



2018 Integrated Resource Plan Stakeholder Workshop #1

February 15, 2018

Northeast Indiana Innovation Center
3211 Stellhorn Road
Fort Wayne, IN 46815



Meeting Access Information

Wi – Fi Access

- Provided at the meeting

Dial-In Access Information

- Toll Free: 1 888-237-7001
- Host Code: 572987



GROUND RULES

Ground Rules

- Everyone will be heard and have the opportunity to contribute
- Please be respectful of all opinions and/or proposals
- Stick to the time allotted

Housekeeping

- Safety – emergency exits
- Restroom locations
- Lunch logistics
- Please silence phones and if you must take a call, please step outside the room to do so



I&M's Key Priorities for the 2018 IRP

- ✓ Stakeholder Engagement
- ✓ Continuous Improvement of IRP Processes
- ✓ Continued DSM/EE Advancement/Deployment
- ✓ Continued Renewables Deployment
- ✓ Continued Support for CHP and DG Opportunities
- ✓ Understanding of Rockport Options
- ✓ Develop a reasonable and prudent preferred resource plan that balances cost effectiveness, reliability, portfolio risk and uncertainty to meet I&M's future energy and capacity needs
- ✓ Develop an IRP that meets the requirements of IURC draft proposed rule 170 IAC 4-7, dated April 28, 2017 and 2016 MI Public Act 341 Section 6t.(4)



Goals for Today

□ Today's Goals:

- ✓ Discuss the IRP process, key priorities, initial assumptions and preliminary scenarios/portfolios
- ✓ Obtain Stakeholder Input on the IRP process, priorities, assumptions and scenarios/portfolios



Preliminary Stakeholder Meeting Schedule

Meeting	Date	Topic
1	February 15, 2018 Northeast Indiana Innovation Center 3211 Stellhorn Road Fort Wayne, IN 46815	2018 IRP Kick-off Meeting - Stakeholder Process & Scenario Discussion
2	April 11, 2018 Barnes & Thornburg 11 S. Meridian St. Indianapolis, IN 46204	Considerations for Modeling DSM in the 2018 IRP & Update on other IRP Issues
3	July 2018	Final Inputs, Portfolios, Scenarios and Initial Modeling Results
4	Sept. - Oct. 2018	Modeling Results and Preferred Portfolio Discussion

If needed after meetings 2 & 3 I&M plans to host discussions ~10 days after Stakeholder Meetings to address detailed questions regarding IRP issues

File report on November 1, 2018



Stakeholder Comments

- ❑ I&M has added a comment form on its webpage.
 - ❑ [Link To Stakeholder Comments Input Page](#)
- ❑ **Throughout the IRP Stakeholder Process, please submit comments, suggested inputs and portfolio scenarios as soon as you can so I&M will have time to consider & respond.**
- ❑ Specifically, I&M welcomes comments on:
 - Fundamental Commodity Forecast Pricing Assumptions
 - Load Forecast
 - Cost of Technology Options
 - DSM/Energy Efficiency assumptions
 - Sensitivity cases
 - Portfolios to Consider
 - Other
- ❑ I&M will respond to all relevant input related to the development of the 2018 IRP. I&M will also post meeting minutes from each Stakeholder Meeting



Today's Agenda

- Welcome
- Introduction to I&M
- Stakeholder Presentations
- Q&A on Resource Planning 101 (Pre-Read)
- Discussion of Key Inputs
- Stakeholder Input
 - Discuss Portfolio Characteristics
 - Discussion of Sensitivities & Other Resources
- Next Steps



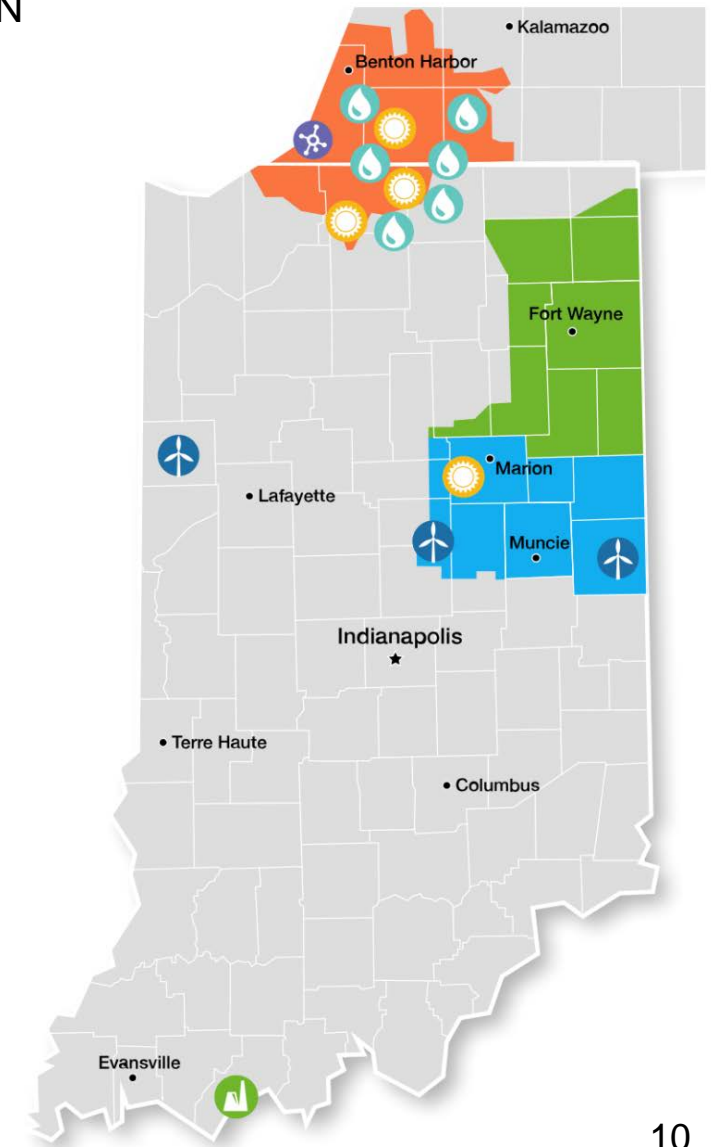
Today's Agenda

- Introduction to I&M
- Discussion of key inputs and resource assumptions
- Stakeholder Input
 - Development of Non-optimized Resource Portfolios
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- Next Steps



Introduction to I&M

- ❑ Indiana Michigan Power (I&M), headquartered in Fort Wayne, IN
- ❑ More than 585,000 customers in Michigan & Indiana.
- ❑ Our Indiana service area spans portions of 23 counties & includes cities such as Elkhart, Fort Wayne, Marion, Muncie & South Bend.
- ❑ I&M's existing generation portfolio consists of:
 - 2,223 megawatts (MW) of coal in Indiana (post Jun 2015)
 - 2,154 MW of nuclear in Michigan,
 - 18.3 MW of hydroelectric power in both states, and
 - 16 MW of solar in both states
 - I&M purchases 450 MW of wind power in Indiana under PPA;
 - ❖ 150 MW from the Fowler Ridge Wind Farm in Benton County Ind.,
 - ❖ 100 MW from the Wildcat Wind Farm in just north of Indianapolis,
 - ❖ 200 MW from Headwaters Wind Farm in Randolph County, Ind.
- ❑ I&M has achieved:
 - 1,054GWh of energy reductions since 2008 through Company sponsored Energy Efficiency programs and 51MW of demand savings in 2018; as well as 312MW of Interruptible and Demand Reduction programs in 2018.
- ❑ Almost all of the power produced within Indiana Michigan Power's service area is base load generation.



I&M is a unit of American Electric Power (NYSE: AEP), which is one of the largest electric utilities in the United States, delivering electricity to more than 5 million customers in 11 states.



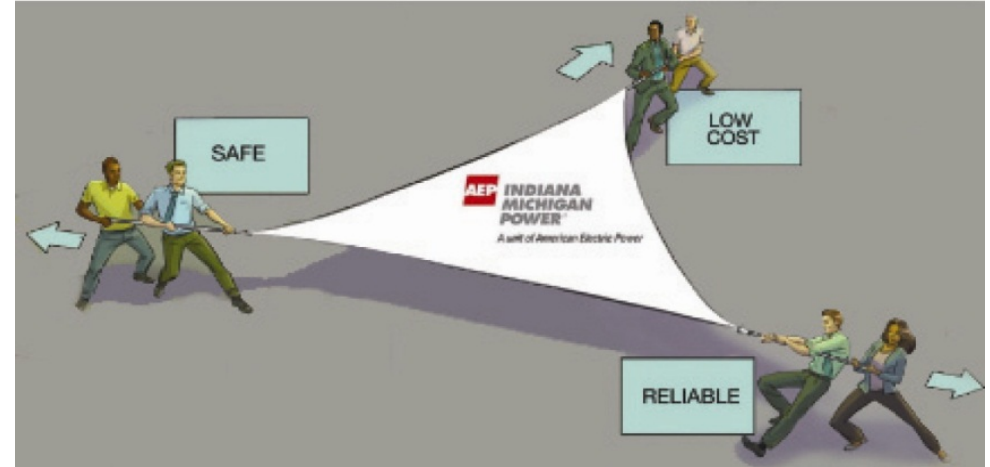
Today's Agenda

- Introduction by Paul Chodak, President I&M
- Resource Planning 101 (Pre-Read – Q&A only)**
- Discussion of key inputs and resource assumptions
- Stakeholder Input
 - Development of Non-optimized Resource Portfolios
 - Discussion of Sensitivities and Other Resources
- Next Steps



The Integrated Resource Planning Process

- ❑ Resource planning is a complex effort that must balance the needs of a variety of stakeholders:
 - Customers
 - Regulators
 - Shareholders
- ❑ While ensuring that electricity is provided in a safe, reliable & efficient manner at just & reasonable rates.



There are many priorities that compete for resources as I&M works toward its objective is to provide safe, reliable, clean power at rates that are reasonable.

- ❑ The process involves looking at “big-picture” trends that affect energy markets, developing & using forecasting & analysis models, & selecting approaches that will meet customer needs in the safest, most reliable & economical way given the uncertainties about the future.

Note: I&M along with the other Indiana IOUs developed, hosted and recorded an Overview to IRPs on February 3, 2016 and I&M suggest that you review that recording before the Stakeholder Meeting. The recording link is posted on the I&M IRP Webpage and is provided here: [Link to IRP Stakeholder Education](#)



Indiana Michigan Resource Options

The Integrated Resource Planning (IRP) Process requires the selection of a mix of resources to meet the future energy & capacity needs. The Resources are generally categorized into traditional *supply-side and demand-side resources*.

Supply Side Resources

- Nuclear, Coal, Biomass
- Natural Gas Combined Cycle
- Natural Gas Combustion Turbine & Reciprocating Engines
- Wind
- Solar
- Hydro
- Energy Storage

Demand Side Resources

- Energy Efficiency
- Demand Response
- Distributed Generation
- Grid Improvements



Resource Planning Specific to I&M

- ❑ I&M includes both Indiana & Michigan jurisdictions
- ❑ I&M is a member of the PJM Regional Transmission Organization (RTO) & is able to transact capacity & energy within PJM
- ❑ The discount rate used in all calculations is I&M's weighted average cost of capital (WACC)
- ❑ The analysis period covers 30 years, and the IRP results and report will cover a 20-year period
- ❑ Sunk Costs are not included in the analysis
 - Example: unamortized costs of past investments
 - Assumes all sunk costs continue to be recovered regardless of resource disposition



I&M Integrated Resource Planning Process (Pre-Read)

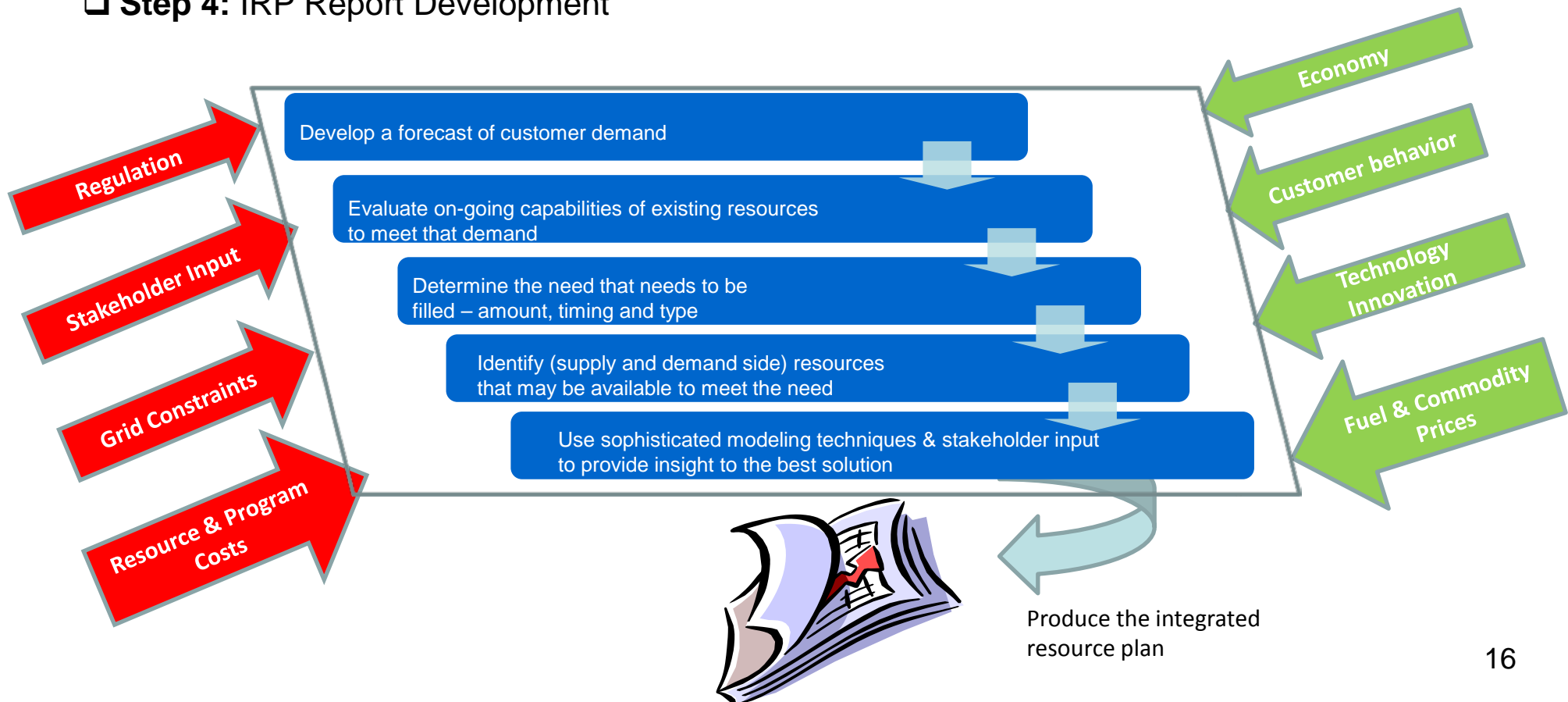
- ❑ The Integrated Resource Plan provides a blueprint for future resource decisions
 - It is a snapshot in time & subject to revision
 - Significant resource decisions can require separate regulatory proceedings by IURC & MPSC
- ❑ Enables stakeholders to view various possible or plausible resource solutions under a diverse set of possible future states
- ❑ Each portfolio will have unique revenue requirements & revenue requirements “at risk”



The Integrated Resource Plan Development

Creating an Integrated Resource Plan (IRP) involves four basic & interconnected steps:

- ❑ **Step 1:** Gathering data, developing input assumptions & creating scenarios
- ❑ **Step 2:** Portfolio Development
- ❑ **Step 3:** Analyzing portfolios
- ❑ **Step 4:** IRP Report Development





Gathering data, developing input assumptions and creating scenarios

Step 1 in the IRP Development:

- I&M works with its internal experts to develop forecasts for commodities & fuel prices. These are the core drivers in the integrated resource plan
- Load forecasts are developed for the next thirty years. These forecasts take into consideration elements such as projected economic growth & energy efficiency effectiveness. They help the resource planners to anticipate the level of energy & capacity needed during the 20-year timeframe of the IRP.
- Cost projections are developed for new construction, environmental compliance & other key input assumptions. Stakeholder input is solicited to confirm reasonableness of assumptions.
- Potential resource options are screened to eliminate those that have technical & commercial availability limitations or are not feasible in Indiana Michigan Power's service territory.
- Assumptions on operational characteristics of existing resources are revisited, including their anticipated remaining useful life.
- Scenarios are developed to reflect possible future states. These scenarios will be used to guide analysis of different resource portfolios. Stakeholder feedback will be solicited during the development of the scenarios.



Portfolio Development

Step 2 in the IRP Development:

- ❑ Screening models are used that incorporate the capital & operating cost of each resource option to identify cost-effective resource options that will be evaluated in more detail over the range of scenarios & sensitivities
- ❑ Various resource portfolios are constructed to fill the “Gap” between load requirements & current resources. Stakeholder input will be considered for resource portfolio development
- ❑ Sensitivities are performed to determine how the cost-effectiveness of the portfolios change if certain key assumptions are varied. Such sensitivities may include: fuel prices, load forecast, construction/capital costs, and carbon and environmental policies. Stakeholders will be asked for feedback on which sensitivities should be performed



Analyzing Portfolios

Step 3 in the IRP Development

- Optimized portfolios are created using Plexos
- Portfolio costs under each scenario, results of sensitivities, and other key considerations including system diversity and environmental footprint are used in this selection process
- The preferred resource portfolio is selected by determining which portfolio and/or combination of portfolios best balances cost effectiveness, reliability and portfolio risk and uncertainty



IRP Report Development

Step 4 in the IRP Development

- ❑ Optimized portfolios are modified based on stakeholder/I&M input and stochastic(risk) analysis
- ❑ Results of the preferred resource portfolio and other key components of the draft IRP will be shared with Stakeholder prior to finalizing the IRP
- ❑ The final document is reviewed and approved by I&M's senior management prior to final submittal to the IURC by the deadline of November 1, 2018



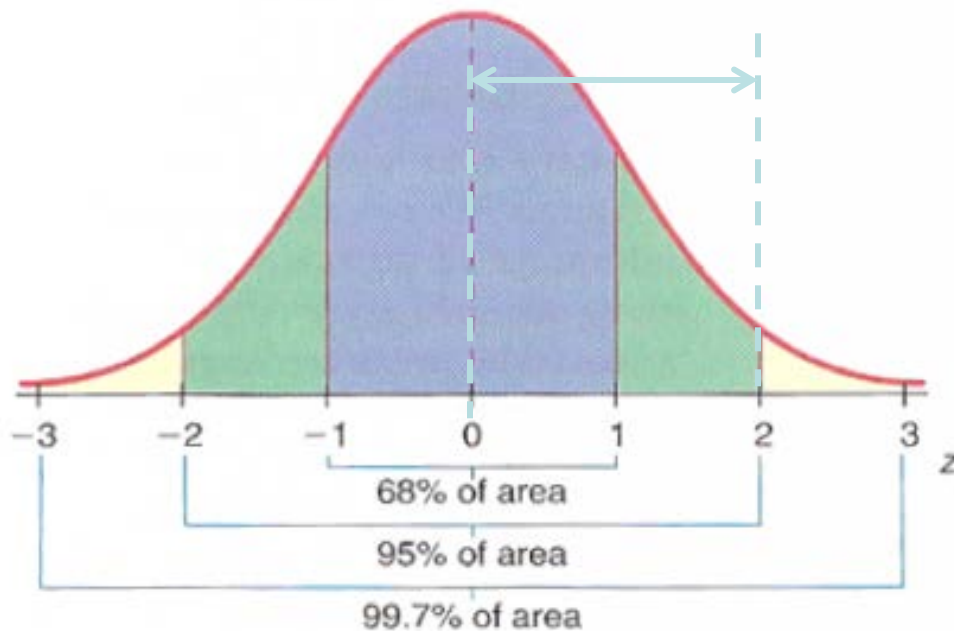
Output

- ❑ The optimized portfolio will be a resource portfolio that has the lowest present value of revenue requirements (PVRR), given the set of forecasts & assumptions.
- ❑ The model can calculate the PVRR for portfolios that are developed by I&M or stakeholders (non-optimized portfolios).
- ❑ When performing a risk analysis on a portfolio, the output is a distribution of PVRRs.



Risk Modeling

- ❑ “Risk” is the likelihood and magnitude of a bad outcome.
- ❑ The present value of revenue requirements measured over 100+ simulations that vary key inputs
 - Power, natural gas, coal and CO₂



“Revenue Requirements at Risk” is defined as the difference in the 95% of results from the 50% (median) results.



Risk Variables

- ❑ Determining Correlations between power, natural gas, coal and CO₂ is done with historical data
- ❑ Other variables can be modeled as well, but if there is no historical data then correlations must be hypothesized.



Plexos

- ❑ *Plexos* is a model that incorporates all of the fundamental inputs and supply and demand options.
- ❑ *Plexos* can:
 - Given a set of fundamentals, “build” a portfolio that has the lowest (PV) revenue requirements
 - Given a supply and demand side portfolio, determine its (PV) revenue requirements
 - Given both, run multiple (Monte Carlo) iterations

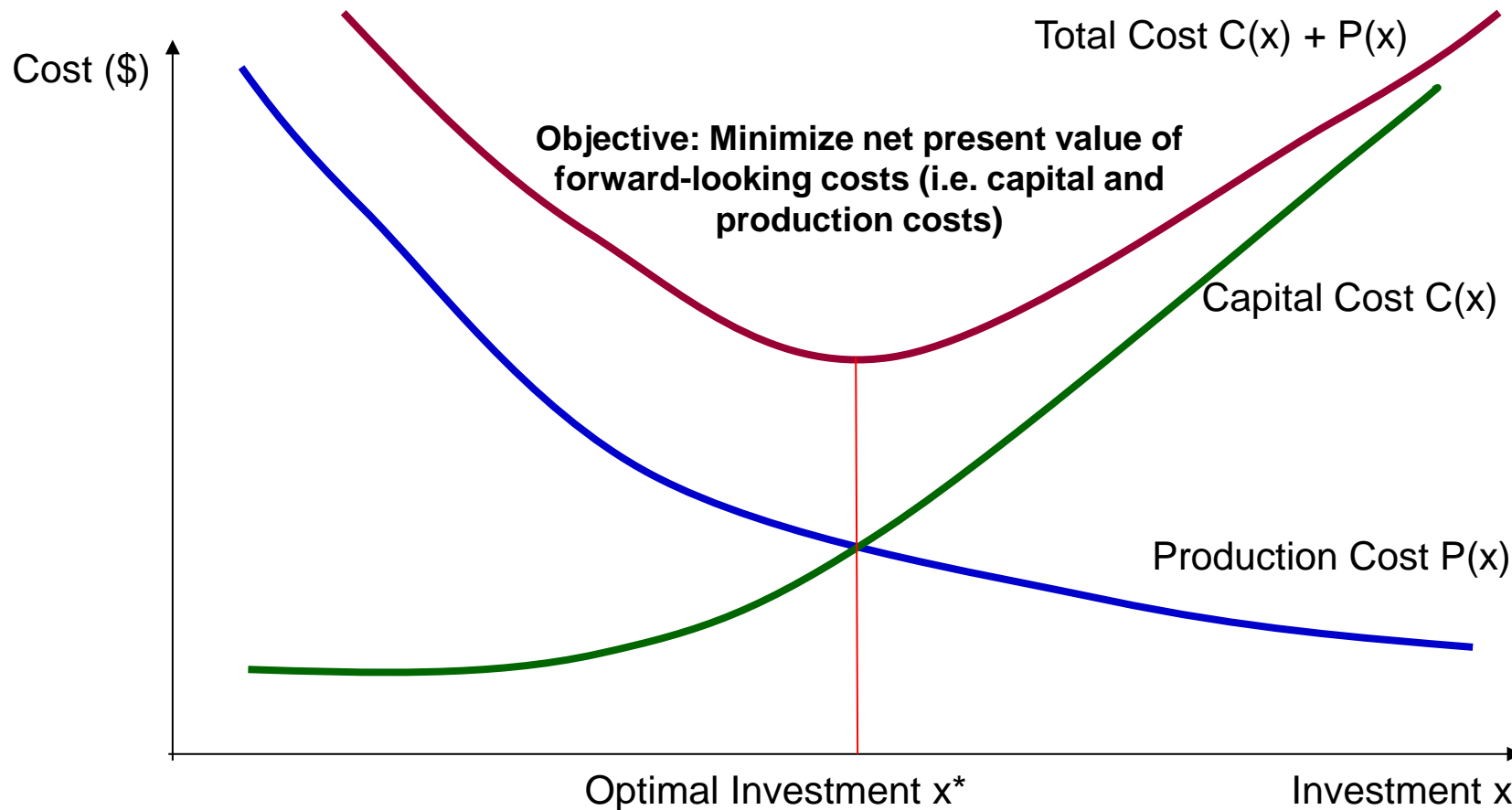
*Resource Planning is currently using the **Plexos Long-term Planning Module***

*known as **Plexos LTPlan**®*



IRP Development – Modeling Tool

The PLEXOS LTPlan model selects the optimal (lowest total cost) plan based on resource characteristics (e.g. installed cost, heat rate, fuel costs, min run times, load shapes)





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- Stakeholder Input
 - Development of Non-optimized Resource Portfolios
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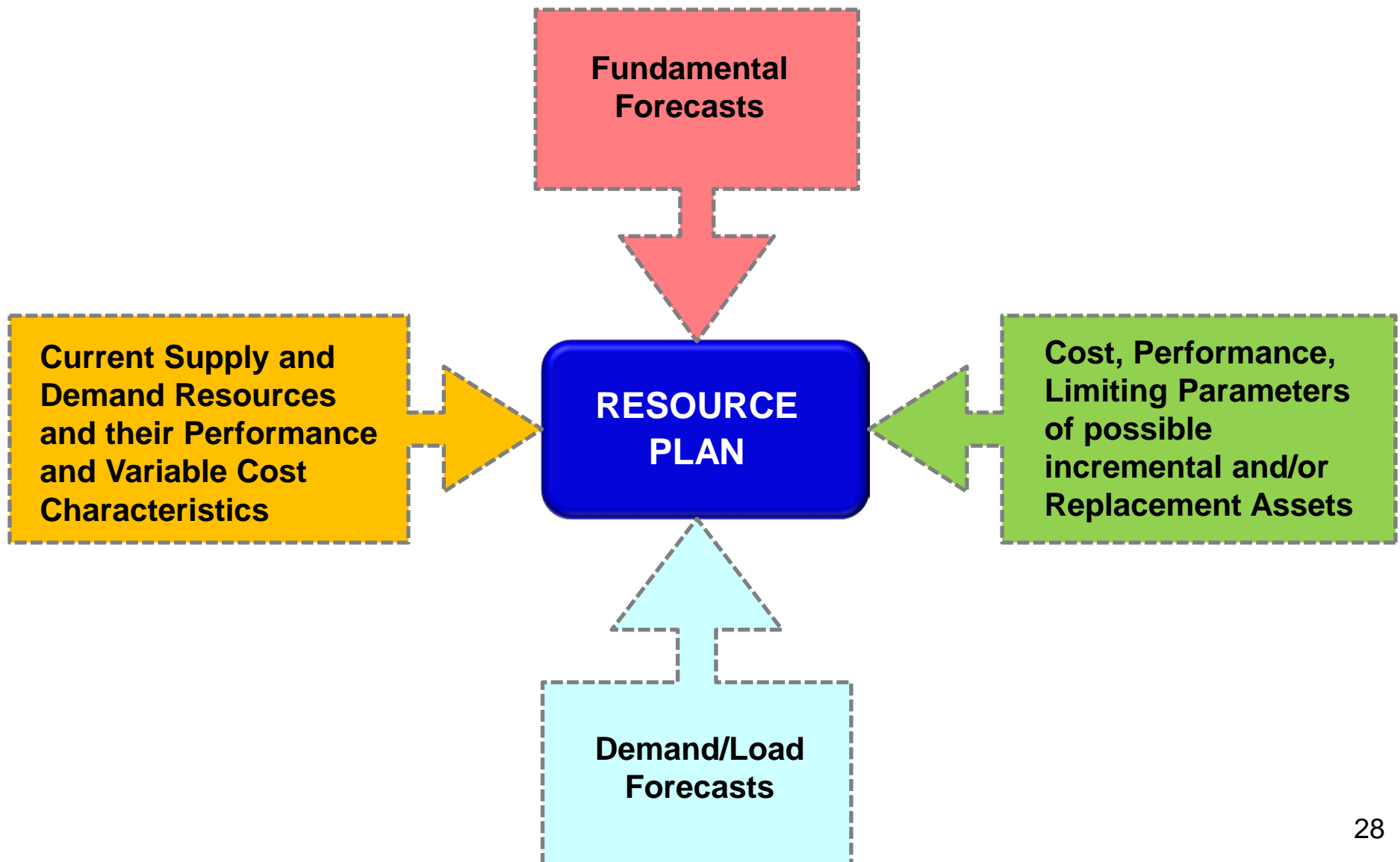
Featured Speakers

□ IRP Key Inputs – Speakers

- **Fundamentals:** Connie Trecuzzi – *Staff Analyst - Fundamental Analysis*
- **Load Forecast:** Chad Burnett – *Director Economic Forecasting*
- **Existing Assets:** Scott Fisher – *Manager of Resource Planning*
- **Portfolio Development:** John Torpey – *Managing Director Integrated Resource Planning*



Building Blocks of the Resource Plan

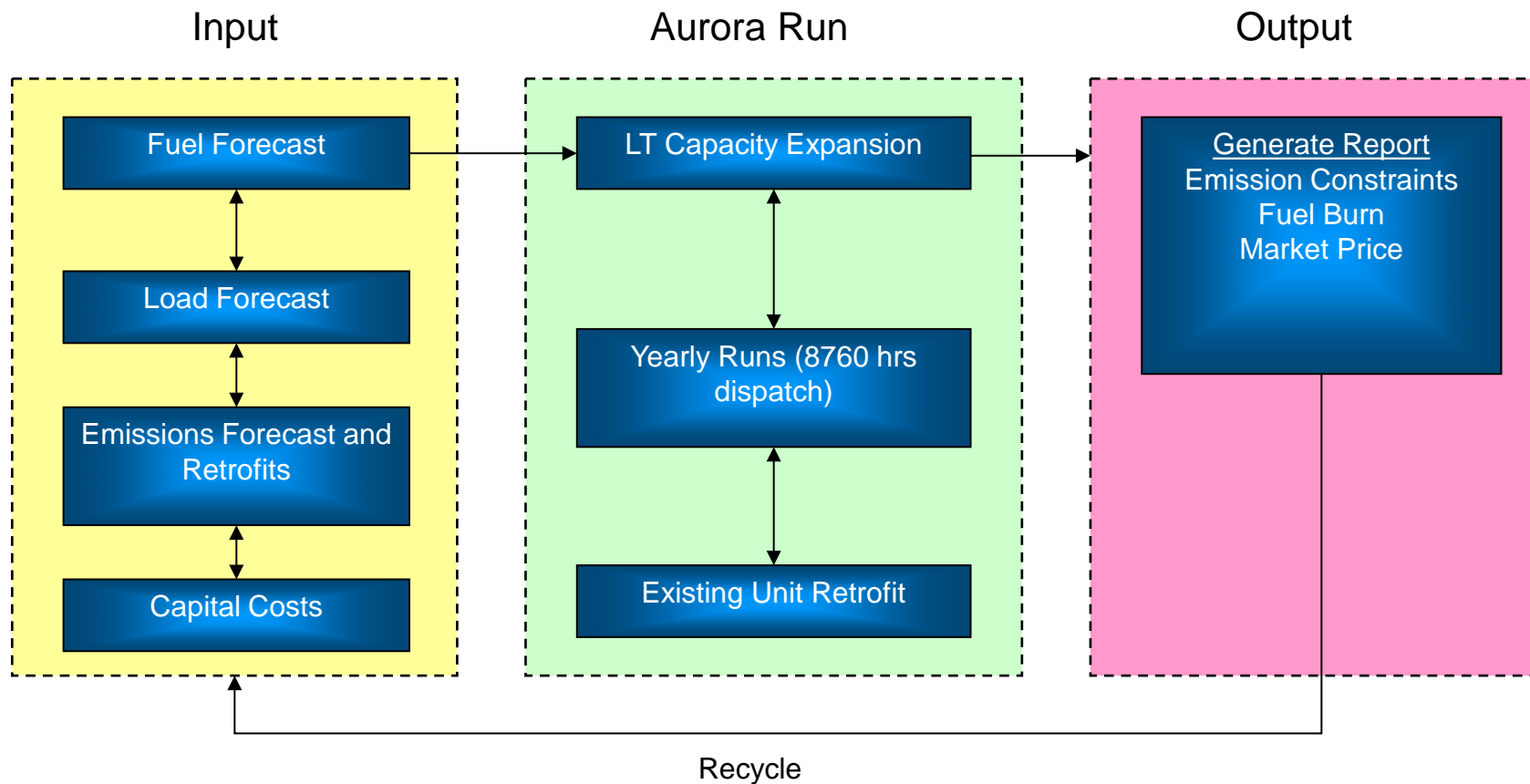




Fundamentals

Forecast Process:

- ❑ Forecast requires iterative solution to satisfy all constraints

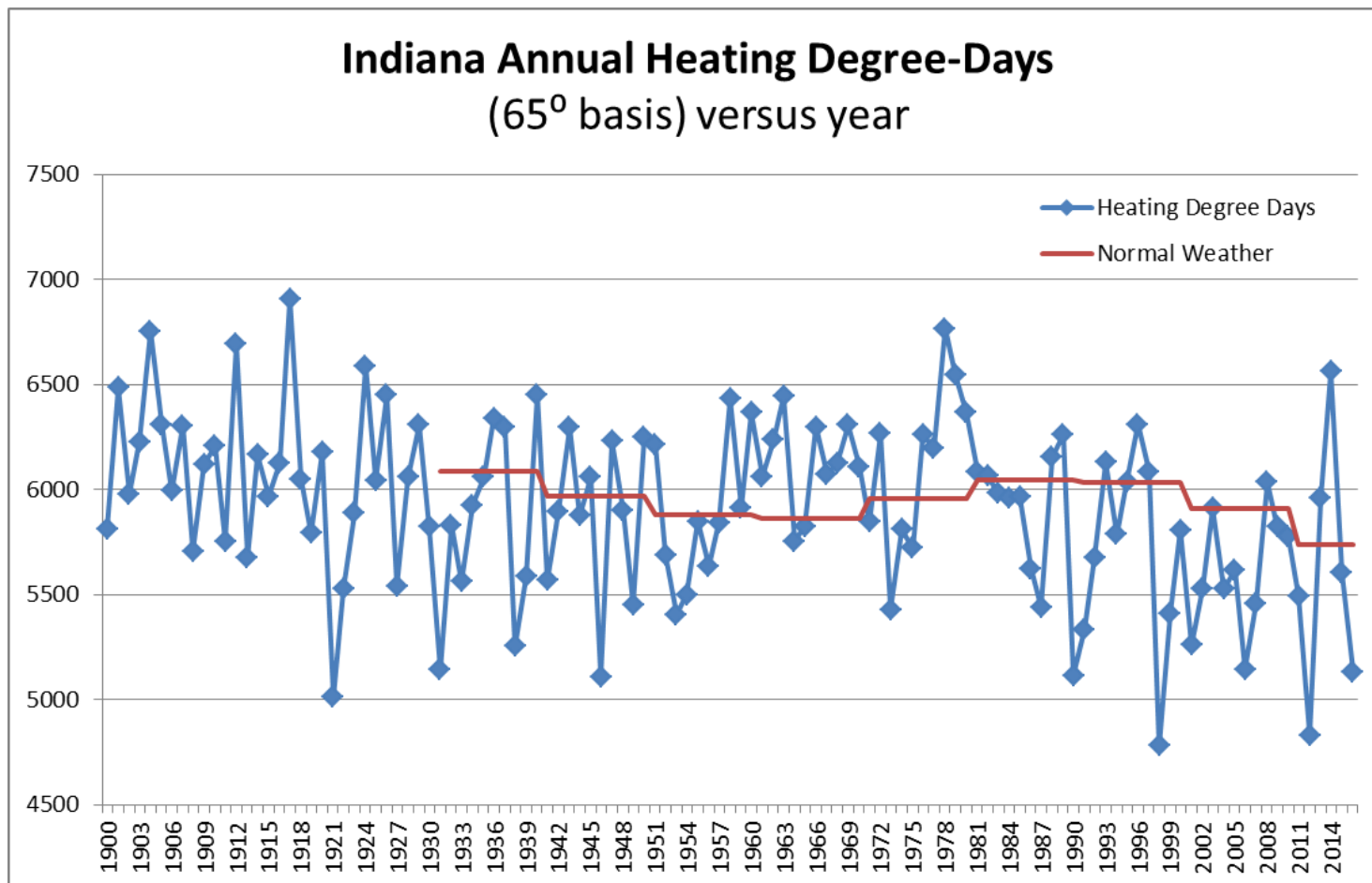




Fundamentals

Forecast Process:

- ❑ 30 Year Normal Weather vs Actual Weather





Analysis and Insight

❑ The Long-Term Forecast

- The centerpiece is the Reference Case, referred to internally as the “Consensus Case”. It contains:
 - Objective input assumptions and output analysis
 - Fuel sensitivities used to portray cause-and-effect and provide regulatory bounding of power prices
 - Comparisons with the EIA and other retained consultancies (names redacted) featured along with a cursory gap analysis

❑ “Scenarios”

- Collaborative scenarios
 - Distributed as a supplement to the Reference Case.
 - Highlights internal concerns and observations that deviate from “sensitivities” in that contributing/concurring factors must harmonize



Fundamentals

Fundamental Forecast – 2016H2:

- Base Fundamental Forecast
- High, Low and No Carbon Cases
- CPP Effective 2024

Future Considerations:

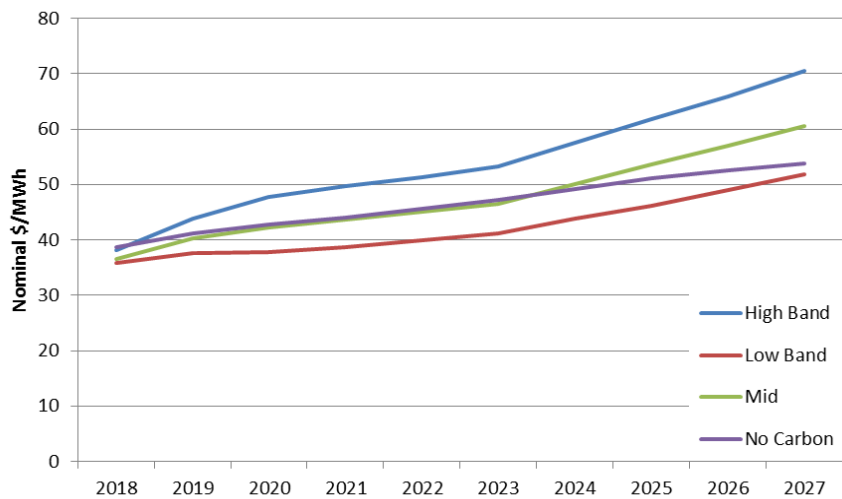
- Natural Gas Fundamentals
- Current State of CPP



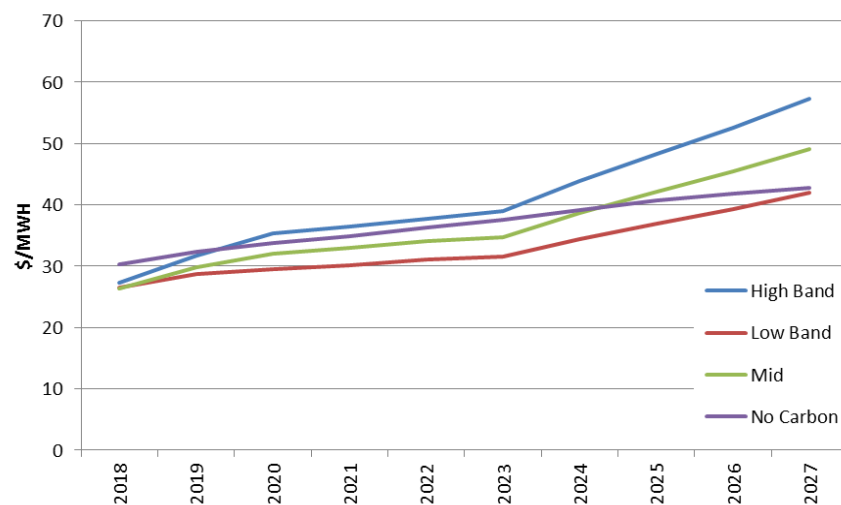
Commodity Prices (2016 Forecast – Nominal \$)

(Prices are not location specific but reflect trading hubs)

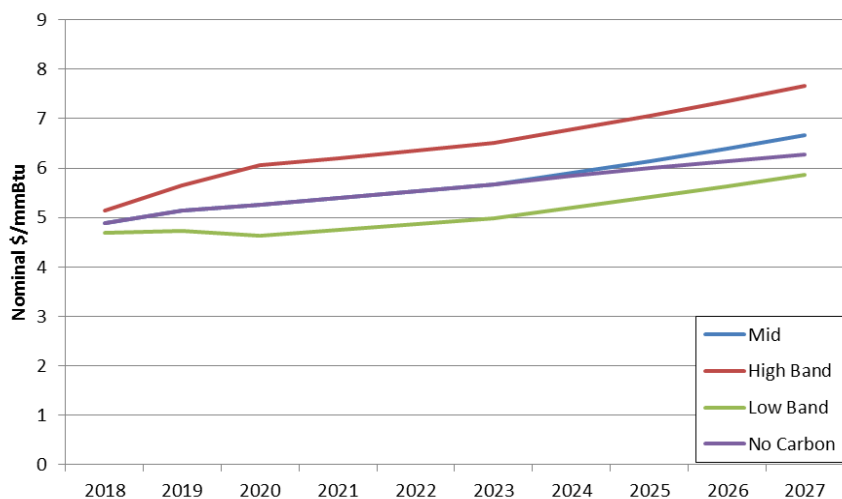
PJM AEP Peak - (Nominal \$/MWh)



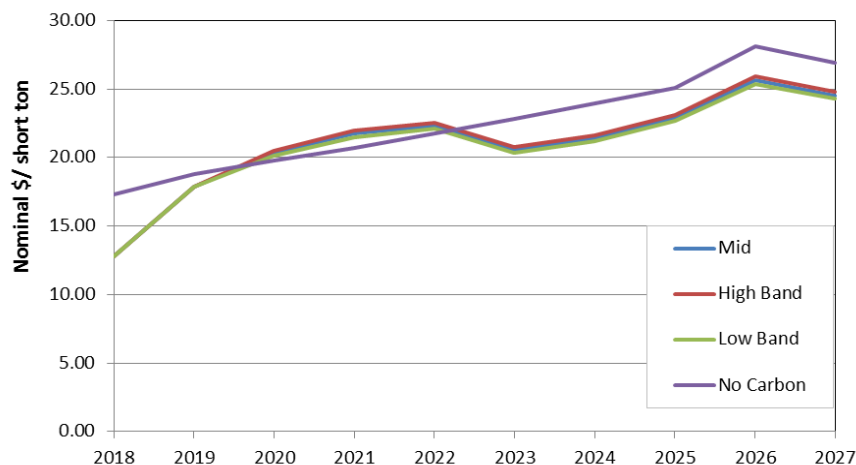
PJM AEP Off-Peak - (Nominal \$/MWh)



Henry Hub Outlook - (Nominal \$/mmBtu)



PRB 8,800 Btu/lb. Coal Prices (Nominal \$/short ton, FOB Origin)





Scenarios & Sensitivities

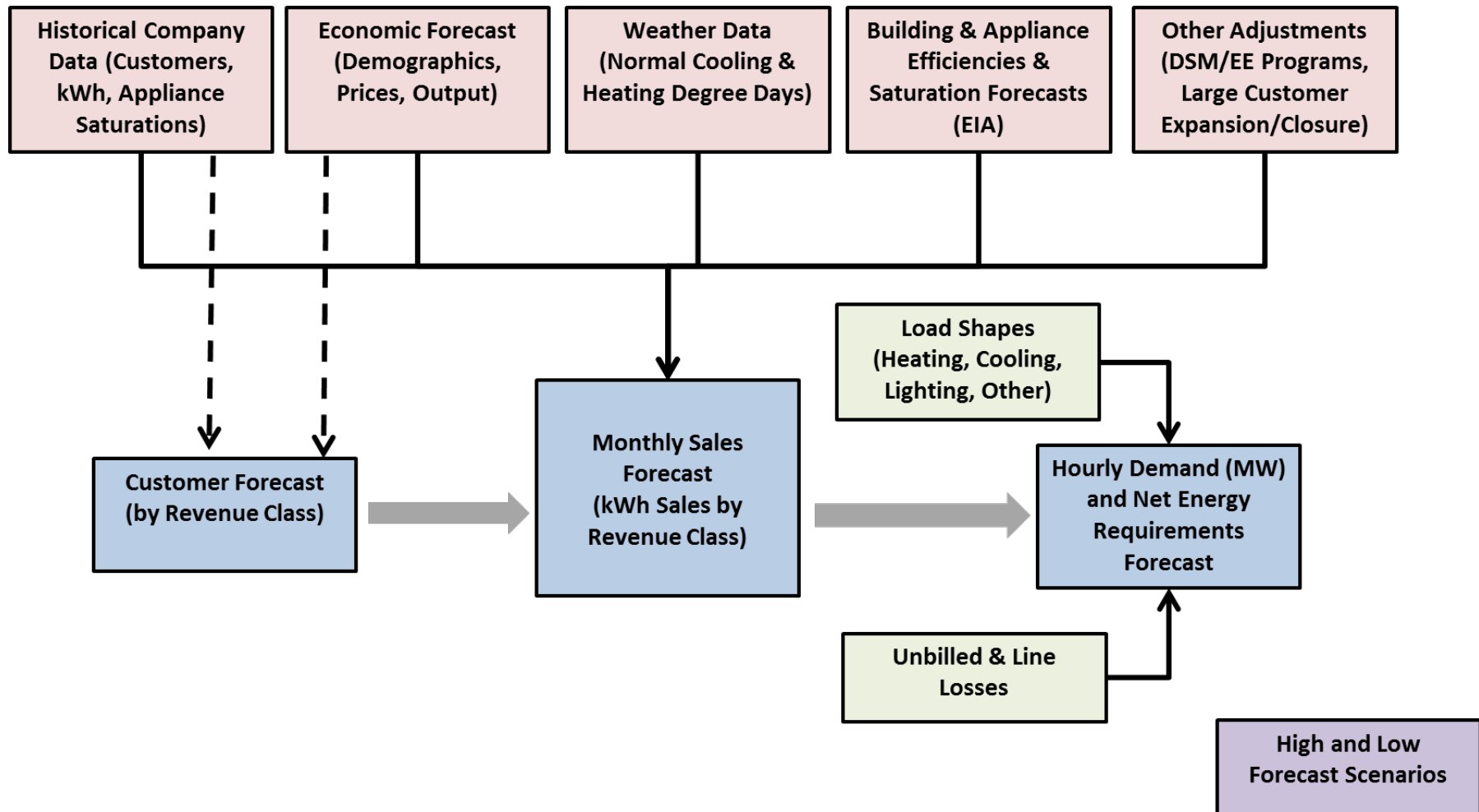
- ❑ Scenarios encapsulate future states in a way that all input variables are simultaneously plausible.
 - Examples include
 - “low growth” or
 - “boom economy”

- ❑ Sensitivities change a single variable so that its impact within a scenario can be understood.
 - Examples include:
 - carbon tax,
 - high gas prices,
 - low gas prices
 - Sensitivities are not the basis for portfolio construction.



Demand/Load Forecasts

Load Forecast Process





Drivers of Load Forecast

Key Drivers of Load

Economic data is provided by Moody's Analytics

❑ Residential

- Regional Economic Variables (Employment, Income)
- Demographics (Population, Households)
- Gross Regional Product
- Electricity Price
- State Natural Gas Price
- Mortgage Interest Rate
- Heating & Cooling Degree Days
- Prior period kWh and Customer count
- Appliance saturation (surveyed every 3-4 years)
- Appliance efficiency standards & trends
- Building standards & trends

❑ Other Ultimate

- Regional Economic Variables (Employment)
- Heating & Cooling Degree Days
- Prior Period kWh

❑ Commercial

- Regional Economic Variables (Employment, Income)
- Commercial Gross Regional Product
- Electricity Price
- State Natural Gas Price
- Heating & Cooling Degree Days
- Prior period kWh and Customer count
- Appliance saturation
- Appliance efficiency standards & trends
- Building standards & trends

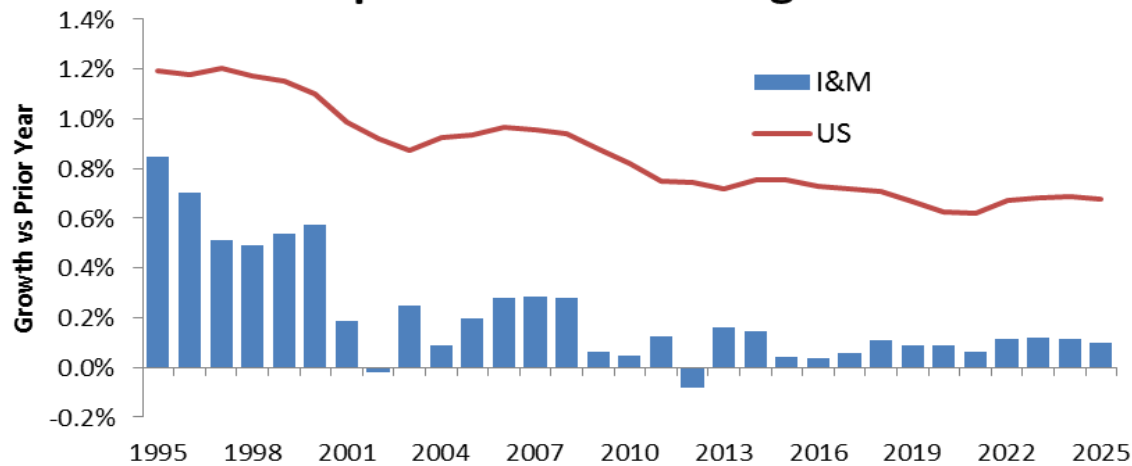
❑ Industrial

- FRB Industrial Production Indices (Selected)
- Regional Economic Variables (Employment)
- Regional Coal Production
- Manufacturing Gross Regional Product
- Electricity & Petroleum Prices
- State Natural Gas Prices
- Prior period kWh



Economic Forecasts

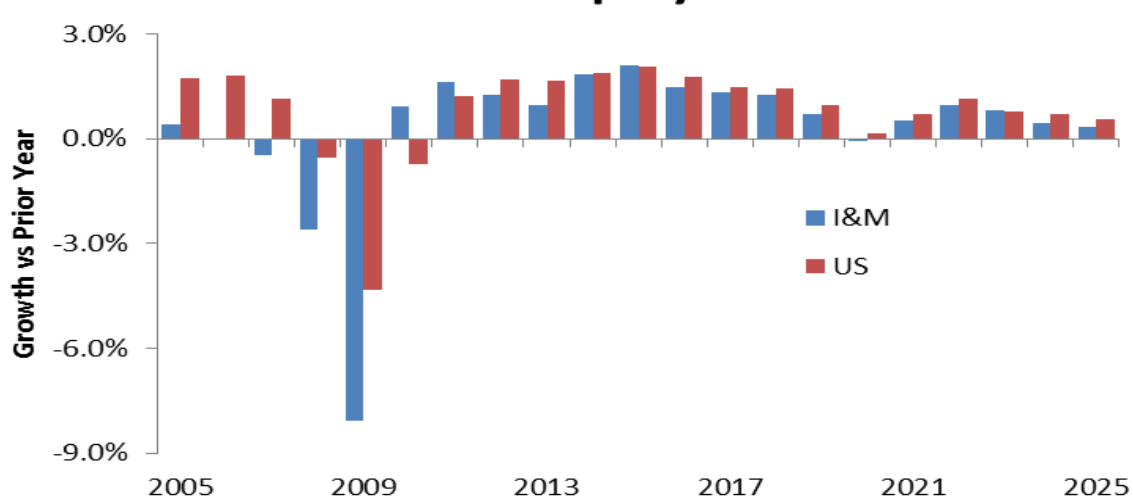
I&M Population Growth Lags the US



Population within I&M service territory expected to grow at 0.1% per year compared to 0.7% per year for the US over the next decade.

Slow population growth has a limiting effect on overall growth for a particular region, which acts as a headwind for future load growth.

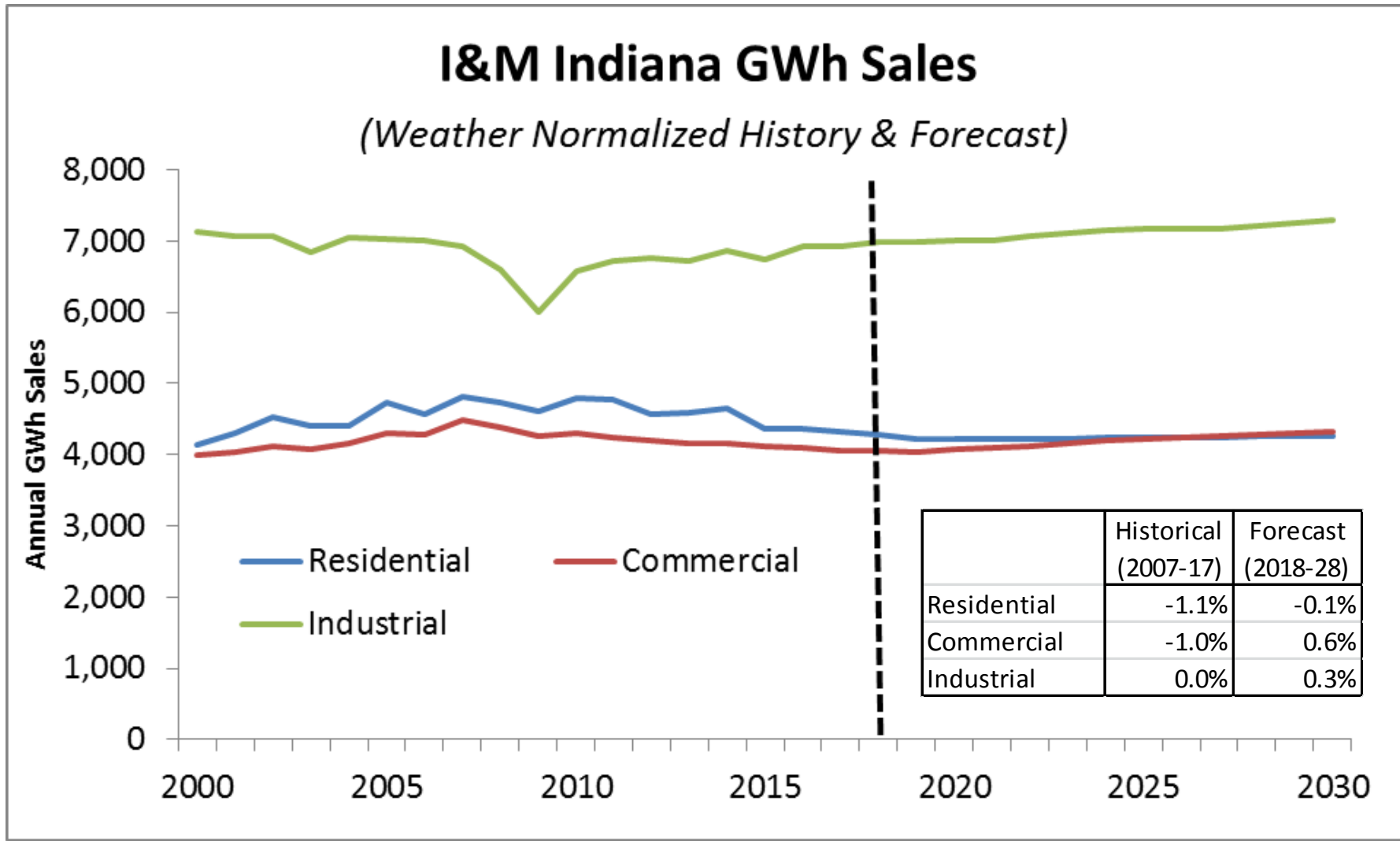
I&M Non-farm Employment Outlook



I&M's economic outlook for GRP and Non-farm employment will also lag the US over the next 10 years.



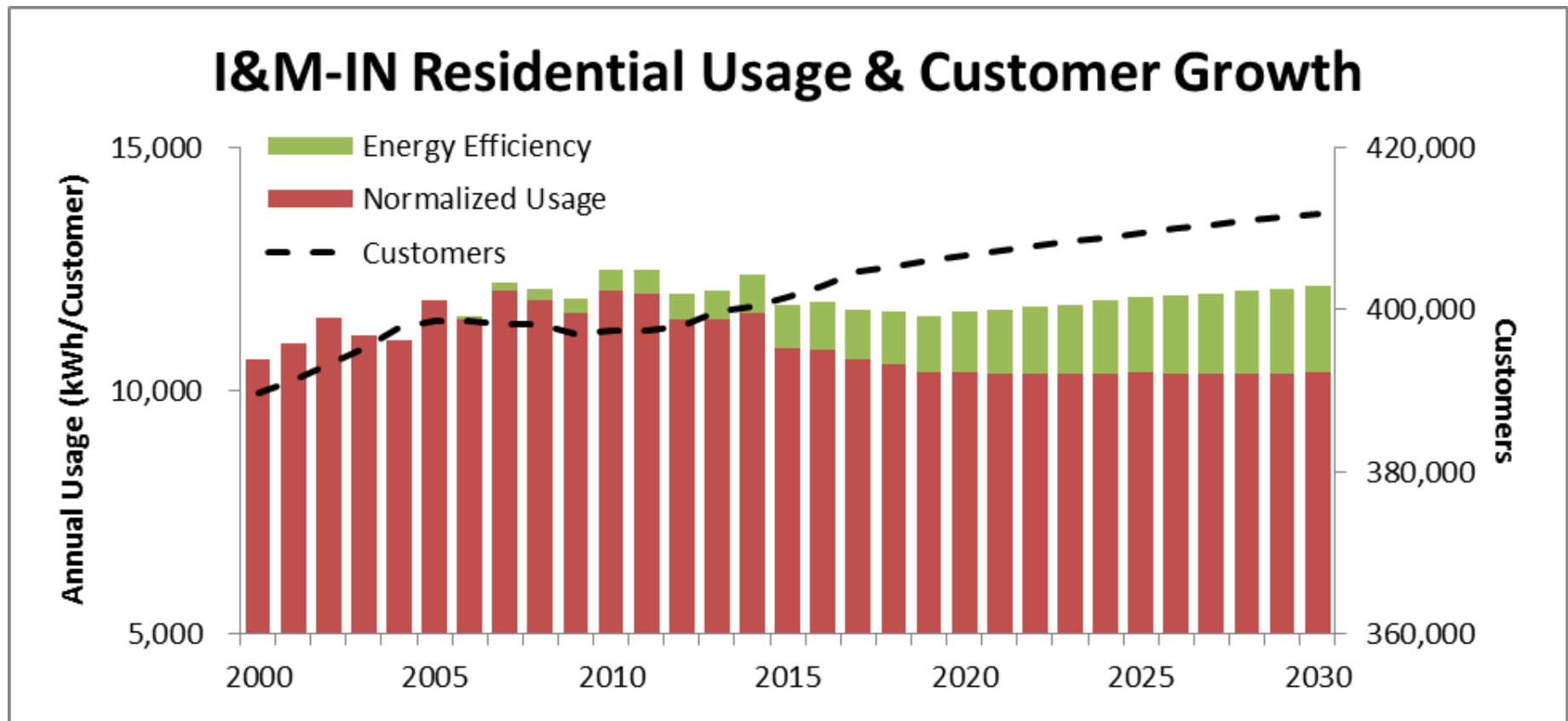
Energy Sales Outlook



- ❑ I&M's Indiana service area expected load growth is impacted by both the economy (demographics) and federal, state and company energy efficiency.



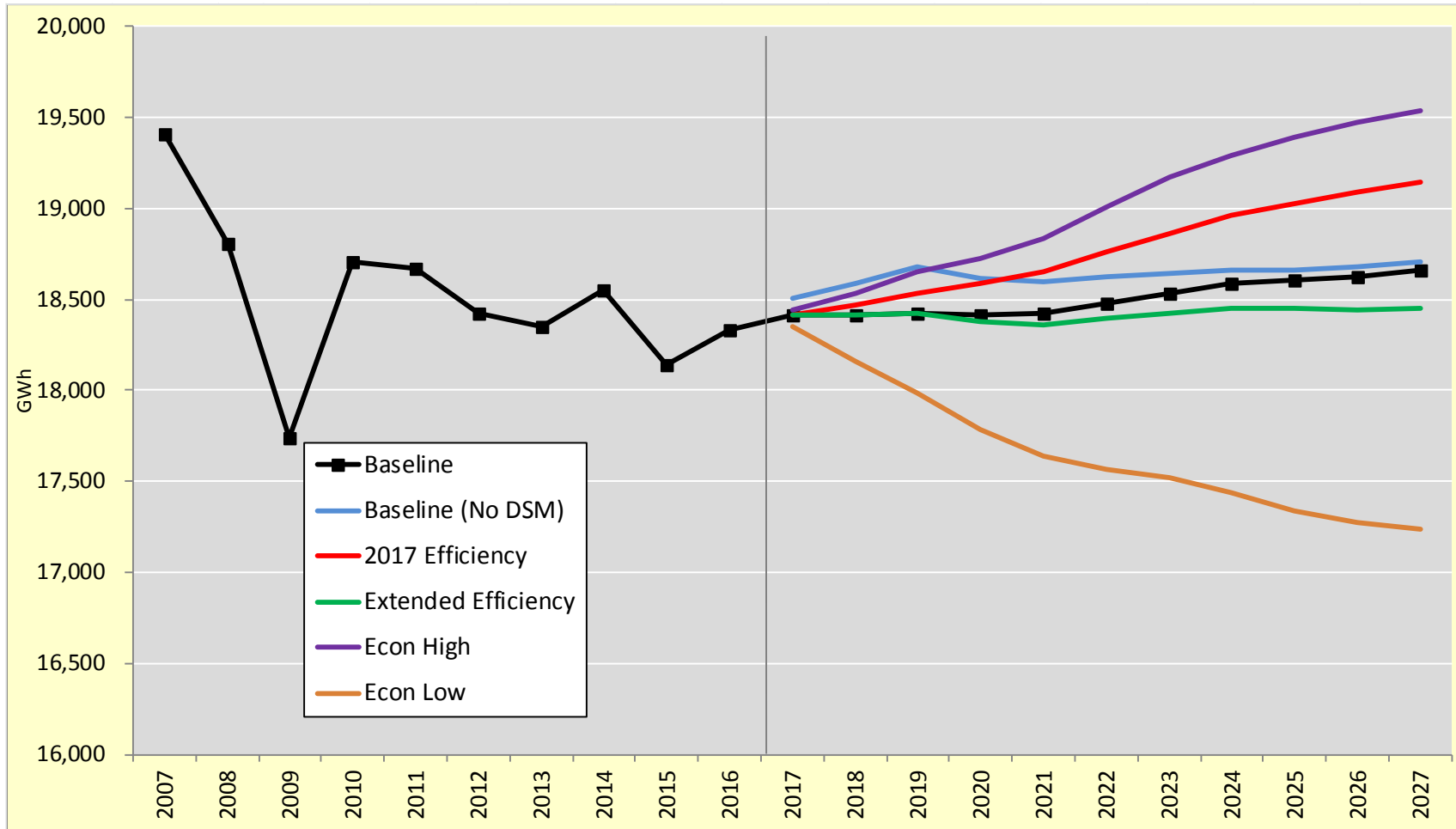
Declining Residential Load Growth



- ❑ Prior to the last decade, IMI experienced steady growth in Residential customers and usage.
- ❑ Over the past decade, weak demographics combined with an emphasis on energy efficiency (federal & state standards plus company sponsored programs) have significantly impacted the growth in Residential usage.
- ❑ Residential usage is expected to continue to decline throughout the next decade.



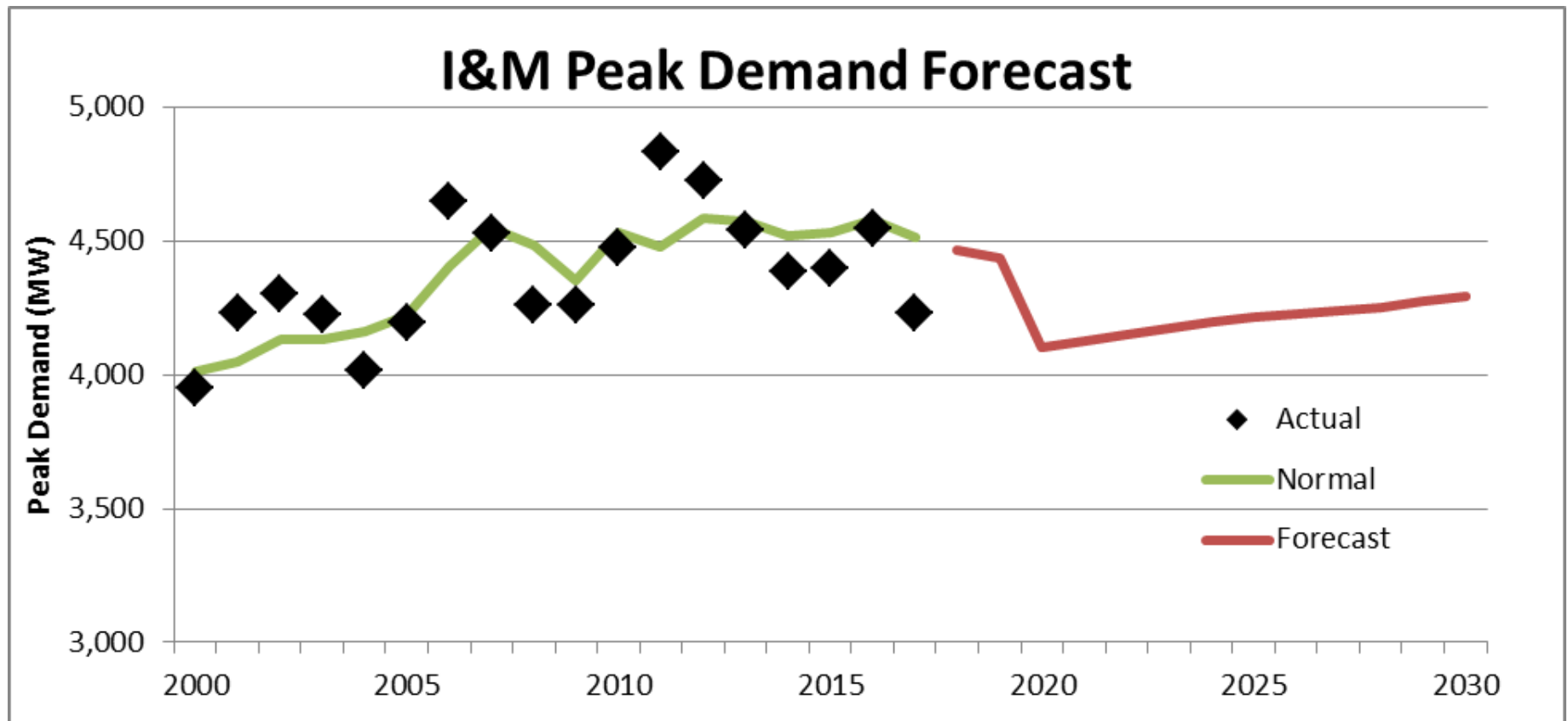
Load Forecast Scenarios



	Scenario	Description
	Baseline	Our base forecast
	Baseline (No DSM)	Our base forecast excluding impact of future DSM programs
From EIA	2017 Efficiency	Forecast assuming current technology efficiencies are fixed indefinitely
	Extended Efficiency	Assuming additional efficiency standards are implemented in the future
	Econ High	Forecast under much stronger economic conditions than assumed in the base case
	Econ Low	Forecast under much weaker economic conditions than assumed in the base case



Demand Forecasts



- ❑ I&M has a number of wholesale contracts that are expiring in 2018, 2019, and 2020 that are not expected to renew. Combined these loads represent approximately 438 MW that will no longer be served by I&M.
- ❑ Historical normalized peak demand growth over the last 10 years has been -0.1%. Forecasted peak demand growth of -0.5% over the next 10 years.



Portfolio Development Discussion

I&M's Existing Generating Portfolio

Owned Resources	Type	ICAP (MW)				
		2018	2019	2020	2021	2022
DC Cook Unit 1	Nuclear	1,006	1,006	1,006	1,006	1,006
DC Cook Unit 2	Nuclear	1,148	1,148	1,148	1,148	1,148
Rockport Unit 1	Coal	1,118	1,118	1,118	1,118	1,118
Rockport Unit 2	Coal	1,105	1,105	1,105	1,105	1,105
Berrien Springs 1 - 12	Hydro	6.0	6.0	6.0	6.0	6.0
Buchanan 1 - 10	Hydro	3.2	3.2	3.2	3.2	3.2
Constantine 1 - 4	Hydro	0.9	0.9	0.9	0.9	0.9
Elkhart 1 - 3	Hydro	1.8	1.8	1.8	1.8	1.8
Mottville 1 - 4	Hydro	1.6	1.6	1.6	1.6	1.6
Twin Branch 1 - 8	Hydro	4.8	4.8	4.8	4.8	4.8
Universal Solar (Michigan)	Solar	1.7	1.7	1.7	1.7	1.7
Universal Solar (Indiana)	Solar	4.1	4.1	4.1	4.1	4.1
Michigan (Nuclear)		2,154	2,154	2,154	2,154	2,154
Indiana (Coal)		2,223	2,223	2,223	2,223	2,223
Michigan (Renewable)		13	13	13	13	13
Indiana (Renewable)		11	11	11	11	11
Total		4,401	4,401	4,401	4,401	4,401

Represents 16MW of "Nameplate" Solar Resources

Purchases/Contracted	Type	2018	2019	2020	2021	2022
Fowler Ridge 1	Wind	12.7	12.7	12.7	12.7	12.7
Fowler Ridge 2	Wind	6.5	6.5	6.5	6.5	6.5
Headwaters	Wind	26.0	26.0	26.0	26.0	26.0
Wildcat	Wind	12.8	12.8	12.8	12.8	12.8
Total		58.0	58.0	58.0	58.0	58.0
Customer Self Supply (Net)	N/A	1.0	1.0	1.0	1.0	
OVEC Entitlement	Coal	163.0	163.0	163.0	163.0	163.0
Total		164.0	164.0	164.0	164.0	163.0
Total I&M Resources		4,623	4,623	4,623	4,623	4,622

Represents 450MW of "Nameplate" Wind Resources



Today's Agenda

- Resource Planning 101
- Discussion of key inputs and resource assumptions
- Stakeholder Input**
 - Discuss Portfolio Characteristics
 - Discussion of Sensitivities and Other Resources
- Next Steps



Portfolio Development Discussion

Identify I&M's PJM Obligations - *Preliminary*

Planning Year	Internal Demand (a)	DSM (b)	Net Internal Demand	Interruptible Demand Response (c)	Forecast Pool Req't (d)	Total UCAP Obligation
2018 /19	4,223	(51)	4,223	312	1.091	4,265
2019 /20	4,225	(68)	4,225	312	1.090	4,263
2020 /21	3,904	(51)	3,904	312	1.090	3,914
2021 /22	3,917	(41)	3,917	312	1.090	3,929
2022 /23	3,992	(30)	3,962	312	1.090	3,977
2023 /24	4,004	(19)	3,985	312	1.090	4,002
2024 /25	4,012	(7)	4,005	312	1.090	4,024
2025 /26	4,027	(3)	4,025	312	1.090	4,046
2026 /27	4,037	(2)	4,035	312	1.090	4,057
2027 /28	4,048	(2)	4,045	312	1.090	4,068
2028 /29	4,061	(2)	4,059	312	1.090	4,083
2029 /30	4,080	(2)	4,078	312	1.090	4,104
2030 /31	4,097	(2)	4,095	312	1.090	4,122
2031 /32	4,114	(1)	4,113	312	1.090	4,142
2032 /33	4,127	(1)	4,125	312	1.090	4,156
2033 /34	4,151	(1)	4,150	312	1.090	4,183
2034 /35	4,166	(1)	4,165	312	1.090	4,199
2035 /36	4,184	(1)	4,183	312	1.090	4,218
2036 /37	4,195	(1)	4,194	312	1.090	4,230
2037 /38	4,218	(1)	4,217	312	1.090	4,255

- Notes: (a) Based on (June 2017, updated Nov. 2017) Load Forecast (with implied PJM diversity factor)
 (b) Existing plus approved and projected "Passive" EE and VVO
 (c) Demand Response approved by PJM in the prior planning year plus forecasted "Active" DR
 (d) Forecast Pool Requirement (FPR) = (1 + IRM) * (1 - PJM EFORD)

Note: The Load Forecast is not final, the final forecast is expected in June. Reflects the PJM Obligation, which is different from the Internal Load Forecast



Portfolio Development Discussion

Identify I&M's current plans and capacity needs

Planning Year	Total UCAP Obligation	Resources								I&M Position (MW)
		Existing Capacity & Planned Changes (e)	Net Capacity Sales (f)	Planned Capacity Additions		Net ICAP	I&M EFORd (g)	Available UCAP	BASE UCAP Removed (h)	Net Position w/o New Capacity
				Units	MW					
2018 /19	4,265	4,622	1.0		0	4,621	3.17%	4,475	0	210
2019 /20	4,263	4,622	1.0		0	4,621	3.17%	4,475	0	212
2020 /21	3,914	4,622	1.0		0	4,621	3.17%	4,475	272	288
2021 /22	3,929	4,622	1.0		0	4,621	3.17%	4,475	272	273
2022 /23	3,977	4,622	0		0	4,622	3.17%	4,475	217	281
2023 /24	4,002	4,622	0		0	4,622	3.17%	4,475	217	256
2024 /25	4,024	4,622	0		0	4,622	3.17%	4,475	217	234
2025 /26	4,046	4,592	0		0	4,592	3.16%	4,447	217	184
2026 /27	4,057	4,592	0		0	4,592	3.16%	4,447	217	173
2027 /28	4,068	4,592	0		0	4,592	3.16%	4,447	217	162
2028 /29	4,083	4,550	0		0	4,550	3.17%	4,406	209	113
2029 /30	4,104	4,543	0		0	4,543	3.17%	4,399	205	89
2030 /31	4,122	4,543	0		0	4,543	3.17%	4,399	205	71
2031 /32	4,142	4,543	0		0	4,543	3.17%	4,399	205	51
2032 /33	4,156	4,530	0		0	4,530	3.18%	4,386	198	32
2033 /34	4,183	4,530	0		0	4,530	3.18%	4,386	198	5
2034 /35	4,199	3,498	0		0	3,498	3.57%	3,373	182	(1,008)
2035 /36	4,218	3,498	0		0	3,498	3.57%	3,373	182	(1,027)
2036 /37	4,230	3,492	0		0	3,492	3.58%	3,367	182	(1,045)
2037 /38	4,255	2,344	0		0	2,344	4.52%	2,238	182	(2,199)

Existing Portfolio provides an adequate Reserve Margin to 2034 before the planned retirements of Cook 1 in 2034 and Cook 2 in 2037.

See Notes description on the next slide



Portfolio Development Discussion

Identify I&M's current plans and capacity needs - Notes

- Notes:
- (a) Based on (June 2017, updated Nov. 2017) Load Forecast (with implied PJM diversity factor)
 - (b) Existing plus approved and projected "Passive" EE and VVO
 - (c) Demand Response approved by PJM in the prior planning year plus forecasted "Active" DR
 - (d) Forecast Pool Requirement (FPR) = $(1 + \text{IRM}) * (1 - \text{PJM EFORD})$
 - (e) Reflects the members ownership ratio of following summer capability assumptions:
 - AEP share of OVEC capacity (43.47% PPR-share of full ~2,180 total capacity)
 - Assumes hydro units are derated to August average output in 2017/18
 - Wind Farm PPAs (Where Applicable)
- EFFICIENCY IMPROVEMENTS:**
- FGD DERATES:**
- 2025/26: Rockport 1: (35) MW, I&M share 29.8 MW
 - 2028/29: Rockport 2: (35) MW, I&M share 29.8 MW
- RETIREMENTS:**
- Cook 1 - 10/25/2034
 - Cook 2 - 12/23/2037
- (f) Includes: Offset from Ander's Frank load and IMPA Capacity transfer
 - (g) Beginning 2008/09, based on 12-month avg. AEP EFORD in Capacity as of twelve months ended 9/30 of the previous year
 - (h) PJM Capacity Performance Rule impact, current assumptions are: Wind 5%, Solar 38%, ROR Hydro 25%, Demand Response 50%, IMPA Transfer 0%.



Portfolio Development Discussion

Pending Motions to Modify the Consent Decree:

Various portfolio options will ultimately be analyzed and will include considerations for:

- The Existing Resources
- DSM and EE
- Combined Heat and Power
- Universal Wind and Solar
- Customer Owned Solar
- Energy Storage
- Market Purchases
- Natural Gas Combined Cycle, Simple Cycle and Reciprocating Engines

The Company is expecting a decision regarding the “Modified” Consent Decree in March 2018. This information combined with Stakeholder input from this meeting will be used to develop DRAFT Portfolios for Discussion at the April 11th, 2nd Stakeholder Meeting



Stakeholder Input

Stakeholders are asked to provide comments on:

- The portfolio components (resources) that should be considered by I&M.
- The attributes of resources (cost and performance) to be considered by I&M
- Considerations for economic scenarios.
- Considerations for evaluating risk.



Today's Agenda

- Resource Planning 101
- Discussion of key inputs and resource assumptions
- Stakeholder Input
 - Development of Non-optimized Resource Portfolios
 - Discussion of Sensitivities and Other Resources
- Next Steps



Next Steps

- Publish Key Issues and Comments from Today's Meeting
- Begin Planning for the 2nd Stakeholder Meeting - DSM/EE Meeting
- Develop Recommendations for Issues Identified Today
- Begin to finalize initial IRP Inputs for publication and review e.g. Load Forecast, Fundamental Commodity Forecast, Supply-side Resource Key Characteristics, etc.



Follow-up Steps in the Stakeholder Process

Meeting	Date	Topic
1	February 15, 2018 Northeast Indiana Innovation Center 3211 Stellhorn Road Fort Wayne, IN 46815	2018 IRP Kick-off Meeting - Stakeholder Process & Scenario Discussion
2	April 11, 2018 Barnes & Thornburg 11 S. Meridian St. Indianapolis, IN 46204	Considerations for Modeling DSM in the 2018 IRP & Update on other IRP Issues
3	July 2018	Final Inputs, Portfolios, Scenarios and Initial Modeling Results
4	Sept. - Oct. 2018	Modeling Results and Preferred Portfolio Discussion

If needed after meetings 2 & 3 I&M plans to host discussions ~10 days after Stakeholder Meetings to address detailed questions regarding IRP issues

File report on November 1, 2018



Meeting 2 - Preliminary Agenda

- Overview of I&M's DSM/EE Plan and Performance
- Overview of I&M's Load Forecasting Process
treatment of DSM/EE by Customer Class
- Modeling Approaches for DSM/EE within the IRP
- DSM/EE Issue Discussion
- Update on IRP Issues



Thank You for Your Participation
and Safe Travels

See You April 11th, at
Barnes & Thornburg for our
2nd Stakeholder Meeting