IRP Public Stakeholder Meeting

August 18, 2022

Welcome and Safety Share

Richard Leger
Senior Vice President Indiana Electric

Safety share

Know your exits

- Whenever you are entering a public area or a guest in a facility such as this, always know your exits. Take note of the signs
- There are two emergency exits, immediately behind me, Additionally, there are exit doors directly behind you – once through the door, to the left is the main entrance into the building. Should the main entrance be blocked there is an exit to the right of this room through a set of doors leading to the loading dock area

Visualize for safety

- When you enter a new space, visualize that an emergency – like a fire, bad weather, or an earthquake – could happen there and consider how you can respond
- The best way is to prepare to respond to an emergency before it happens. Few people can think clearly and logically in a crisis, so it is important to do so in advance, when you have time to be thorough

Fire

- Evacuate the building and move to the back of the CNP Plaza parking lot, near the YWCA

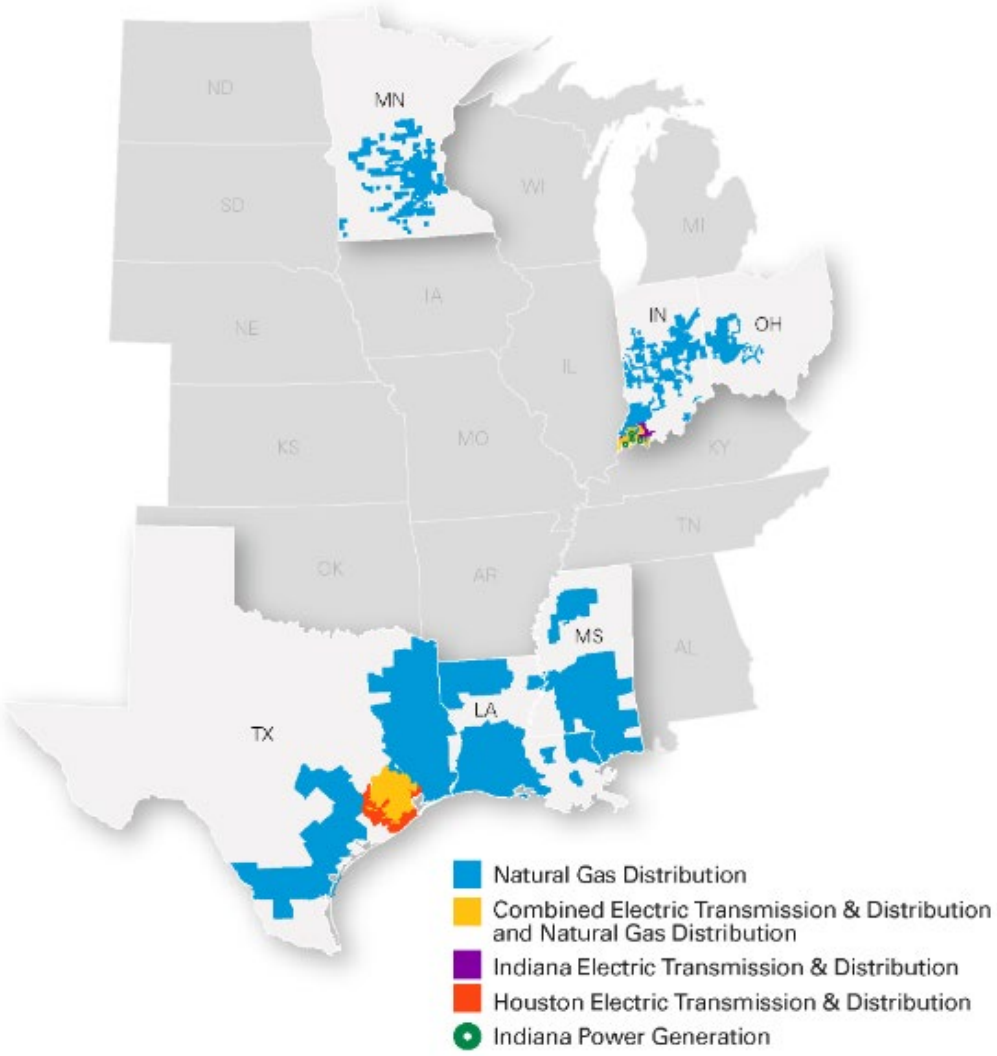
Bad Weather

- During a tornado warning, stay away from windows, glass doors, and outside walls
- Move in an orderly fashion to the stairwell, just outside of the lobby in the main entrance way

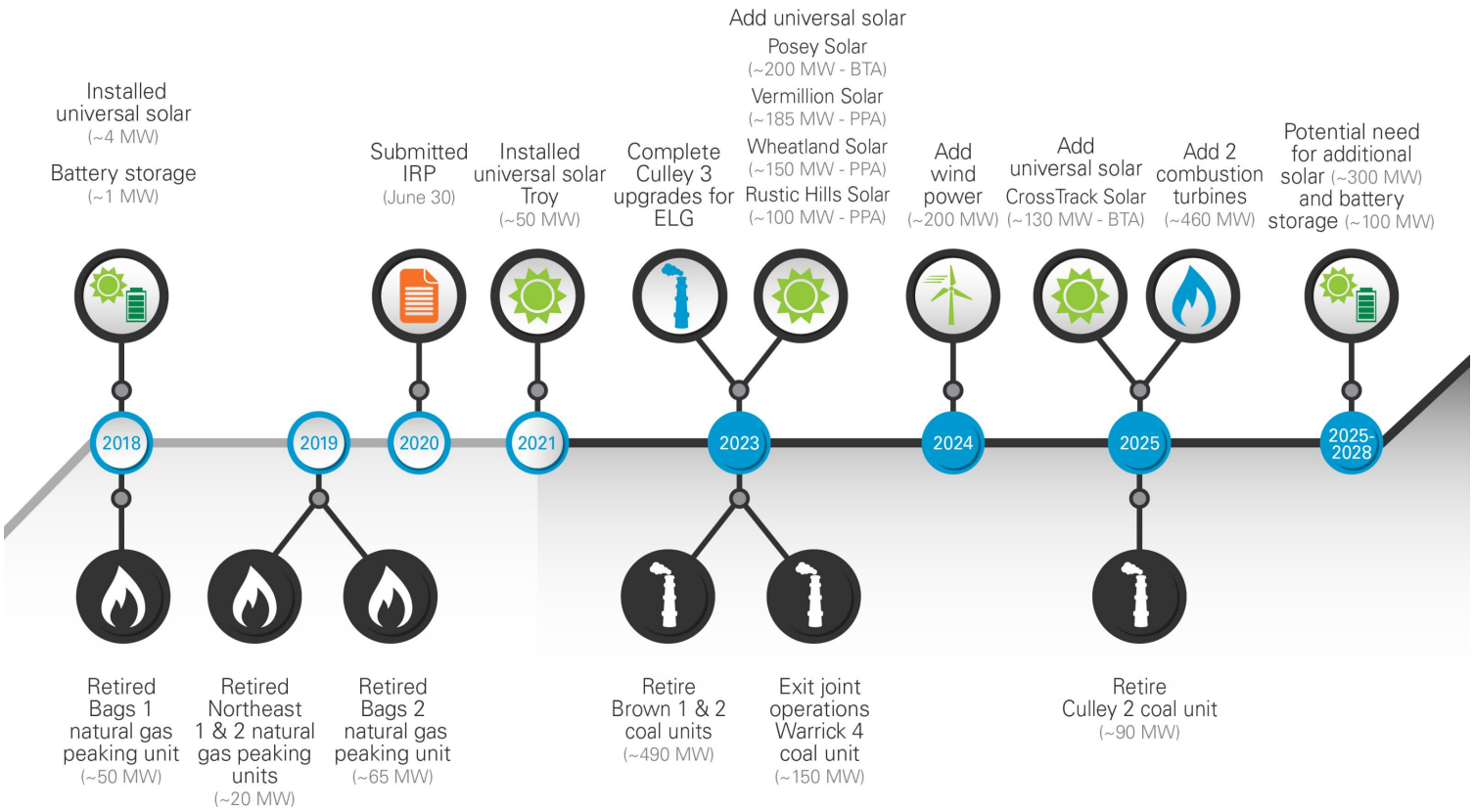
Earthquake

- Move under the desk where you are sitting, facing away from glass, and cover your head and face
- Once shaking has subsided, move in an orderly fashion towards the nearest exit and move to the back of the CNP Plaza parking lot, near the YWCA

Our Businesses



Generation Transition Timeline



Bags = Broadway Avenue Gas Turbines
BTA = Build Transfer Agreement/Utility Ownership
ELG = Effluent Limitations Guidelines
MW = Megawatt
PPA = Power Purchase Agreement
RFP = Request for Proposal

2022/2023 IRP Process

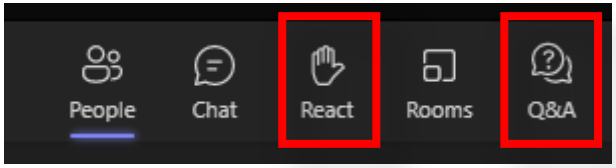
Matt Rice
Director, Regulatory and Rates

Agenda

Time		
9:00 a.m.	Sign-in/Refreshments	
9:30 a.m.	Welcome, Safety Message	Richard Leger, CenterPoint Energy Senior Vice President Indiana Electric
9:40 a.m.	2022/2023 IRP Process	Matt Rice, CenterPoint Energy Director Regulatory & Rates
9:55 a.m.	Draft Objectives & Measures	Matt Lind, Director, Resource Planning & Market Assessments, 1898 & Co.
10:20 a.m.	EnCompass Software	Kyle Combes, Project Manager, Resource Planning & Market Assessments, 1898 & Co.
10:35 a.m.	Break	
10:45 a.m.	All-Source RFP	Drew Burczyk, Consultant, Resource Planning & Market Assessments, 1898 & Co.
11:20 a.m.	Lunch	
12:00 p.m.	MISO Update	Matt Lind, Director, Resource Planning & Market Assessments, 1898 & Co.
12:35 p.m.	Environmental Compliance Update	Scott Duhon, CenterPoint Energy Director of Environmental Compliance & Policy
1:05 p.m.	DSM Market Potential Study	Jeffrey Huber, Principal, Energy Efficiency, GDS Associates
1:30 p.m.	Break	
1:40 p.m.	Draft Load Forecast Methodology	Michael Russo, Forecast Consultant - Itron
2:00 p.m.	Resource Options	Kyle Combes, Project Manager, Resource Planning & Market Assessments, 1898 & Co.
2:20 p.m.	Draft Reference Case Market Inputs and Scenarios	Matt Lind, Director, Resource Planning & Market Assessments, 1898 & Co.
3:00 p.m.	Stakeholder Questions and Feedback	Moderated by Matt Lind, Director, Resource Planning & Market Assessments, 1898 & Co.
3:30 p.m.	Adjourn	

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 up 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.
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.



Directors Report Feedback

- CEI South always utilizes feedback from the Director's report for continuous improvement opportunities

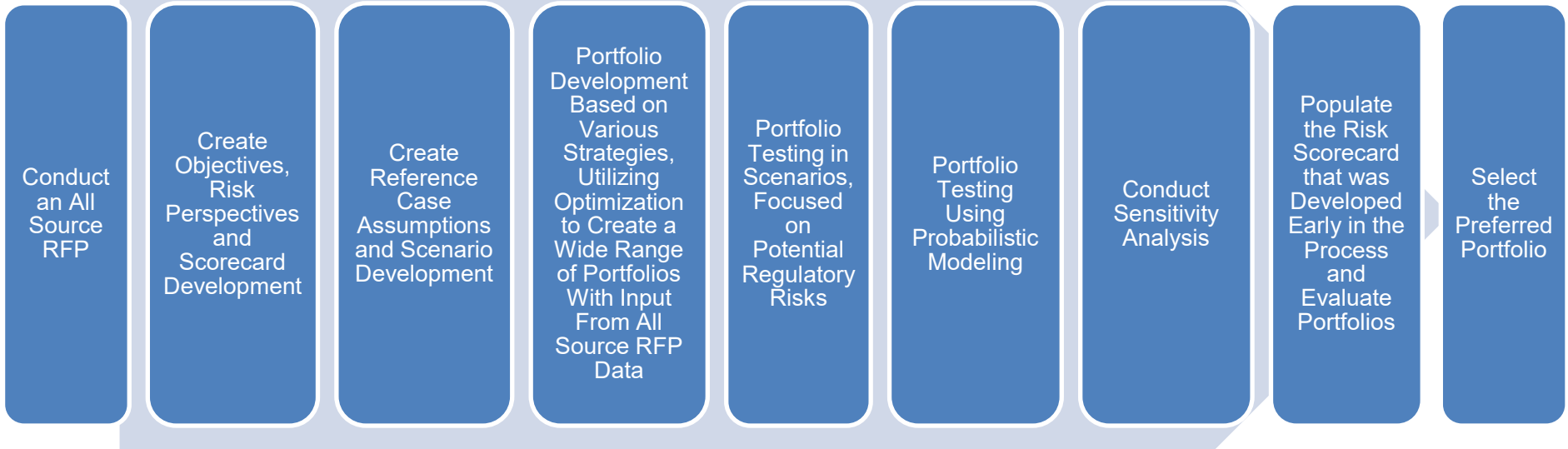
Improvement Opportunities	Positive Comments
One optimization run with a minimum of constraints	Significant improvements in all aspects of the IRP
Break out EE bundles into C&I and residential	Risk and uncertainty analysis and discussion in the IRP are well done
Allow DERs to participate in RFP	Wide range of alternative candidate portfolios
Consider sub-hourly to capture value of ancillary services	

Commitments for 2022/2023 IRP

- Will strive to make every encounter meaningful for stakeholders and for us
- The IRP process informs the selection of the preferred portfolio
- 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
- 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
- Will conduct technical meetings with interested stakeholders who sign an NDA
- Evaluate options for existing resources
- 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

Proposed 2022/2023 IRP Process

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



2022/2023 Stakeholder Process

August 18, 2022	October 11, 2022	December 13, 2022	March 14, 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 • Draft Reference Case Modeling Results • Probabilistic Modeling Approach and Assumptions	• Draft Scenario Optimization Results • Draft Portfolios • Final Scorecard and Risk Analysis • Final Resource Inputs	• Final Reference Case Modeling • Probabilistic Modeling Results • Risk Analysis Results • Preview the Preferred Portfolio

Draft Objectives and Measures

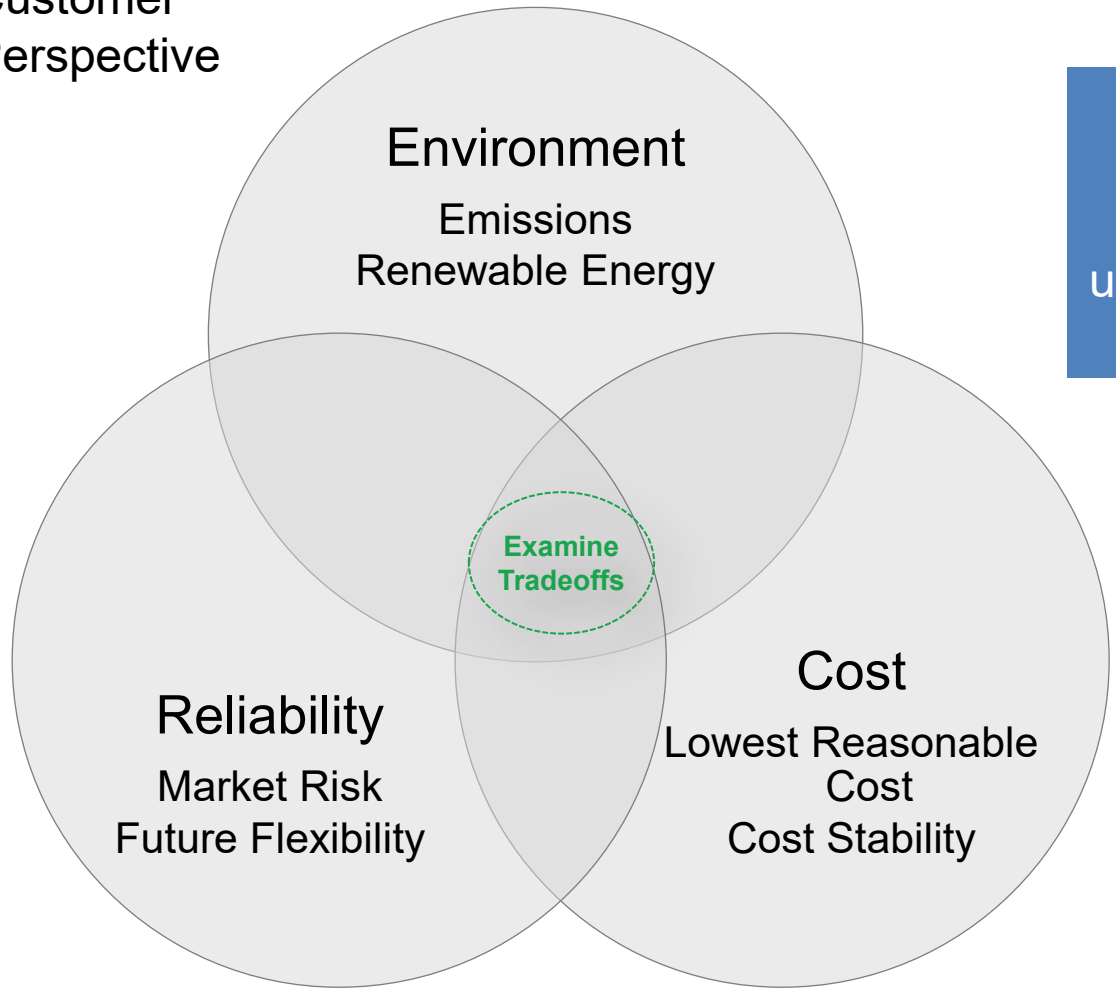
Matt Lind
Director, Resource Planning & Market Assessments
1898 & Co.

IRP Overview

- **Purpose:** Evaluate CenterPoint Energy's current energy resource portfolio and a range of alternative future portfolios to meet customers' electrical energy needs in an affordable, system-wide manner
- **Process:** Evaluate portfolios across many objectives
  - Environmental stewardship
  - Market and price risk, and future flexibility
  - System flexibility to provide backup resources
  - Reliability
  - Resource diversity
- Each objective is important and worthy of balanced consideration in the IRP process, taking into account uncertainty; Some objectives are better captured in portfolio construction than as a portfolio measure
- The measures allow the analysis to compare portfolio performance and potential risk on an equal basis

EACH portfolio will have tradeoffs

Customer Perspective



Each portfolio will be tested against all objectives and metrics. This evaluation will ultimately result in the selection of the preferred portfolio.

IRP Draft Objectives & Measures

CenterPoint Energy

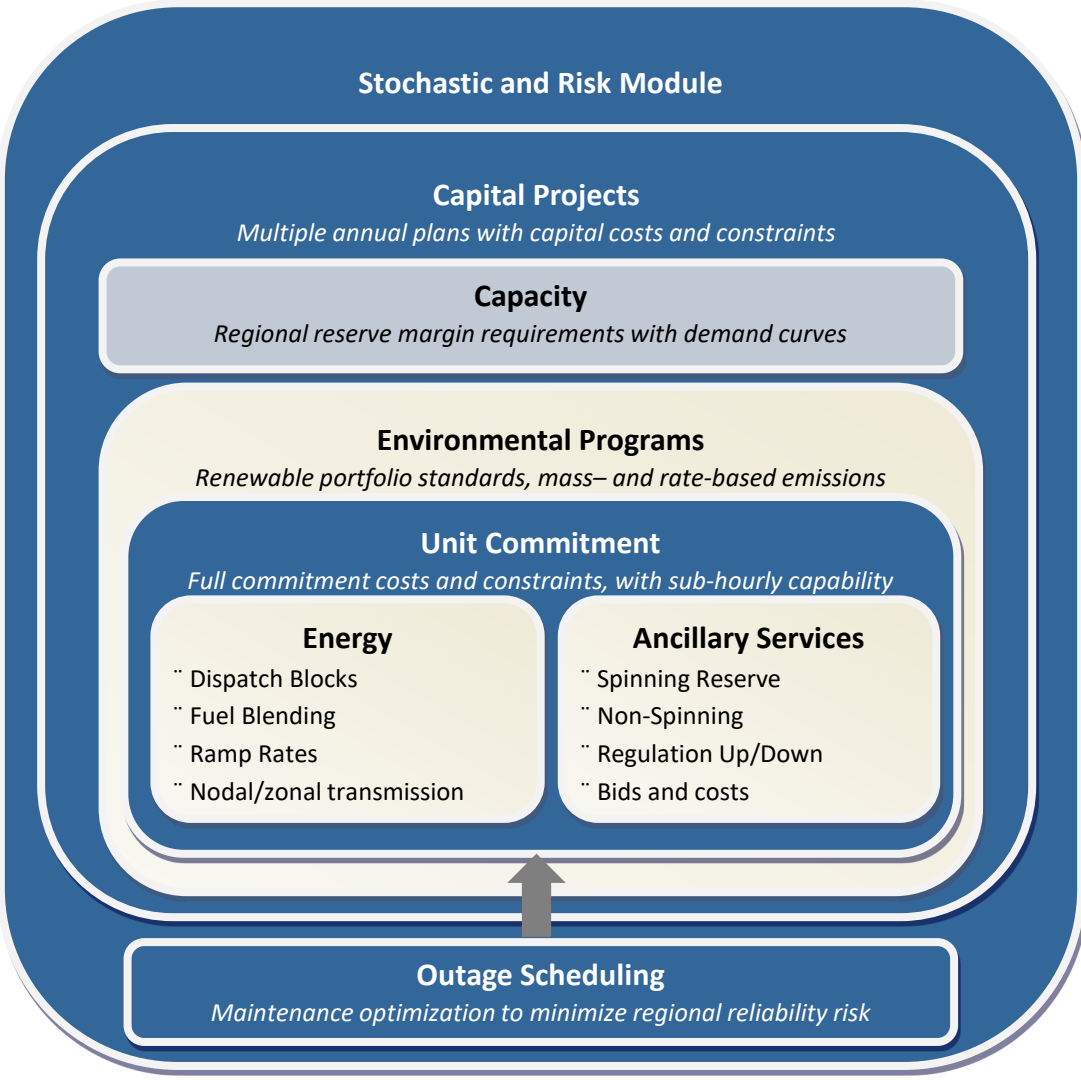
Objective	Potential Measures	Unit
Affordability	20 year NPVRR	$
Environmental Sustainability	CO_2 Intensity	Tons CO_2/kwh
Reliability	Must Meet MISO Planning Reserve Margin Requirement in All Seasons	UCAP MWs
	Spinning Reserve\Fast Start Capability	% of Portfolio MW's That Offer Spinning Reserve\Fast Start
Market Risk Minimization	Energy Market Purchases or Sales	%
	Capacity Market Purchases or Sales	%
Execution	Assess Challenges of Implementing Each Portfolio	Qualitative

EnCompass

Kyle Combes
Project Manager, Resource Planning & Market Assessments
1898 & Co.

What is EnCompass?

- Robust production cost and capacity expansion software developed by Anchor Power Solutions
- Currently serves as the basis for regulatory filings in 17 states
- Combines a time series data model with performance options for managing runtime and complexity, while always maintaining chronological constraints



What are EnCompass' Capabilities?

CenterPoint Energy

- Can import and export data into non-proprietary, easy to read spreadsheets
- Has built-in high-level summaries and detailed dispatch reports that support transparency
- Can solve for seasonal capacity obligations, like those currently proposed by MISO
- Can co-optimize dispatch of storage along with other traditional resource types
- Can perform sophisticated stochastic modeling of variables to assist in evaluating risk
- Can incorporate ramp rates, startup times, and startup costs; data items that most traditional long-term models ignore

ANCHOR POWER SOLUTIONS

ENCOMPASS POWER PLANNING SOFTWARE

Who uses EnCompass?

- EnCompass is licensed by utilities, consultants, and stakeholders as a powerful and accurate tool

...and many more!

All-Source RFP

Drew Burczyk
Consultant, Resource Planning & Market Assessments
1898 & Co.

All-Source RFP Overview

- CenterPoint's 2022 All-Source RFP follows a very similar process as the 2019 All-Source RFP
- Sought feedback and incorporated input from stakeholder groups prior to issuing the RFP
- The guiding principles of the RFP are to conduct a process that is:
  - Objective
  - Fair
  - Open
- Issued advanced notice of RFP
- Open to continued feedback for future RFPs

All-Source RFP Purpose

- The All-Source RFP will help inform CenterPoint Energy's 2022/2023 Integrated Resource Plan modeling
- From the proposals received, CenterPoint Energy can better understand and access current market data

All-Source RFP Overview

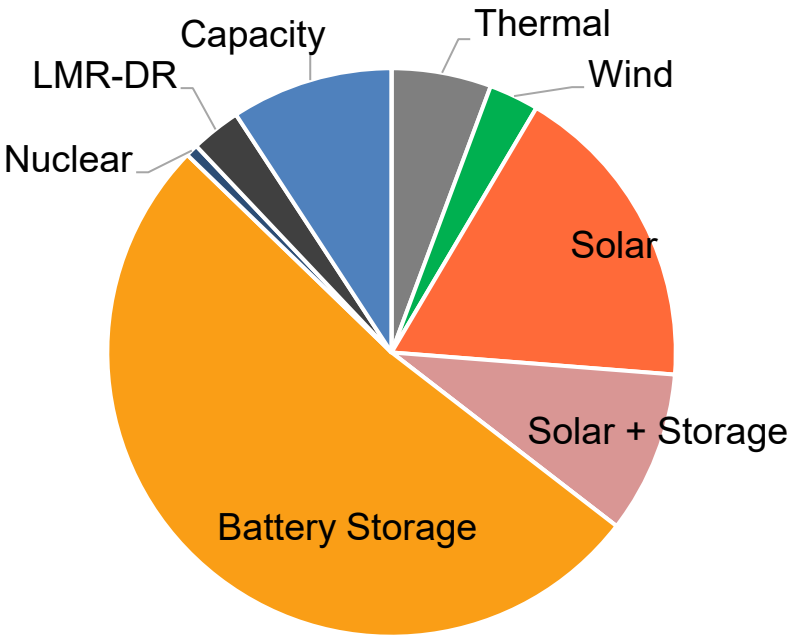
- Open and non-limiting
- Technologies
  - Renewables and storage
  - Thermal
  - Load modifying resources and demand resources
  - Capacity only
- Eligible transaction structures
  - PPA
  - Asset purchase
  - Renewable project in development
  - Demand-side contracts
  - Capacity only contracts
- Resources to be accredited prior to March 1st, 2027

RFP Key Dates

RFP Issued	Wednesday, May 11, 2022
Notice of Intent, NDA, and Respondent Application Due	Friday, May 27, 2022
Pre-Bid Meeting	Wednesday, June 1, 2022
Proposal Submittal Due Date	Tuesday, July 5, 2022
Initial Proposal Review and Evaluation Period	Wednesday, July 6, 2022 – Wednesday August 11, 2022
Proposal Evaluation Completion Target and Short List to CenterPoint For Further Due Diligence	Friday, August 12, 2022

PRELIMINARY RFP STATISTICS

As part of the RFP, we received 129 proposals from 27 different respondents.



Proposal Breakdown

2022 RFP Responses	Proposal Installed Capacity (MW)	Project Installed Capacity (MW)
Thermal	3,087	1,909
Battery Storage	10,149	1,651
Solar + Storage	2,700	1,400
Capacity	632	557
Solar	2,588	1,529
LMR-DR	64	63
Wind	800	400
Total	20,019	7,508

Summary of RFP Responses

- Received significant number of proposals accounting for a diverse set of generation technologies to help inform IRP modeling
- Consistent with industry trend of higher pricing compared to proposals seen in recent years potentially impacted by:
  - Supply chain and COVID impacts
  - Inflation
  - Solar market uncertainty due to Department of Commerce Anti-Dumping/Countervailing Duties Investigation
  - Uyghur Forced Labor Prevention Act (UFLPA)
  - MISO generator interconnection queue
- IRP scenario modeling to help evaluate portfolio replacement decisions under varying future technology costs

MISO Update

Matt Lind
Director, Resource Planning & Market Assessments
1898 & Co.

What is MISO?

- **M**idcontinent **I**ndependent **S**ystem **O**perator
- In 2001, MISO was approved as the first Regional Transmission Organization (RTO)
  - MISO has operational authority: the authority to control transmission facilities and coordinate security for its region to ensure reliability
  - MISO is responsible for dispatch of lowest cost generation units: MISO's energy market dispatches the most cost effective generation to meet load needs
- MISO is divided into 10 Local Resources Zones (LRZ), Indiana is part of Zone 6, which includes northwest Kentucky (Big Rivers Electric Cooperative)
- Each LRZ has its own planning requirements in regard to energy and capacity
- Each Zone's ability to rely on neighboring Zones depends largely on transmission infrastructure. Based on MISO's Local Clearing Requirement (LCR), approximately 70% of CenterPoint's generation must be physically located within MISO Zone 6

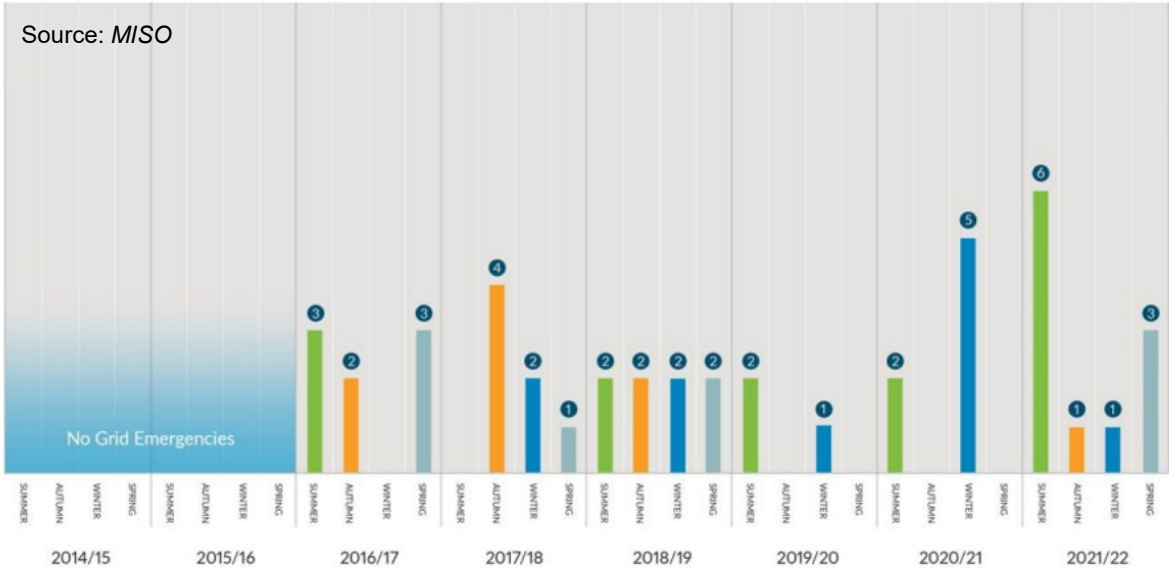
Source: *MISO*

MISO Updates

- New technologies, regulations and policies are changing market dynamics
  - Ongoing power supply fleet transition MISO-wide through resource retirements and increasing intermittent resource additions
  - Corresponding reduction in excess capacity and/or energy during certain periods across MISO is resulting in changes to MISO's Resource Adequacy design
  - In September 2020 FERC issued order 2222, which will allow for distributed energy resources to participate in the market once implemented in MISO

MISO Resource Adequacy

- One of MISO's key functions is to facilitate the availability of adequate and cost-effective resources to reliably meet peak demand in the MISO region
- With MISO's ongoing power supply fleet transition, resource adequacy must evolve to account for new technologies and impacts due to seasonal weather



MISO Resource Adequacy

- MISO's Market Redefinition efforts have led to a proposed[1] seasonal resource adequacy construct with availability-based accreditation
  - Winter - December, January, February
  - Spring - March, April, May
  - Summer - June, July, August
  - Fall - September, October, November

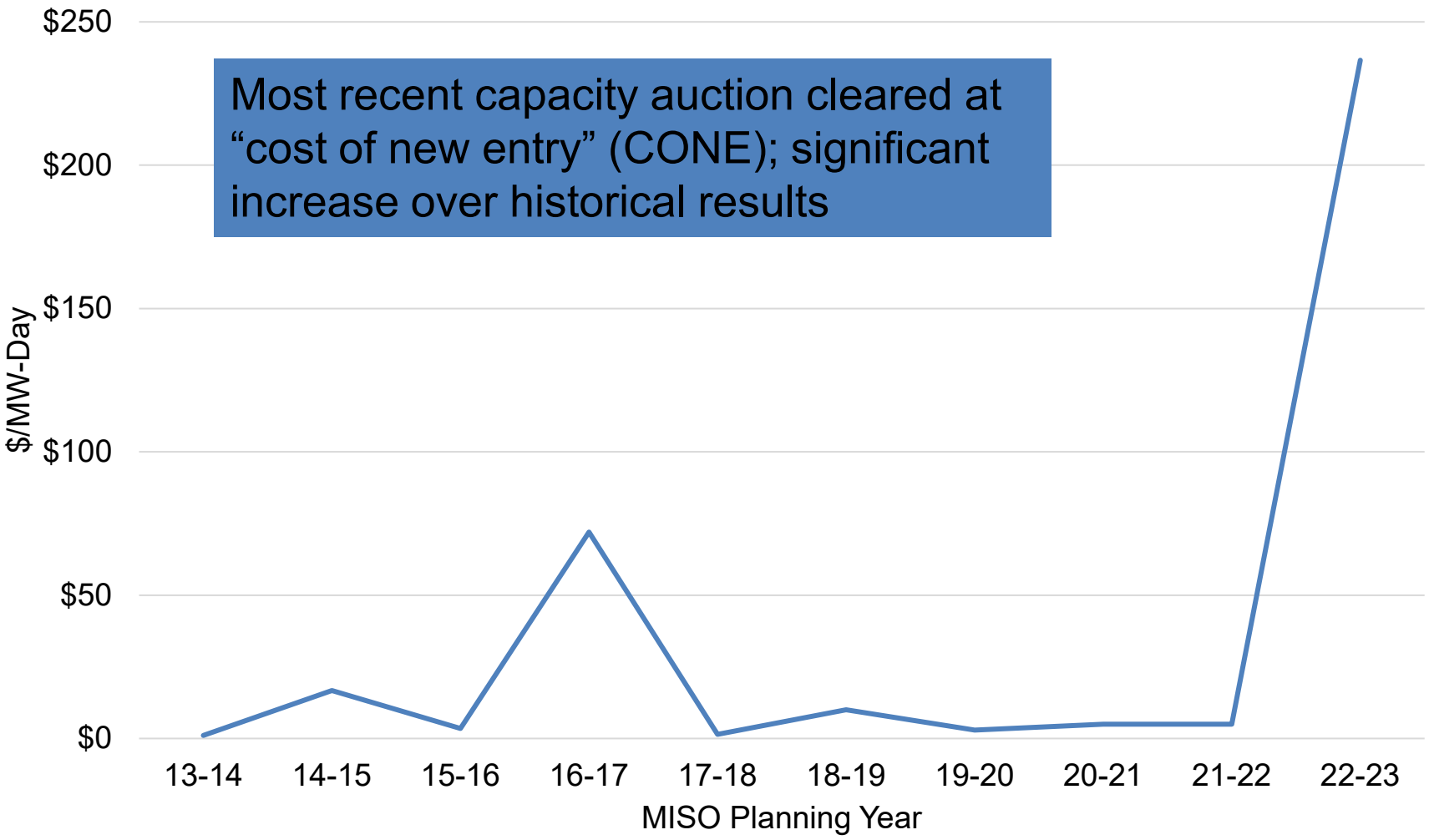
[1]Filed with FERC Nov. 2020 to be effective Sept. 1, 2022 with implementation beginning in PY 2023/24.

Proposed Seasonal Resource Adequacy Construct

MISO's Market Redefinition aims to ensure resources with needed capabilities and attributes will be available in the highest risk periods across the year.

- MISO will calculate sub-annual resource adequacy requirements to align with seasonal needs
  - Loss of load expectation study will calculate the planning reserve margin requirements and local reliability requirements on a seasonal basis
- Accredit resources by season to ensure resources are available when needed, seasonal accredited capacity (SAC)
  - Thermal accreditation will be calculated based on tiered structure within each season, tight hours and non-tight hours
  - Intermittent resource accreditation enhancements are being evaluated; current seasonal accreditation methodology:
    - Wind - Seasonal Effective Load Carrying Capability (ELCC) based on historical performance in 8 peak days per season
    - Non-Wind - based on historical output during hours 15, 16, 17 EST for spring, summer, and fall; Winter accreditation based on hours 8, 9, 19, and 20 EST

MISO Zone 6 Capacity Prices



FERC 2222

- FERC Order No. 2222 removes barriers preventing distributed energy resources (DERs) from participating in organized capacity, energy and ancillary services markets run by regional grid operators such as MISO
- DERs are small-scale power generation or storage resources located on an electric utility's distribution system or behind a customer meter
- Example technologies include solar, storage, demand response, energy efficiency, electric vehicles

FERC 2222

- MISO's proposed approach to 2222 has been submitted for compliance with FERC
  - Proposed implementation date of October 1, 2029
- Planning to incorporate into scenario and/or sensitivity analysis
  - Looking for input and feedback on FERC 2222 in IRP analysis

Environmental Update

Scott Duhon,
Director of Environmental Compliance & Policy

Coal Combustion Residuals Rule

- Final Rule issued April 2015
- Allows continued beneficial reuse of coal combustion residuals
  - Majority of CEI South's fly ash beneficially reused in cement application
  - Scrubber by-product at Culley and Warrick beneficially reused in synthetic gypsum application
- Rule established operating criteria and assessments as well as closure and post-closure care standards
  - Culley West ash pond closure activities were completed in December 2020
  - Culley East ash pond is still operating, with planned closure-by-removal. Closure plan submitted to IDEM in February 2022
  - Brown ash pond is still operating, with planned closure by removal and beneficial reuse. Beneficial reuse activities have commenced
- Part A Rule finalized in August 2020
  - Finalized revised compliance deadline (April 2021) and provided a mechanism to request limited extension for use of ponds. CEI South filed extension requests for A.B. Brown ash pond and F.B. Culley East ash pond in November 2020
    - EPA has not yet issued a decision on either extension request; however, construction of the extension ponds were recently approved by the IURC in Cause No. 45564, and we are proceeding with design and construction per the commitments provided by our submittals to EPA

Effluent Limitation Guidelines

- On September 30, 2015, the EPA finalized its new Effluent Limitation Guidelines (ELGs) for power plant wastewaters, including ash handling and scrubber wastewaters
- The ELGs prohibit discharge of water used to handle fly ash and bottom ash, thereby mandating dry handling of fly ash and bottom ash
- ELG Reconsideration Rule finalized in October 2020 updated the compliance deadline for bottom ash which allows for continued operation of Culley Unit 2 until December 2025, which CNP may do to help support capacity requirements until new combustion turbines and renewables projects are completed; Operation of Culley Unit 2 beyond December 2025 would require completion of a bottom ash handling retrofit
- Culley Unit 3 retrofit of bottom ash to dry handling was completed in 2020; Spray Dryer Evaporator for scrubber wastewater is on schedule for completion in 2023

Clean Water Act 316(b)

- In May 2014 EPA finalized its Clean Water Act 316(b) rule which focuses on impingement and entrainment of aquatic species during water intake
- The final rule did not mandate cooling tower retrofits
- CNP submitted the multi-year entrainment and other required studies for F.B. Culley as required under the rule and proposed modified traveling screens in its NPDES renewal submittal; CEI South is still in discussion with IDEM as to the applicable 316(b) technology
- For purposes of IRP modeling, CEI South is modeling a range of scenarios which would include intake screen modifications and new wedge wire screens for the Culley plant and will assume a 2024 - 2026 deadline for compliance

NOx Ozone Season Allowances

- Revised CSAPR Update Rule finalized in May 2021 significantly reduced amount of ozone season NOx allowances allocated to each state and have significantly increased the cost

Year	Tons Allocated	Tons Purchased	Purchase Cost per Allowance
2018	1,381	350	$200
2019	1,381	1,050	$164
2020	1,379	800	$73
2021*	1,184	600	$2,310
2022**	851	450	$50,000

*2021 – 2022 are Group 3 allowances under the May 2021 rule. 2021 was prorated due to the rule becoming effective after the start of the ozone season, making 2022 the first full season under the Revised CSAPR Update rule.
**2022 purchase quantity is based on generation as of 7/22/2022. Purchase cost is based on market offer price as of 8/4/2022.

Carbon Regulation

- Since 2015 dueling administrations have attempted to finalize carbon regulations under CAA Sect. 111(d)
- The Clean Power Plan (CPP) would have set stringent state emission caps and effectuated a shift in state generation portfolios to significantly increased renewables, which implementation was stayed by the U.S. Supreme Court
- The EPA sought to vacate the CPP and replace it with the Affordable Clean Energy (ACE) rule, which focused on efficiency targets that could be met at an individual unit level
- In June 2022, the U.S. Supreme Court held that the EPA exceeded its authority when it promulgated the CPP's stringent state emission caps that would have required generation shifting within states; While the decision did not go so far as to hold that EPA was explicitly prohibited from promulgating a regulation requiring compliance measures "outside the fence line" for existing units under 111(d), the ACE rule remains the current reference case 111(d) compliance scenario for modeling purposes

Future Regulation - MATS Revisions

- MATS revision – Mercury & Air Toxics (MATS)
  - In May of 2020, the EPA issued its revised finding that it is not *appropriate and necessary* to regulate coal-fired electric generating units under Section 112 of the CAA; However, EPA did not seek at that time to withdraw the currently applicable MATS standards finalized in 2015
  - In May of 2020 EPA also published its residual risk and technology review of MATS, finding that emissions of hazardous air pollutants (HAPs) have been reduced such that residual risk is at acceptable levels, that there are no developments in 2 HAP emissions controls to achieve further cost-effective reductions beyond the current standards, and no changes to the MATS rule are warranted
  - On January 21, 2022, EPA proposed to revoke its finding that it is not *appropriate and necessary* to regulate coal-fired electric generating units under Section 112 of the CAA, and notified of its intent to review the residual risk and technology review of MATS
  - EPA's actions in January 2022 set the stage for potential updates to the existing MATS limits for mercury and acid gases from coal-fired power plants

Future Regulation – Ozone "Good Neighbor SIP"

- On April 6, 2022, EPA proposed to further reduce emissions of NOx from coal-fired power plants under Section 126 (or the "Good Neighbor") provision of the CAA, which requires coal-fired power plants in 26 states (including Indiana) to reduce emissions of NOx that EPA has found to contribute to ozone nonattainment in downwind states for the more stringent 2015 Ozone NAAQS
- Beginning in the 2023 ozone season, EPA is proposing to include Indiana coal-fired power plants in a revised and potentially significantly more stringent Cross-State Air Pollution Rule (CSAPR) "NOx Ozone Season Group 3 Trading Program"

Natural Gas

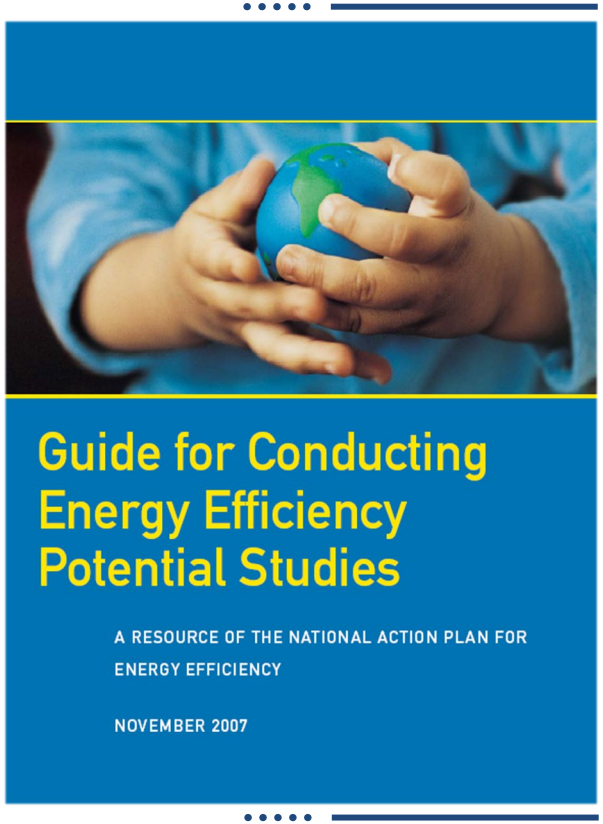
- Clean Water Act Section 401
  - October 2021, the U.S. District Court vacated EPA's 2020 Clean Water Act Section 401 Certification Rule; April 2022, the U.S. Supreme Court stayed the vacatur reinstating the 2020 Rule
- New Source Performance Standards
  - November 2021, the EPA proposed NSPS program rules that would reverse the prior administration's rules and return to the previous methane standards and contain more stringent monitoring requirements and possibly require state specific plans

DSM Market Potential Study

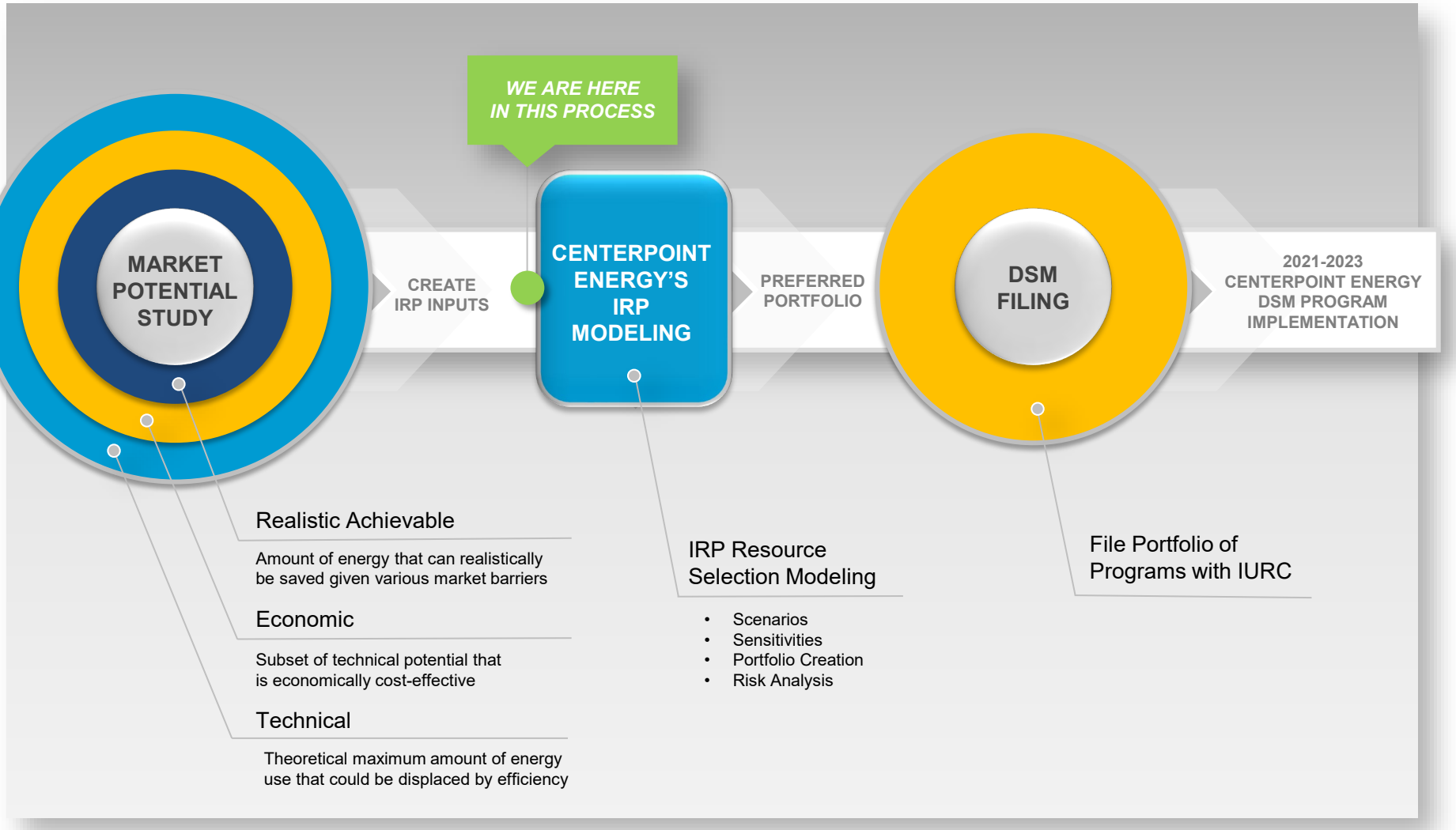
Jeffrey Huber
Principal, Energy Efficiency
GDS Associates, Inc.

Market Potential Studies & IRPs

- What is a Market Potential Study (MPS)?
  - Simply put, a potential study is a quantitative analysis of the amount of energy savings that either exists, is cost-effective, or could be realized through the implementation of energy efficiency programs and policies
- About the CEI South MPS
  - Includes Energy Efficiency (EE) and Demand Response (DR)
  - 2022 MPS is considered a “refresh” and does not include new primary market research
  - MPS analysis covers 2025-2042



Market Potential Studies & IRPs



Types of EE/DR Potential

TECHNICAL POTENTIAL

All technically feasible measures are incorporated to provide a theoretical maximum potential.

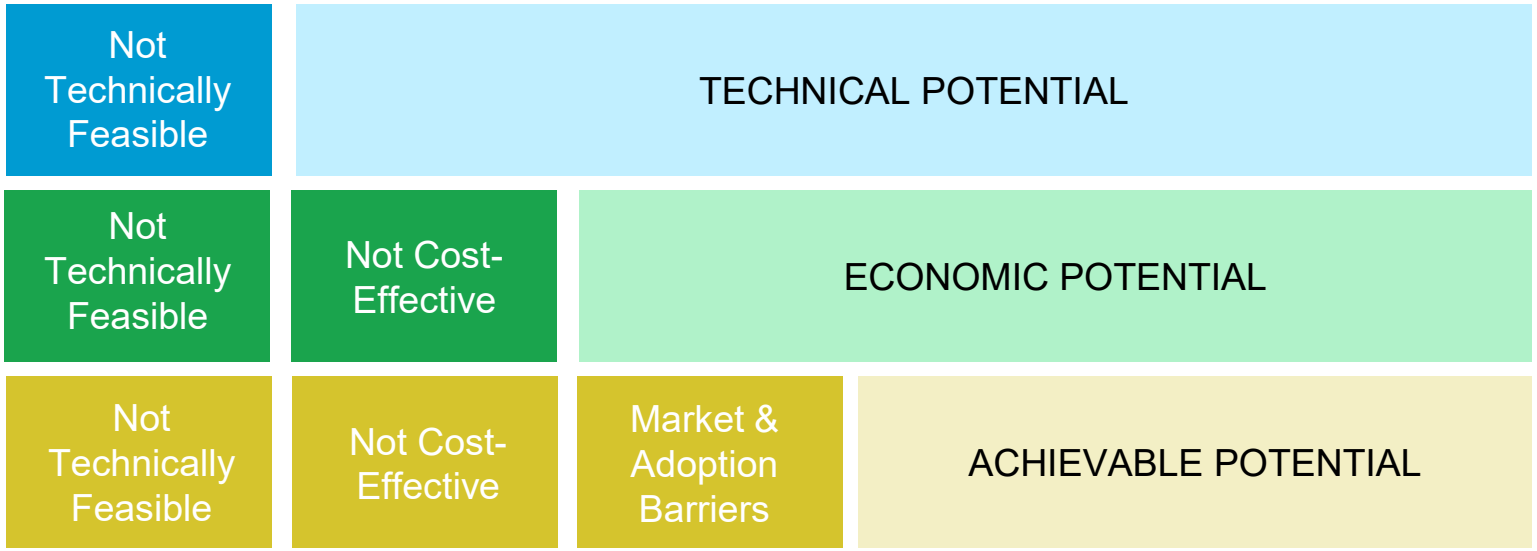
ECONOMIC POTENTIAL

All measures are screened for cost-effectiveness using the UCT Test. Only cost-effective measures are included.

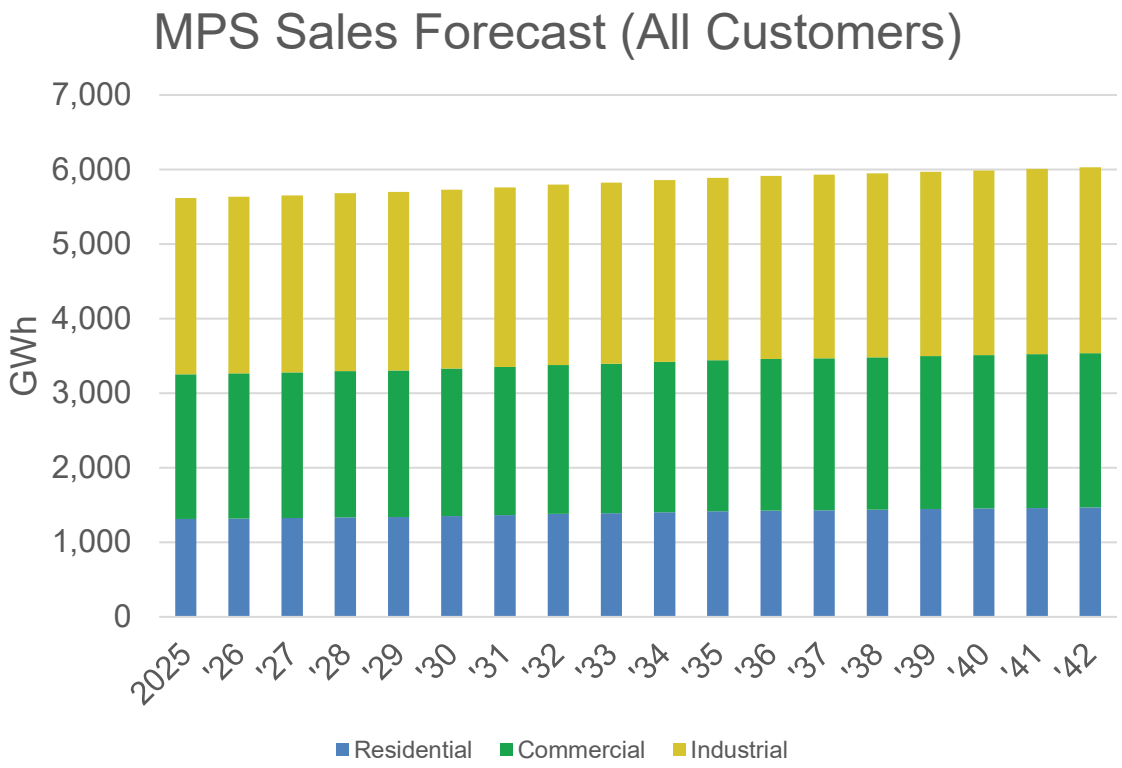
ACHIEVABLE POTENTIAL

Cost-effective energy efficiency potential that can practically be attained in a real-world program delivery case, assuming that a certain level of market penetration can be attained.

Types of Energy Efficiency Potential

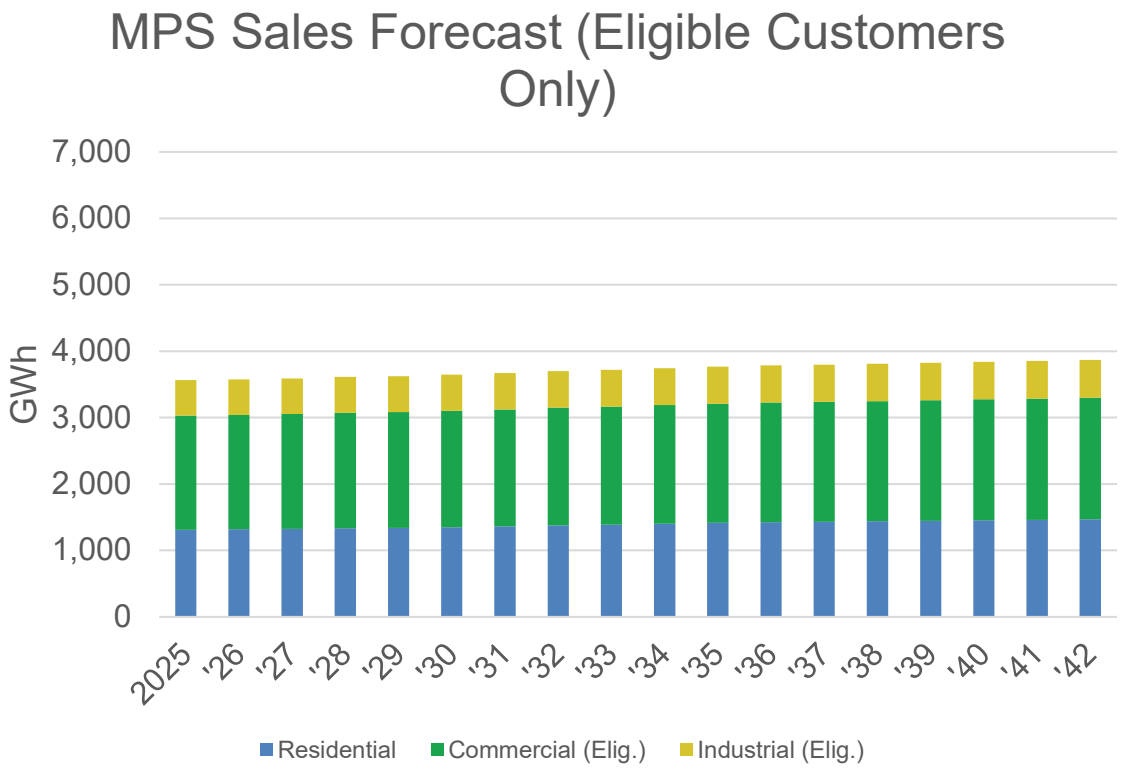


Load Forecast for EE/DR



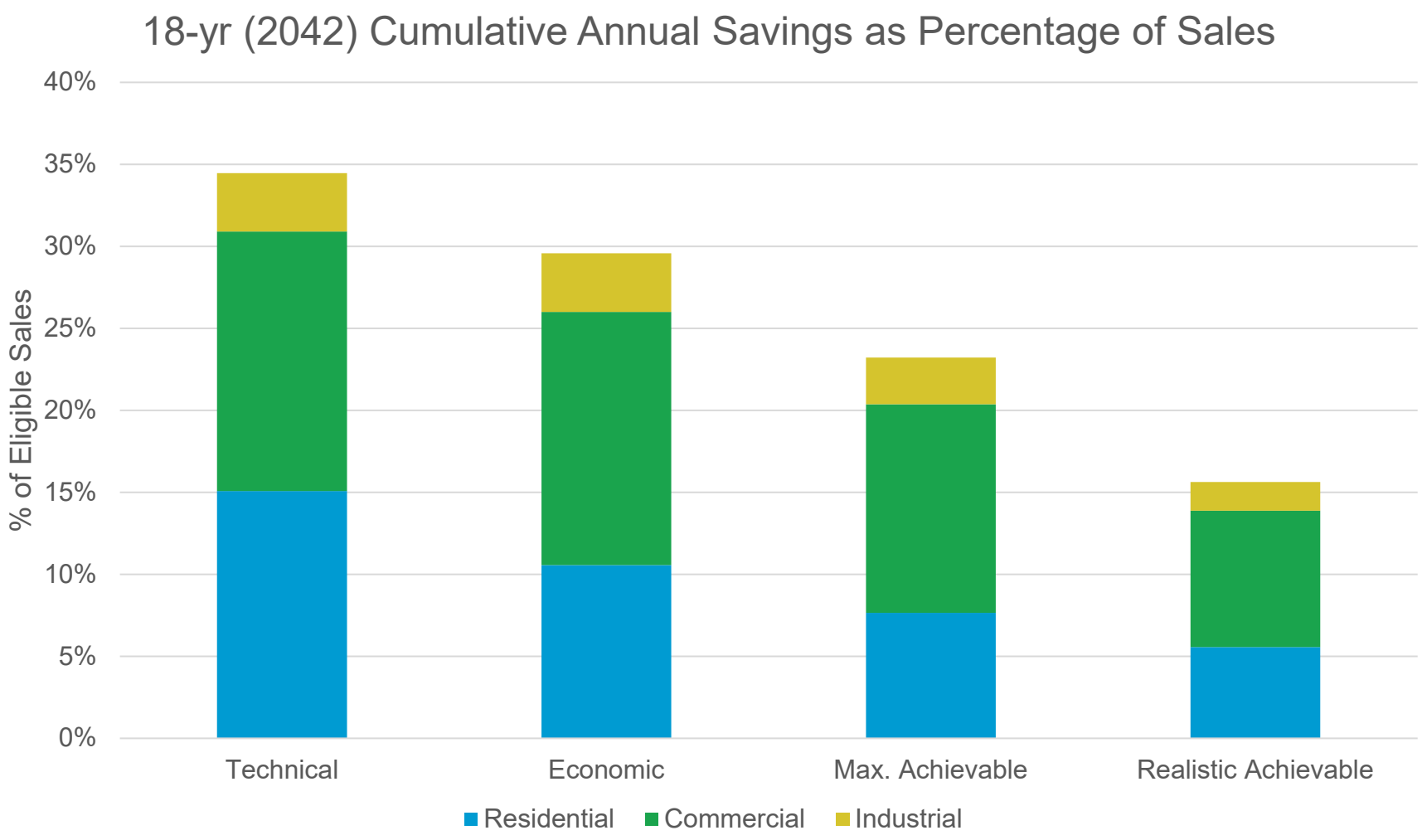
- MPS Sales Forecast reclassifies some load between commercial and industrial to reflect building type vs. rate code
- A substantial portion of the industrial load (and a smaller portion of the commercial load) can opt out of utility DSM programs

Eligible Load for EE/DR

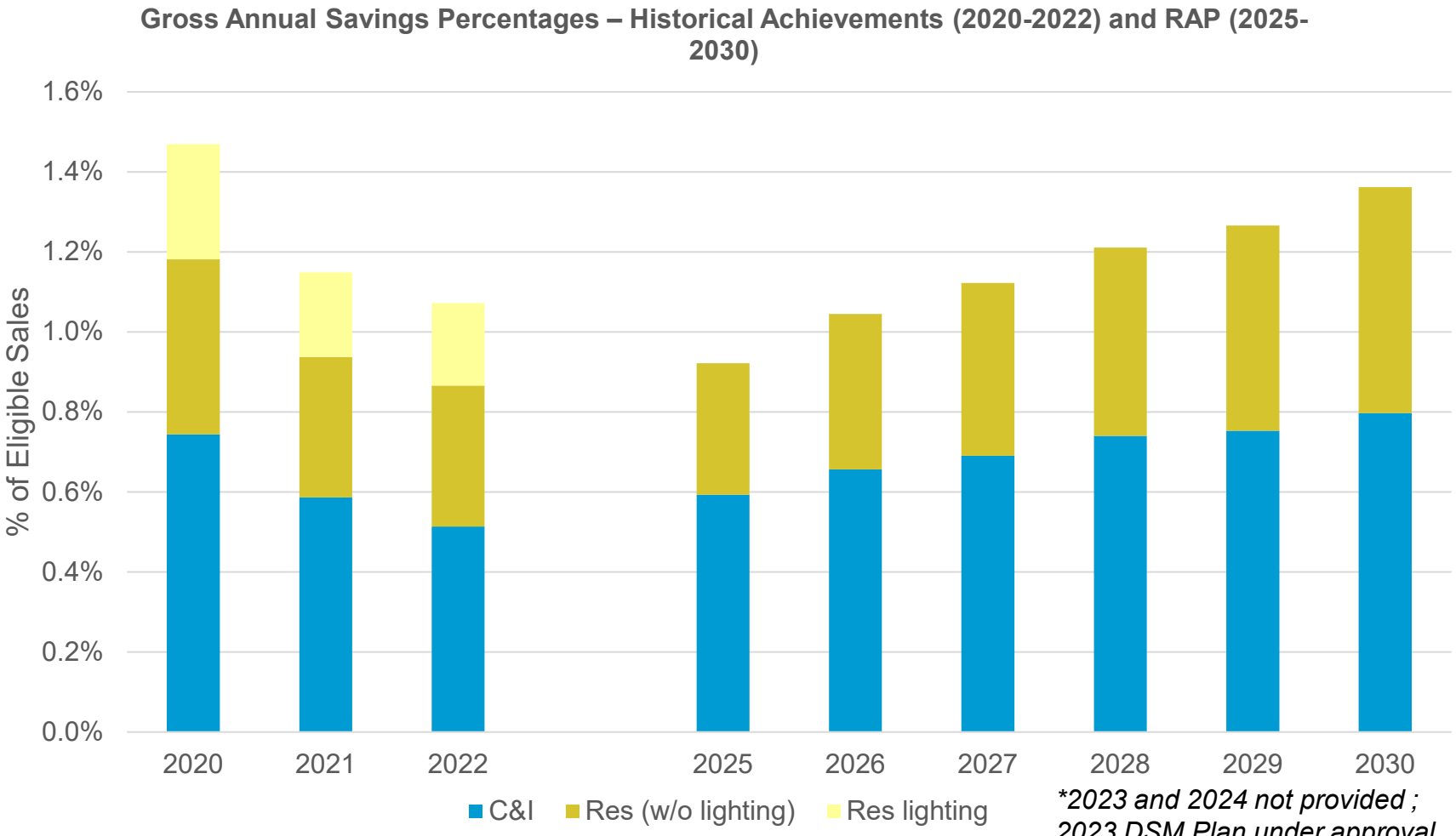


- Opt-out customers are not included in the base case of the MPS

EE Analysis – Summary Results



EE Analysis – Historical Comparison



*2023 and 2024 not provided ;
2023 DSM Plan under approval
2024 DSM Plan will be extension filing

DR Analysis – Programs Included

- DR programs analyzed include:
  - Direct load control of air conditioning (using thermostats and switches), water heaters, and pool pumps
  - Rate programs include critical peak pricing (with enabling technology and without), peak time rebates, real time pricing, and time of use
- Timing of programs:
  - DLC air conditioning switches expected to fully transition to thermostats by 2029
  - Rate programs starting in 2026 as potential pilots and ramping up starting in 2031

DR Hierarchy

DR analysis accounts for interactive effects as additional types of demand response programs are added to the mix. The hierarchy places existing DR programs at the top of the list. Rate programs are ordered based on the highest load reduction per customer. The hierarchy for demand response programs is as follows:

1. Direct Load Control
2. Critical Peak Pricing with Enabling Technology (such as a smart thermostat)
3. Critical Peak Pricing without Enabling Technology
4. Real Time Pricing
5. Peak Time Rebate
6. Time of Use

EE/DR Inputs into IRP

- EE Inputs will align with RAP Potential *(but adjusted from gross to net savings)*
- EE Inputs will be provided over three vintages
  - 2025-2027 (3 years)
  - 2028-2030 (3 years)
  - 2031-2042 (12 years)
- For 2025-2027, EE Inputs will be bundled to closely resemble program offerings
  - For remaining vintages, EE inputs will be aggregated at the sector level
- EE Costs will include utility costs (incentives and non-incentive costs)
  - Costs will be adjusted to recognize value of avoided lifetime T&D benefits

EE/DR Inputs into IRP

- Income Qualified Savings will be a going-in resource (i.e. not selectable) as high program costs would likely prohibit selection in the IRP model
  - The cost (and savings) of the income-qualified program will be aligned so that the future income-qualified annual budget maintains the same proportion to the total budget as the current DSM Plan
- Expected Improvements to the DSM Plan
  - Bundles will be sector specific, consistent with request from the prior Director's Report
  - Within a bundle/vintage, the EE Savings are broken out by end-use
  - Cost adjustment to reflect avoided transmission and distribution benefits
  - Consistent with prior IRP DSM Inputs, model will account for full lifetime savings of DSM bundles

EE/DR Inputs into IRP

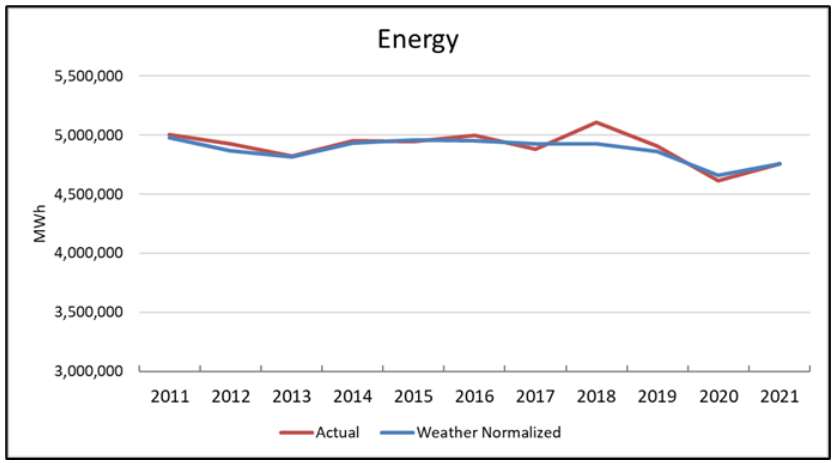
- Bundles for demand response follow the same vintages as Energy Efficiency
- Demand response bundles created for four categories
  - Residential DLC
  - Residential Rates
  - C&I DLC
  - C&I Rates/Interruptible
- DR program provide summer peak savings but expected to provide minimal winter peak and energy value to the portfolio
- Phase out of existing DLC legacy air conditioning switches will be a going-in resource; remaining DR will be modeled as a selectable resource

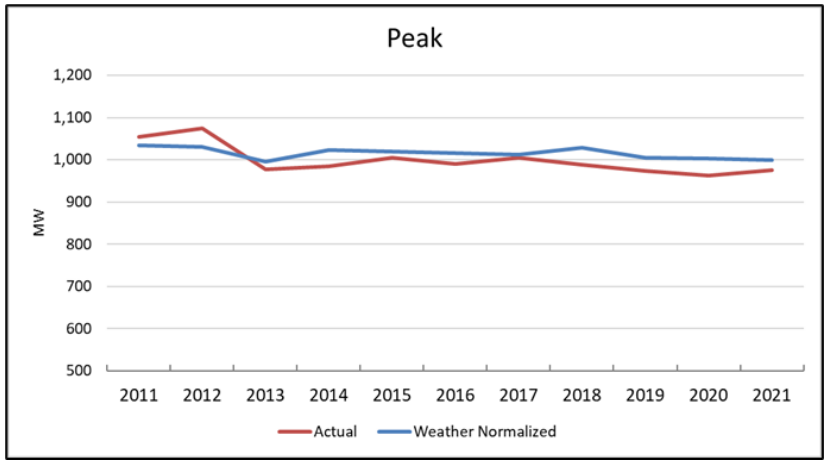
Draft Load Forecast Methodology

Michael Russo
Senior Forecast Consultant - Itron

Historical Energy and Peaks Trends

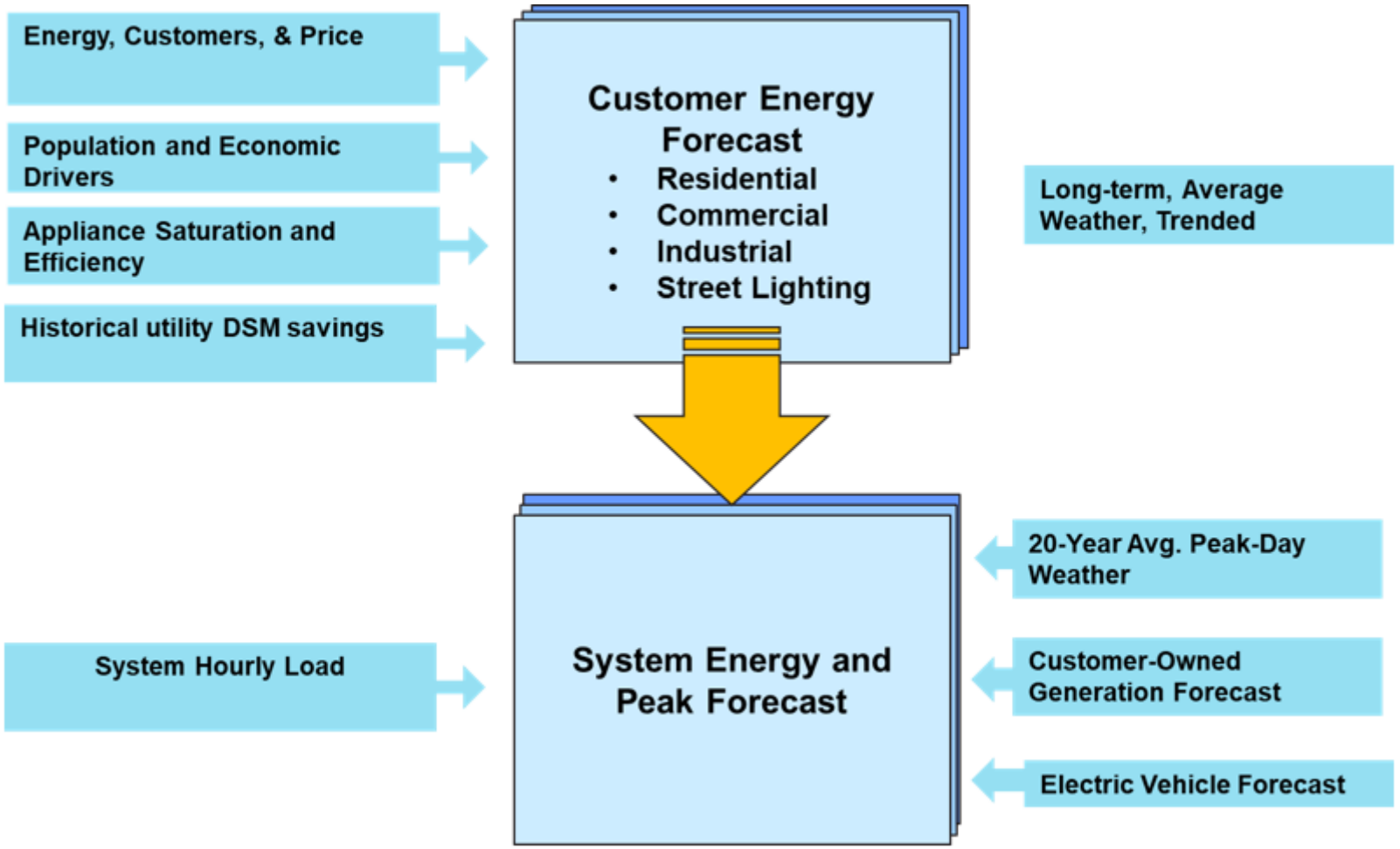
- Historical decline in energy and peaks despite moderate economic and customer growth
  - Strong efficiency gains reflecting new and existing Federal codes and standards as well as utility sponsored energy efficiency program savings
  - 0.4% average annual decline in energy and peaks; 2011-2021, weather normalized





*Excludes the loss of load in 2017 from large customer's cogeneration

Bottom-Up Forecast Approach



Economic Drivers

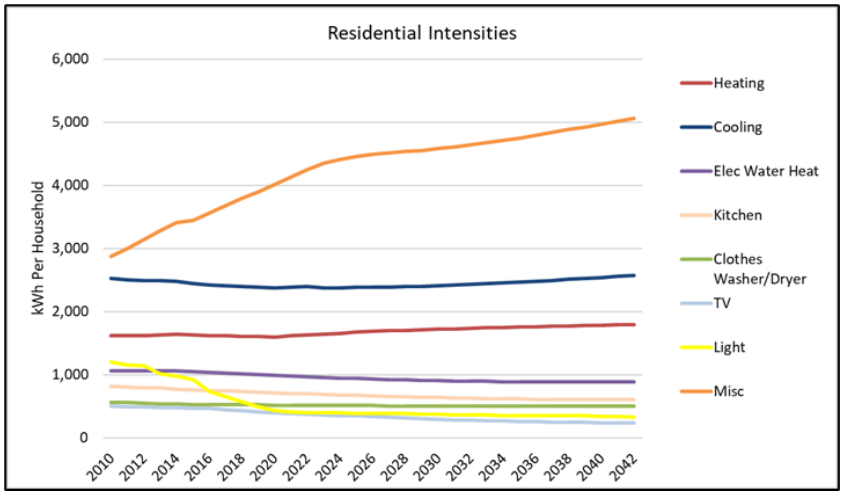
IHS Markit forecast for the Evansville MSA and Indiana

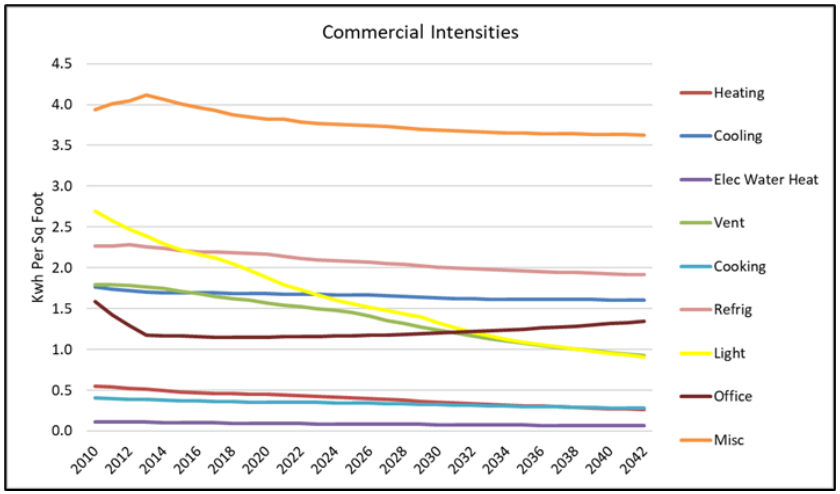
- Residential Sector
  - Households: 0.4% CAGR
  - Real Household Income: 1.6% CAGR
  - Household Size: -0.3% CAGR
- Commercial Sector
  - Non-Manufacturing Output: 1.5% CAGR
  - Non-Manufacturing Employment : 0.3% CAGR
  - Population: 0.4% CAGR
- Industrial Sector
  - Manufacturing Output: 2.2% CAGR
  - Manufacturing Employment: -0.6% CAGR

*CAGR= Compound average growth rate from 2022-2042

End-use intensity Trends

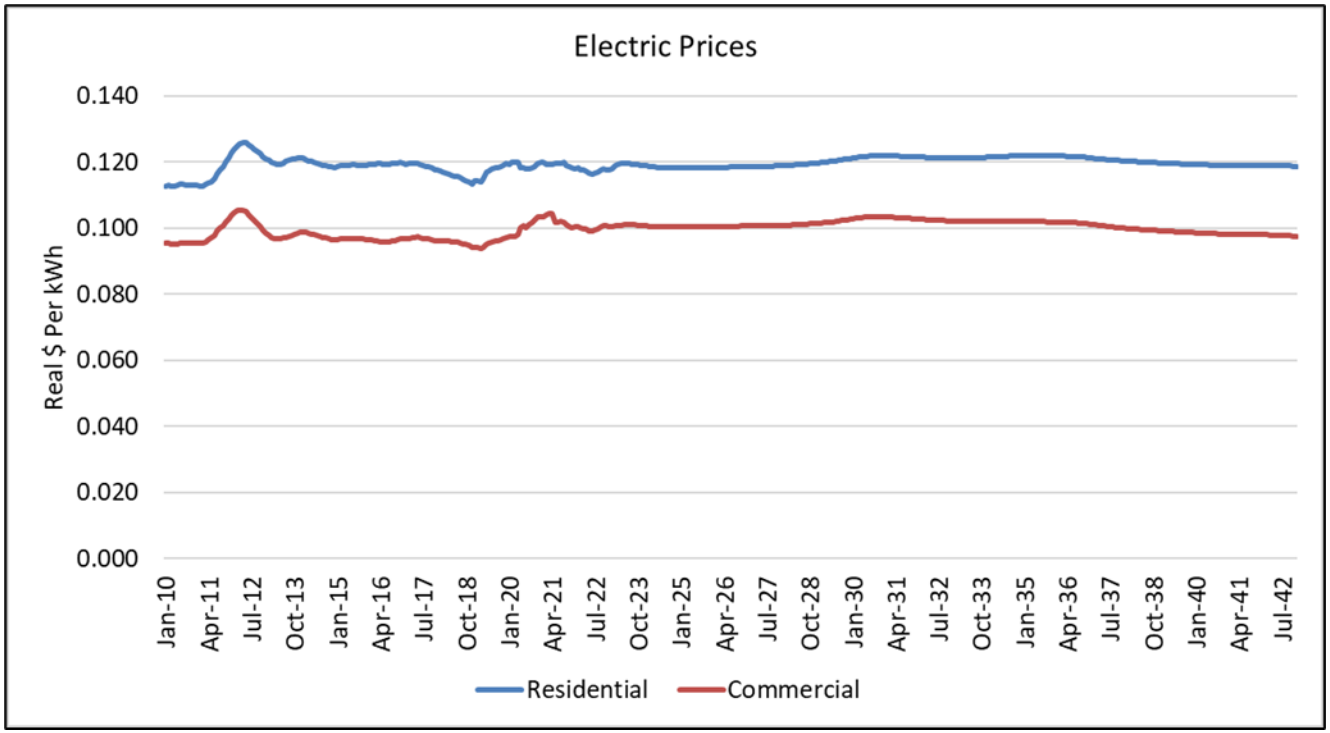
- Residential and Commercial Buildings
  - Reflects change in end-use ownership and efficiency trends
  - Based on the most recent Energy Information Administration's Annual Energy Outlook
    - Calibrated to the Indiana electric service territory
    - Total residential intensity increases at 0.2% CAGR (2022-2042)
    - Total commercial intensity decreases at 0.8% CAGR (2022-2042)





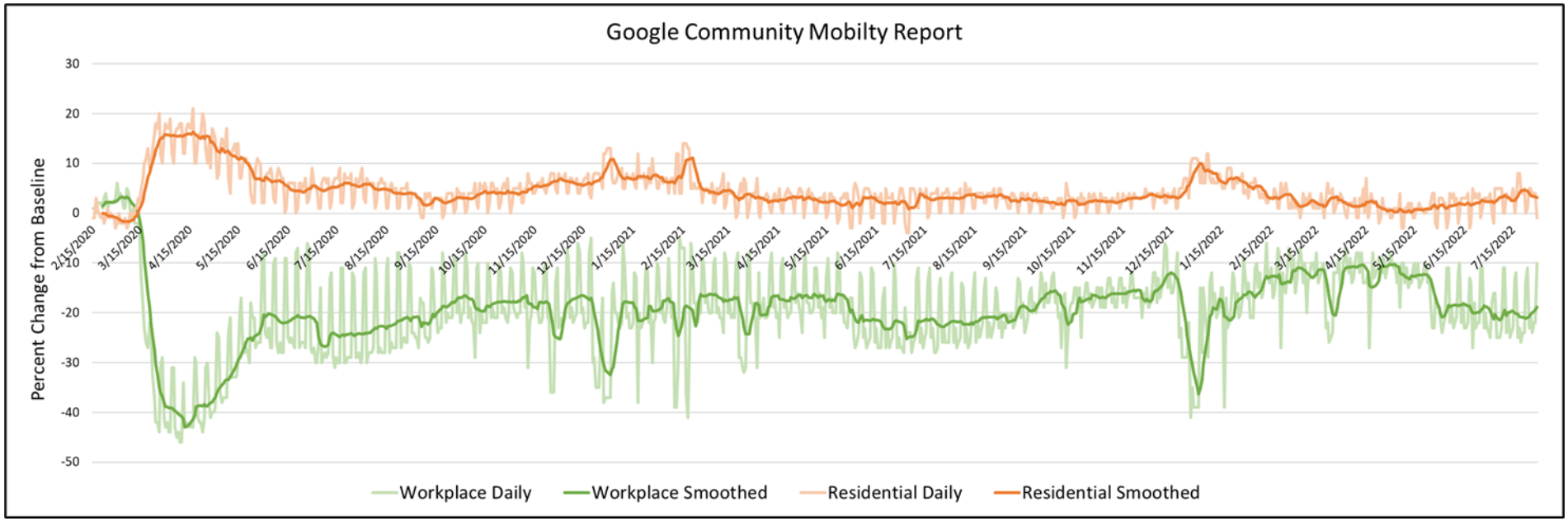
Electricity Prices

- Historical prices based on 12 month rolling average rate (total revenue $/total kWh), converted from nominal to real dollars
- Forecasted price increase/decrease based on Energy Information Administration's regional forecast

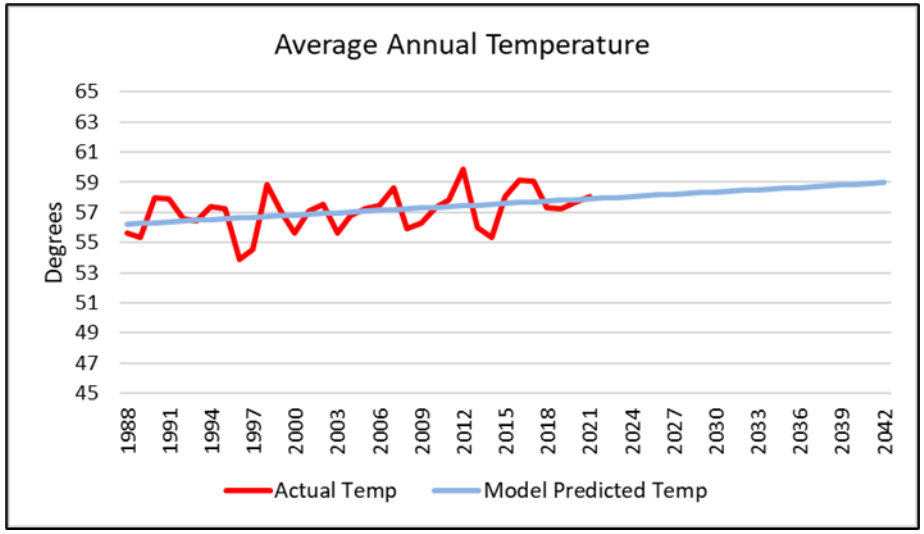


COVID Impact on Electricity Usage

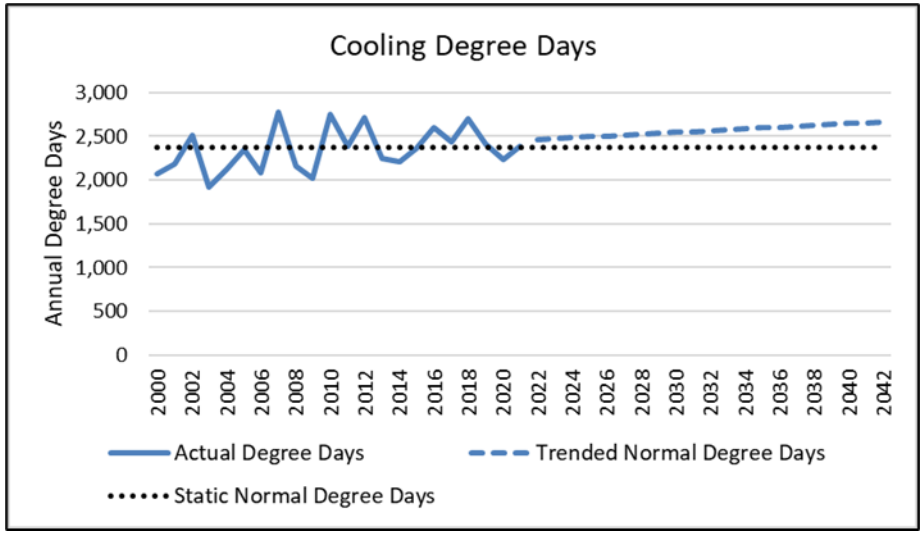
- Increase in residential sales, decrease in commercial sales
- Google Community Mobility Reports data used to explain historical deviations from normal usage
  - Vanderburgh County data
  - Residential and Workplace categories used

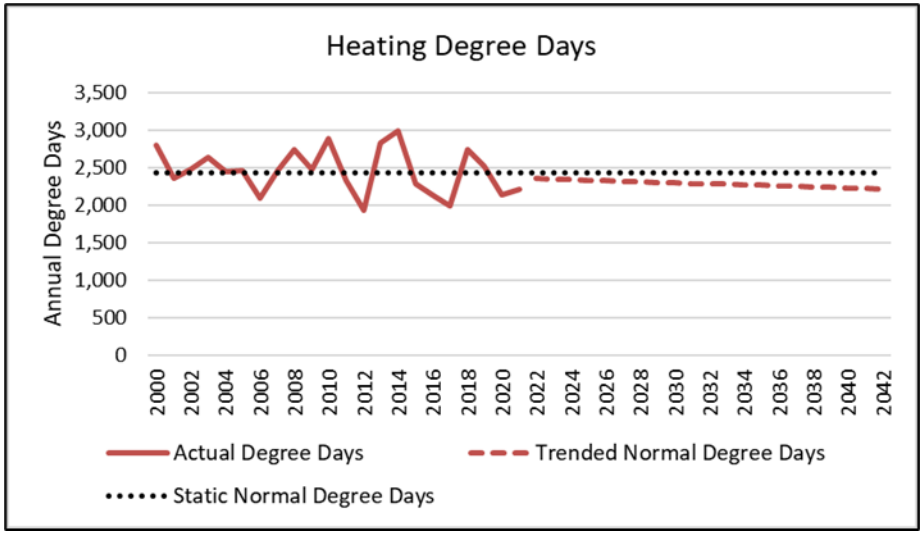


Trended Normal Weather

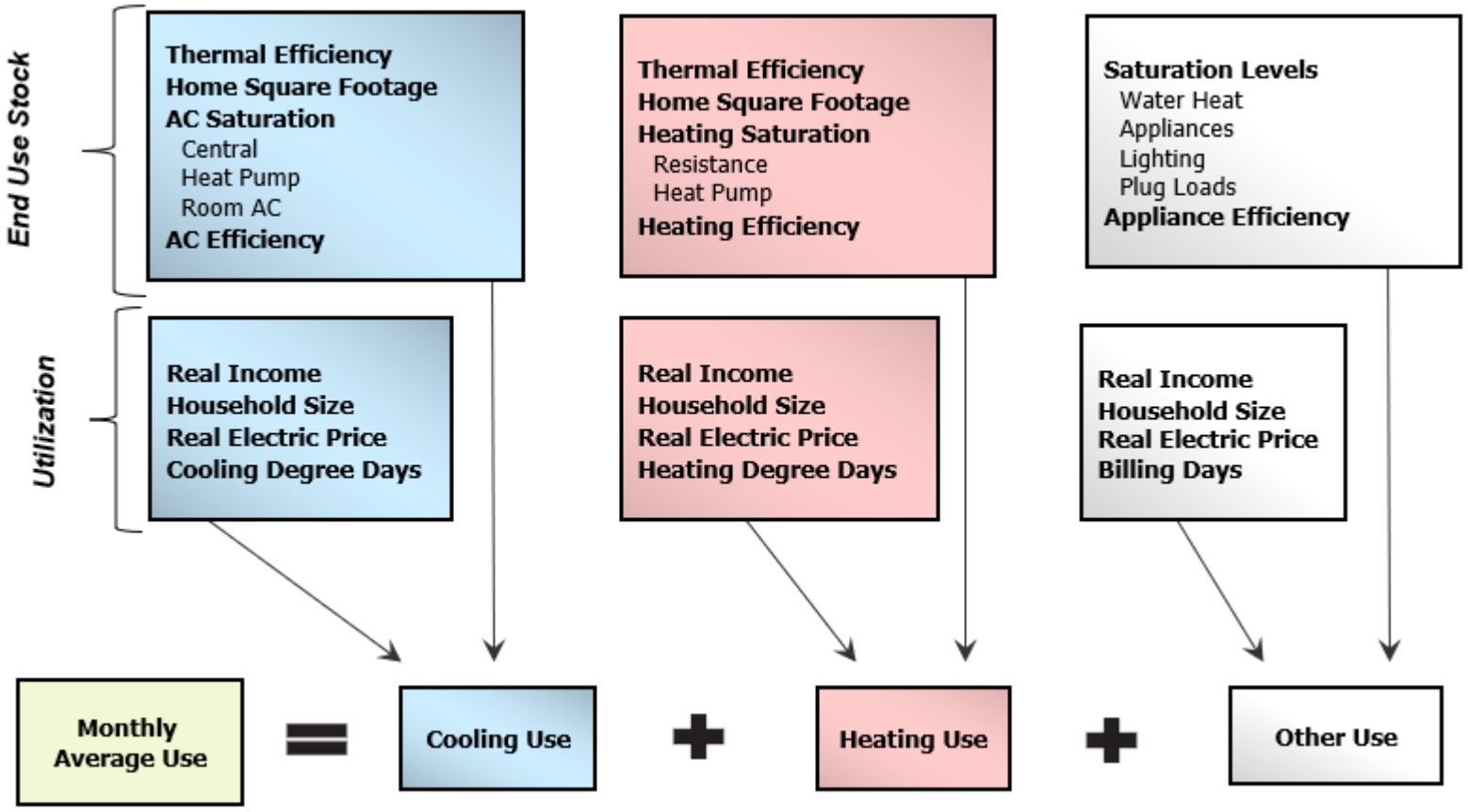


- Average temperature is increasing
  - Trend based on statistical analysis of historical temperature data (1988 to 2021).
  - Average annual temperature increasing 0.5 degrees per decade
  - Decline in HDD (warmer/shorter winters)
  - Increase in CDD (warmer/longer summers)





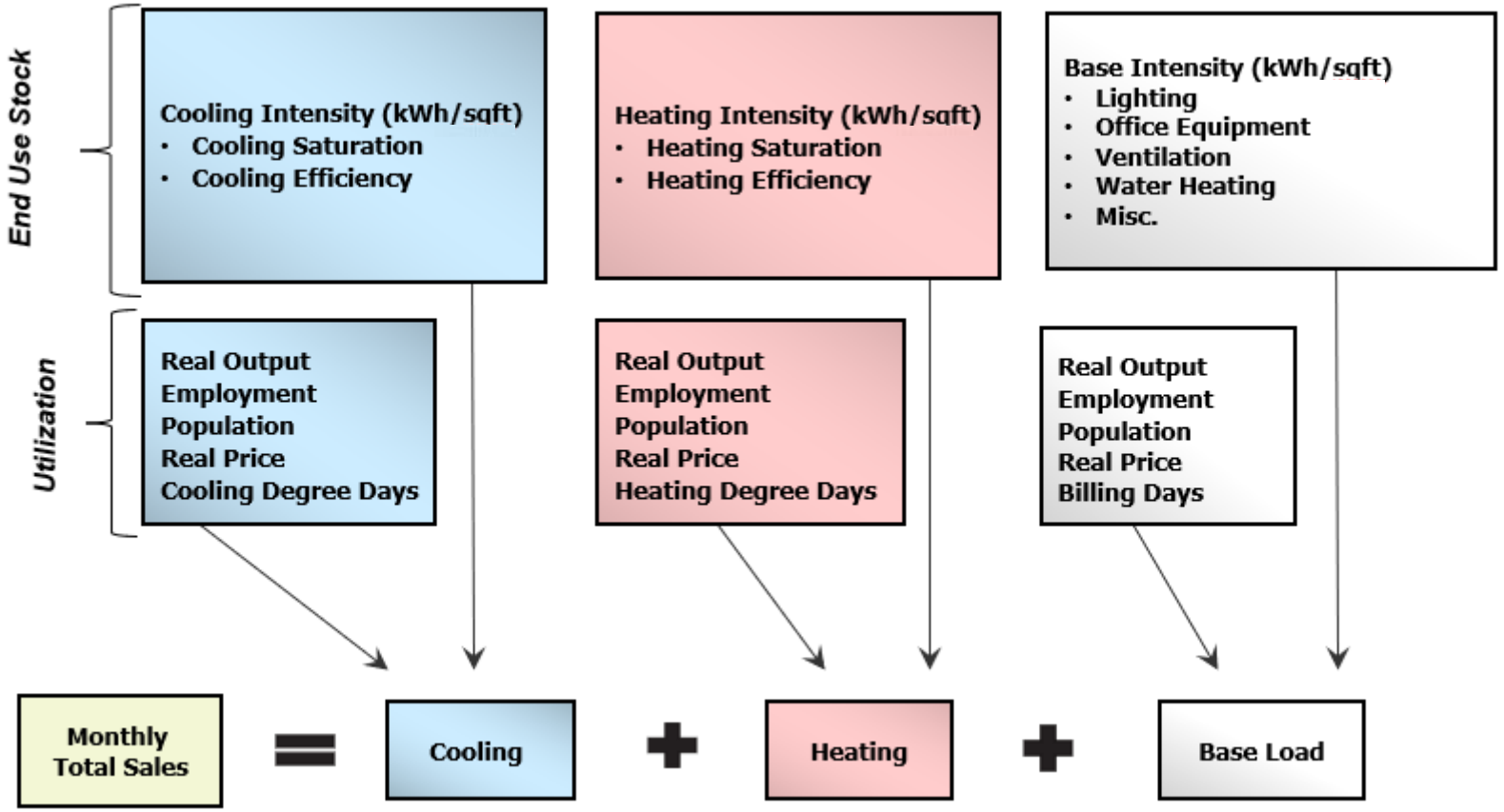
Residential Average Use model



Electric Vehicles and Customer Owned PV Approach

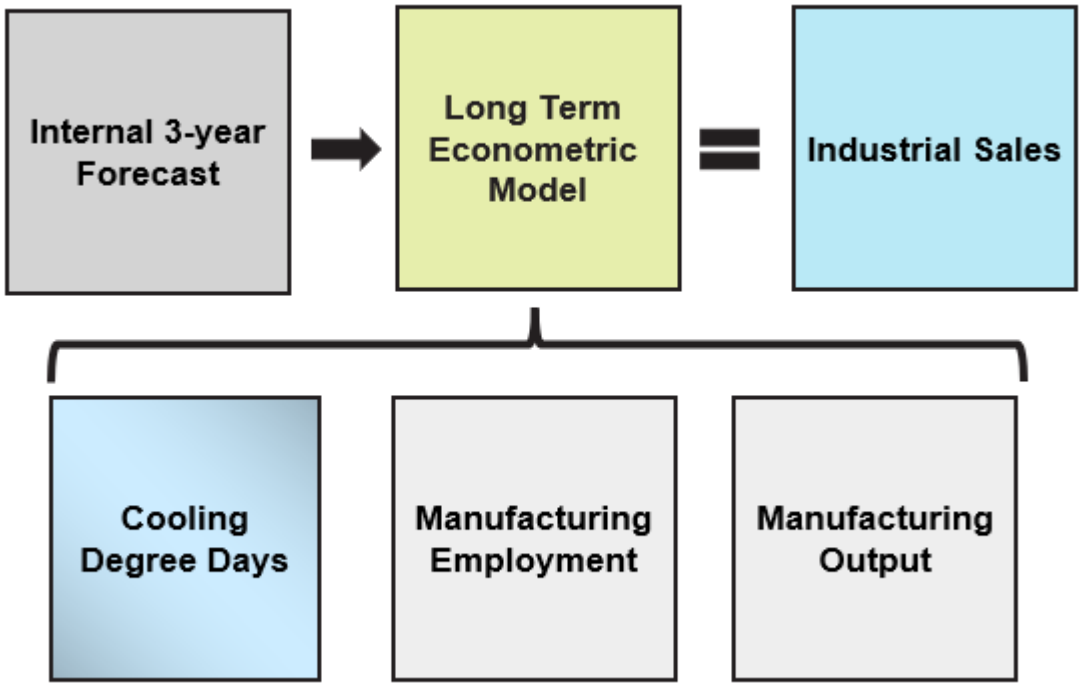
- Energy Information Administration (EIA) forecast based on share of total registered vehicles; Differentiating between all electric (BEV) and plug-in hybrid electric (PHEV)
- Customer economics defined using simple payback
  - Incorporates declining solar system costs, electric price projections, changes in net metering laws, and federal incentives
  - Monthly adoption based on simple payback

Commercial Sales model



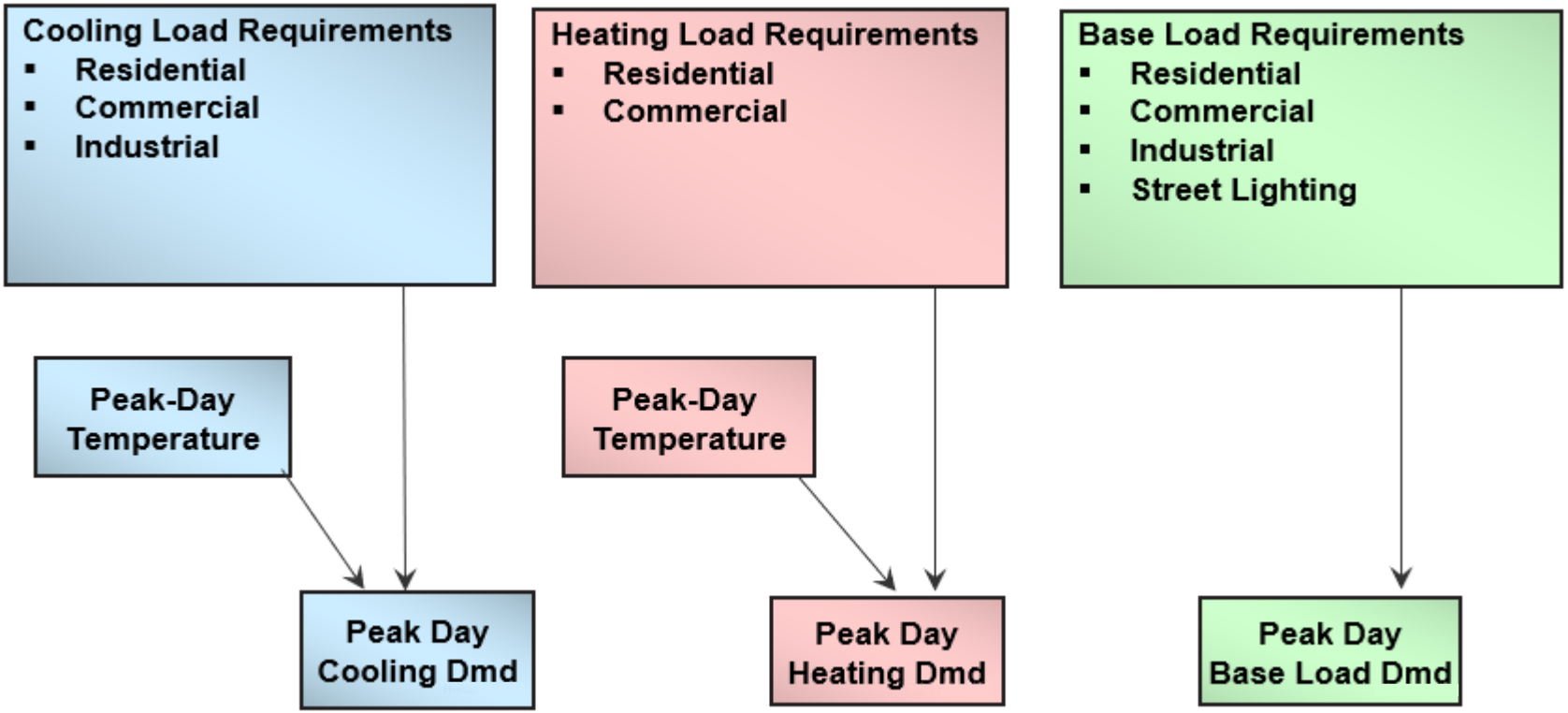
Industrial Forecast

- The industrial (large customer) forecast is a two-step approach
  - The first 3 years is based on Indiana Electric's internal forecast
  - The long-term growth rate is developed using the econometric model framework



Peak Demand Forecast

- Peak demand is driven by heating, cooling, and base load requirements derived from the customer class forecasts



Portfolio Resource Options

Kyle Combes
Project Manager, Resource Planning & Market Assessments
1898 & Co.

Existing and Planned Thermal Resources

Name	Type	Capacity (MW)	In-Service Date	Retirement / Contract End Date
A.B. Brown 1	Coal	245	1979	2023
A.B. Brown 2	Coal	245	1986	2023
A.B. Brown 3	Natural Gas	80	1991	N/A
A.B. Brown 4	Natural Gas	80	2002	N/A
F.B. Culley 2	Coal	90	1966	2025
F.B. Culley 3	Coal	270	1973	N/A
Warrick 4	Coal	150	1970	2023 or 2025
OVEC	Coal	32	-	N/A
Blackfoot	Landfill Gas	3	2009	N/A
A.B. Brown 5	Natural Gas	230	2025	N/A
A.B. Brown 6	Natural Gas	230	2025	N/A

Planned

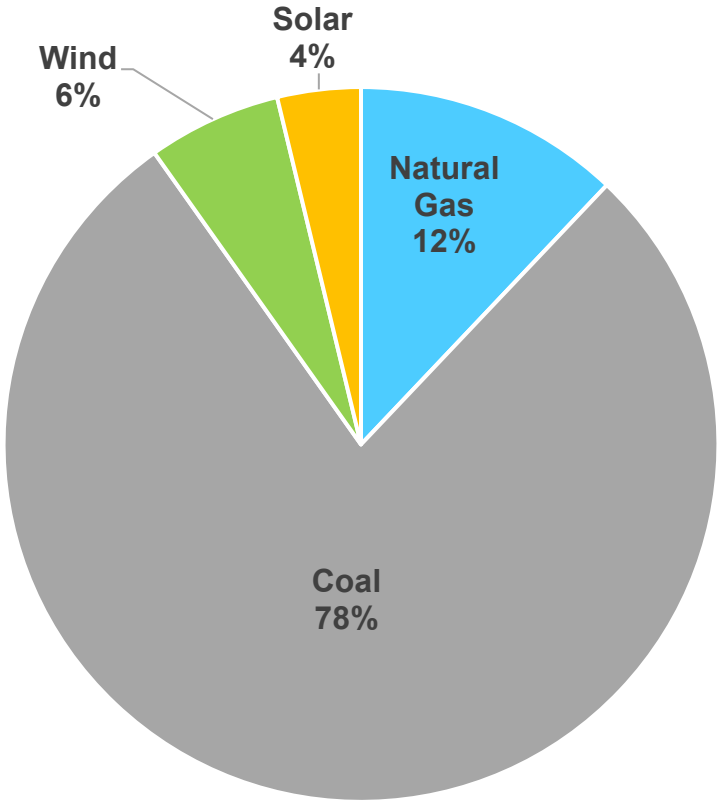
Existing and Planned Non-Thermal Resources

Name	Type	Capacity (MW)	In-Service Date	Retirement / Contract End Date
Benton County	Wind	30	2007	2028
Fowler Ridge	Wind	50	2010	2030
Oakhill	Solar	2	2018	N/A
Volkman Road	Solar\Battery	2\1	2018	N/A
Troy	Solar	50	2021	N/A
Posey	Solar	200	2024	N/A
Vermillion	Solar	185	2024	2038
Wheatland	Solar	150	2024	2044
Rustic Hills	Solar	100	2024	2049
CrossTrack	Solar	130	2025	N/A
Future TBD	Wind	200	2025	N/A

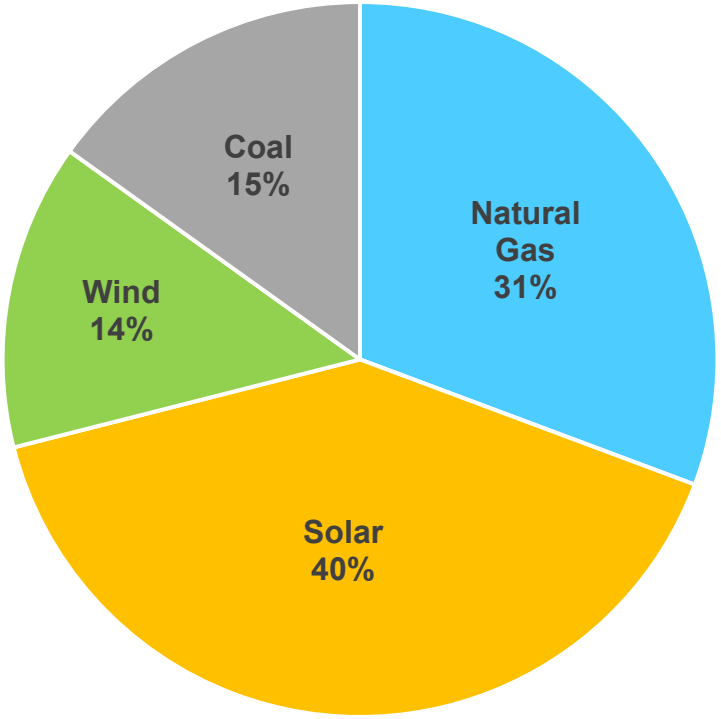
Planned

Existing and Planned Resource Mix

2022 (ICAP MW)



2026 (ICAP MW)



New Thermal Resources Options

Peaking Natural Gas (~95% Summer & Winter Capacity Accreditation)

- Simple cycle gas turbines
- Reciprocating engines
- F.B. Culley 3 conversion

Combined Cycle Natural Gas (~95% Summer & Winter Capacity Accreditation)

- Fired and unfired
- With and without CCS
- A.B. Brown 5 & 6 conversion

Cogeneration (~95% Summer & Winter Capacity Accreditation)

- Partnership with large industrial customers

Coal (~90% Summer & Winter Capacity Accreditation)

- Supercritical with CCS
- Ultra-supercritical with CCS

Nuclear (~90% Summer & Winter Capacity Accreditation)

- Small modular reactors

New Non-Thermal Resources Options

Wind (~10% Summer / ~20% Winter Capacity Accreditation*)

- On-shore in northern and southern Indiana
- With and without paired storage

Solar (~50% Summer / ~0% Winter Capacity Accreditation*)

- Utility scale with single axis tracking
- With and without paired storage

Storage (~95% Summer & Winter Capacity Accreditation*)

- Lithium ion (4-hour)
- Long duration (10-hour, compressed air as proxy)

Hydroelectric (To Be Determined)

- At existing Newburgh and J.T. Myers dams on Ohio River

Demand Side

- Energy efficiency
- Demand response

*Accreditation expected to decline over time due to ELCC

Draft Reference Case Inputs and Scenario Discussion

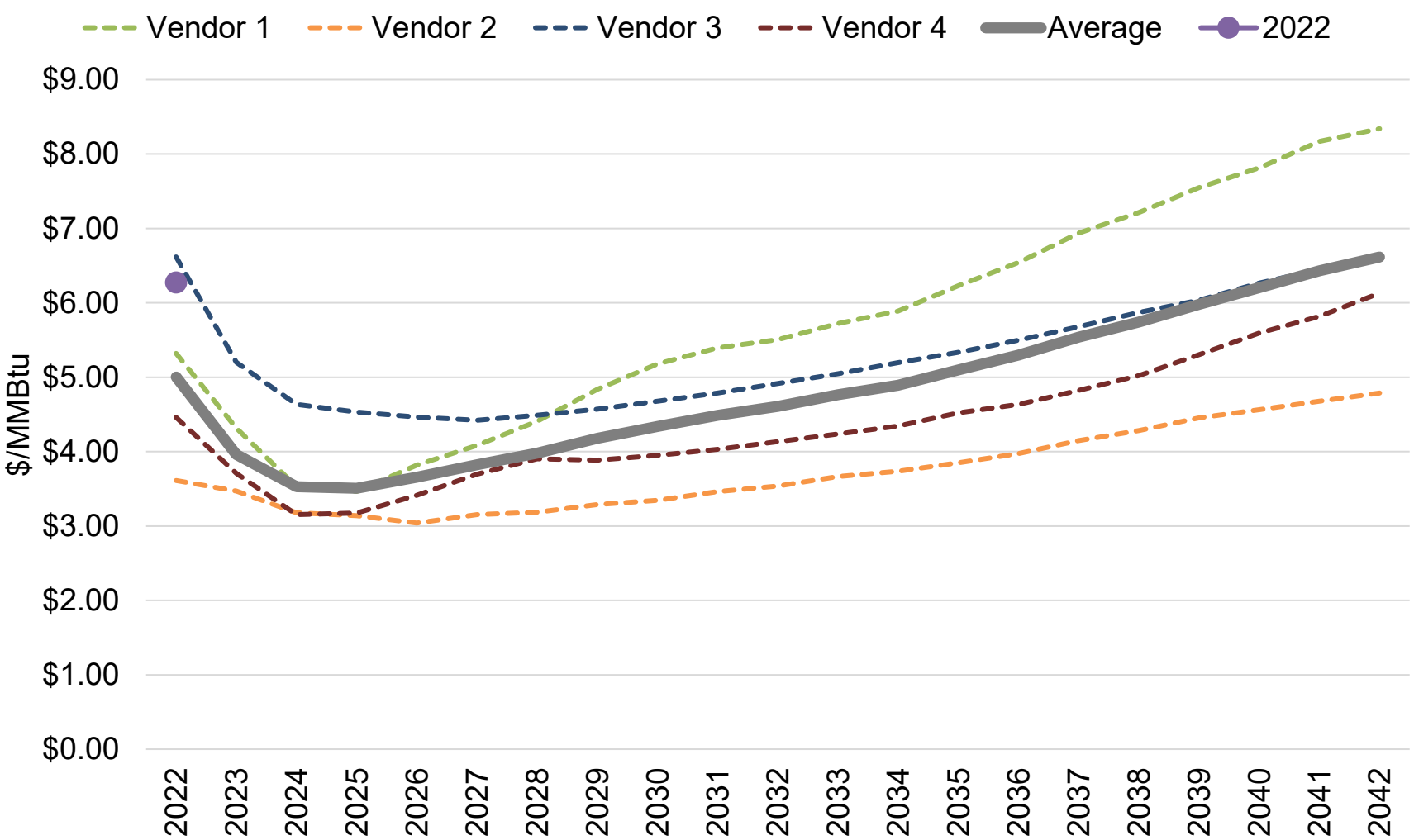
Matt Lind
Director, Resource Planning & Market Assessments
1898 & Co.

Reference Case Inputs

CenterPoint surveyed and incorporated a wide array of sources in developing its Reference Case inputs, which reflect a current consensus view of key drivers in power and fuel markets.

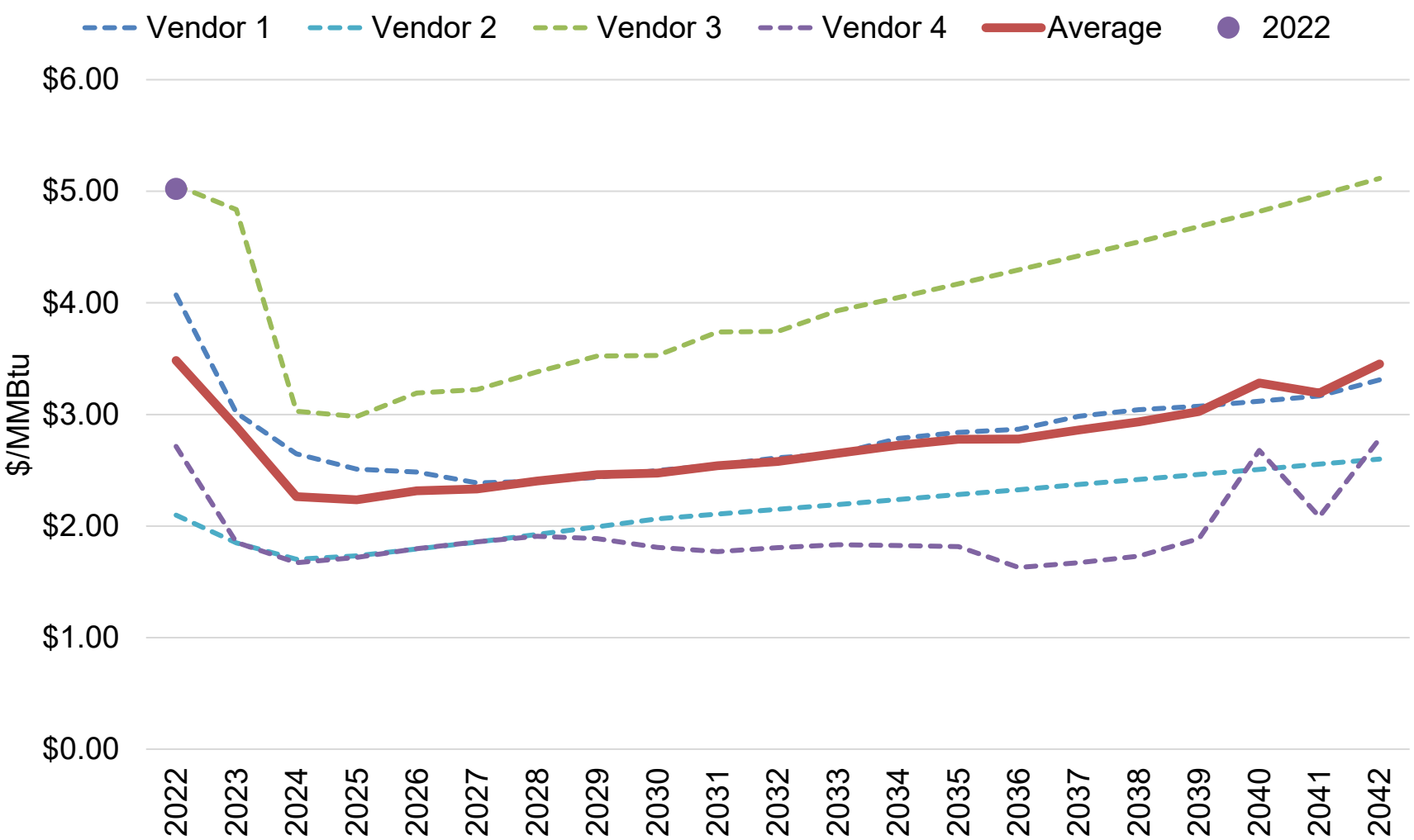
- Reference Case market inputs include forecasts of the following key drivers:
  - Henry Hub and delivered natural gas prices
  - Illinois Basin mine mouth and delivered coal prices
  - MISO Capacity Costs
  - CO_2 ACE Proxy
  - Capital costs for various generation technologies
  - Load forecast
- On- and off-peak power prices are an output of scenario assumptions
- CenterPoint uses a consensus Reference Case view, by averaging forecasts from several sources when available; This ensures that reliance on one forecast or forecaster does not occur

Natural Gas (Henry Hub) Forecast



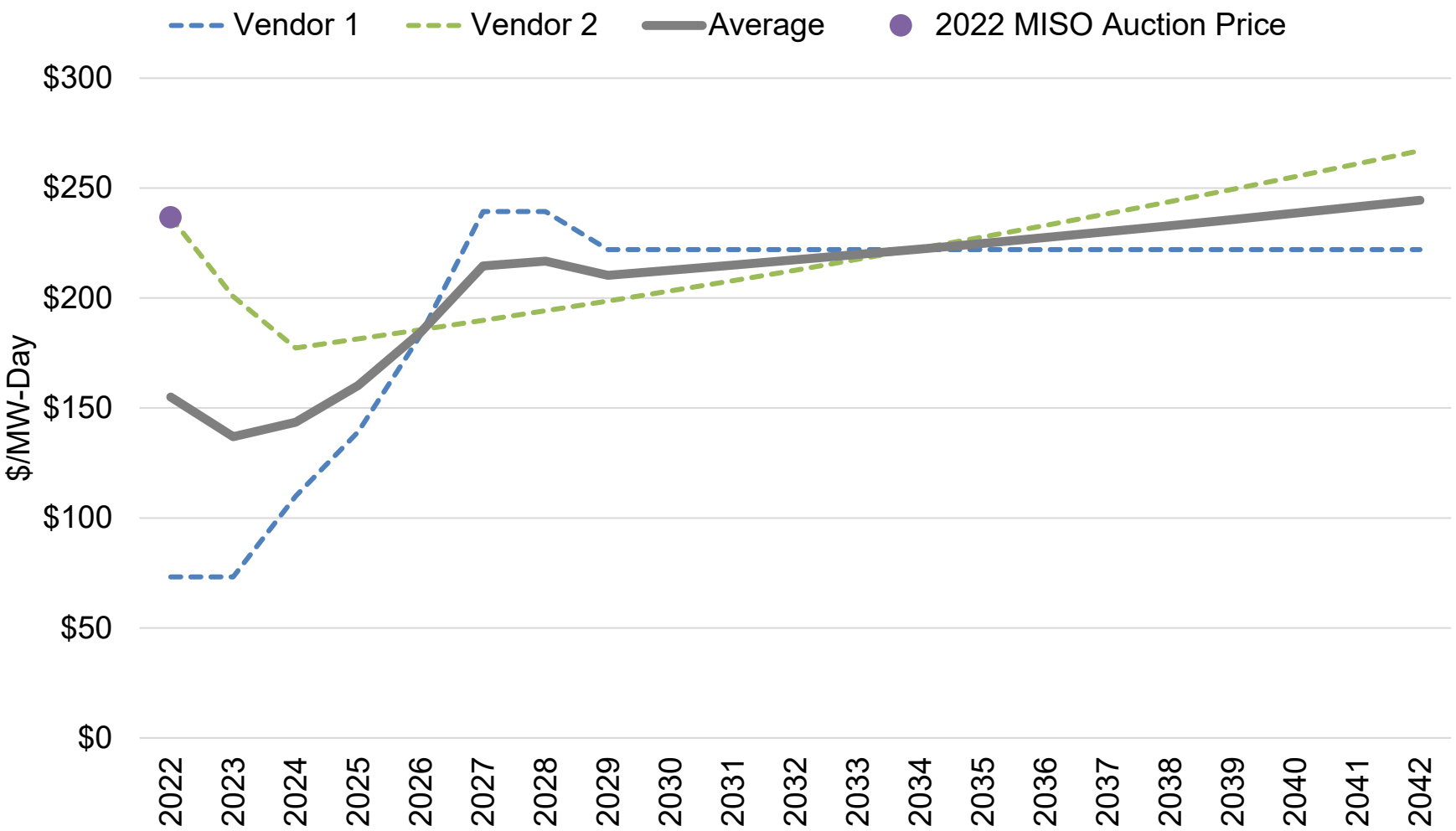
Will be revised as individual forecasts are updated

Coal Forecast



Will be revised as individual forecasts are updated

MISO Capacity Forecast



Will be revised as individual forecasts are updated

Potential Scenarios

	Coal Price	Natural Gas Price	Load	Carbon	Renewables and Storage Cost	Economy	Gas Regulation	Other Environmental Regulations	EE Cost
Reference Case	Base	Base	Base	ACE Proxy	Base	Base	None	None	Base
High Regulatory	⟷	↑	↓	↑	↓	↓	Fracking Ban	MATS Update	↑
Market Driven Innovation	↓	↓	↑	↓	↓	↑	None	None	↓
Decarbonization \ Electrification	↑	⟷	↑	↑	⟷	⟷	Methane	None	↓
Continued High Inflation & Supply Chain Issues	↑	↑	↓	⟷	↑	↓	None	None	↑

↑ = Higher than Reference Case

↓ = Lower than Reference Case

⟷ = Same as Reference Case

Scenario Narratives - High Regulatory – Increased regulations from legislature and government

	Coal Price	Natural Gas Price	Load	Carbon	Renewables and Storage Cost	Economy	Gas Regulation	Other Environmental Regulations	EE Cost
High Regulatory	⟺	↑	↓	↑	↓	↓	Fracking Ban	MATS Update	↑

- **Coal** - While there could be regulations that could increase the coal price - demand would be going down, offsetting the increase
- **Natural Gas** – In a high reg environment there will be a ban on fracking which will restrict supply, thus causing gas prices to increase
- **Load** – In high regulatory scenario there is a drag on the economy; Low economic output leads to lower load
- **Carbon** - Legislature passes a high tax on CO_2
- **Renewables and Storage Costs** – Renewables and storage receive increased government incentives reducing their overall cost
- **EE Cost** – Technological innovation is stifled; Lower load leads to less opportunity for cost effective energy efficiency; In addition, a high regulatory environment leads to more codes and standards for equipment; This in turn results in higher incentives for more efficient equipment

Scenario Narratives - Market Driven Innovation – Less government regulation, more free market

	Coal Price	Natural Gas Price	Load	Carbon	Renewables and Storage Cost	Economy	Gas Regulation	Other Environmental Regulations	EE Cost
Market Driven Innovation	↓	↓	↑	↓	↓	↑	None	None	↓

- **Coal Price** – Less government influence drives competition among competing fuels for the increase in load
- **Natural Gas Price -** Less government influence drives competition among competing fuels for the increase in load
- **Load** - Less government influence reduces costs, which drives increased usage
- **Carbon** - No carbon tax nor ACE like requirements
- **Renewables and Storage Costs** – Increased demand for renewable and storage resource options spurs further technological innovation to lowers cost
- **EE Cost** – Technological innovation drives more opportunities for EE programs; Increased load drives more opportunity for cost effective energy efficiency; Less codes and standards changes will allow utility sponsored EE programs more opportunities to transform the market at a lower incentive cost

Scenario Narratives - Decarbonization\Electrification

– Consumers are moving to electrify transportation and promotes fuel switching in homes and businesses from natural gas to electricity

	Coal Price	Natural Gas Price	Load	Carbon	Renewables and Storage Cost	Economy	Gas Regulation	Other Environmental Regulations	EE Cost
Decarbonization \ Electrification	↑	↔	↑	↑	↔	↔	Methane	None	↓

- **Coal Price** – Demand for coal decreases as a mid level carbon tax is imposed, supply is constrained causing price to increase
- **Natural Gas Price** – Methane regulation causes the cost of gas to increase but is offset by increased supply due to fuel switching away from natural gas heating
- **Load** – Increased due to fuel switching while economy remains at reference levels
- **Carbon** - Mid level carbon tax imposed
- **Renewables and Storage Costs** – Technological improvements which typically lowers costs are offset by higher demand and rising land and labor costs
- **EE Cost** – Increased load allows more opportunities for EE potential and reduces the cost of EE acquisition; Further, a carbon tax will allow for more cost-effective EE measures

Scenario Narratives - Continued High Inflation & Supply Chain Issues

	Coal Price	Natural Gas Price	Load	Carbon	Renewables and Storage Cost	Economy	Gas Regulation	Other Environmental Regulations	EE Cost
Continued High Inflation & Supply Chain Issues	↑	↑	↓	↔	↑	↓	None	None	↑

- **Coal Price** – Increased costs for delivery and labor with reduced supply drive coal prices higher
- **Natural Gas** – Less new drilling leads to reduced supply and increased demand, resulting in higher cost
- **Load** – High inflation reduces economic output, reducing load demand
- **Carbon -** Reference
- **Renewables and Storage Costs** – Continued disruption in supply chain partnered with high inflation shows continued high cost for renewables and storage
- **EE Cost** – Reduction in load results in less potential and higher cost of EE acquisition both for incentives passed to customers and implementation of programs as implementers experience increased cost; Shortage of EE equipment leads to increased cost of high-efficient measures

CenterPoint Energy

Q&A

Appendix

Definitions

Term	Definition
ACE	Affordable Clean Energy (ACE) Rule, establishes emission guidelines for states to develop plans to address greenhouse gas emissions from existing coal-fired power plants
All-Source RFP	Request for proposals, regardless of source (renewable, thermal, storage, demand response)
BAGS	Broadway Avenue Gas Turbine
BTA	Build Transfer Agreement/Utility Ownership
C&I	Commercial and Industrial
CAA	Clean Air Act
CAGR	Compound Annual Growth Rate
Capacity	The maximum output of electricity that a generator can produce under ideal conditions (megawatts)
CCGT	A combined-cycle power plant uses both a gas and a steam turbine together to produce up to 50 percent more electricity from the same fuel than a traditional simple-cycle plant. The waste heat from the gas turbine is routed to the nearby steam turbine, which generates extra power
CCR Rule	Coal Combustion Residuals Rule
CCS	Carbon Capture and Storage
CDD	Cooling Degree Day
CEI South	CenterPoint Energy Indiana South
CO_2	Carbon dioxide

Definitions Cont.

Term	Definition
CONE	Cost of New Entry
CPCN	A Certificate of Public Convenience and Necessity is required to be granted by the Commission for significant generation projects
CSAPR	Cross State Air Pollution Rule
DER	Distributed Energy Resource
Deterministic Modeling	Simulated dispatch of a portfolio in a determined future. Often computer generated portfolios are created by optimizing on cost to the customer
DLC	Direct Load Control
DR	Demand Response
DSM	Demand side management includes both Energy Efficiency and Demand Response programs to reduce customer demand for electricity
EE	Energy Efficiency
ELCC	Effective Load Carrying Capability
ELG	Effluent Limitation Guidelines are U.S. national standards for wastewater discharges to surface waters and publicly owned treatment works
EnCompass	Electric modeling forecasting and analysis software
Energy	Amount of electricity (megawatt-hours) produced over a specific time period

Definitions Cont.

Term	Definition
EPA	Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
GW	Gigawatt (1,000 million watt), unit of electric power
GWh	Gigawatt Hour
HDD	Heating Degree Day
Henry Hub	Point of interconnection of interstate and intrastate natural gas pipelines as well as other related infrastructure in Erath, Louisiana
IDEM	Indiana Department of Environmental Management
Installed Capacity (ICAP)	Refers to generating capacity after ambient weather adjustments and before forced outages adjustments
Intermittent	An intermittent energy source is any source of energy that is not continuously available for conversion into electricity and outside direct control
IRP	Integrated Resource Plan is a comprehensive plan to meet customer load expectations
IURC	The Indiana Utility Regulatory Commission is the public utilities commission of the State of Indiana. The commission regulates electric, natural gas, telecommunications, steam, water and sewer utilities
KWh	Kilowatt Hour

Definitions Cont.

Term	Definition
LCOE	Levelized Cost of Energy, A measure that looks at cost and energy production over the life of an asset so different resources can be compared. Does not account for capacity value.
LMR	Load Modifying Resource
Local Clearing Requirement (LCR)	Capacity needs to be fulfilled by local resource zone
LRZ6	MISO Local Resource Zone 6
MATS	Mercury and Air Toxics Standard
Mine Mouth	At the mine location
MISO	Midcontinent Independent System Operator, an Independent System Operator (ISO) and Regional Transmission Organization(RTO) providing open-access transmission service and monitoring the high-voltage transmission system in the Midwest United States and Manitoba, Canada and a southern United States region which includes much of Arkansas, Mississippi, and Louisiana. MISO also operates one of the world's largest real-time energy markets
MMBTU	Million British Thermal Units
MPS	Market potential study - Determines the total market size (value/volume) for a DSM at a given period of time
MSA	Metropolitan Statistical Area
MW	Megawatt (million watt), unit of electric power
NAAQS	National Ambient Air Quality Standards

Definitions Cont.

Term	Definition
Name Plate Capacity	The intended full-load sustained output of a generation facility
NDA	Non-Disclosure Agreement
NOI	Notice of Intent
NO_x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NPVRR	Net Present Value Revenue Requirement
NSPS	New Source Performance Standards
OMS	Organization of MISO States, was established to represent the collective interests of state and local utility regulators in the Midcontinent Independent System Operator (MISO) region and facilitate informed and efficient participation in related issues.
Peaking	Power plants that generally run only when there is a high demand, known as peak demand, for electricity
Planning Reserve Margin Requirement (PRMR)	Total capacity obligation each load serving entity needs to meet
Portfolio	A group of resources to meet customer load
PPA	Purchase Power Agreement

Definitions Cont.

Term	Definition
Preferred Portfolio	The IRP rule requires that utilities select the portfolio that performs the best, with consideration for cost, risk, reliability, and sustainability
Probabilistic modeling	Simulate dispatch of portfolios for a number of randomly generated potential future states, capturing performance measures
PV	Photovoltaic
RA (Resource Adequacy)	RA is a regulatory construct developed to ensure that there will be sufficient resources available to serve electric demand under all but the most extreme conditions
RAP	Realistic Achievable Potential
Resource	Supply side (generation) or demand side (Energy Efficiency, Demand Response, Load Shifting programs) to meet planning reserve margin requirements
SAC	Seasonal Accredited Capacity
Scenario	Potential future State-of-the-World designed to test portfolio performance in key risk areas important to management and stakeholders alike
SDE	Spray Dryer Evaporator
Sensitivity Analysis	Analysis to determine what risk factors portfolios are most sensitive to
SIP	State Implementation Plan
Spinning Reserve	Generation that is online and can quickly respond to changes in system load

Definitions Cont.

Term	Definition
T&D	Transmission and Distribution
Technology Assessment	An analysis that provides overnight and all-in costs and technical specifications for generation and storage resources
Unforced Capacity (UCAP)	A unit's generating capacity adjusted down for forced outage rates (thermal resources) or expected output during peak load (intermittent resources)
VAR Support	Unit by which reactive power is expressed in an AC electric power system
ZLD	Zero Liquid Discharge