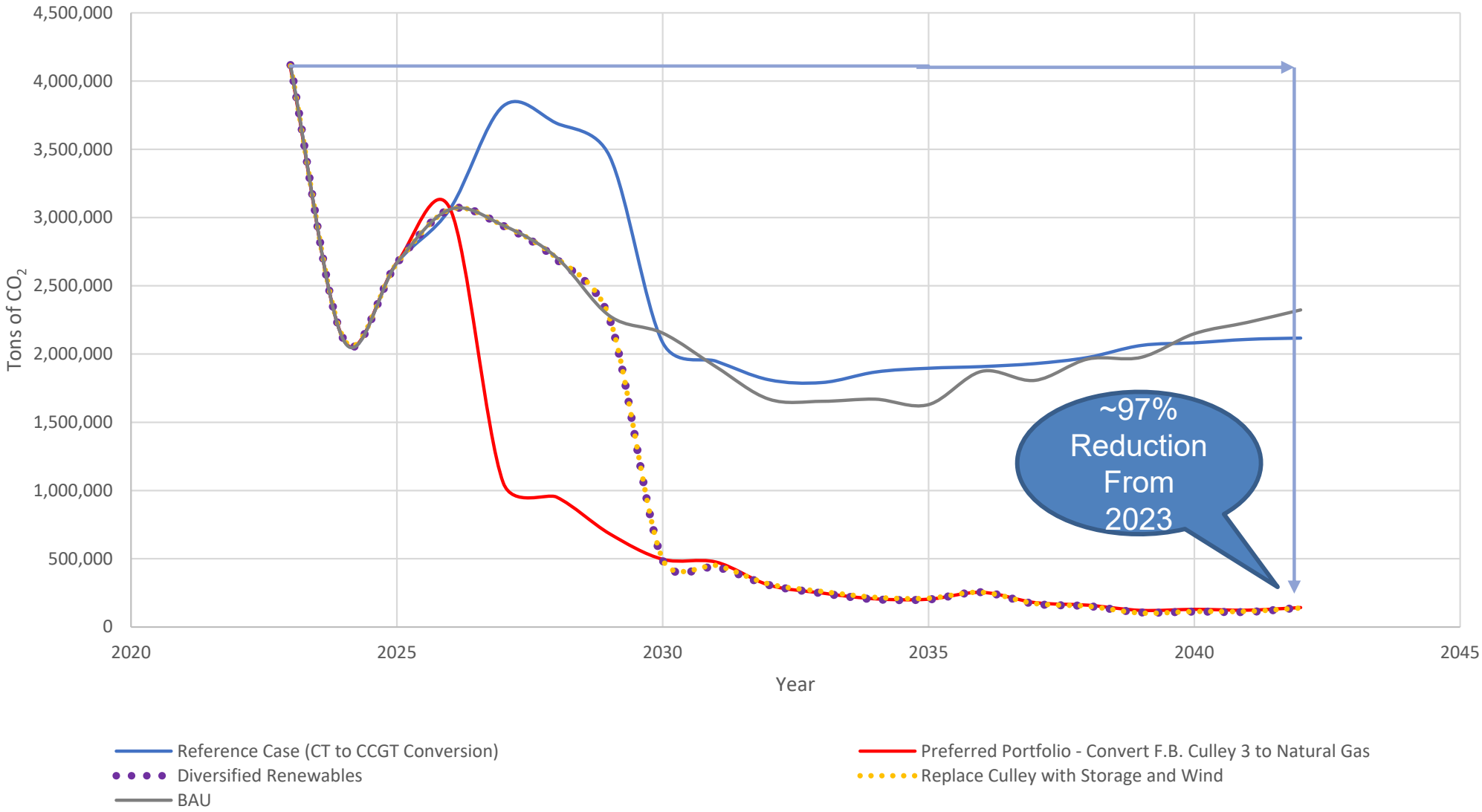
Preferred Portfolio Annual Generation and Emissions

- Generation will shift from coal to renewables and gas in the near term with a long-term shift from natural gas to mostly renewables
- By 2030 80% of energy produced will be from wind and solar resources
- From 2023 to 2030 CO_2 emissions drop by 88% and 97% by the end of the period



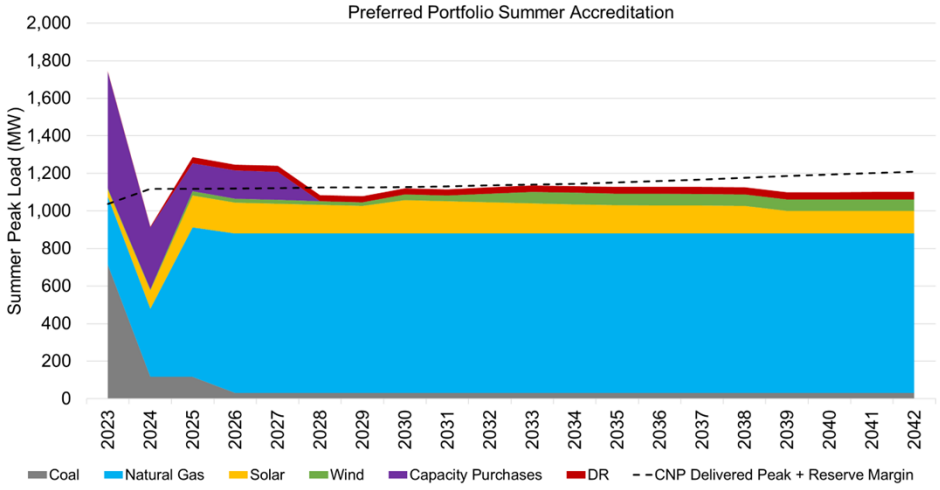


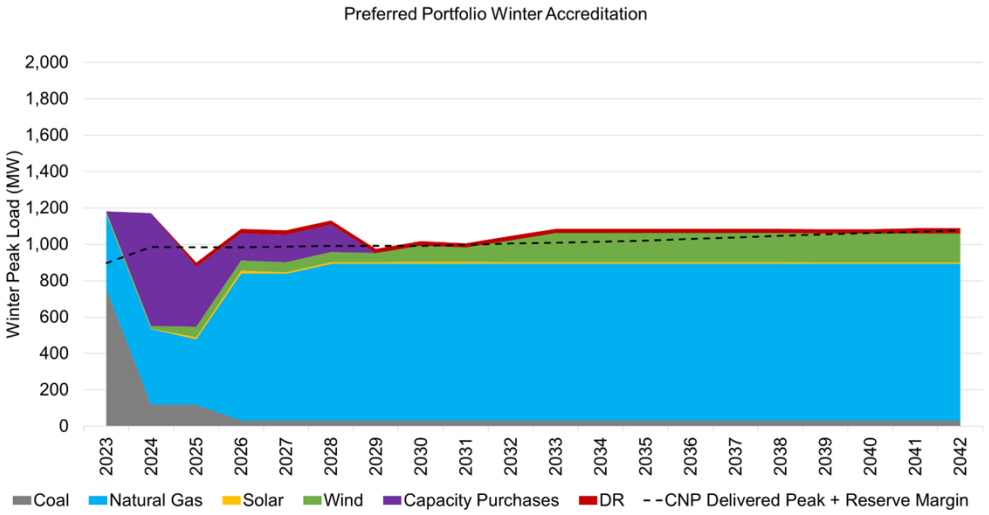
Portfolio CO_2 Emissions



Preferred Portfolio Additions and Retirements

2030-2031 Planning Year	2030-2031 Summer UCAP (MW)	Summer Accreditation %	% Summer UCAP	2030-2031 Winter UCAP (MW)	Winter Accreditation %	% Winter UCAP
Coal	30	94%	2%	30	95%	3%
Natural Gas	851	94%	76%	862	95%	85%
Solar	176	17%	16%	10	1%	1%
Wind	31	7%	3%	90	20%	9%
DR	33	100%	3%	24	100%	2%
Total Resources	1,121	N/A	100%	1,016	N/A	100%





Demand Side Resources in the Preferred Portfolio[1]

- Consistent with the 2019 IRP, the framework for the 2021-2023 EE Plan was modeled at a savings level of 1.2% of retail sales adjusted for an opt-out rate of 77% of eligible load.
  - CEI South used the realistic achievable potential identified in a Market Potential Study (MPS) as a starting point and worked closely with stakeholders on their suggested process
  - Residential sector savings were segmented into two tiers (High-Cost & Low/Mid Cost) due to stakeholder and CEI South concerns that aggregated residential sector bundles would not get selected
  - To maximize the amount of residential energy efficiency that could be selected, bundles were redrawn, shifting higher cost measures from Tier 1 into Tier 2
  - This process was utilized instead of altering EE pricing utilizing the standard deviations described in prior stakeholder meetings. Results were built into all portfolios for risk analysis modeling
  - Income Qualified Weatherization (IQW), the transition of Legacy DLC (Summer Cycler), and the Industrial DR programs were applied to all scenarios[2]

Vintage	Portfolio Selection
Vintage 1 2025 - 2027	DR Legacy - 2023
	DR Industrial
	C&I Enhanced
	HER
	IQW
	Res LowMed
Vintage 2 2028 - 2030	C&I Enhanced
	IQW
	HER
	Res LowMed
	DR CI Rates
Vintage 3 2031 - 2042	C&I Enhanced
	DR CI Rates
	IQW
	Res LowMed

[1]CEI South's DSM programs have been approved by the Commission and implemented pursuant to various IURC orders over the years

[2]CEI South is currently in discussion with a C&I aggregator to help realize the Industrial DR included in the preferred portfolio

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Q&A

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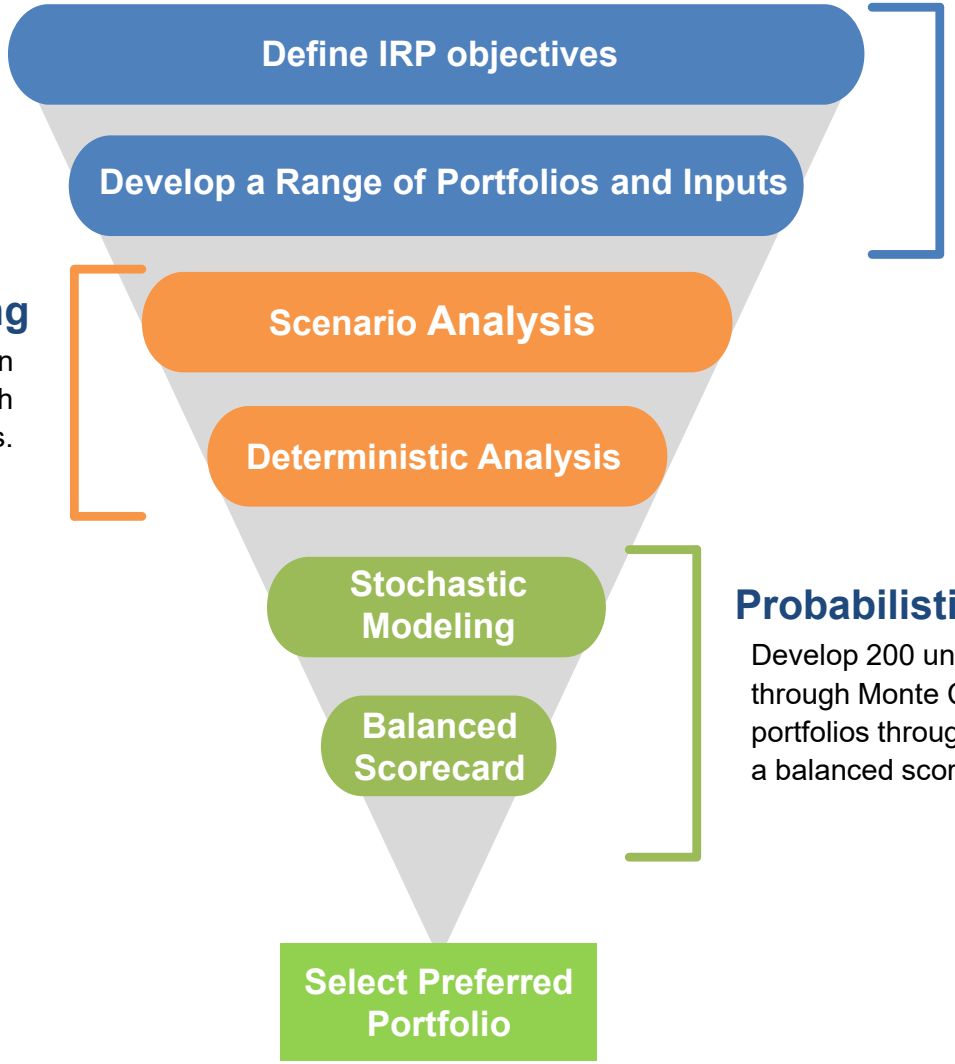
Risk Analysis Modeling and Portfolios

Drew Burczyk, 1898

IRP Portfolio Evaluation and Selection Process



Initial Modeling Phase

Outline the customer requirements and project options/constraints within the model.

Deterministic Modeling

Optimize the least cost capacity expansion plan for each portfolio. Run hourly dispatch modeling on all portfolios.

Probabilistic Modeling

Develop 200 unique families of modeling inputs through Monte Carlo simulation. Run selected portfolios through 200 families of inputs to achieve a balanced scorecard.

Probabilistic Modeling Approach

Objective: Utilize stochastic analysis around key IRP inputs to measure uncertainty around power supply portfolio costs

Two Purposes:

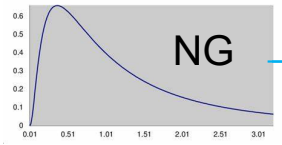
1. Evaluate results of stochastic inputs analysis to inform on what inputs to use for various scenarios; and
2. Stochastically develop 200 “families” of correlated inputs to run through PCM – result will be probability distribution around power supply costs

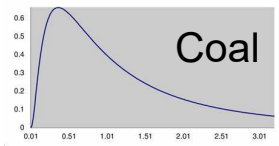
Risk Analysis Process Overview

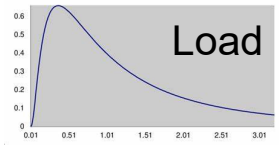
Variable Mean & Standard Deviation

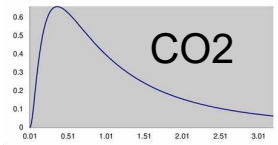
Correlations

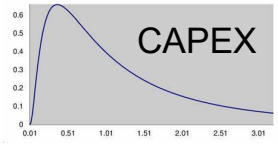
Variable Outputs (yarn charts)





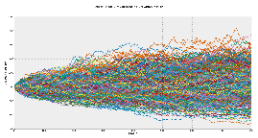


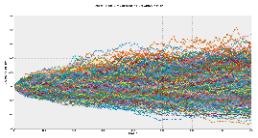


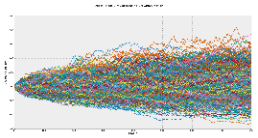


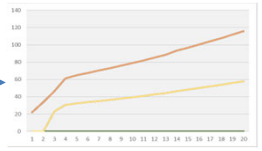
Monte Carlo Simulation 200 Iterations

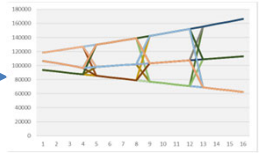
Assigned Post-simulation:









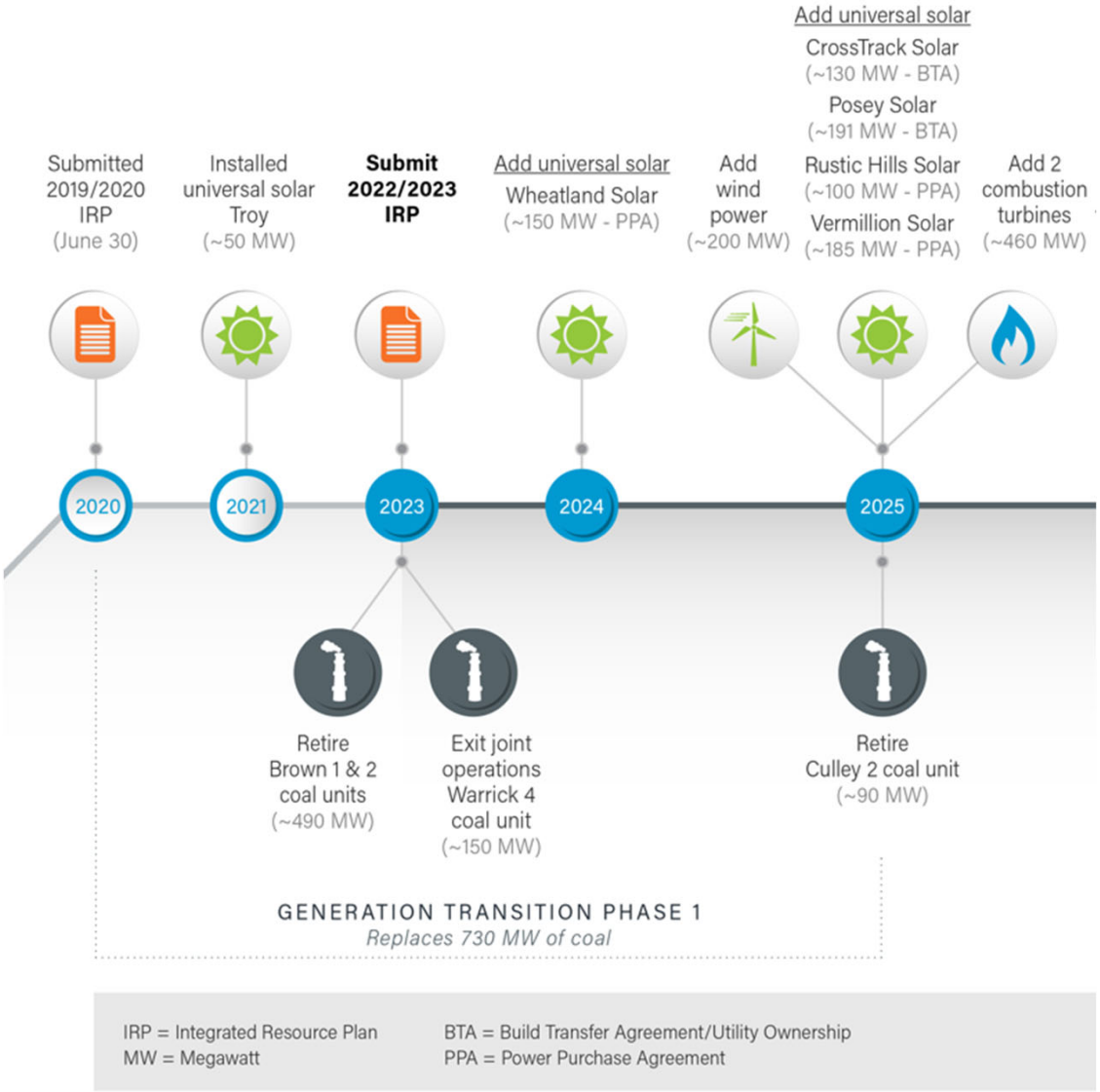


200 families of inputs where each iteration (family) reflects variable levels and paths that are tied together by correlations

Risk Analysis Methodology

- Utilize 200 draws from Scenario inputs for Gas, Coal, Load
- Renewable + storage capital cost variation in risk analysis
  - Assigned to 200 EnCompass draws based on:
    - First 50 draws - Low forecast
    - Next 100 draws - Reference case forecast
    - Last 50 draws - High forecast
  - Every 4 years, draws randomly “reshuffled” and above assignments are made
- CO_2 forecast variation in risk analysis - Assigned to 200 EnCompass draws based on:
    - First 120 draws use Reference case forecast ($0/Ton)
    - Next 40 draws use Medium forecast
    - Last 40 draws use High forecast

IRP Portfolio Decisions



- FB Culley 2 & 3 conversion or retirement decision is a key part of this IRP
- With MISO's shift to seasonal construct there is a capacity shortfall in 2024 prior to the CTs coming online and then into the 2030s
- Analyzed a wide range of portfolios that provide insights around the F.B. Culley decision and the future resource mix

Range of IRP Portfolios

Portfolio Strategy Group	Portfolio
Reference	Optimized Portfolio in Reference Case conditions
Scenario-Based	Optimized Portfolio using High Regulatory scenario assumptions
	Optimized Portfolio using Market Driven Innovation scenario assumptions
	Optimized Portfolio using Decarbonization/Electrification scenario assumptions
	Optimized Portfolio using High Inflation and Supply Chain Issues scenario assumptions
Deterministic	Business as Usual (Continue to run FB Culley 3 through 2042)
	AB Brown CTs with and without CCGT conversion
	FB Culley 2 or 3 gas conversion
	FB Culley 2 and 3 gas conversion
	Retire FB Culley 2 by 2025 • Replace with non-thermal (Wind, Solar, Storage) • Replace with thermal (CCGT, CT)
	Retire FB Culley 3 by 2029 • Replace with non-thermal (Wind, Solar, Storage) • Replace with thermal (CCGT, CT)
	Retire FB Culley 3 by 2035 • Replace with non-thermal (Wind, Solar, Storage) • Replace with thermal (CCGT, CT)

Range of Portfolios

- Starting from the 12 portfolios that were presented at the third stakeholder meeting, additional portfolios and iterations of portfolios were developed based on:
  - Continue right sizing portfolios on both for capacity and energy
  - To examine tradeoffs in different existing resource decision timing
  - Stakeholder feedback
  - Lessons learned from preliminary portfolio optimization results

Portfolio Screening

- After iterative portfolio development and testing, portfolios were screened in order to maintain a reasonable number of portfolios to run through risk analysis
- Portfolios were screened primarily based on the following
  - Portfolio similarities and overlap
    - Desire portfolios that are included in risk analysis to be different enough to provide insights between different options (not have 10 portfolios that include the same resource types)
  - Right sizing for CNP and customers
    - Meets seasonal capacity requirements, while not significantly over built
    - Does not over rely on the market for energy sales or energy purchases
  - Cost

Portfolio Screening For Risk Analysis -
12.13.22 Stakeholder Meeting Draft Optimized Portfolios

CenterPoint Energy

Year	Reference Case	Market Driven Innovation	Decarbonization/ Electrification
2024	Solar (635MW) Wind (200MW)	Solar (635MW) Wind (200MW)	Solar (635MW) Wind (200MW)
2025	Retire FB Culley 2 Solar (130MW) CTs (460MW)	Retire FB Culley 2 Solar (130MW) CTs (460MW)	Retire FB Culley 2 Solar (130MW) CTs (460MW)
2026			
2027	CCGT Conversion	CCGT Conversion	CCGT Conversion
2028			
2029	Retire FB Culley 3	Retire FB Culley 3 Storage (1 x 10MW)	Retire FB Culley 3
2030			Wind North (1 x 200MW)
2031			
2032			Long Duration Storage (300MW) Wind North (1 x 200MW)
2033	Wind North (3 x 200MW)		Wind North (3 x 200MW)
2036			
2041		Storage (1 x 10MW)	
2042		Storage (2 x 10MW)	

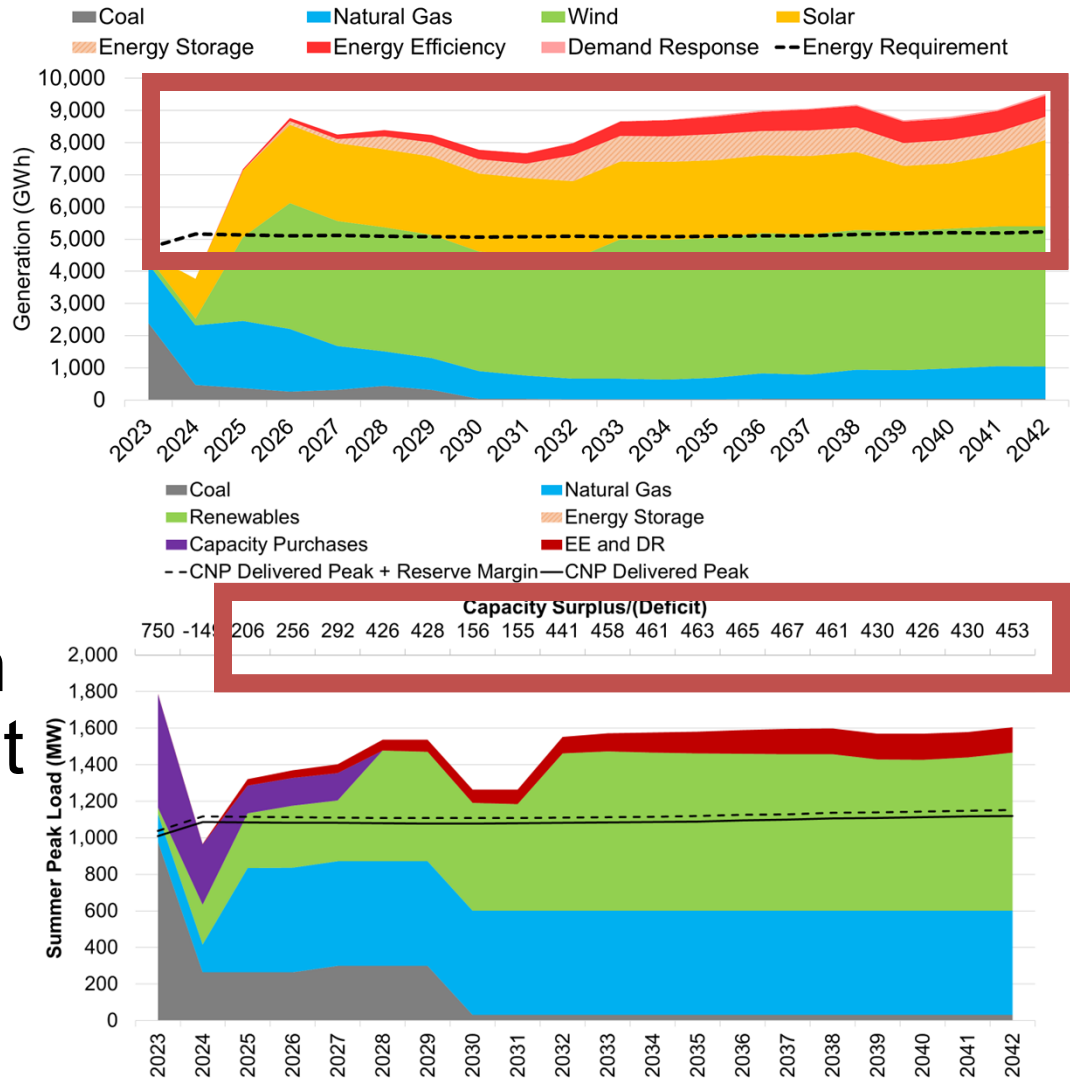
Common themes across several portfolios:

- AB Brown CT to CCGT Conversion
- Retire Culley 3 in 2029
- New wind resources being added

Portfolio Screening - Right sizing CenterPoint and Customer needs

- Several portfolios which were hundreds of MW long on capacity and/or over generated energy compared to CNP need throughout study period were screened out
- Resource mixes and portfolio concepts learned were included in deterministic portfolios at smaller scale

Energy Generation Mix



Portfolio Screening - Cost

Year	Diversified Renewables	Diversified Renewables (With Hydro)
2023	Exit Warrick 4	Exit Warrick 4
2024	Solar (341MW) Wind (200MW)	Solar (341MW) Wind (200MW)
2025	Retire FB Culley 2 Solar (415MW) CTs (460MW)	Retire FB Culley 2 Solar (415MW) CTs (460MW)
2026		
2027		
2028		
2029	Retire FB Culley 3 Wind (200MW)	Retire FB Culley 3
2030	Storage (200MW) Solar (200MW) Wind (200MW)	Storage (200MW) Hydro (58MW)
2031		
2032		Wind (200MW)
2033	Wind (200MW)	Wind (600MW)
2041		
2042		

- Portfolios which were significantly higher on cost when run through the reference case were screened prior to the risk analysis
- Portfolios which tested adding/replacing a specific resource(s) that decreased portfolio performance were also screened

Balanced Portfolio Buildouts (1 of 2)

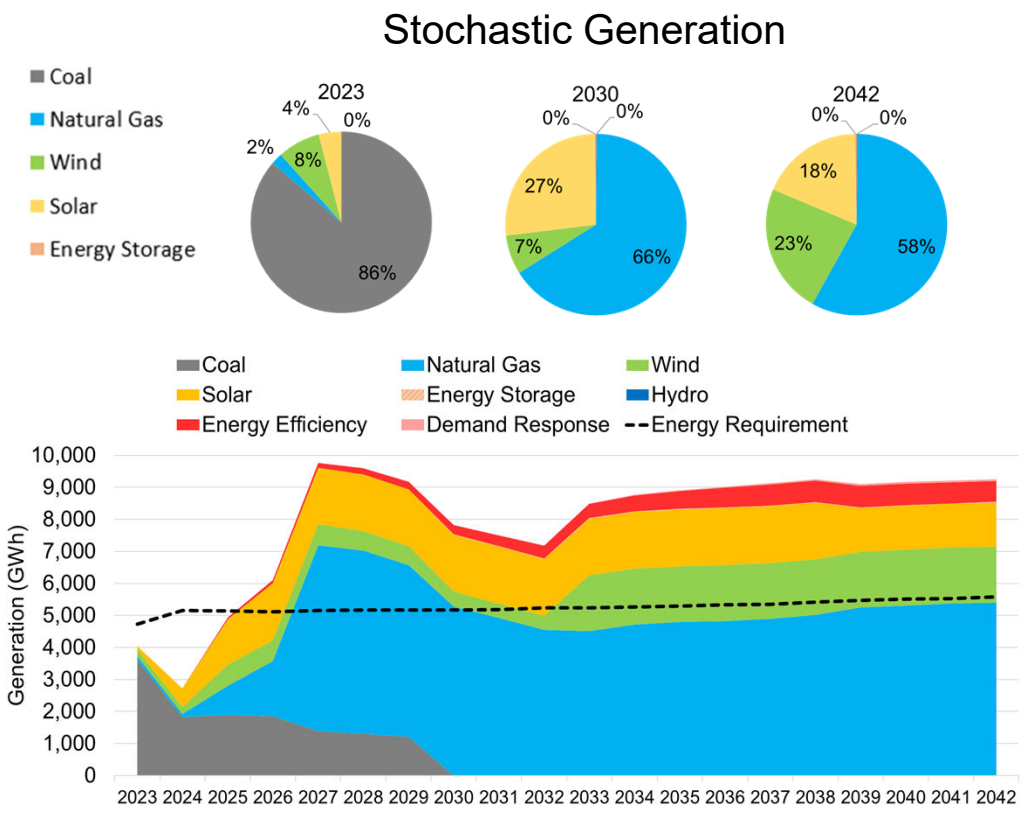
Year	Reference Case	Business as Usual (BAU) Cont. FB Culley 3 on Coal	Convert F.B. Culley 3 to Natural Gas by 2030	Convert F.B. Culley 3 to Natural Gas by 2027	Convert F.B. Culley 3 to Natural Gas by 2027 with Wind and Solar
2023	Exit Warrick 4	Exit Warrick 4	Exit Warrick 4	Exit Warrick 4	Exit Warrick 4
2024	Solar (341MW) Wind (200MW)	Solar (341MW) Wind (200MW)	Solar (341MW) Wind (200MW)	Solar (341MW) Wind (200MW)	Solar (341MW) Wind (200MW)
2025	Retire FB Culley 2 Solar (415MW) CTs (460MW)	Retire FB Culley 2 Continue FB Culley 3 Solar (415MW) CTs (460MW)	Retire FB Culley 2 Solar (415MW) CTs (460MW)	Retire FB Culley 2 Solar (415MW) CTs (460MW)	Retire FB Culley 2 Solar (415MW) CTs (460MW)
2026					
2027	CCGT Conversion			Covert FB Culley 3 to Natural Gas	Covert FB Culley 3 to Natural Gas Wind (200MW) Solar (200MW)
2028					
2029	Retire FB Culley 3	Storage (10 MW)			
2030		Wind (200MW)	Covert FB Culley 3 to Natural Gas Wind (200MW) Solar (200MW)	Wind (200MW) Solar (200MW)	
2031					
2032			Wind (200MW)	Wind (200MW)	Wind (200MW)
2033	Wind (400MW)		Wind (200MW)	Wind (200MW)	Wind (200MW)
2041	Storage (10MW)				
2042		Storage (10 MW)			

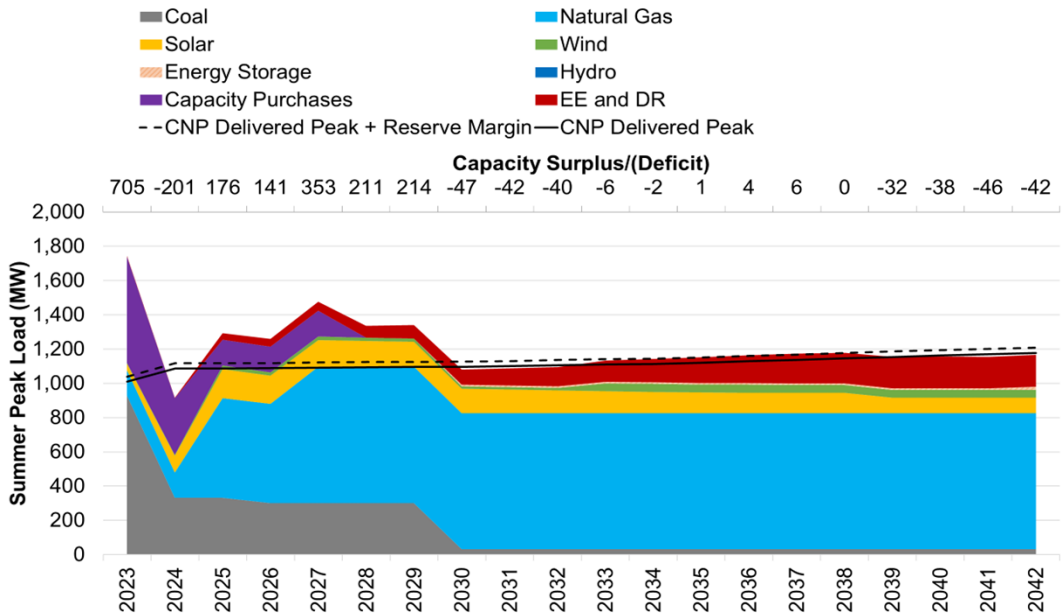
Balanced Portfolio Buildouts (2 of 2)

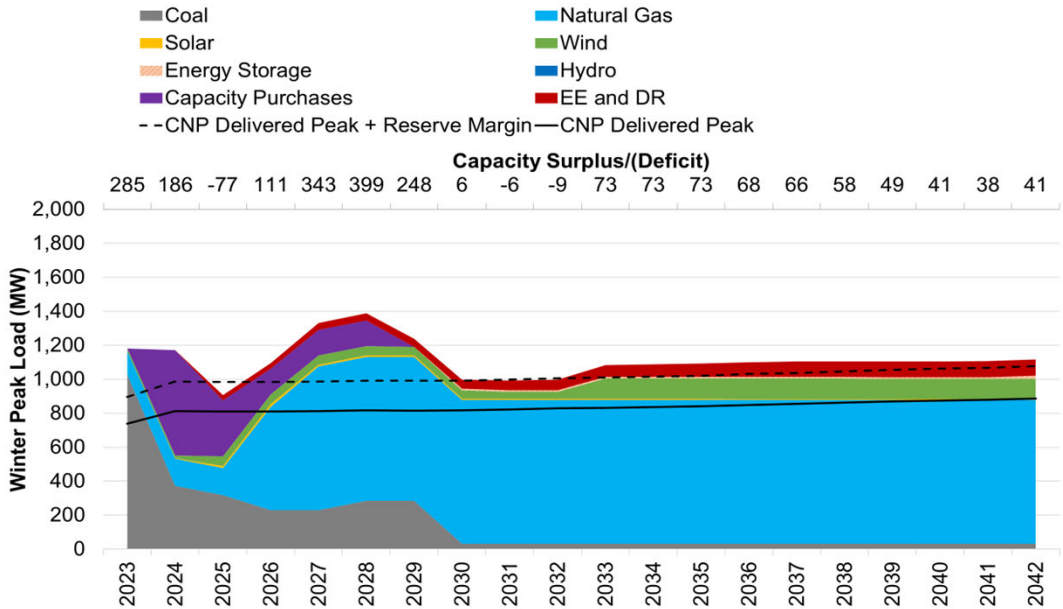
Year	CT Portfolio (Replace FB Culley 3 with F Class CT)	Diversified Renewables	Diversified Renewables (Early Storage & DG Solar)	Replace FB Culley 3 with Storage and Wind	Replace FB Culley 3 with Storage and Solar
2023	Exit Warrick 4	Exit Warrick 4	Exit Warrick 4	Exit Warrick 4	Exit Warrick 4
2024	Solar (341MW) Wind (200MW)	Solar (341MW) Wind (200MW)	Solar (341MW) Wind (200MW)	Solar (341MW) Wind (200MW)	Solar (341MW) Wind (200MW)
2025	Retire FB Culley 2 Solar (415MW) CTs (460MW)	Retire FB Culley 2 Solar (415MW) CTs (460MW)	Retire FB Culley 2 Solar (415MW) CTs (460MW)	Retire FB Culley 2 Solar (415MW) CTs (460MW)	Retire FB Culley 2 Solar (415MW) CTs (460MW)
2026					
2027			Solar (60MW)		
2028			Storage (90MW)		
2029	Retire FB Culley 3	Retire FB Culley 3 Wind (200MW)	Retire FB Culley 3	Retire FB Culley 3	Retire FB Culley 3
2030	F-Class CT Storage (60MW)	Storage (200MW) Solar (200MW) Wind (200MW)	Storage (100MW) Wind (400MW) Solar (100MW)	Storage (300MW) Wind (400MW)	Storage (250MW)
2031					
2032					
2033	Wind (600 MW)	Wind (200MW)	Wind (200MW)	Wind (200MW)	Solar (300MW)
2041			Solar (100MW)		
2042			Solar (100MW)		Storage (10MW)

Reference Case (Unconstrained)

- 2025 retirement of FB Culley 2
- 2029 retirement of FB Culley 3
- Conversion of CTs to CCGT
- Wind in 2033 and Storage in 2041

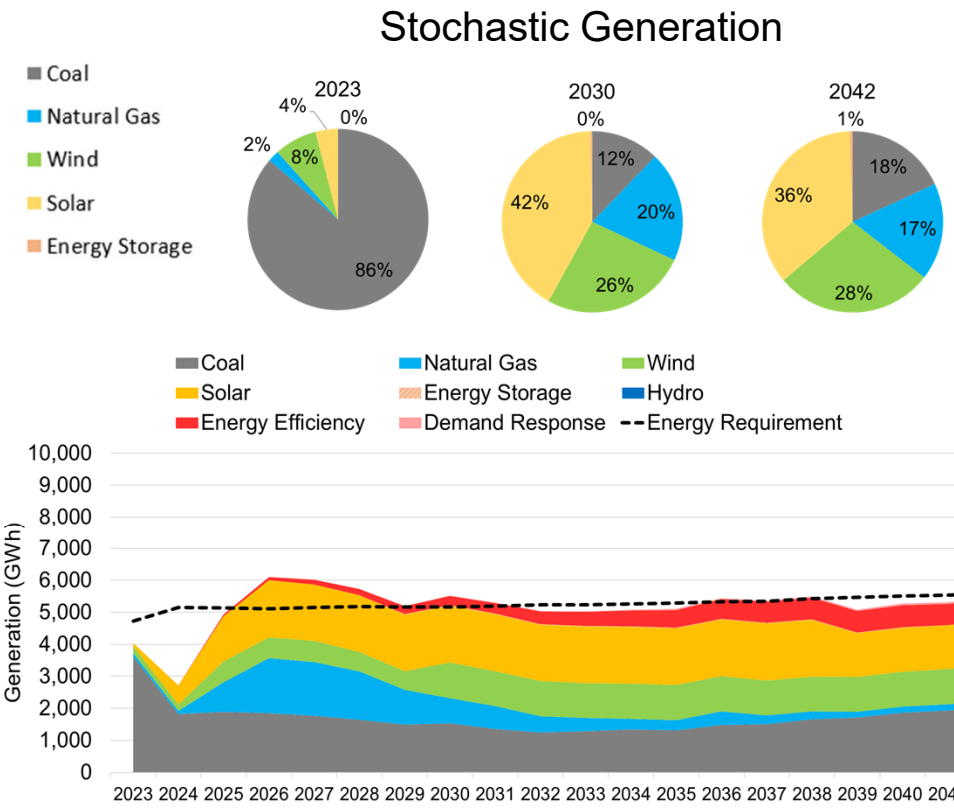


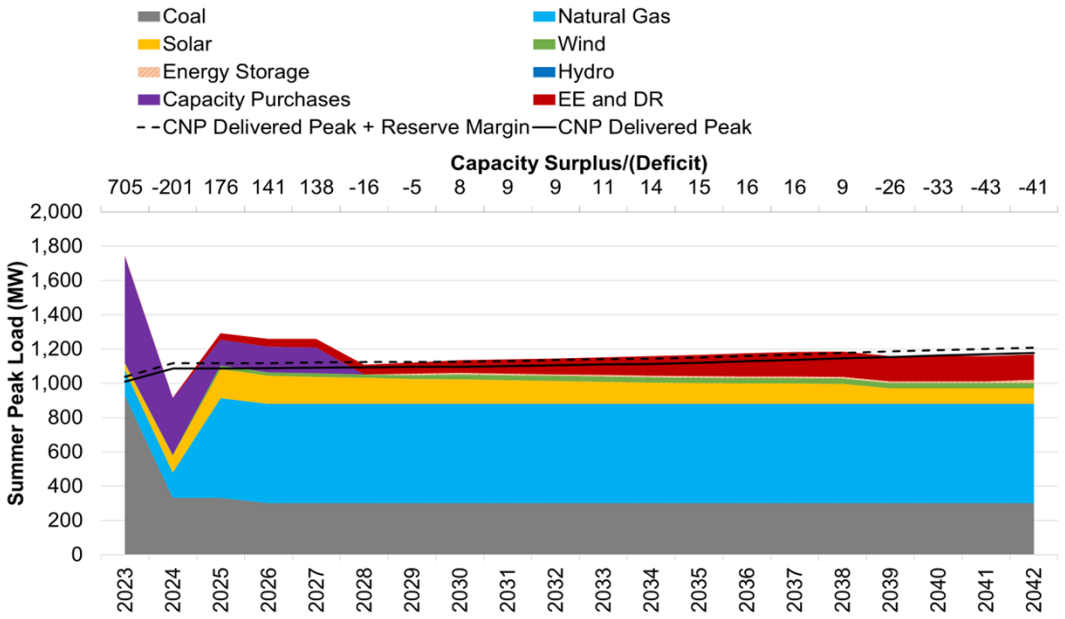


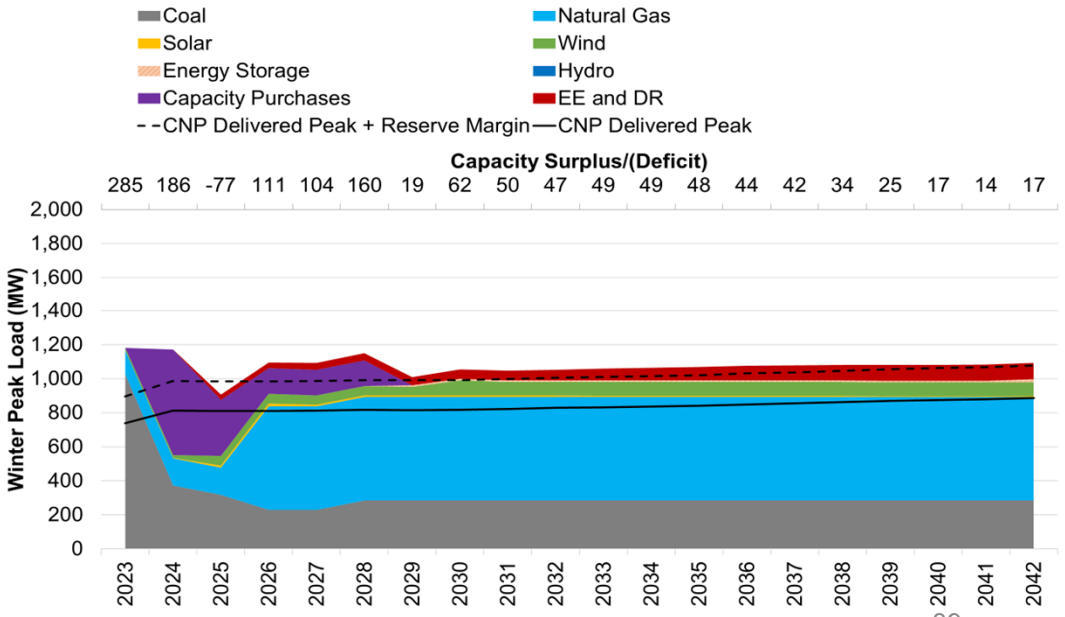


Business as Usual (BAU) Cont. FB Culley 3 on Coal

- 2025 retirement of FB Culley 2
- Continue FB Culley 3 on coal
- Wind in 2030
- 10 MW Storage in 2029 and 2042

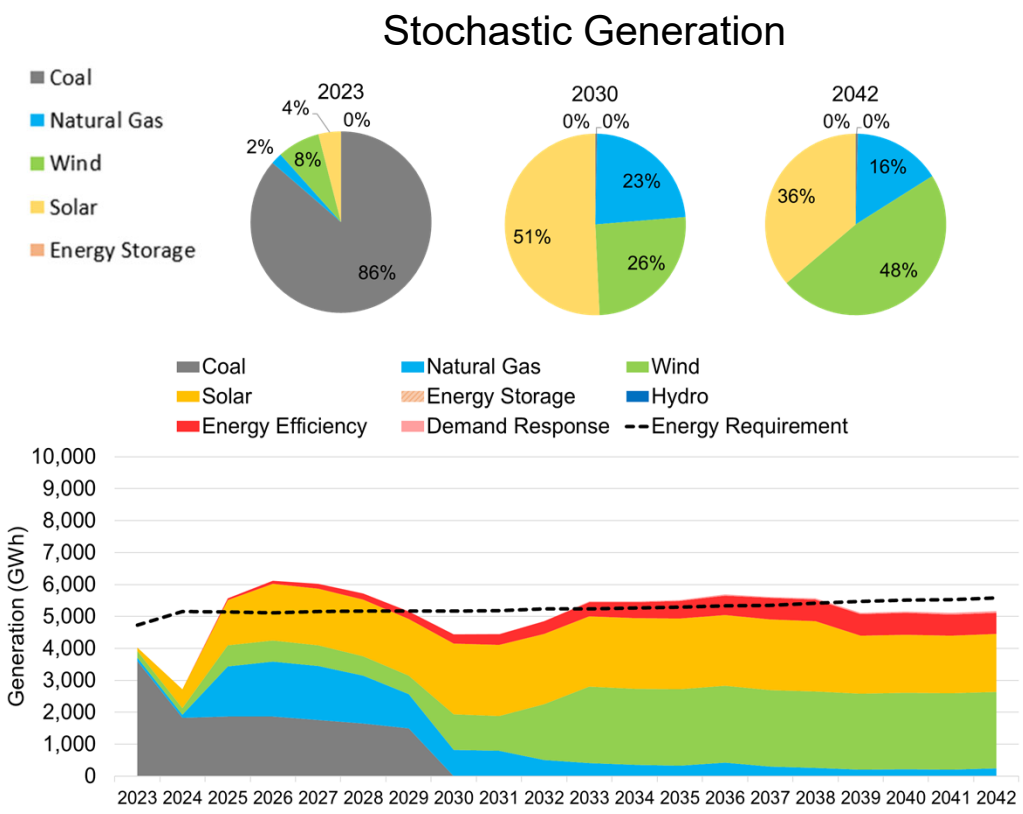


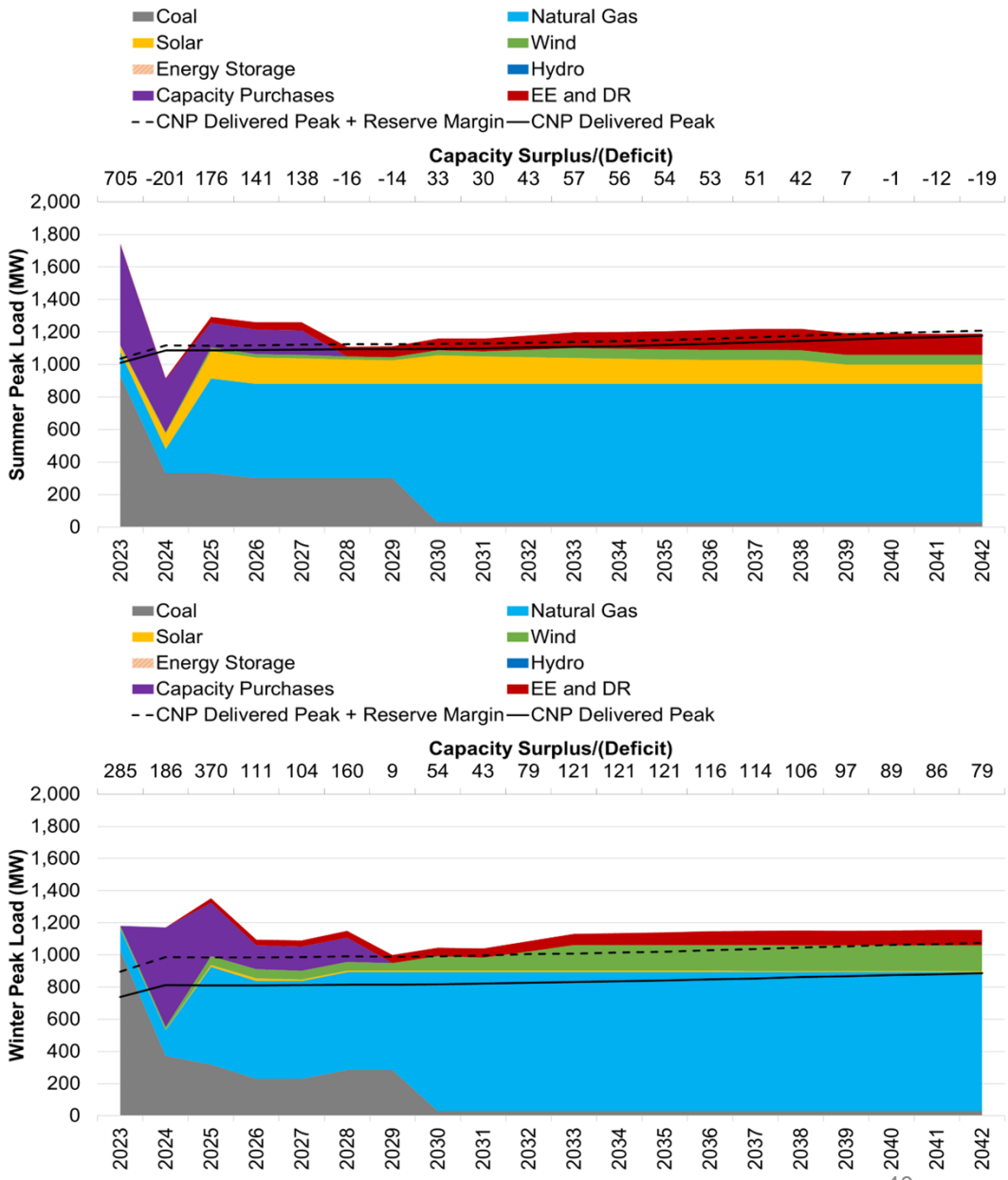




Convert F.B. Culley 3 to Natural Gas by 2030

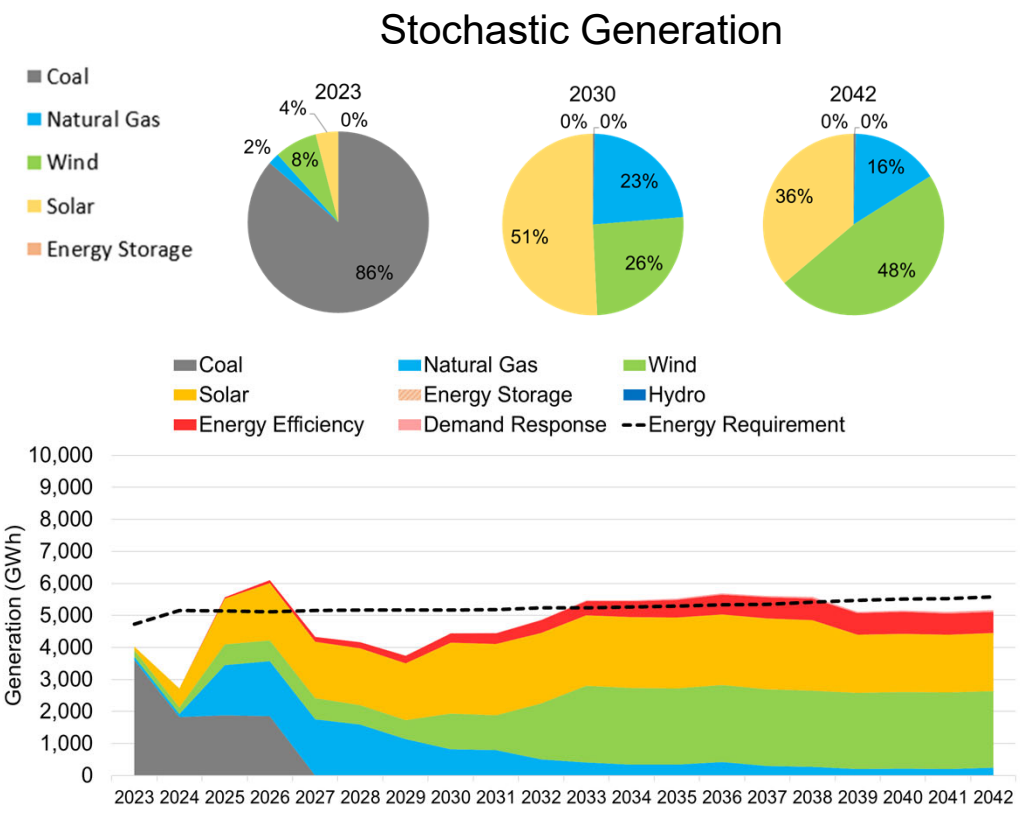
- 2025 retirement of FB Culley 2
- 2030 conversion of FB Culley 3 to NG
- Wind in early 2030s
- Solar in 2030

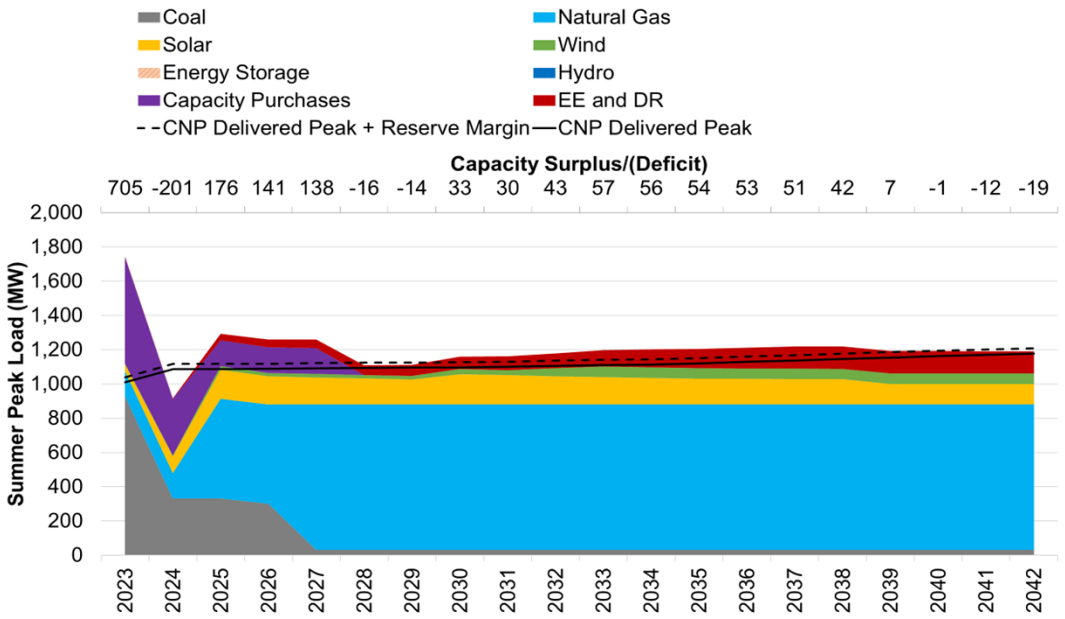


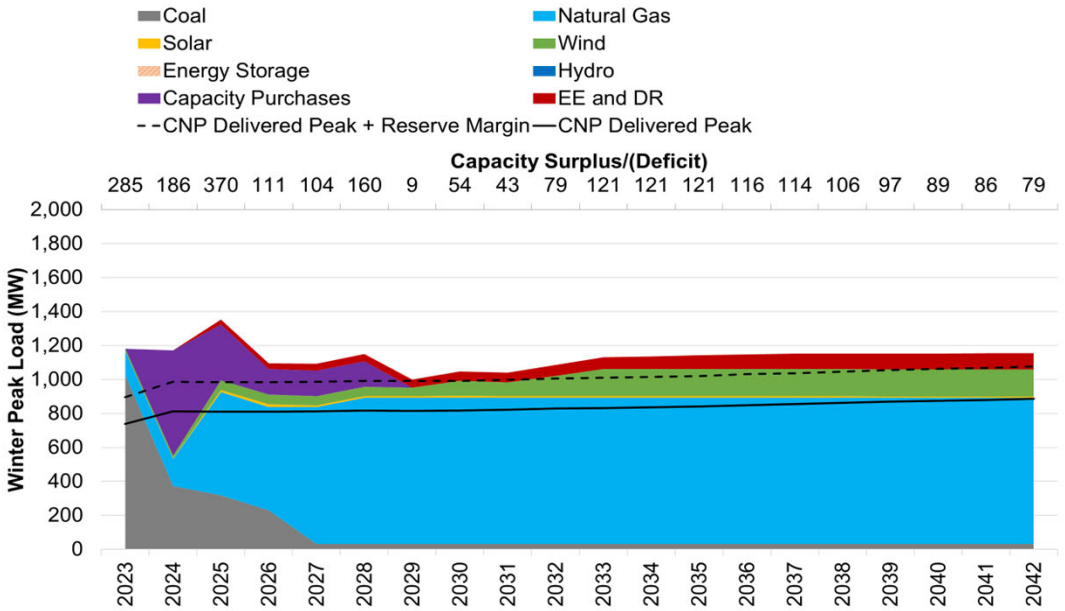


Convert F.B. Culley 3 to Natural Gas by 2027

- 2025 retirement of FB Culley 2
- 2027 conversion of FB Culley 3 to NG
- Wind in early 2030s
- Solar in 2030

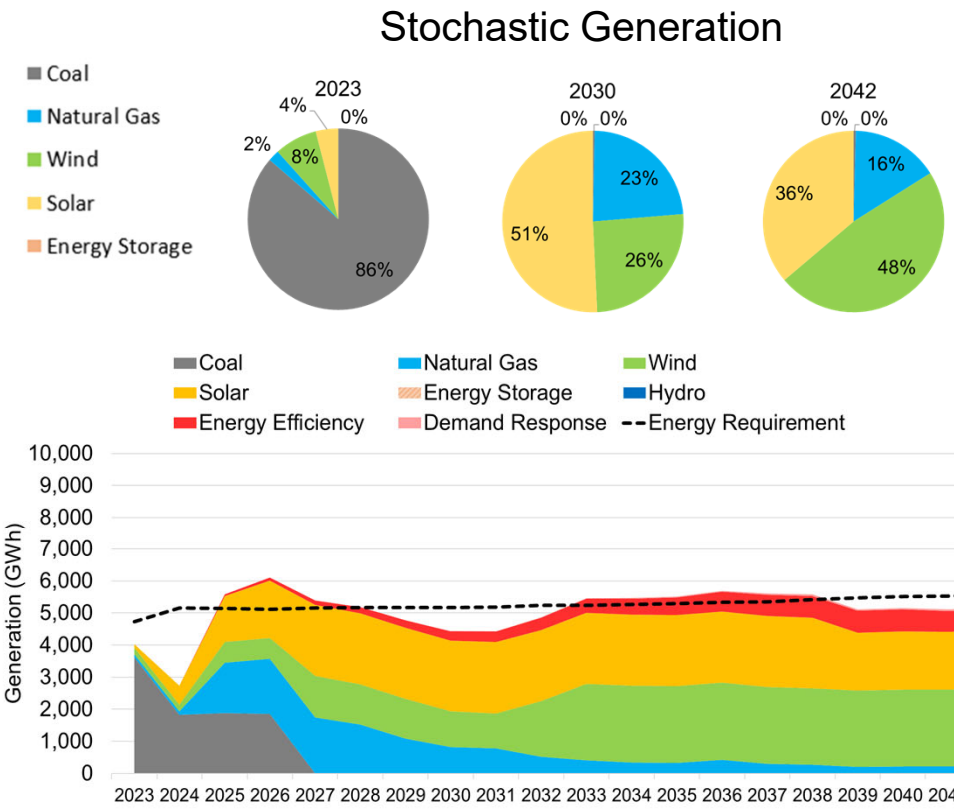


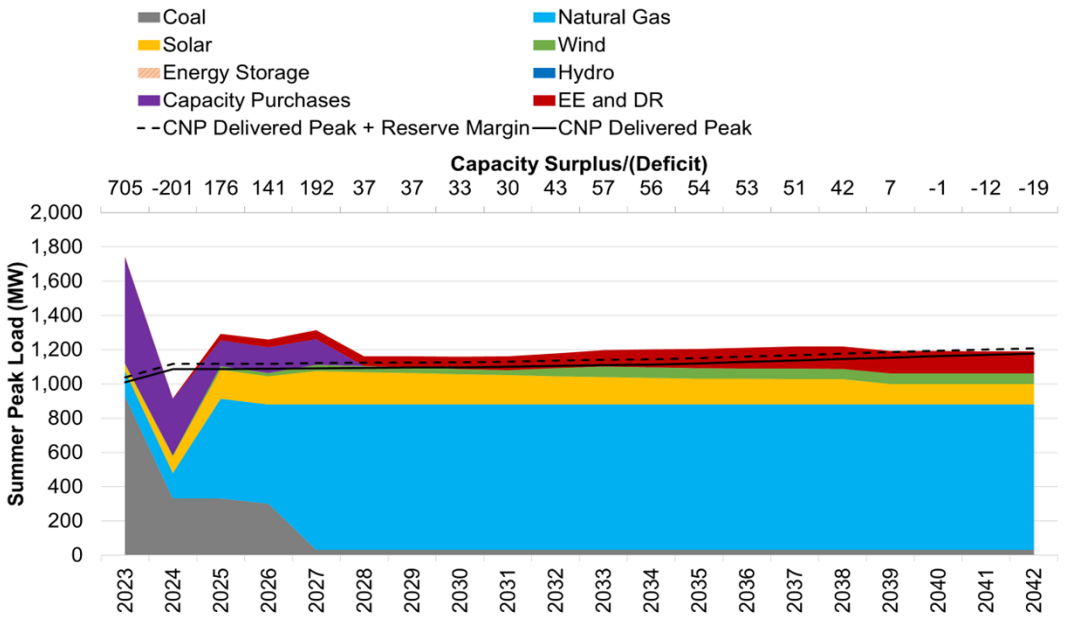


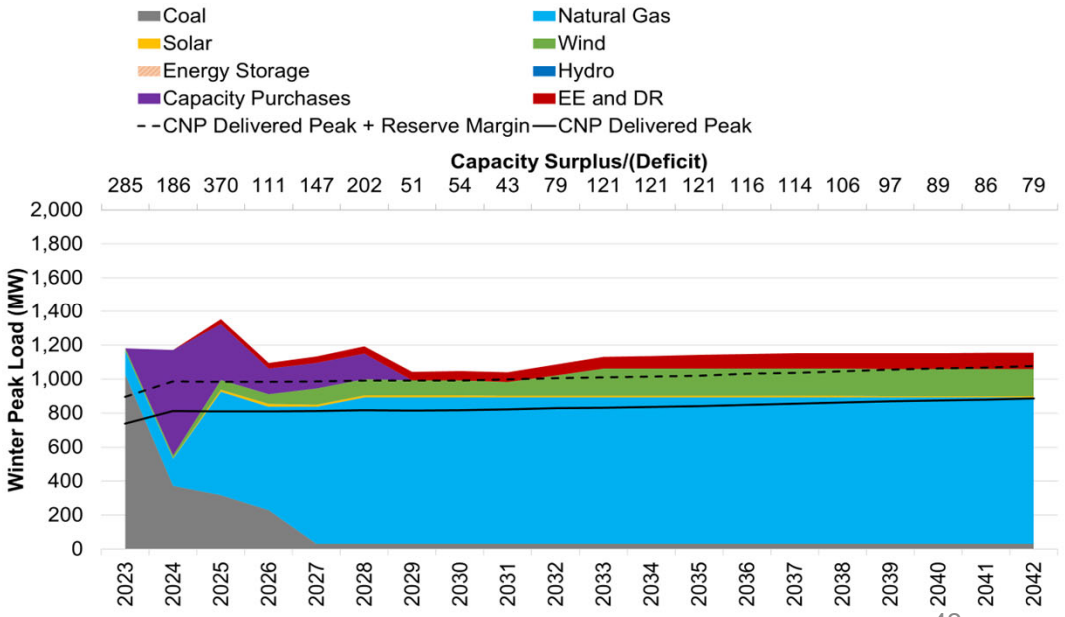


Convert F.B. Culley 3 to Natural Gas by 2027 with 2027 Wind and Solar

- 2025 retirement of FB Culley 2
- 2027 conversion of FB Culley 3 to NG
- Wind and solar in 2027
- Additional wind in early 2030s



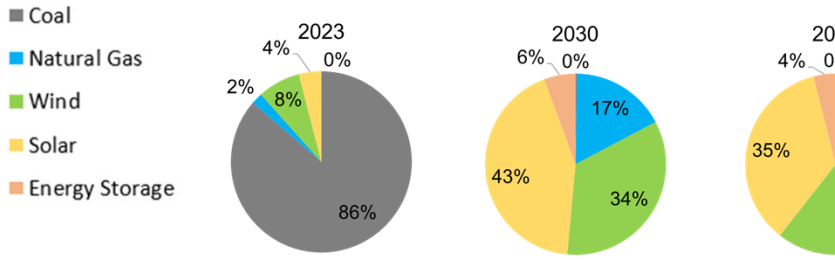


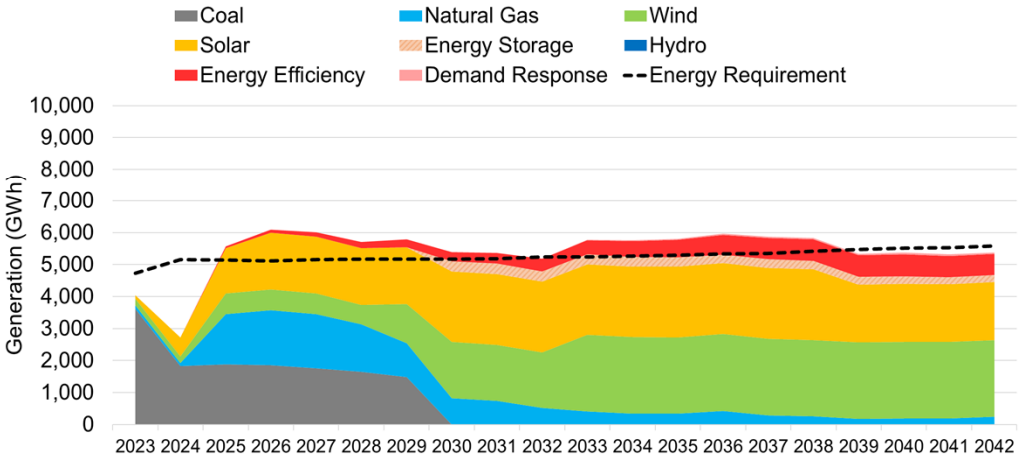


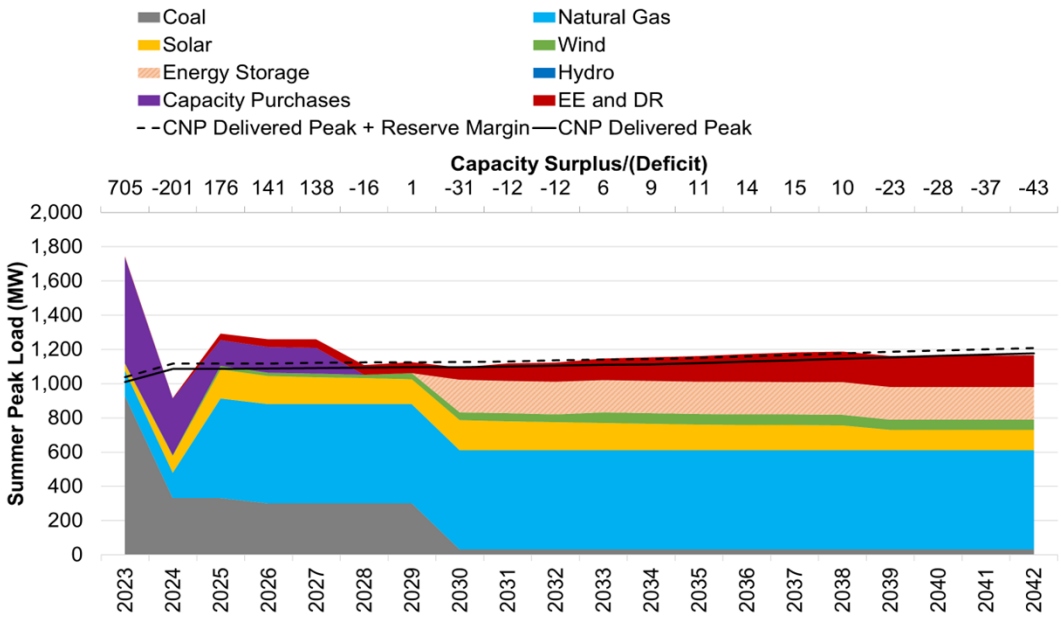
Diversified Renewables

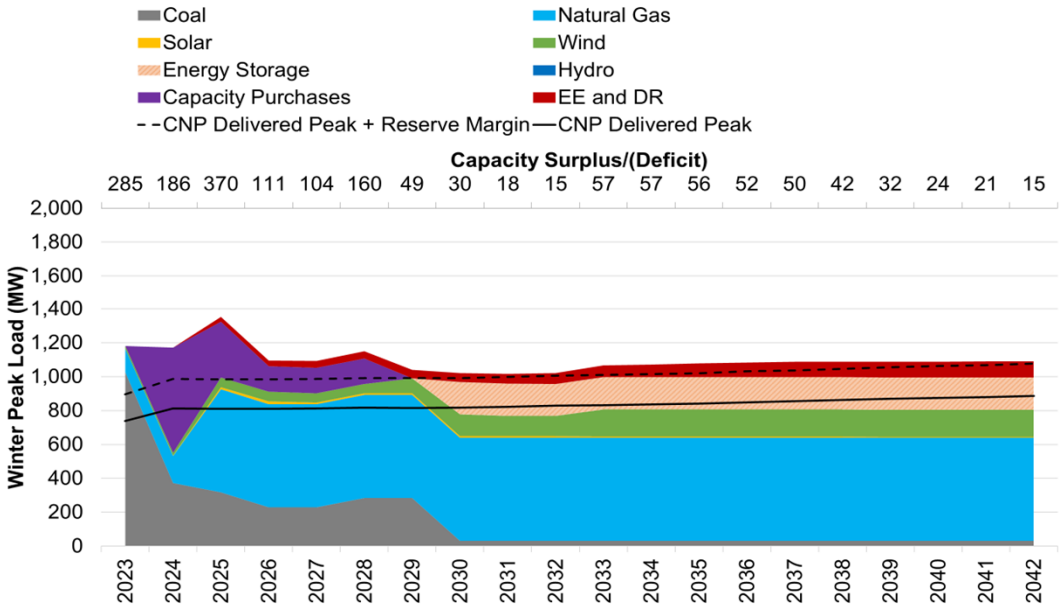
- 2025 retirement of FB Culley 2
- 2029 retirement of FB Culley 3
- Wind in 2029 and 2030s
- Solar and Storage in 2030

Stochastic Generation





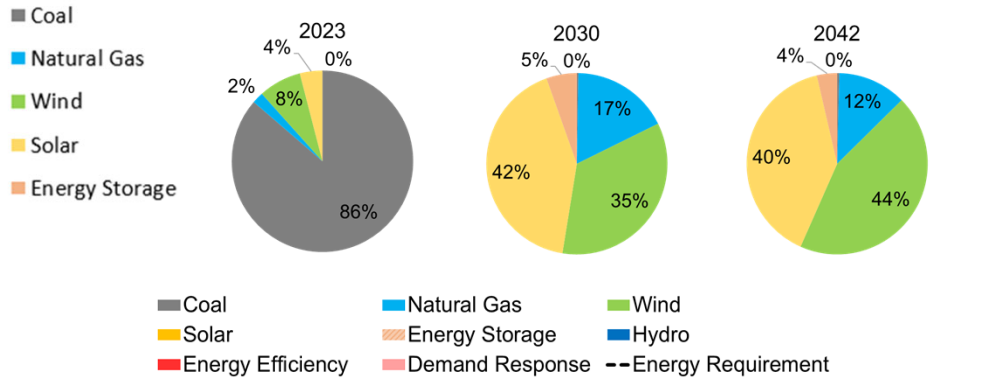


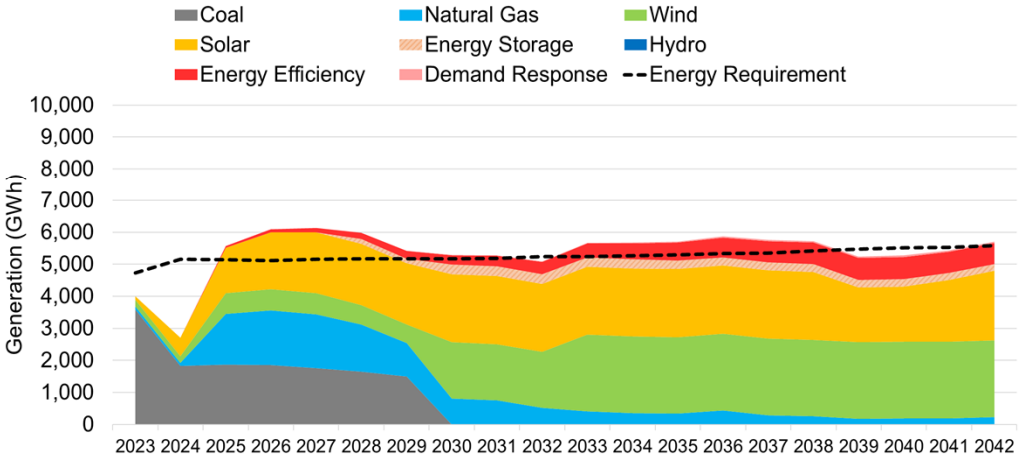


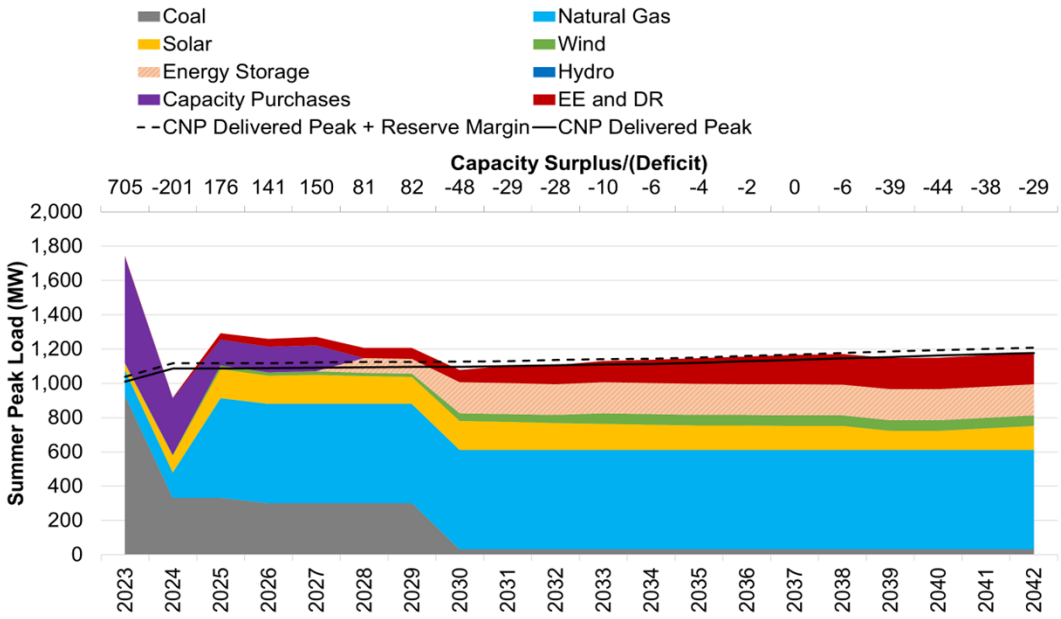
Diversified Renewables (Early Storage & DG Solar)

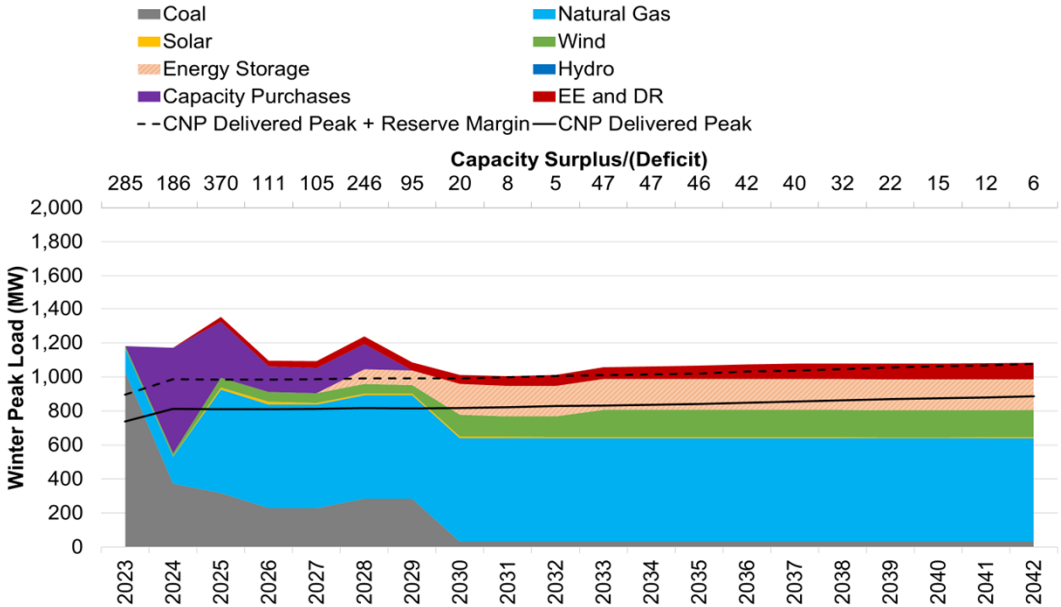
- 2025 retirement of FB Culley 2
- 2029 retirement of FB Culley 3
- DG Solar + Solar through study period
- Storage in 2028 and 2030
- Wind in 2030s

Stochastic Generation



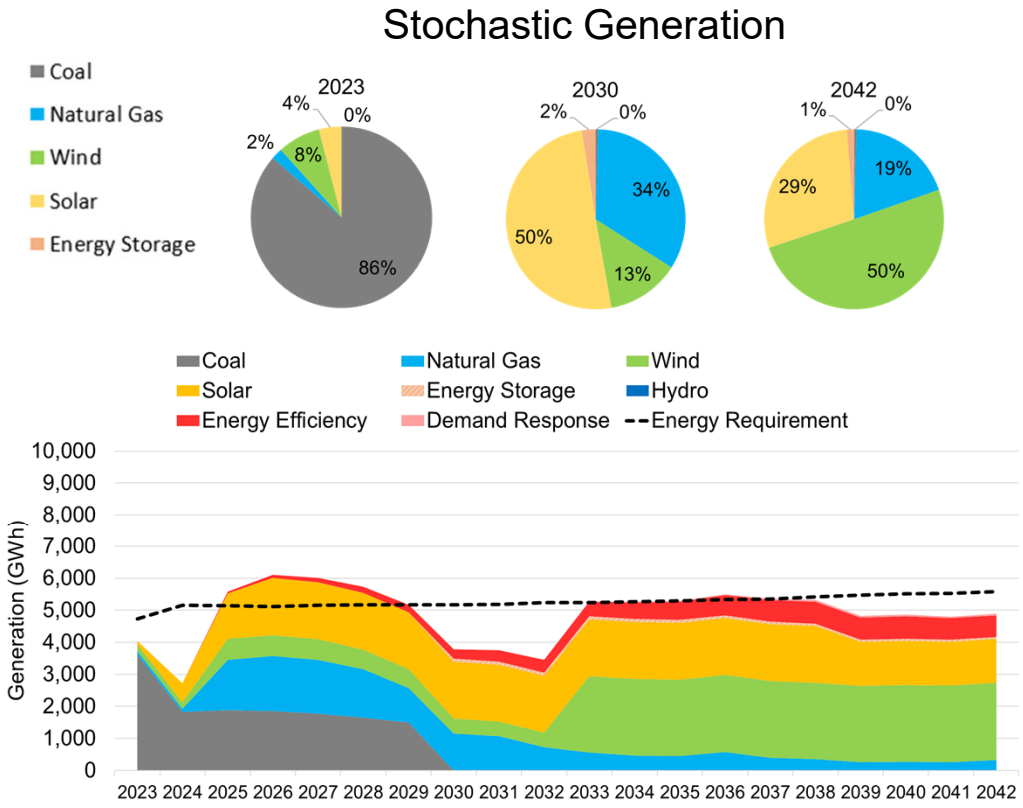


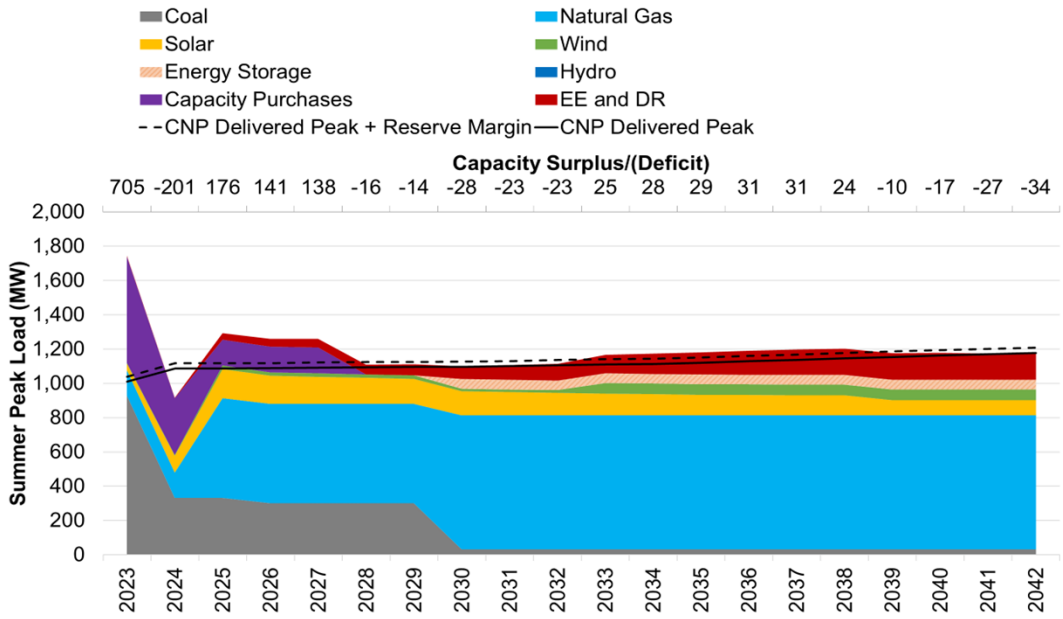


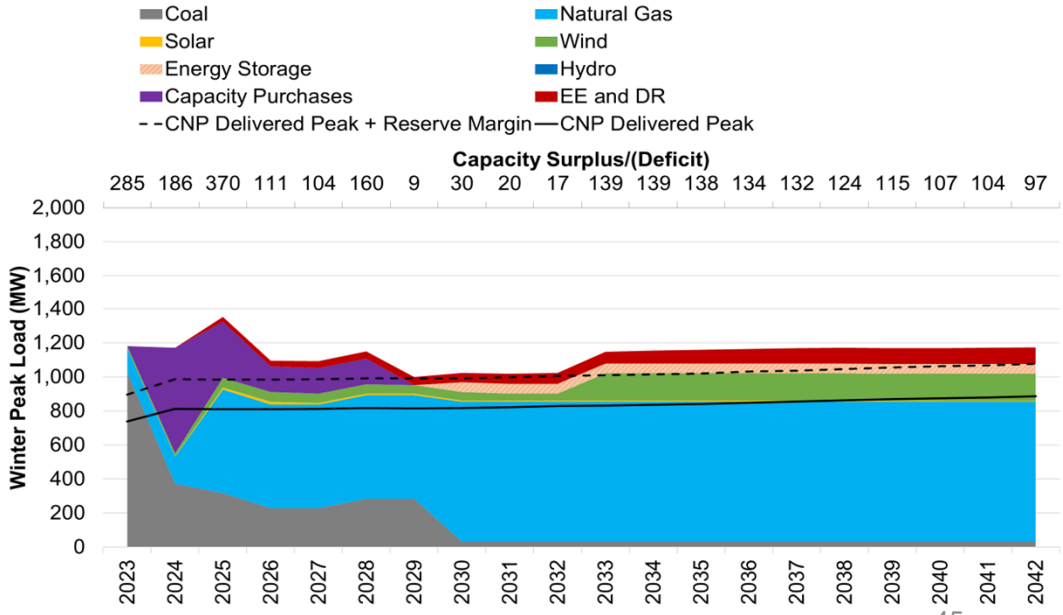


CT Portfolio (Replace FB Culley 3 with F Class CT)

- 2025 retirement of FB Culley 2
- 2029 retirement of FB Culley 3
- F-Class CT in 2030
- Storage in 2030
- Wind in 2033

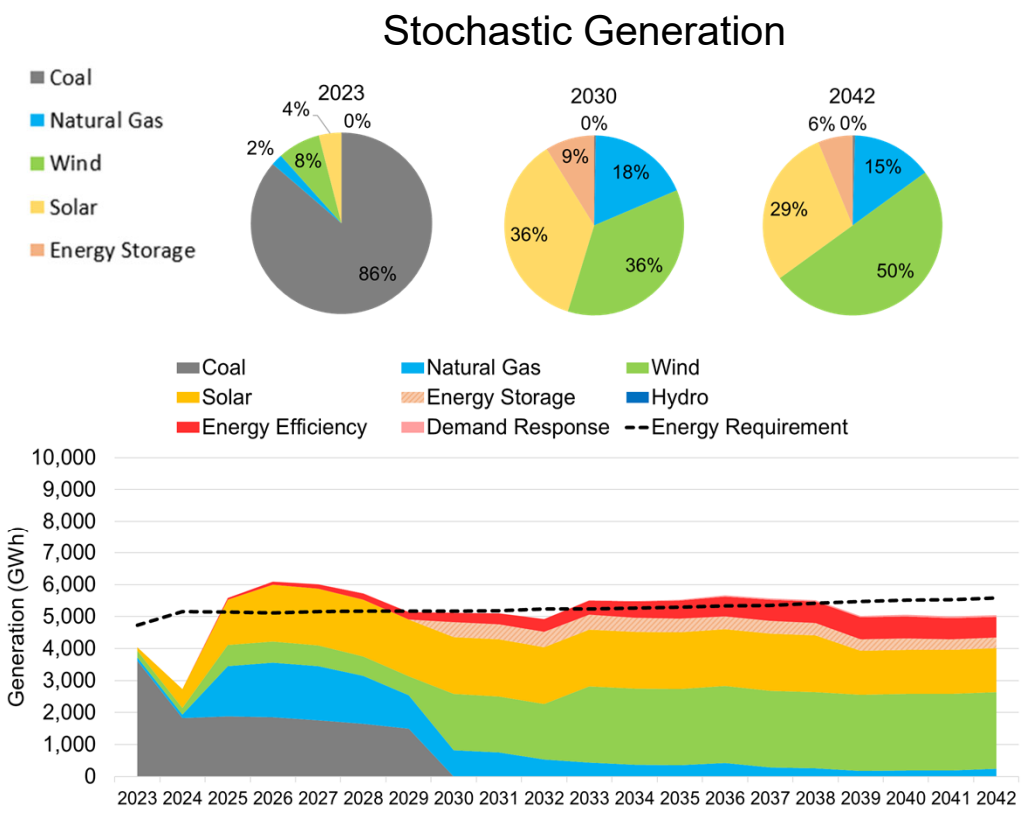


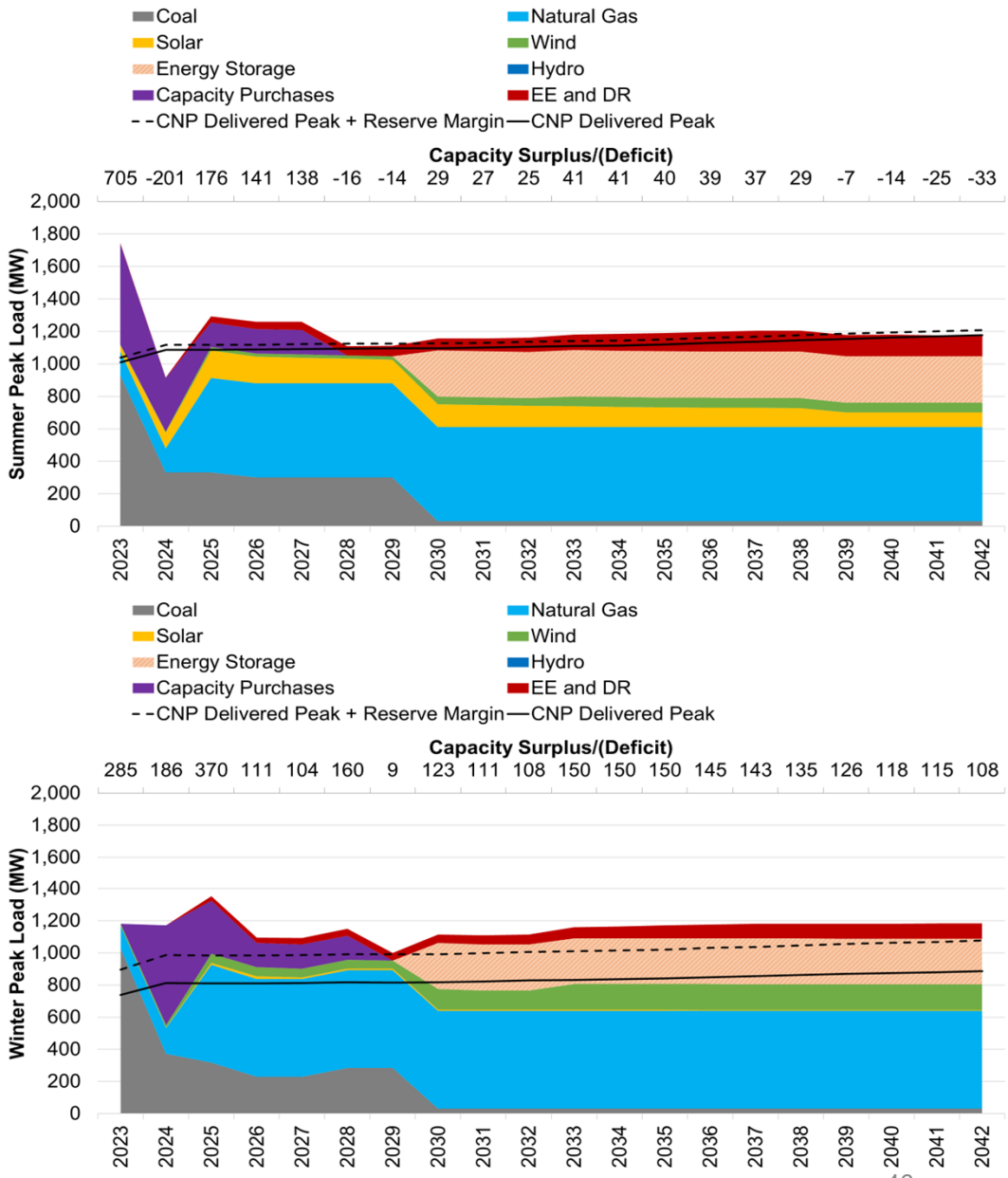




Replace FB Culley 3 with Storage and Wind

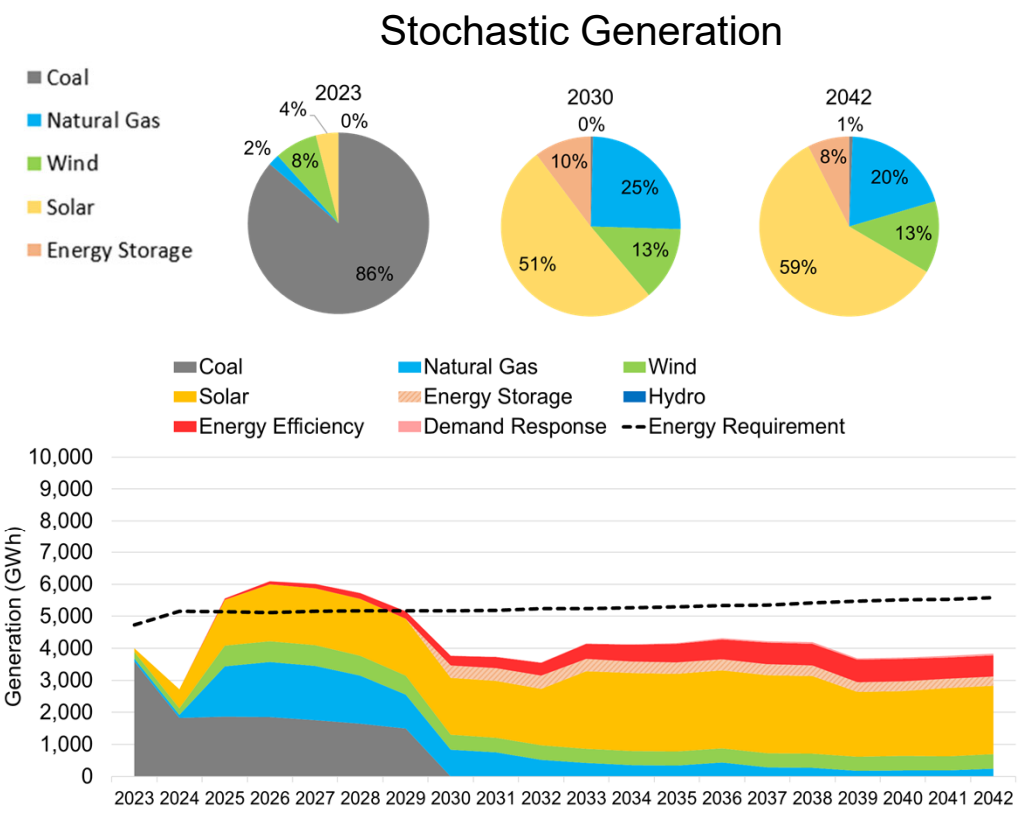
- 2025 retirement of FB Culley 2
- 2029 retirement of FB Culley 3
- Wind in 2030s
- Storage in 2030

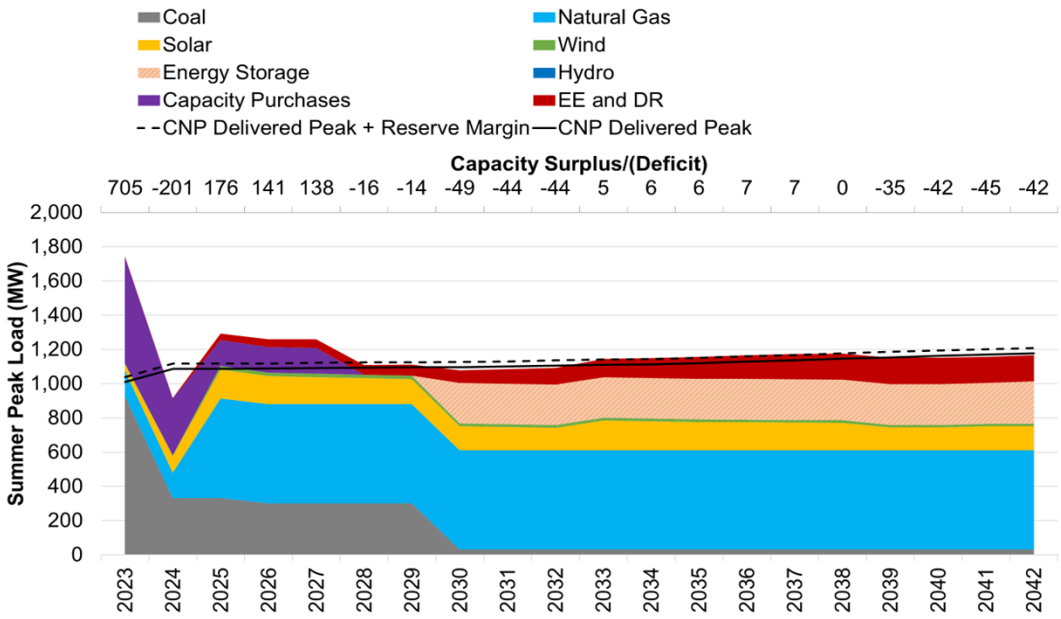


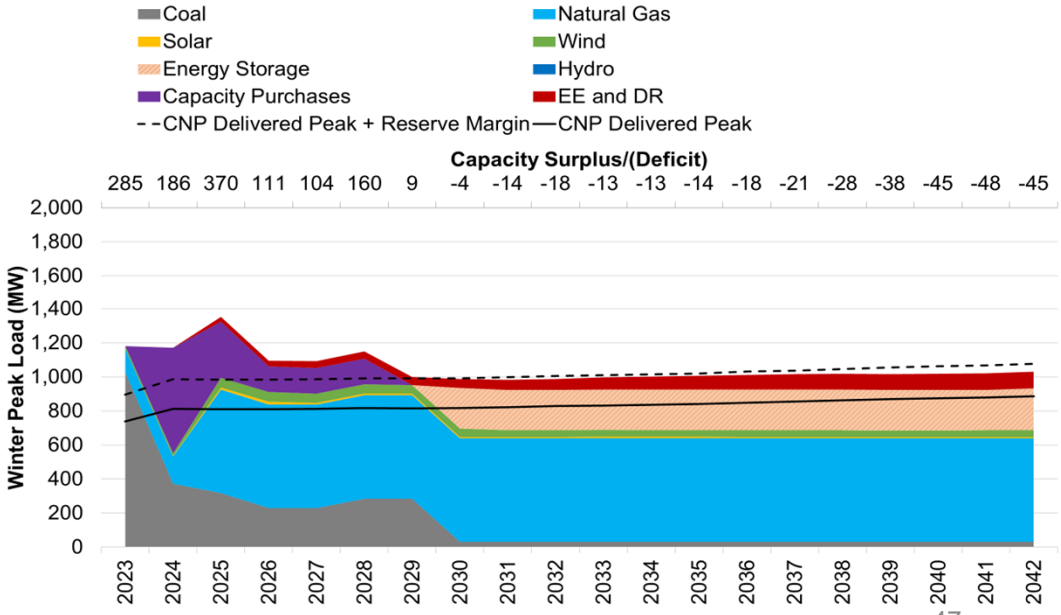


Replace FB Culley 3 with Storage and Solar

- 2025 retirement of FB Culley 2
- 2029 retirement of FB Culley 3
- Storage in 2030
- Solar in 2033







CenterPoint Energy

Q&A

CenterPoint Energy

Risk Analysis Scorecard

Matt Lind, 1898

Balanced Scorecard Affordability/Cost Risk

Portfolio	20 Year NPVRR ($M)	Delta From Reference (%)	Proportion of Energy Generated by Resources With Exposure to Coal and Gas Markets and Market Purchases (%)[1]	95% Value of NPVRR ($)
Reference Case	$4,214	0.0%	56%	$4,952
F-Class CT	$4,499	6.7%	30%	$5,413
Convert F.B. Culley 3 to Natural Gas by 2027	$4,503	6.8%	27%	$5,316
Convert F.B. Culley 3 to Natural Gas by 2030	$4,508	7.0%	27%	$5,332
Replace FB Culley 3 with Storage and Solar	$4,539	7.7%	29%	$5,416
Convert F.B. Culley 3 to Natural Gas by 2027 with 2027 wind and solar	$4,559	8.2%	25%	$5,347
Replace FB Culley 3 with Storage and Wind	$4,580	8.7%	26%	$5,328
Business as Usual	$4,581	8.7%	35%	$5,486
Diversified Renewables	$4,583	8.8%	25%	$5,313
Diversified Renewables (Early Storage & DG Solar)	$4,676	11.0%	25%	$5,408

1: Total energy generation from coal and gas / total fleet generation from 2023 - 2042

Balanced Scorecard
Environmental Sustainability

CenterPoint Energy

Portfolio	CO2 Intensity (Tons CO_2/kwh)[2]	CO2 Equivalent Emissions (Stack Emissions Tons CO_2e)[3]
Reference Case	0.00024	33,199,947
F-Class CT	0.00018	17,975,167
Convert F.B. Culley 3 to Natural Gas by 2027	0.00015	15,506,174
Convert F.B. Culley 3 to Natural Gas by 2030	0.00016	16,953,911
Replace FB Culley 3 with Storage and Solar	0.00018	15,917,099
Convert F.B. Culley 3 to Natural Gas by 2027 with 2027 wind and solar	0.00014	15,382,405
Replace FB Culley 3 with Storage and Wind	0.00015	15,931,427
Business as Usual	0.00025	23,897,336
Diversified Renewables	0.00015	15,763,426
Diversified Renewables (Early Storage & DG Solar)	0.00015	15,766,880

2: Average CO_2e from generation / average fleet generation from 2030 - 2042

**CO_2e shown in metric tons*

3: Sum of CO_2e emissions from 2023 - 2042

Balanced Scorecard Reliability

CenterPoint Energy

Portfolio	Must Meet MISO Planning Reserve Margin Requirement in All Seasons (MW)[4]		Fast Start Capability (MW)[5]	Dispatchable Resource with Spinning Reserve Capability (MW)[6]
	Summer	Winter		
Reference Case	97	62	11	919
F-Class CT	80	22	758	900
Convert F.B. Culley 3 to Natural Gas by 2027	60	21	469	941
Convert F.B. Culley 3 to Natural Gas by 2030	60	21	469	941
Replace FB Culley 3 with Storage and Solar	101	137	720	671
Convert F.B. Culley 3 to Natural Gas by 2027 with 2027 wind and solar	60	21	469	941
Replace FB Culley 3 with Storage and Wind	74	9	769	671
Business as Usual	90	74	480	941
Diversified Renewables	89	71	669	671
Diversified Renewables (Early Storage & DG Solar)	94	81	659	671

4: Maximum seasonal capacity deficit in summer/winter from 2030 - 2042
5: Average MW of installed battery, CT, recip capacity from 2030 - 2042
6: Average MW of dispatchable resources from 2030 - 2042

Balanced Scorecard
Market Risk Minimization

Portfolio	Energy Market Purchases[7]			Energy Market Sales[7]			Capacity Market Purchases/Sales (%)[8]	
	Average	Near Term Max	Long Term Max	Average	Near Term Max	Long Term Max	Purchases	Sales
Reference Case	12%	24%	18%	33%	42%	41%	1.2%	12%
F-Class CT	28%	40%	46%	17%	21%	24%	0.8%	11%
Convert F.B. Culley 3 to Natural Gas by 2027	26%	39%	32%	19%	22%	27%	0.6%	12%
Convert F.B. Culley 3 to Natural Gas by 2030	25%	35%	32%	19%	22%	27%	0.6%	12%
Replace FB Culley 3 with Storage and Solar	38%	43%	49%	13%	21%	17%	1.7%	8%
Convert F.B. Culley 3 to Natural Gas by 2027 with 2027 wind and solar	24%	31%	32%	20%	24%	27%	0.6%	13%
Replace FB Culley 3 with Storage and Wind	27%	35%	33%	15%	21%	21%	0.7%	12%
Business as Usual	31%	35%	36%	14%	21%	19%	0.9%	10%
Diversified Renewables	25%	31%	30%	18%	22%	24%	1.1%	9%
Diversified Renewables (Early Storage & DG Solar)	25%	34%	30%	18%	22%	24%	1.2%	9%

7: Average GWh energy market interaction / total energy + sales from 2023 - 2042

Near Term: 2026 - 2030

Long Term: 2031 - 2042

8: Average capacity market purchases / coincident peak demand from 2023 - 2042

Balanced Scorecard Results

CenterPoint Energy

Scorecard - Ranked	Affordability / Cost Risk				Environmental Sustainability		Reliability				Market Risk Minimization							
Portfolio	20 Year NPVRR ($M)	Delta From Reference (%)	Proportion of Energy Generated by Resources With Exposure to Coal and Gas Markets and Market Purchases (%)[1]	95% Value of NPVRR ($)	CO2 Intensity (Tons CO_2/kwh)[2]	CO2 Equivalent Emissions (Stack Emissions) (Tons CO_2)[3]	Must Meet MISO Planning Reserve Margin Requirement in All Seasons (MW)[4] Summer	Winter	Fast Start Capability (MW)[5]	Dispatchable Resource with Spinning Reserve Capability (MW)[6]	Energy Market Purchases[7] Average	Near Term Max	Long Term Max	Energy Market Sales[7] Average	Near Term Max	Long Term Max	Capacity Market Purchases or Sales (%)[8] Purchases	Sales
Reference Case	$4,214	0.0%	56%	$4,952	0.00024	33,199,947	97	62	11	919	12%	24%	18%	33%	42%	41%	1.2%	12%
F-Class CT	$4,499	6.7%	30%	$5,413	0.00018	17,975,167	80	22	758	900	28%	40%	46%	17%	21%	24%	0.8%	11%
Convert F.B. Culley 3 to Natural Gas by 2027	$4,503	6.8%	27%	$5,316	0.00015	15,506,174	60	21	469	941	26%	39%	32%	19%	22%	27%	0.6%	12%
Convert F.B. Culley 3 to Natural Gas by 2030	$4,508	7.0%	27%	$5,332	0.00016	16,953,911	60	21	469	941	25%	35%	32%	19%	22%	27%	0.6%	12%
Replace FB Culley 3 with Storage and Solar	$4,539	7.7%	29%	$5,416	0.00018	15,917,099	101	137	720	671	38%	43%	49%	13%	21%	17%	1.7%	8%
Convert F.B. Culley 3 to Natural Gas by 2027 with 2027 wind and solar	$4,559	8.2%	25%	$5,347	0.00014	15,382,405	60	21	469	941	24%	31%	32%	20%	24%	27%	0.6%	13%
Replace FB Culley 3 with Storage and Wind	$4,580	8.7%	26%	$5,328	0.00015	15,931,427	74	9	769	671	27%	35%	33%	15%	21%	21%	0.7%	12%
Business as Usual	$4,581	8.7%	35%	$5,486	0.00025	23,897,336	90	74	480	941	31%	35%	36%	14%	21%	19%	0.9%	10%
Diversified Renewables	$4,583	8.8%	25%	$5,313	0.00015	15,763,426	89	71	669	671	25%	31%	30%	18%	22%	24%	1.1%	9%
Diversified Renewables (Early Storage & DG Solar)	$4,676	11.0%	25%	$5,408	0.00015	15,766,880	94	81	659	671	25%	34%	30%	18%	22%	24%	1.2%	9%

1: Total energy generation from coal and gas / total fleet generation from 2023 - 2042

2: Average CO_2e from generation / average fleet generation from 2030 - 2042

CO_2e shown in metric tons

3: Sum of CO_2e emissions from 2023 - 2042

4: Maximum seasonal capacity deficit in summer/winter from 2030 - 2042

5: Average MW of installed battery, CT, recip capacity from 2030 - 2042

6: Average MW of dispatchable resources from 2030 - 2042

7: Average GWh energy market interaction / total energy + sales from 2023 - 2042

Near Term: 2026 - 2030

Long Term: 2031 - 2042

8: Average capacity market purchases / coincident peak demand from 2023 - 2042

Sensitivities

- Sensitivities were performed to further understand how portfolios cost or resource selection may be impacted by changes in the future
- Base modeling assumed CenterPoint would be able to fully monetize 100% of the ITC
  - Based on sensitivity analysis the impact to portfolio NPVs by adjusting the ITC monetization is minimal
- Due to uncertainty about future resources ability to capitalize on the IRA energy community bonus, it was not included in base modeling assumptions.
  - Based on the sensitivity analysis this adder would have a limited impact on portfolio NPV
- If storage capacity accreditation decreases, portfolios which include storage as a resource must either rely more on market capacity or add additional resources. The costs associated with storage capacity accreditation declining from 95% to 75% over the study period would increase portfolios that include 200MW+ of storage by at least 2%
- To evaluate the cost risk of increased emissions regulations set by the New Source Performance Standards 111(B), all 10 portfolios were run through 200 different simulations, of which 80 included a carbon tax, each of the portfolios saw a 16% - 26% increase in NPV with the inclusion of additional emissions regulation

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Q&A

Next Steps

Matt Rice

Short Term Action Plan

- Near-Term:
  - File for 2021-2023 DSM Extension for 2024
  - Submit IRP
  - Begin class 1 engineering study
- Mid-term:
  - File 2025-2027 DSM Plan
  - Issue Renewable RFP for renewable projects
  - File Certificate of Public Convenience and Necessity (CPCN) for F.B. Culley 3 conversion
  - Bring Generation Transition Phase 1 projects online
  - File Certificate of Public Convenience and Necessity (CPCN) for renewables

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