

NIPSCO Integrated Resource Plan - 2018 Update

Public Advisory Meeting Five

October 18, 2018



Welcome and Introductions

Process for Participating Via Webinar

- In order to best facilitate today's discussion, we are asking that you use the "chat" feature on the webinar to ask questions
- Please type your question at any point and it will be read to the audience by the facilitator
- When entering your question, please include your name and organization you are representing (if applicable)
- You may also email questions to nipsco_irp@nisource.com and those questions will be answered as they are received
- We look forward to your thoughts and questions

Agenda

Time (Central Time)	Topics
9:30-9:45	Welcome and Introductions <ul style="list-style-type: none"> • Safety Moment
9:45-10:30	Public Advisory Process, Review of Prior Meetings and Update on Stakeholder One-on-One Meetings
10:30-10:45	Break
10:45-11:15	Stakeholder Requested Analysis
11:15-11:45	Updated Retirement and Replacement Analysis
11:45- 12:30	Lunch
12:30-1:30	Preferred Resource Plan and Short Term Action Plan
1:30-1:45	Break
1:45-2:15	Stakeholder Presentations
2:15-2:30	Public Advisory Feedback/Next Steps/Wrap Up

Safety Moment:

Fire Extinguisher Use and Limitations

- **Fire Extinguishers are used to prevent small fires from becoming larger.**
 - Do not use them to combat large or rapidly moving fires.
 - Always be aware of your safety and always call the appropriate authorities to combat the fire.
- **P.A.S.S. Method to using a fire extinguisher.**
 - **P- Pull.** Pull the pin. Hold the extinguisher away and release the locking mechanism.
 - **A- Aim.** Aim the stream towards the base of the fire.
 - **S- Squeeze.** Squeeze the lever slowly and evenly
 - **S- Sweep.** Sweep the nozzle side to side to combat the fire.
- **Limitations**
 - A dry chemical fire extinguisher such as the common red “ABC” extinguishers will reach a distance of 5 to 20 feet.
 - A 10lb to 20lb dry chemical fire extinguisher will most likely last only 10 to 25 seconds.
 - Fire extinguishers are to fight small fires only – a good rule of thumb is to use one only if the fire is the size of a small trash can or smaller.
 - Must be inspected to maintain operating order.



NIPSCO's Planning and the Public Advisory Process

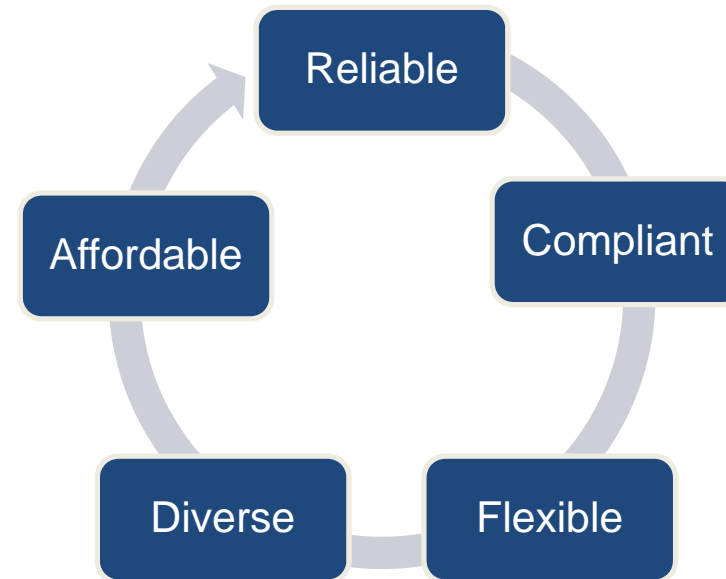
Dan Douglas
Vice President, Corporate Strategy & Development

How Does NIPSCO Plan for the Future?

Charting The Long-Term Course for Electric Generation

About the IRP Process

- Every three years, NIPSCO outlines its long-term plan to supply electricity to customers over the next 20 years
- This study – known as an Integrated Resource Plan (“IRP”) – is required of all electric utilities in Indiana
- IRP process includes extensive analysis of a range of generation scenarios, with criteria such as reliable, affordable, compliant, diverse and flexible



Requires careful planning and consideration for all of NIPSCO’s stakeholders including the communities we serve and our employees

Overview of the Public Advisory Process

- **Today's meeting is the fifth out of five meetings**
 - Three in-person meetings and one webinar so far
 - Additional technical webinar added at stakeholder request
 - Presentation materials and summary meeting notes are posted on NIPSCO's IRP webpage: www.nipSCO.com/irp
- **The Public Advisory process provides NIPSCO with feedback on our process, assumptions and conclusions. This helps inform the modeling and the overall IRP results**
- **Your participation and candid feedback is key to the process**
 - Please ask questions and provide comments on the material being presented and the process itself to ensure this is a valuable exercise for NIPSCO and its customers
- **Ability to make presentations as part of each Public Advisory meeting**
 - If you wish to make a presentation today and have not already indicated so, please see Alison Becker during break or at lunch

Stakeholder Engagement Roadmap

	Meeting 1 (March 23)	Meeting 2 (May 11)	Meeting 3 (July 24)	Technical Webinar (August 28)	Meeting 4 (September 19)	Meeting 5 (October 18)
Key Questions	<ul style="list-style-type: none"> -Why has NIPSCO decided to file an IRP update in 2018? -What has changed from the 2016 IRP? -What are the key assumptions driving the 2018 IRP update? -How is the 2018 IRP process different from 2016? 	<ul style="list-style-type: none"> -What is NIPSCO existing generation portfolio and what are the future supply needs? -Are there any new developments on retirements? -What are the key environmental considerations for the IRP? -How are DSM resources considered in the IRP? 	<ul style="list-style-type: none"> -What are the preliminary results from the all source request for proposals (“RFP”) Solicitation? 	<ul style="list-style-type: none"> -How are the RFP results integrated into the IRP modeling? 	<ul style="list-style-type: none"> -What are the preliminary results from the modeling and how do they inform the retirement and replacement decisions? -What is the “most viable” retirement and replacement path? -What is NIPSCO’s forecasted customer demand? -How is NIPSCO modeling risk and uncertainty in the IRP? 	<ul style="list-style-type: none"> -What is NIPSCO’s preferred plan? -What is the short term action plan?
Meeting Goals	<ul style="list-style-type: none"> -Communicate and explain the rationale and decision to file in 2018 -Articulate the key assumptions that will be used in the IRP -Explain the major changes from the 2016 IRP -Communicate the 2018 process, timing and input sought from stakeholders 	<ul style="list-style-type: none"> -Common understanding of DSM resources as a component of the IRP and the methodology that will be used to model DSM -Understanding of the NIPSCO resources, the supply gap and alternatives to fill the gap -Key environmental issues in the IRP 	<ul style="list-style-type: none"> -Communicate the preliminary results of the RFP and next steps 	<ul style="list-style-type: none"> -Explain the process for integrating the results from the RFP into the IRP modeling for both the retirement and replacement analysis 	<ul style="list-style-type: none"> -Share with stakeholders most viable retirement path and most viable replacement portfolios -Explain how NIPSCO is modeling risk and uncertainty in the IRP -Communicate NIPSCO forecasts for customer demand 	<ul style="list-style-type: none"> -Communicate NIPSCO’s preferred resource plan and short term action plan -Obtain feedback from stakeholders on preferred plan

Stakeholder Interactions

- During the IRP process, NIPSCO has met with and responded to requests from stakeholder groups
- Also received written comments from stakeholders

Stakeholder	Subject Area/Discussion Topic
Sierra Club	IRP Modeling and Scenarios
Office of Utility Consumer Counselor (“OUCC”)	All-Source RFP, IRP Modeling and Scenarios, Load Forecasting
Citizens Action Coalition of Indiana, Inc. (“CAC”)	IRP Modeling and Demand Side Management (“DSM”), DSM Decrement Approach
Indiana Utility Regulatory Commission (“IURC”)	All-Source RFP and IRP Modeling
NIPSCO Industrial Group	All-Source RFP and IRP Modeling
Indiana Coal Council	Scenario/Portfolio Requests
NAACP of Indiana	DSM, On-Bill financing, Retirement Dates
St. Joseph Energy Center	All-Source RFP and IRP Modeling

Stakeholder Requested Analysis Results

Pat Augustine
Charles River Associates

Stakeholder Requested Analysis

- As part of the 2018 IRP Public Advisory Process, Stakeholders have requested that NIPSCO run the following analyses:

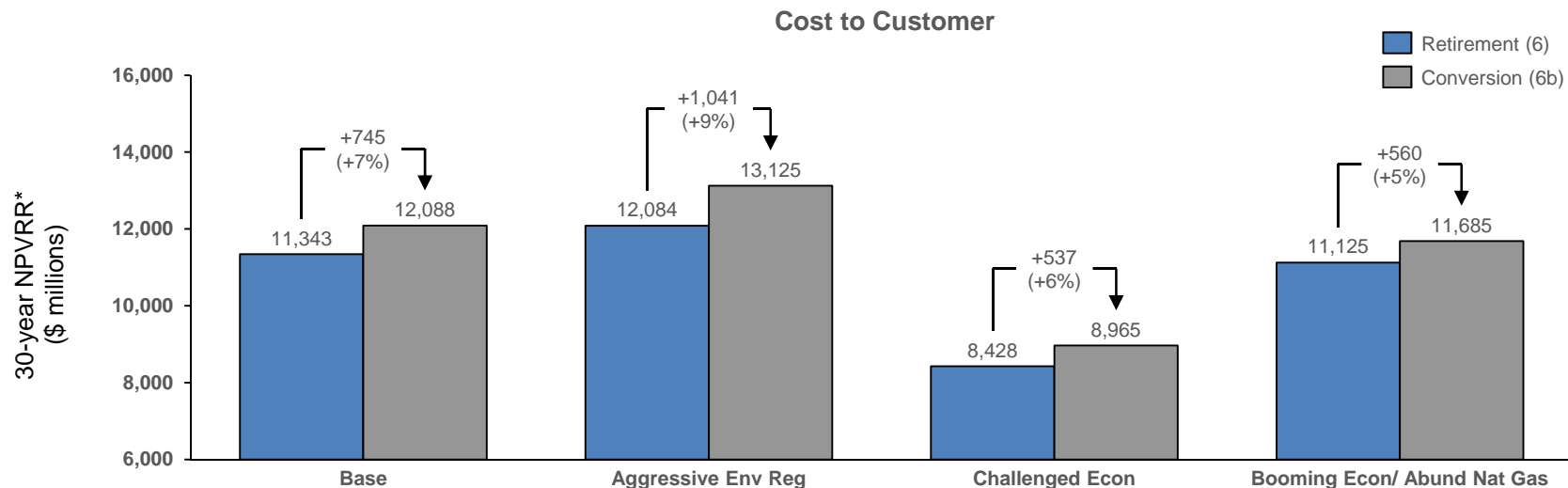
		Requested Analysis
Stakeholder	OUCC	Evaluate the conversion of Schahfer Units 17 and 18 to burn natural gas
	CAC	Decrements Approach for Energy Efficiency and DSM Modeling
	Indiana Coal Council	<p>Lower Cost ELG Compliance Scenarios</p> <p>Alternative Market Scenario</p> <ul style="list-style-type: none"> No carbon price High natural gas price \$45/ton flat real delivered coal price for 17/18

Coal to Gas Conversion Analysis Assumptions (Converting Either 17/18 or Unit 17 only)

	Category	NIPSCO Assumption	Notes
Operating Parameters	Conversion Capacity(megawatts, or “MW”) per unit	302	15% de-rate from current unforced capacity rating (“UCAP”) of 355 MW
	Heat Rate (Btu/kWh)	11,106	
	Forced Outage Rate	10%	
	Category	Estimated Cost	Notes
Conversion Investment Costs	Conversion (2015\$)	\$43M for 17 \$87M for 17/18	<ul style="list-style-type: none"> Equipment, materials and construction labor, contingency, owners and indirect costs from Sargent and Lundy (“S&L”) November 2015 Engineering Study Technical Assessment for the 2016 NIPSCO IRP. Estimated cost of \$121/kW
	Gas Interconnection	\$0M	<ul style="list-style-type: none"> Based on the data from the S&L November 2015 Engineering Study Technical Assessment for the 2016 NIPSCO Integrated Resource Plan and a preliminary review with NIPSCO Gas Systems Engineering, it would be possible to convert Unit 17 or Unit 18 to natural gas without installing an additional pipeline as long as both Units 14 and 15 are retired. Leaving Units 14 and 15 in operation would likely create operational limitations related to when the units would be available to start up. Conversion of Units 17 and 18 to run simultaneously would require an additional pipeline. The size of the additional line could be smaller than the 30” referenced in the S&L study but further detailed engineering analysis would be required to determine the appropriate size. Assumed zero cost in analysis
	Environmental Compliance	\$0M	<ul style="list-style-type: none"> The revised analysis assumes no environmental compliance capital costs if the units are converted to natural gas
Maintenance Capital	Maintenance Capital (Total 2024-2038) Nominal \$	\$122M for U17 \$298M for 17/18	<ul style="list-style-type: none"> Assumes maintenance capital needs will be 25% lower than current coal operations. Derived from review of last 3 years of capital expenditures for 17/18 that showed 25% of maintenance capital expenditures was for coal specific components
Ongoing Costs	Fixed Operations and Maintenance (“O&M”) Costs (2015\$/kW-yr)	\$39	<ul style="list-style-type: none"> Based on S&L Study cost estimates for expected O&M post conversion

Coal to Gas Conversion Results (Units 17 and 18): Cost To Customer

- Across all scenarios, converting both Unit 17 and 18 would cost NIPSCO customers between \$540M to \$1.04B more than retirement and replacement with economically optimized resource selections from the RFP results



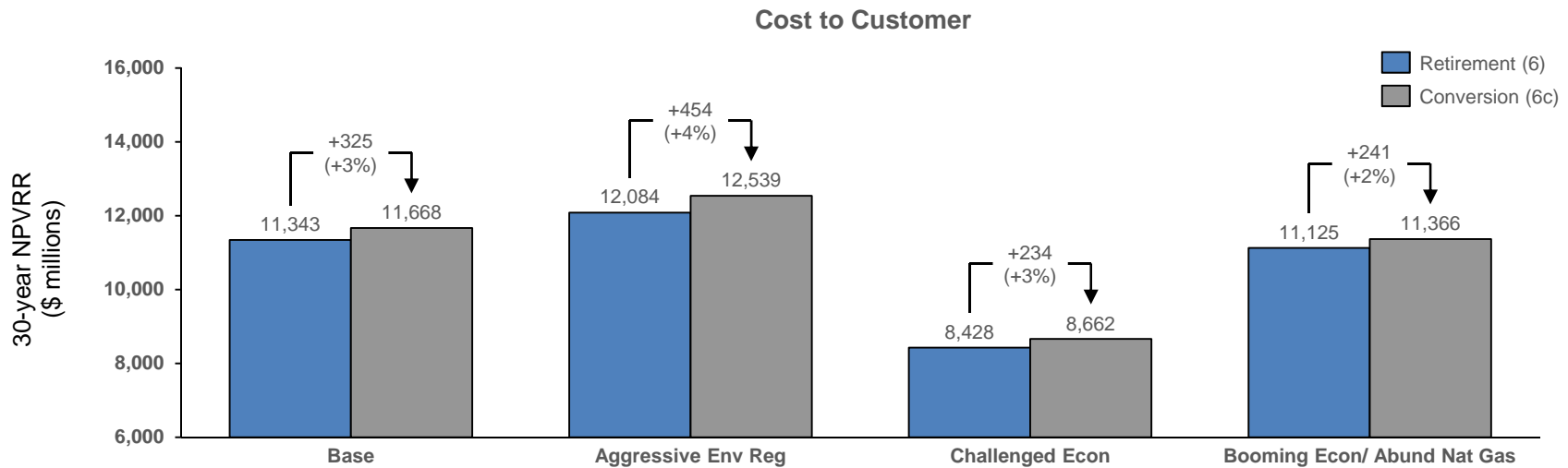
Portfolio Transition Target:	15% Coal in 2023	15% Coal in 2023 (Schfr.17/18 gas)	15% Coal in 2023	15% Coal in 2023 (Schfr.17/18 gas)	15% Coal in 2023	15% Coal in 2023 (Schfr.17/18 gas)	15% Coal in 2023	15% Coal in 2023 (Schfr.17/18 gas)
Retire:	Mich. City: 12 (2028) Schfr: 17, 18 (2023) Schfr: 14, 15 (2023)	Mich. City: 12 (2028) Schfr: 14, 15 (2023)						
Retain beyond 2023:	Mich. City: 12 (2028)	Schfr: 17, 18 (gas) Mich. City: 12 (2028)						

*NPVRR: Net present value of revenue requirements

Michigan City 12	Retire 2028	Retire 2028
Schahfer 14	Retire 2023	Retire 2023
Schahfer 15	Retire 2023	Retire 2023
Schahfer 17	Retire 2023	Convert to Gas 2023
Schahfer 18	Retire 2023	Convert to Gas 2023

Coal to Gas Conversion Results (Unit 17 Only): Cost To Customer

- Across all scenarios, converting a single Unit (17) would cost NIPSCO customers between \$230M and \$450M more than retirement and replacement with economically optimized resource selections from the RFP results

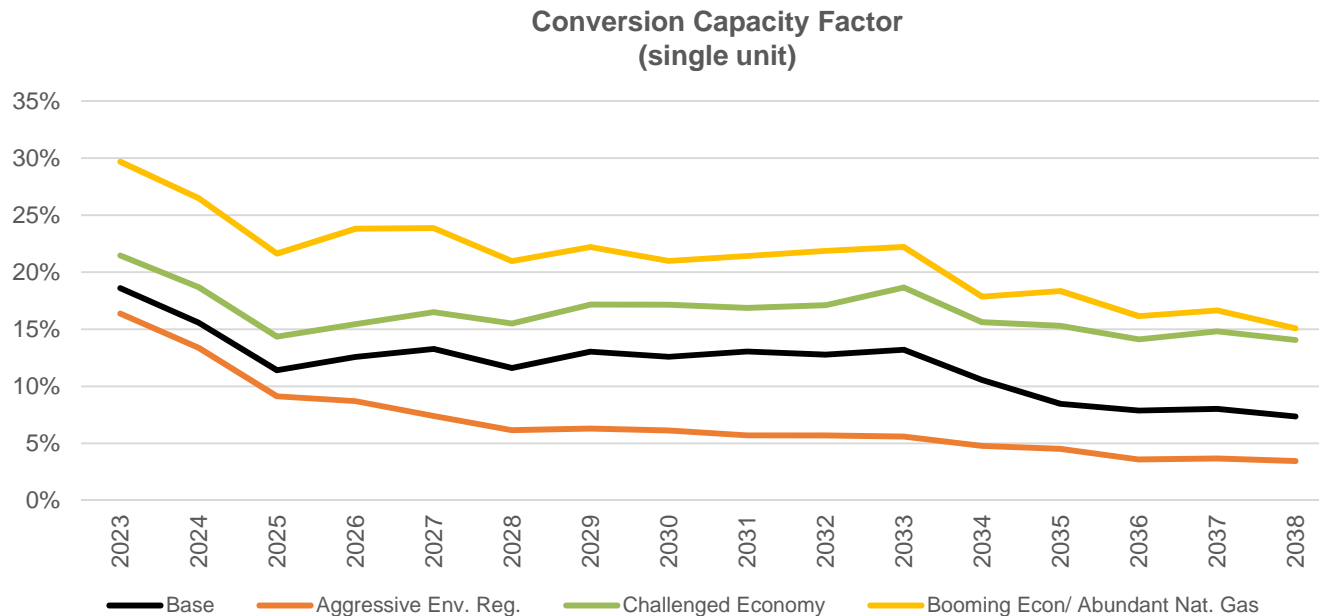


Portfolio Transition Target:	15% Coal in 2023	15% Coal in 2023 (Schfr. 17 gas)	15% Coal in 2023	15% Coal in 2023 (Schfr.17/18 gas)	15% Coal in 2023	15% Coal in 2023 (Schfr.17/18 gas)	15% Coal in 2023	15% Coal in 2023 (Schfr.17/18 gas)
Retire:	Mich.City:12 (2028) Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:14,15 (2023)						
Retain beyond 2023:	Mich. City: 12 (2028)	Schfr:17(gas) Mich. City: 12 (2028)						

Michigan City 12	Retire 2028	Retire 2028
Schahfer 14	Retire 2023	Retire 2023
Schahfer 15	Retire 2023	Retire 2023
Schahfer 17	Retire 2023	Convert to Gas 2023
Schahfer 18	Retire 2023	Retire 2023

Coal to Gas Conversion Results: Capacity Factors

- The Base Case capacity factors are in the 7-16% range, while the full range across all scenarios is about 3-25%
- Capacity Factors tend to fall over time, as gas prices generally increase and as the Midcontinent Independent System Operator (“MISO”) market evolves towards having more lower variable cost capacity.
- Under all scenarios, conversion leads to higher MISO market purchases, potentially increasing NIPSCO customer’s exposure to market risk



Notes: 2023 is a partial year, since the converted unit is assumed to begin operating in June. The 2023 annual capacity factor is thus slightly weighted towards the higher summer months.

Decrements Approach for Energy Efficiency and DSM Modeling

- CAC proposed that NIPSCO consider evaluating energy efficiency and DSM programs with an avoided cost decrements approach.

- As per CAC guidance, this approach should do the following:

When modeled as “decrements,” energy efficiency savings are assumed to be fixed in any given modeling run. That is, they are embedded as reductions to the load forecast and are not selectable resources.

- *The blocks are modeled without any assumption as to their cost.*
- *The supply-side plan is allowed to simultaneously change with each decrement of efficiency, meaning that it is possible that future supply-side additions could be avoided as levels of energy efficiency increase.*

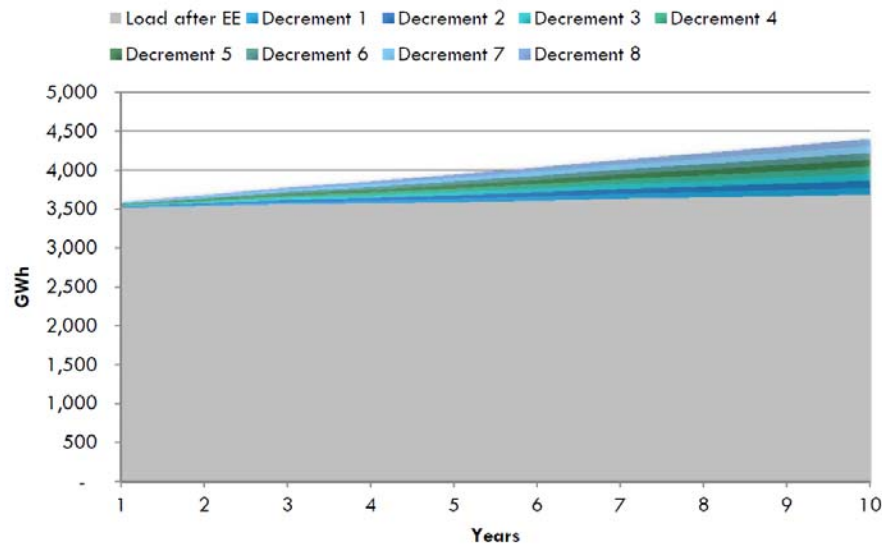
- *The key output is the net present value (“NPV”) of each scenario, which represents the total capacity and energy costs over the study period, discounted to the present year’s dollars.*

Source: Sommer, Anna, “An Avoided Cost Decrement Approach to Energy Efficiency in IRPs,” April 10, 2018

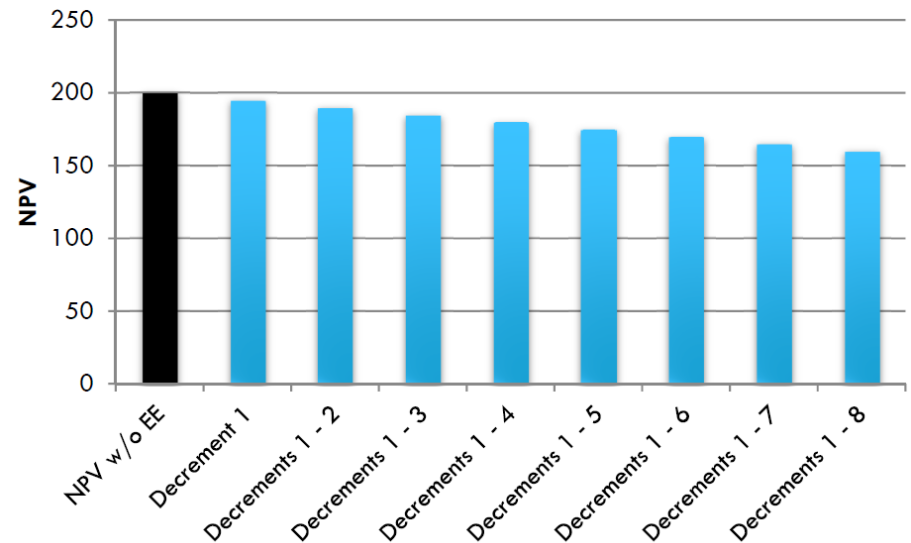
Decrements Approach

- The approach is designed to identify potential decrements (or savings) from the load forecast and evaluate the impacts of such savings on portfolio NPV, without accounting for any costs

Illustrative Load after 8 Decrements



Illustrative NPV for 8 Decrements



Source: Sommer, Anna, "An Avoided Cost Decrement Approach to Energy Efficiency in IRPs," April 10, 2018

Comparison to NIPSCO IRP Approach

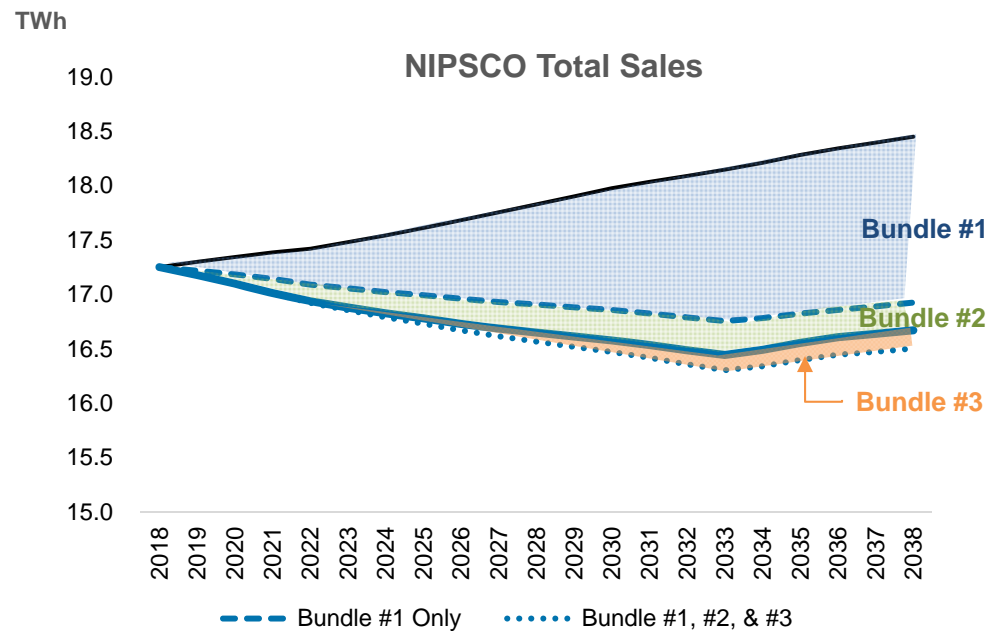
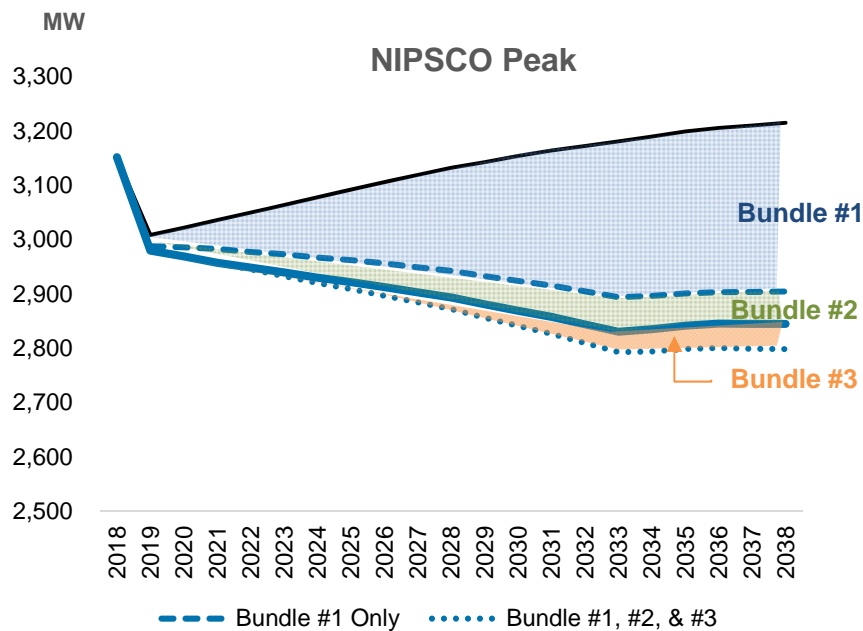
	NIPSCO 2018 IRP	Decrements Approach
EE/DSM input development – energy savings	GDS Associates, Inc. (“GDS”) study identified 3 bundles based on a bottom-up program review, organized by cost	Could use decrements of any size (but NIPSCO preserved 3 bundles for hourly shape integrity in its decrements evaluation)
EE/DSM input development – cost	GDS study produced cost estimates for each bundle by residential or commercial and industrial sector	No cost estimates are required, but savings can be compared to costs, as available
Resource selection process	Aurora portfolio optimization evaluates energy efficiency /DSM bundles on equal footing with other supply-side resources (as determined by the request for proposal responses)	No “selection” of resources, as decrements are all “hard-coded” to record savings
Evaluation criteria	Net present value revenue requirement (“NPVRR”) within IRP structure	NPVRR of savings, with potential to move cost-effectiveness questions into more detailed DSM study phase

Decrement Definition for NIPSCO IRP

- In performing a decrements analysis, NIPSCO utilized the same bundles that were established by GDS in its Energy Efficiency Savings Update.

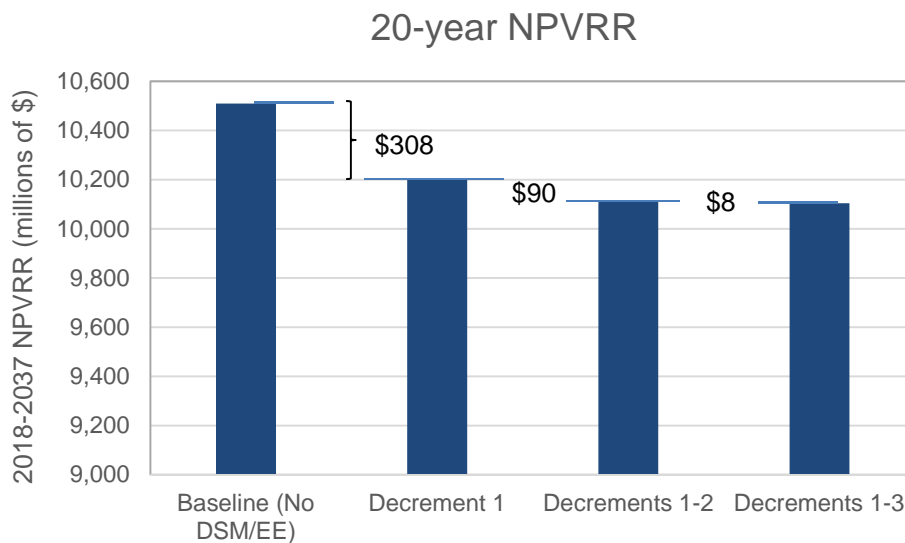
DSM Bundle #	Weighted Avg. Cost (\$/MWh)
1	16.98
2	23.27
3	159.00

Impact of Selected DSM on NIPSCO Peak and Average Load



Decrement Portfolio Results

- Decrement portfolio runs result in lower portfolio costs due to less energy to serve, which results in fewer fuel and energy market purchases, and avoided solar capacity additions, either from RFP resources or generic builds
 - Bundle #1 avoids 298 MW, Bundle #2 avoids 60 MW, and Bundle #3 avoids 43 MW of UCAP additions over the forecast horizon



Summary of NPV of Savings and Costs

	NPV of Savings	NPV of Costs	Net Benefit
Bundle #1	307,639,744	131,461,432	176,178,312
Bundle #2	89,685,940	51,063,023	38,622,917
Bundle #3	7,804,359	108,310,129	(100,505,770)

- Bundles 1 and 2 are cost-effective in this approach, while Bundle 3 is not
- This is consistent with the analysis performed in the IRP

Stakeholder Request – Indiana Coal Council

Portfolios for Schahfer Units 17/18

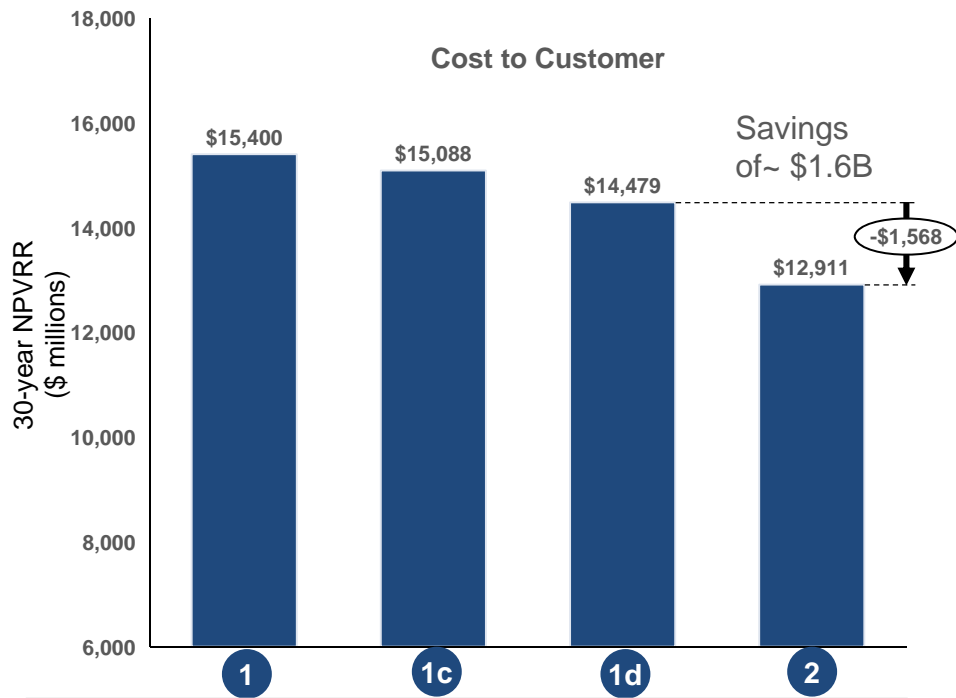
- Indiana Coal Council requested NIPSCO evaluate retirement combinations with less costly ELG-related compliance for Schahfer 17/18 and an alternative market case

	1	1c	1d	2
Portfolio Transition Target:	65% Coal through 2035	65% Coal through 2035	65% Coal through 2035	40% Coal in 2023
Retire:	None	None	None	Schfr:17,18 (2023)
Retain beyond 2023:	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15
Environmental Compliance	CCR ¹ ELG ² : non-ZLD ³	CCR ELG: NONE	No Environmental Capital	CCR ELG: non-ZLD
Michigan City 12	Retain CCR ELG: N/A	→		
Schahfer 14	Retain CCR ELG: non-ZLD	→		
Schahfer 15	Retain CCR ELG: non-ZLD	→		
Schahfer 17	Retain CCR ELG: non-ZLD NOx ⁴ : SCR ⁵	Retain CCR ELG: None NOx: SCR	Retain CCR ELG: None NOx: None	Retire 2023 CCR/ELG: Retirement
Schahfer 18	Retain CCR ELG: non-ZLD NOx: SCR	Retain CCR ELG: None NOx: SCR	Retain CCR ELG: None NOx: None	Retire 2023 CCR/ELG: Retirement

¹Coal Combustion Residuals
²Effluent Limitation Guidelines
³Zero Liquid Discharge
⁴Nitrogen Oxides
⁵Selective Catalytic Reduction System

Stakeholder Request – Indiana Coal Council Scenarios

Base Case



Portfolio Transition Target:	65% Coal through 2035	65% Coal through 2035	65% Coal through 2035	40% Coal in 2023
Retire:	None	None	None	Schfr:17,18 (2023)
Retain beyond 2023:	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15
Env. Compliance	CCR ELG: non-ZLD	CCR ELG: NONE	No Environmental Capital	CCR ELG: non-ZLD

Alternative Case – Coal Council

- No carbon price
- High natural gas price
- \$45/ton flat real delivered coal price for 17/18



Portfolio Transition Target:	65% Coal through 2035	65% Coal through 2035	65% Coal through 2035	40% Coal in 2023
Retire:	None	None	None	Schfr:17,18 (2023)
Retain beyond 2023:	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15
Env. Compliance	CCR ELG: non-ZLD	CCR ELG: NONE	No Environmental Capital	CCR ELG: non-ZLD

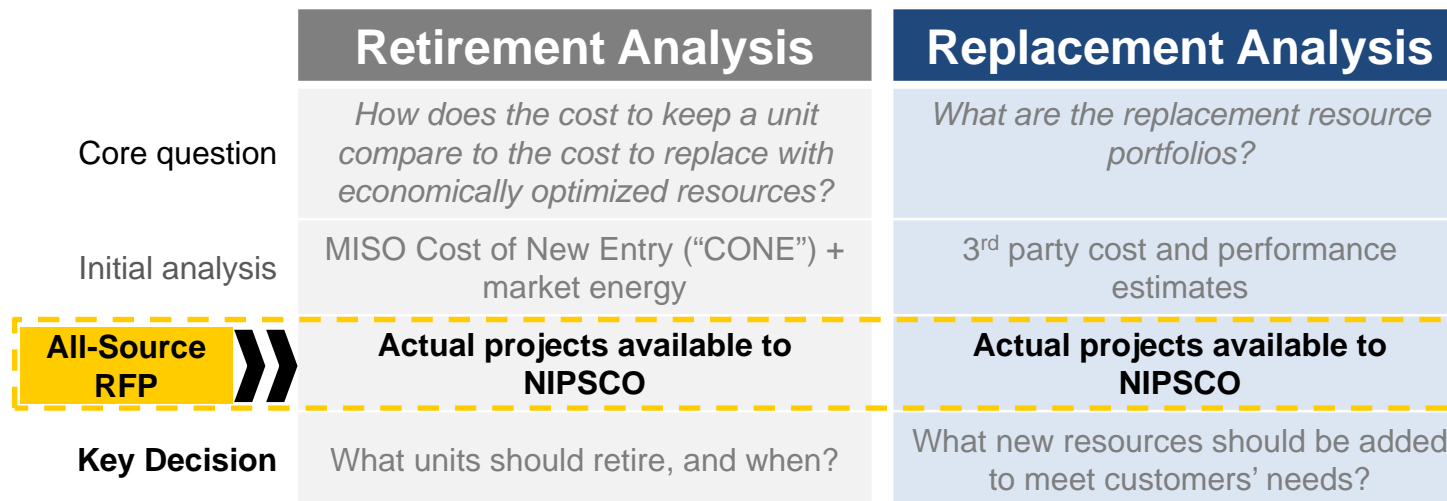
Retirement Analysis

Dan Douglas
Vice President, Corporate Strategy & Development

Pat Augustine
Charles River Associates (CRA)

Recap: Retirement Analysis Framework

- The responses to the all-source RFP provided insight into the supply and pricing of alternatives available to NIPSCO and were fed into the retirement and replacement analysis
- Representative project groups were constructed from RFP results, assembled by technology and ownership structure, for use in the updated retirement analysis



Retirement analysis based on most recent data and representative RFP projects *as selected by the optimization model* – selection driven by economics

Recap: Various Retirement Combinations Were Constructed

	1	2	3	4	5	6	7	8
Portfolio Transition Target:	65% Coal through 2035	40% Coal in 2023	15% Coal by 2028 w/ ELG	15% Coal by 2028 w/o ELG	15% Coal in 2023 (Mich. City in 2035)	15% Coal in 2023 (Mich. City in 2028)	15% Coal by 2023 (Schfr. 17/18 2021)	0% Coal in 2023
Retire:	None	Schfr:17,18 (2023)	Schfr:17,18 (2023) Schfr:14,15 (2028)	Schfr:17,18 (2023) Schfr:14,15 (2028)	Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:17,18 (2021) Schfr:14,15 (2023)	Mich.City:12 (2023) Schfr:17,18 (2023) Schfr:14,15 (2023)
Retain beyond 2023:	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15	Mich. City: 12 Schfr:14,15	Mich. City: 12 (2035) Schfr:14,15	Mich. City: 12 (2035)	Mich. City: 12 (2028)	Mich. City: 12 (2028)	None
Env. Compliance	CCR ¹ ELG ² : non-ZLD ³	CCR ELG: non-ZLD	CCR ELG: non-ZLD	CCR ELG: Extended Retirement	CCR ELG: Retirement	CCR ELG: Retirement	CCR ELG: Retirement	CCR ELG: Retirement
Michigan City 12	Retain CCR ELG: N/A	→				Retire 2028 CCR ELG: N/A	→	Retire 2023 CCR ELG: N/A
Schahfer 14	Retain CCR ELG: non-ZLD	→	Retire 2028 CCR ELG: non-ZLD	Retire 2028 CCR ELG: Extended Retirement	Retire 2023 CCR ELG: Retirement	→	Retire 2023 CCR ELG: Retirement	
Schahfer 15	Retain CCR ELG: non-ZLD	→	Retire 2028 CCR ELG: non-ZLD	Retire 2028 CCR ELG: Extended Retirement	Retire 2023 CCR ELG: Retirement	→	Retire 2023 CCR ELG: Retirement	
Schahfer 17	Retain CCR ELG: non-ZLD NOx: SCR	Retire 2023 CCR/ELG: Retirement	→			Retire 2021 CCR/ELG: Retirement	→	Retire 2023 CCR/ELG: Retirement
Schahfer 18	Retain CCR ELG: non-ZLD NOx ⁴ : SCR ⁵	Retire 2023 CCR/ELG: Retirement	→			Retire 2021 CCR/ELG: Retirement	→	Retire 2023 CCR/ELG: Retirement

 Currently NOT a viable path for ELG compliance

¹CCR: Coal Combustion Residuals
²ELG: Effluent Limitation Guidelines
³ZLD: Zero-Liquid discharge
⁴NOx: Nitrogen oxides
⁵SCR: Selective Catalytic Reduction

Note: Retirement Combination 4, 15% Coal in 2028 without ELG, is not currently a viable from an ELG compliance standpoint and is shown for discussion purposes.

Recap: What Technology Is the Model Selecting From RFP Results?

- Economic optimization model is selecting DSM and renewables as the replacement resources in all retirement cases
- While the model selected resources were used for the retirement analysis, a separate replacement analysis was performed

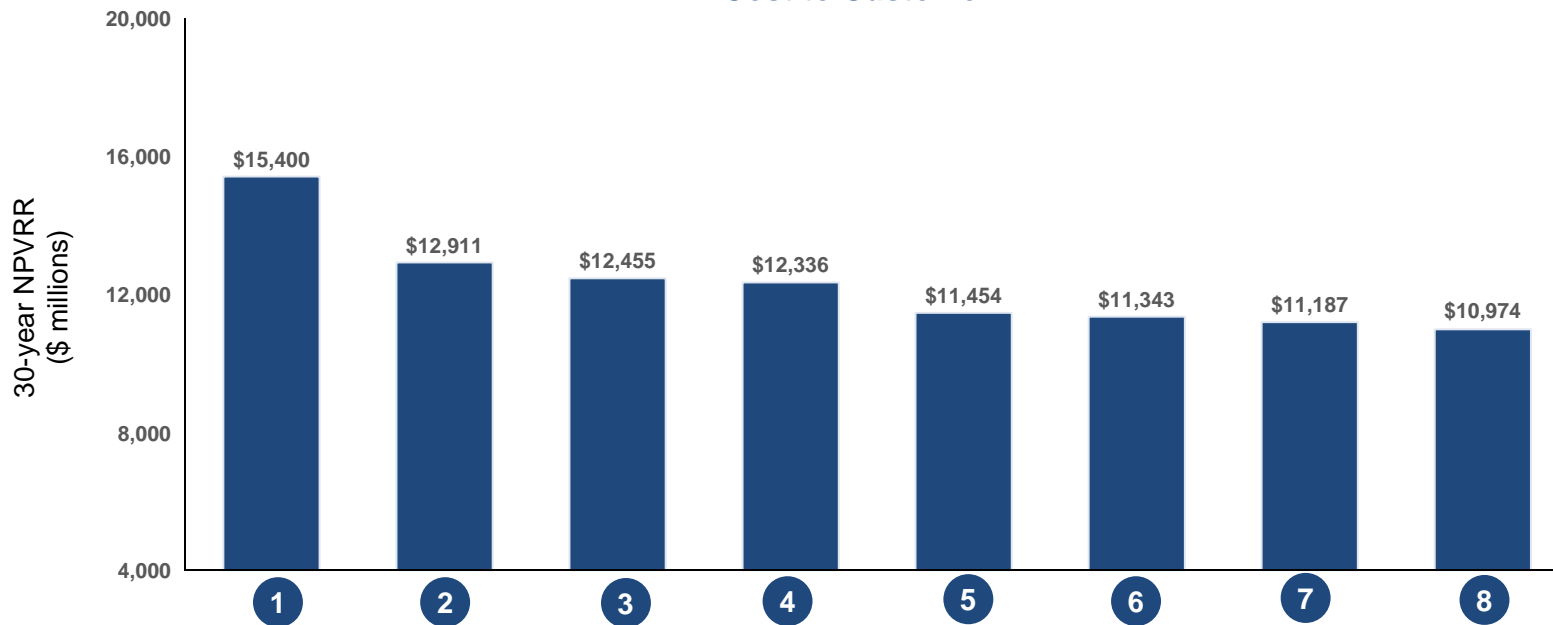
	2 3 4 Schahfer 17/18 Retirement ~600MW UCAP need		5 6 7 Schahfer 14/15/17/18 Retirement ~1,350MW UCAP need		8 All Coal Retirement ~1,750MW UCAP Need	
	TECHNOLOGY	MW	TECHNOLOGY	MW	TECHNOLOGY	MW
Higher	MISO Market Purchase	50	MISO Market Purchase	50	MISO Market Purchase	50
	DSM	125	DSM	125	DSM	125
	Wind	150	Wind	150	Wind	150
	Solar, Solar + Storage	390	Solar, Solar + Storage	1,070	Solar, Solar + Storage	1,500
Lower		715		1,395		1,825

This is not NIPSCO's replacement resource selection or plan

Retirement Results – Base Case

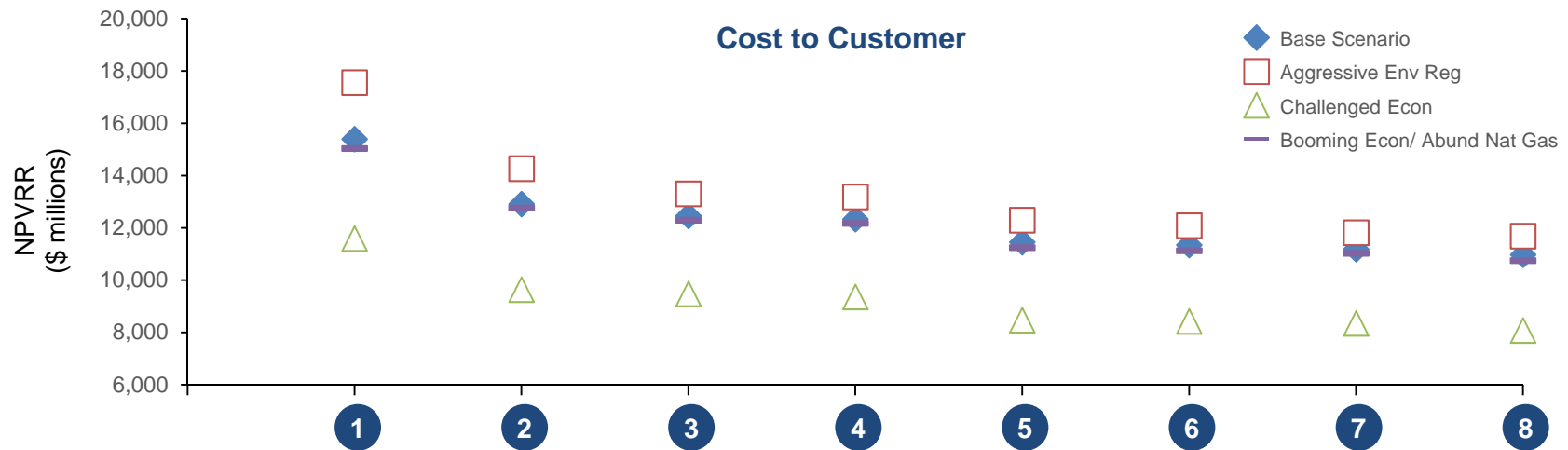
- Retaining more coal in the NIPSCO portfolio results in higher costs to customers

Cost to Customer



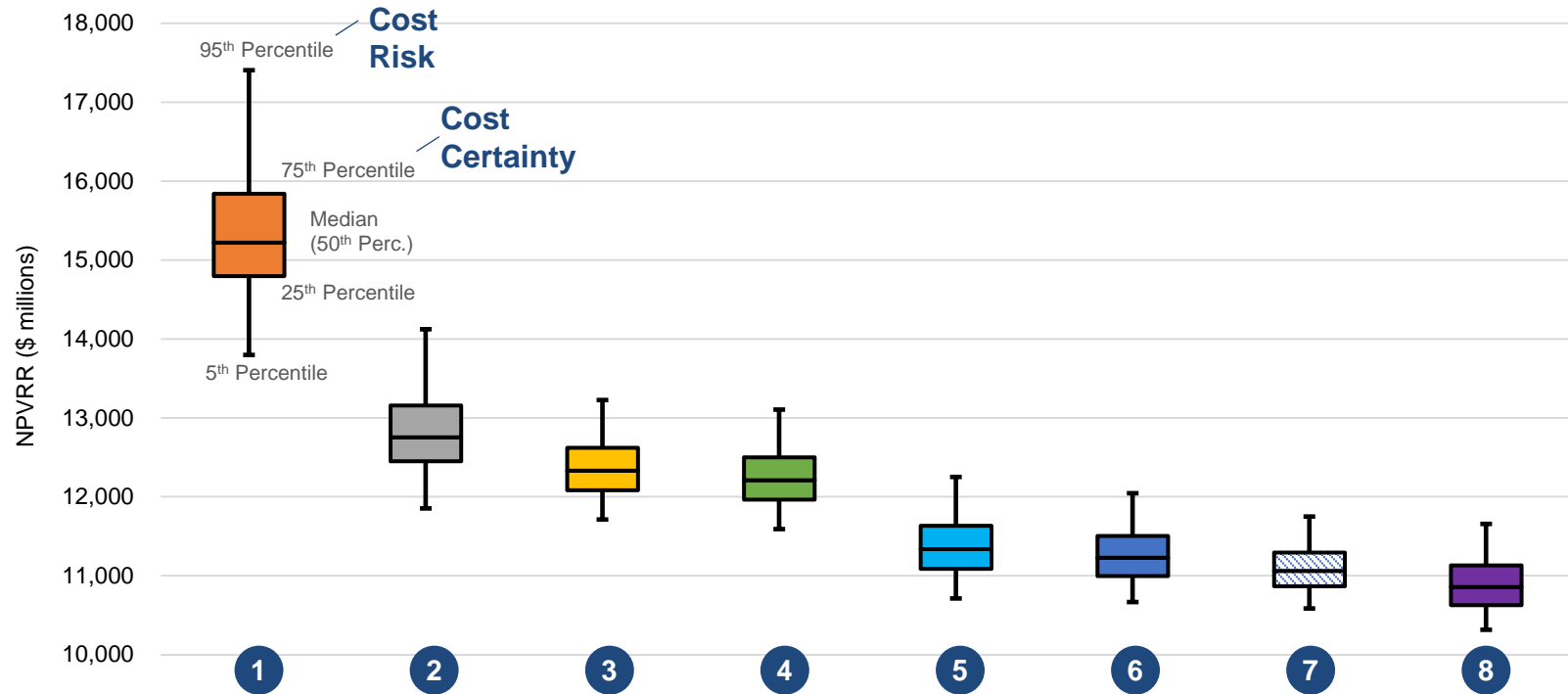
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Retire:	None	Schfr:17,18 (2023)	Schfr:17,18 (2023) Schfr:14,15 (2028)	Schfr:17,18 (2023) Schfr:14,15 (2028)	Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:17,18 (2021) Schfr:14,15 (2023)	Mich.City:12 (2023) Schfr:17,18 (2023) Schfr:14,15 (2023)
Retain beyond 2023:	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15	Mich. City: 12 Schfr:14,15	Mich. City: 12 (2035) Schfr:14,15	Mich. City: 12 (2035)	Mich. City: 12 (2028)	Mich. City: 12 (2028)	None
Delta from Least Cost:	\$4,426M 40%	\$1,937M 18%	\$1,481M 13%	\$1,361M 12%	\$479M 4%	\$369M 3%	\$213M 2%	\$0M

Retirement Analysis: Scenarios



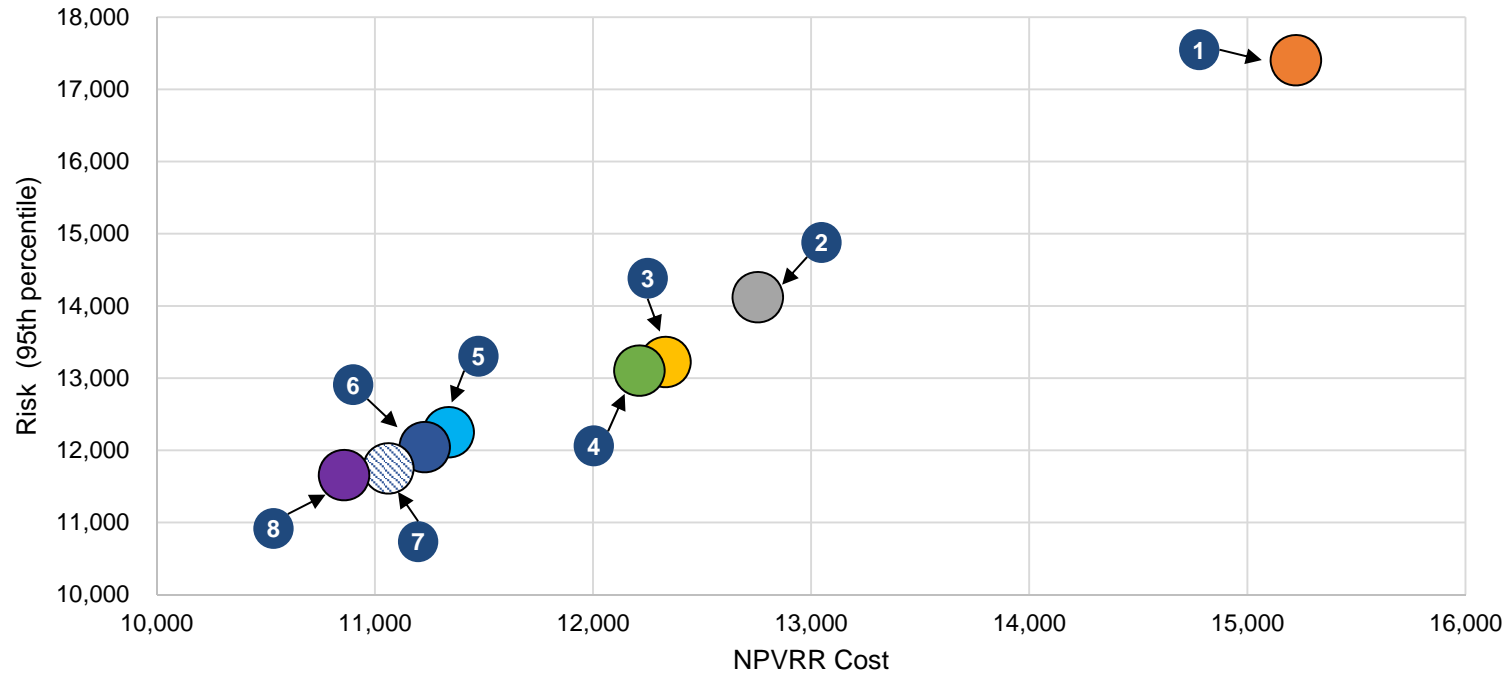
	Portfolio Transition Target:	65% Coal through 2035	40% Coal in 2023	15% Coal in 2028 w/ ELG	15% Coal in 2028 w/o ELG	15% Coal in 2023 (MC 2035)	15% Coal in 2023 (MC 2028)	15% Coal in 2023 (17/18 2021)	0% Coal in 2023
	Retire:	None	Schfr:17,18 (2023)	Schfr:17,18 (2023) Schfr:14,15 (2028)	Schfr:17,18 (2023) Schfr:14,15 (2028)	Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:17,18 (2021) Schfr:14,15 (2023)	Mich.City:12 (2023) Schfr:17,18 (2023) Schfr:14,15 (2023)
	Retain beyond 2023:	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15	Mich. City: 12 Schfr:14,15	Mich. City: 12 Schfr:14,15	Mich. City: 12 (2035)	Mich. City: 12 (2028)	Mich. City: 12 (2028)	None
Base Scenario	Delta from Lowest Cost to Customer	\$4,426M 40.3%	\$1,937M 17.7%	\$1,481M 13.5%	\$1,361M 12.4%	\$479M 4.4%	\$369M 3.4%	\$213M 1.9%	\$0M 0.0%
Aggressive Env Reg	Delta from Lowest Cost to Customer	\$5,869M 50.2%	\$2,584M 22.1%	\$1,616M 13.8%	\$1,496M 12.8%	\$610M 5.2%	\$396M 3.4%	\$132M 1.1%	\$0M 0.0%
Challenged Econ	Delta from Lowest Cost to Customer	\$3,519M 43.6%	\$1,563M 19.3%	\$1,400M 17.3%	\$1,280M 15.8%	\$395M 4.9%	\$349M 4.3%	\$272M 3.4%	\$0M 0.0%
Booming Econ/ Abund Nat Gas	Delta from Lowest Cost to Customer	\$4,285M 39.9%	\$2,013M 18.7%	\$1,546M 14.4%	\$1,426M 13.3%	\$499M 4.6%	\$380M 3.5%	\$278M 2.6%	\$0M 0.0%

Retirement Analysis: Risk (Stochastics)



Portfolio Transition Target:	65% Coal through 2035	40% Coal in 2023	15% Coal in 2028 w/ ELG	15% Coal in 2028 w/o ELG	15% Coal in 2023 (MC 2035)	15% Coal in 2023 (MC 2028)	15% Coal in 2023 (17/18 2021)	0% Coal in 2023
Retire:	None	Schfr:17,18 (2023)	Schfr:17,18 (2023) Schfr:14,15 (2028)	Schfr:17,18 (2023) Schfr:14,15 (2028)	Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:17,18 (2021) Schfr:14,15 (2023)	Mich.City:12 (2023) Schfr:17,18 (2023) Schfr:14,15 (2023)
Retain beyond 2023:	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15	Mich. City: 12 Schfr:14,15	Mich. City: 12 Schfr:14,15	Mich. City: 12 (2035)	Mich. City: 12 (2028)	Mich. City: 12 (2028)	None
Delta from Lowest Cost Certainty	+\$4,708 42.3%	+\$2,026 18.2%	+\$1,490 13.4%	+\$1,370 12.3%	+\$502 4.5%	+\$372 3.3%	+\$163 1.5%	- \$ - %
Delta from Lowest Cost Risk	+\$5,750 49.3%	+\$2,467 21.2%	+\$1,569 13.5%	+\$1,449 12.4%	+\$596 5.1%	+\$389 3.3%	+\$93 0.8%	- \$ - %

Retirement Analysis: Cost Risk



	1	2	3	4	5	6	7	8
Portfolio Transition Target:	65% Coal through 2035	40% Coal in 2023	15% Coal by 2028 w/ ELG	15% Coal by 2028 w/o ELG	15% Coal in 2023 (Mich. City 2035)	15% Coal in 2023 (Mich. City 2028)	15% Coal by 2023 (Schfr 17/18 2021)	0% Coal in 2023
Retire:	None	Schfr:17,18 (2023)	Schfr:17,18 (2023) Schfr:14,15 (2028)	Schfr:17,18 (2023) Schfr:14,15 (2028)	Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:17,18 (2021) Schfr:14,15 (2023)	Mich.City:12 (2023) Schfr:17,18 (2023) Schfr:14,15 (2023)
Retain beyond 2023:	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15	Mich. City: 12 Schfr:14,15	Mich. City: 12 Schfr:14,15	Mich. City: 12 (2035)	Mich. City: 12 (2028)	Mich. City: 12 (2028)	None
Env. Compliance	CCR ELG: non-ZLD	CCR ELG: non-ZLD	CCR ELG: non-ZLD	CCR ELG: Extended Retirement	CCR ELG: Retirement	CCR ELG: Retirement	CCR ELG: Retirement	CCR ELG: Retirement

Retirement Scorecard

2018 Retirement Scorecard

Criteria	Description
Cost to Customer	<ul style="list-style-type: none"> Impact to customer bills Metric: 30-year NPV of revenue requirement (Base scenario deterministic results)
Cost Certainty	<ul style="list-style-type: none"> Certainty that revenue requirement falls within the most likely range of distribution of outcomes (75% certainty that cost will be at or below this level) Metric: 75th percentile of cost to customer
Cost Risk	<ul style="list-style-type: none"> Risk of extreme, high-cost outcomes Metric: 95th percentile of cost to customer
Reliability Risk	<ul style="list-style-type: none"> Assess the ability to confidently transition the resources and maintain customer and system reliability Metric: Qualitative assessment of orderly transition
Employees	<ul style="list-style-type: none"> Net impact on NiSource jobs by 2023 Metric: Approximate number of permanent NiSource jobs affected
Local Economy	<ul style="list-style-type: none"> Property tax amount relative to NIPSCO's 2016 IRP Metric: Difference in NPV of estimated modeled property taxes on existing assets relative to the 2016 IRP

Retirement Scorecard and Preferred Retirement Path

- The most viable option for NIPSCO is the full retirement of Schahfer coal units by 2023 and Michigan City by 2028
- While retiring more coal earlier is less expensive to customers, the reliability risk of those portfolio is unacceptable to NIPSCO

	1	2	3	4	5	6	7	8
Portfolio Transition Target:	65% Coal through 2035	40% Coal in 2023	15% Coal by 2028 w/ ELG	15% Coal by 2028 w/o ELG	15% Coal in 2023 (Mich. City 2035)	15% Coal in 2023 (Mich. City 2028)	15% Coal by 2023 (Schfr 17/18 2021)	0% Coal in 2023
Retire:	None	Schfr:17,18 (2023)	Schfr:17,18 (2023) Schfr:14,15 (2028)	Schfr:17,18 (2023) Schfr:14,15 (2028)	Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:17,18 (2021) Schfr:14,15 (2023)	Mich.City:12 (2023) Schfr:17,18 (2023) Schfr:14,15 (2023)
Retain beyond 2023:	Mich. City: 12 Schfr:14,15,17,18	Mich. City: 12 Schfr:14,15	Mich. City: 12 Schfr:14,15	Mich. City: 12 Schfr:14,15	Mich. City: 12 (2035)	Mich. City: 12 (2028)	Mich. City: 12 (2028)	None
Env. Compliance	CCR ELG: non-ZLD	CCR ELG: non-ZLD	CCR ELG: non-ZLD	CCR ELG: Extended Retirement	CCR ELG: Retirement	CCR ELG: Retirement	CCR ELG: Retirement	CCR ELG: Retirement
Cost To Customer	\$15,400 +\$4,426 40.3%	\$12,911 +\$1,937 17.7%	\$12,455 +\$1,481 13.5%	\$12,336 +\$1,361 12.4%	\$11,454 +\$479 4.4%	\$11,343 +\$369 3.4%	\$11,187 +\$213 1.9%	\$10,974 -\$ -%
Cost Certainty	\$15,840 +\$4,708 42.3%	\$13,158 +\$2,026 18.2%	\$12,622 +\$1,490 13.4%	\$12,502 +\$1,370 12.3%	\$11,634 +\$502 4.5%	\$11,504 +\$372 3.3%	\$11,295 +\$163 1.5%	\$11,132 -\$ -%
Cost Risk	\$17,406 +\$5,750 49.3%	\$14,123 +\$2,467 21.2%	\$13,225 +\$1,569 13.5%	\$13,105 +\$1,449 12.4%	\$12,252 +\$596 5.1%	\$12,045 +\$389 3.3%	\$11,750 +\$93 0.8%	\$11,656 -\$ -%
Reliability Risk	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Unacceptable	Unacceptable
Employees	0	125	125	125	276	276	276	426
Local Economy	+\$118M +47%	\$0M -%	(\$23M) (9%)	(\$31M) (12%)	(\$65M) (26%)	(\$74M) (29%)	(\$74M) (29%)	(\$94M) (37%)

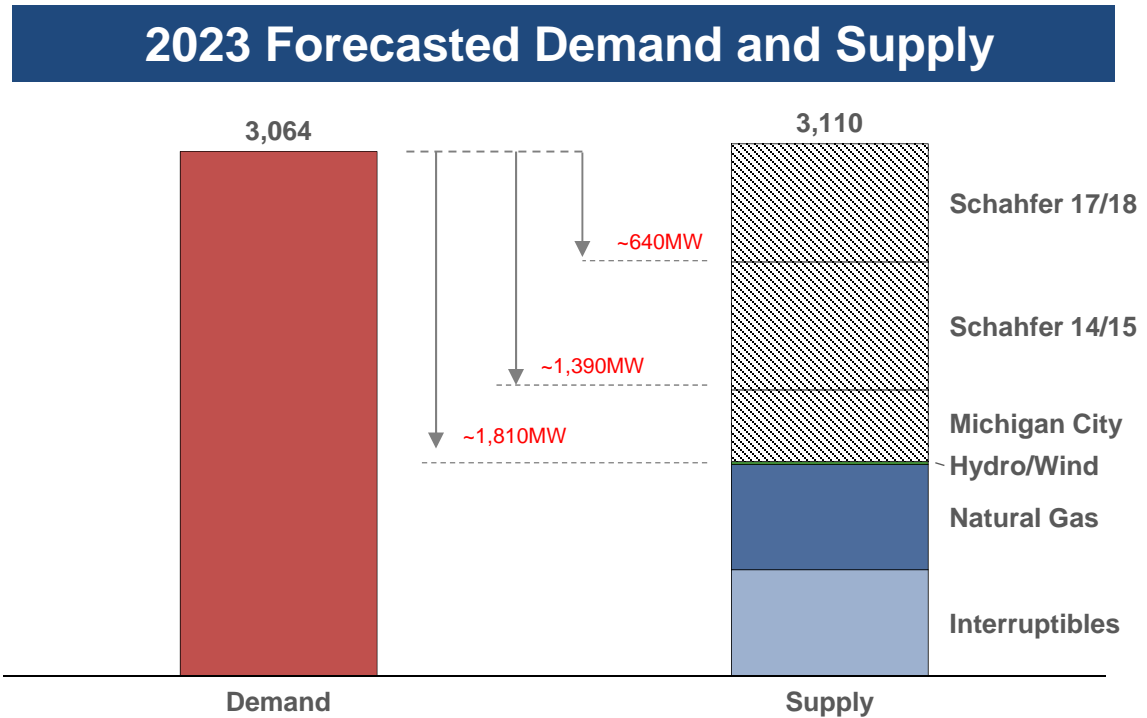
Preferred Retirement Path

Replacement Analysis

Dan Douglas
Vice President, Corporate Strategy & Development

Pat Augustine
Charles River Associates (CRA)

Retirements Will Create A Need For New Resources

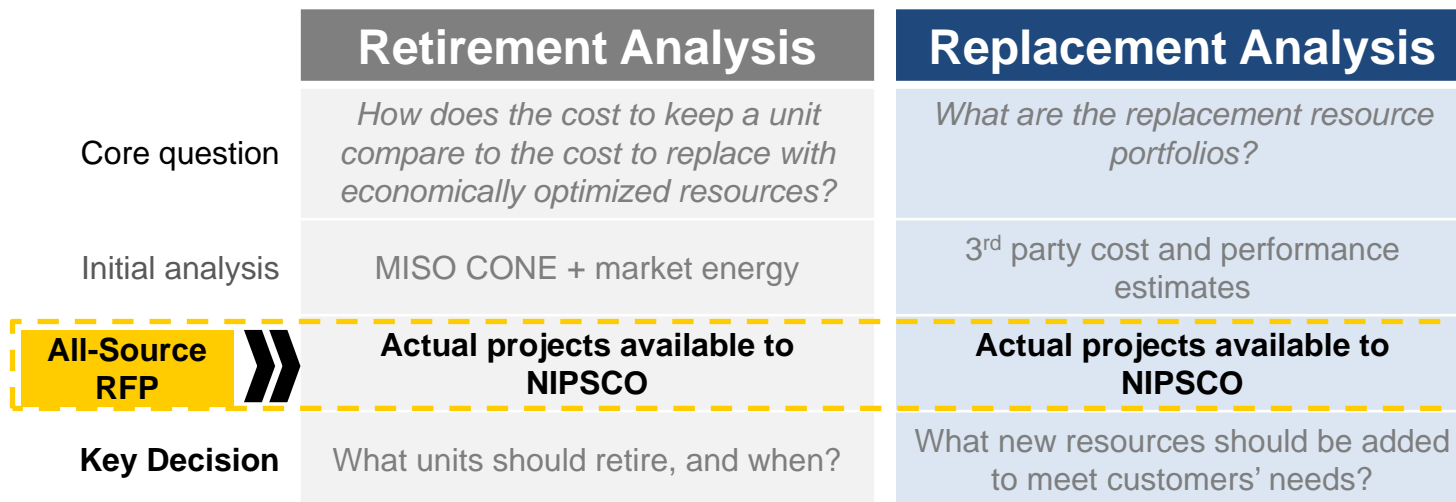


2023 Estimated Capacity Excess/(Need) in MWs	
As-Is	50
Retire Schahfer Units 17/18	(640)
Retire Schahfer Units 14/15/17/18	(1,390)
Retire Schahfer and Michigan City	(1,810)

Notes: Demand reflects loss of BP load

Replacement Analysis Framework

- The responses to the all-source RFP provided insight into the supply and pricing of alternatives available to NIPSCO and fed into the retirement and replacement analysis
- These RFP projects are used to construct resource combinations that explore the range of Ownership / Duration and Diversity possibilities



Replacement Analysis: Resource Combinations Were Created That Explore The Range Of Ownership / Duration And Diversity Possibilities

- RFP projects provide good coverage to construct resource combinations that cover the spectrum of Ownership / Duration and Diversity

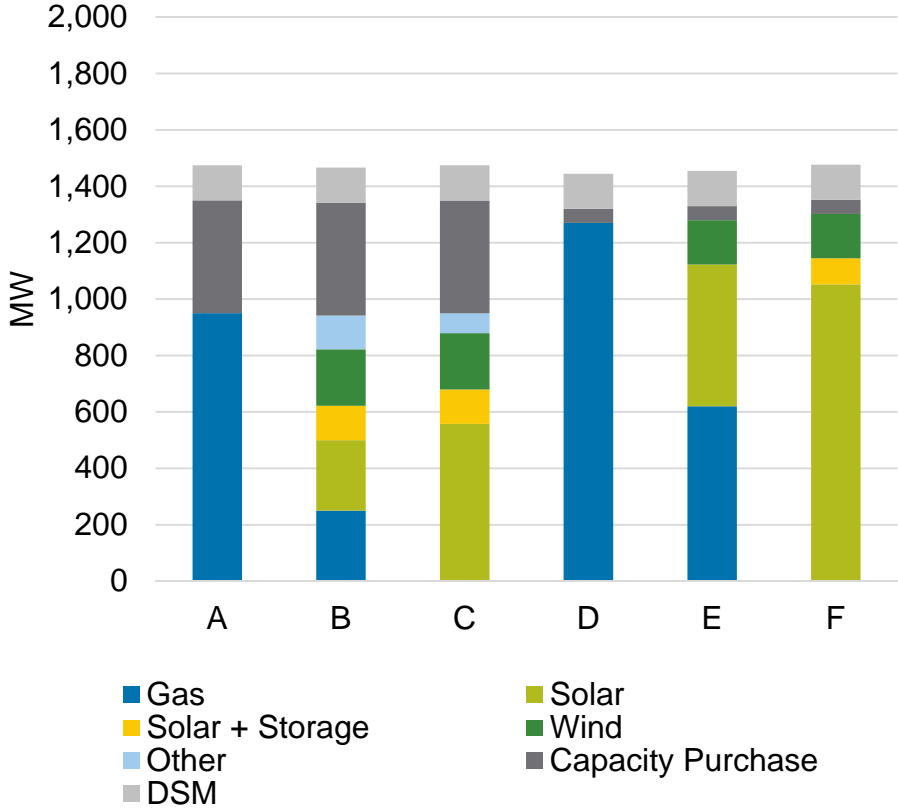
		Diversity		
		Higher Carbon Emissions	Average Carbon Emissions	Average-Low Carbon Emissions
Ownership / Duration	Short Duration	<p>A</p> <p>MISO Capacity Purchase 400MW Combined Cycle Gas Turbine ("CCGT") Purchase Power Agreement ("PPA") 950MW</p>	<p>B</p> <p>MISO Capacity Purchase 400MW CCGT PPA 250MW Renewable PPA 690MW</p>	<p>C</p> <p>MISO Capacity Purchase 400MW Renewable PPA 950MW</p>
	Long Duration	<p>D</p> <p>MISO Capacity Purchase 50MW CCGT 1,300MW</p>	<p>E</p> <p>MISO Capacity Purchase 50MW CCGT 620MW Renewables 670MW</p>	<p>F</p> <p>MISO Capacity Purchase 50MW Renewables 1,300MW</p>

Notes: Values above reflect 2023 additions shown in UCAP; additional generic solar additions are included in all portfolios starting in 2028.

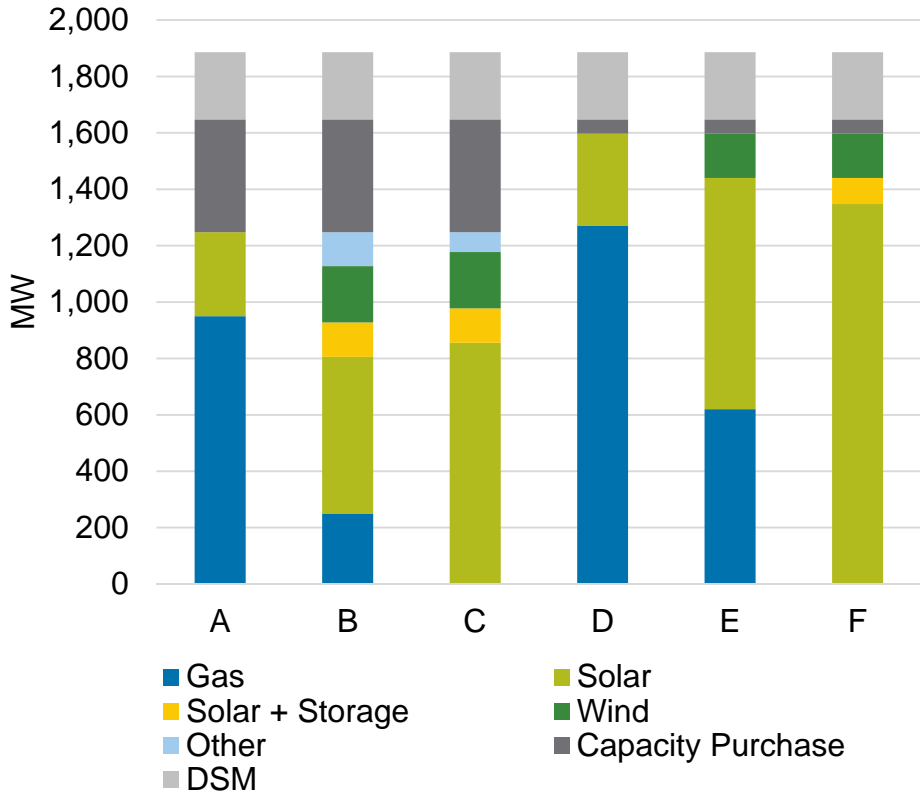
All portfolios include a total of 125 MW (peak) DSM by 2023 and 370 MW (peak) DSM by 2038.

2023 And 2028 New Resources Additions By Portfolio (UCAP MW)

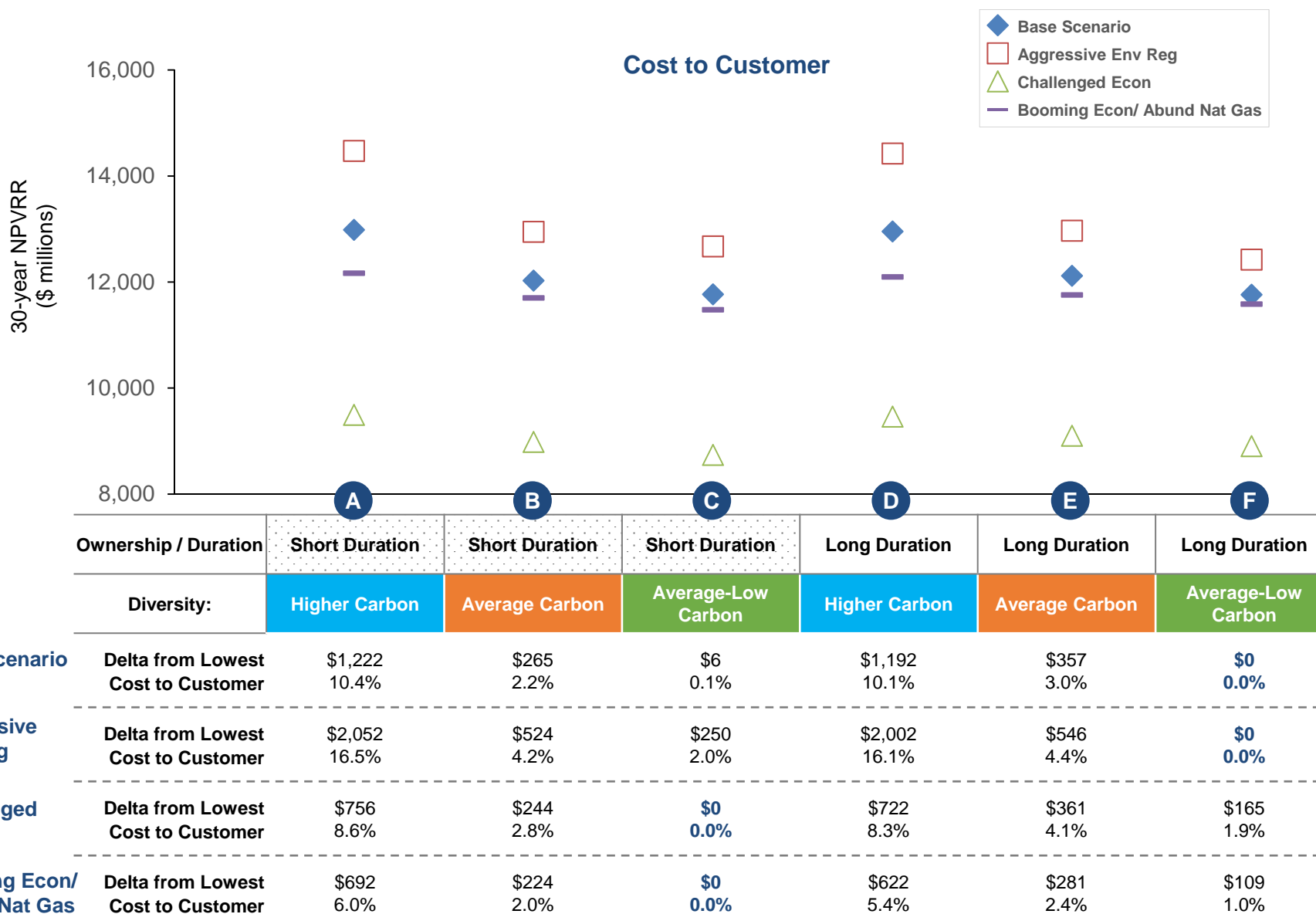
2023 Total UCAP



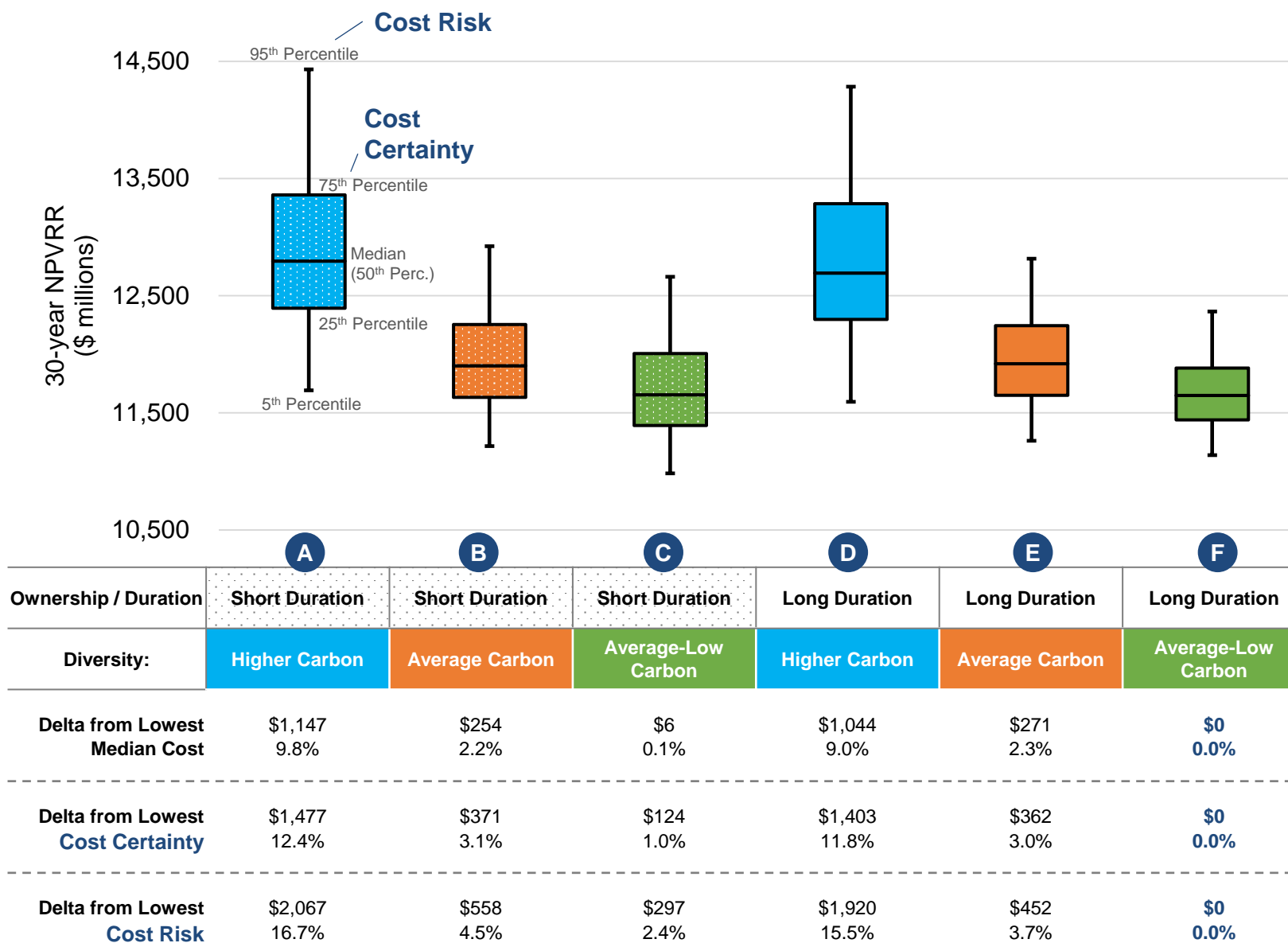
2028 Total UCAP



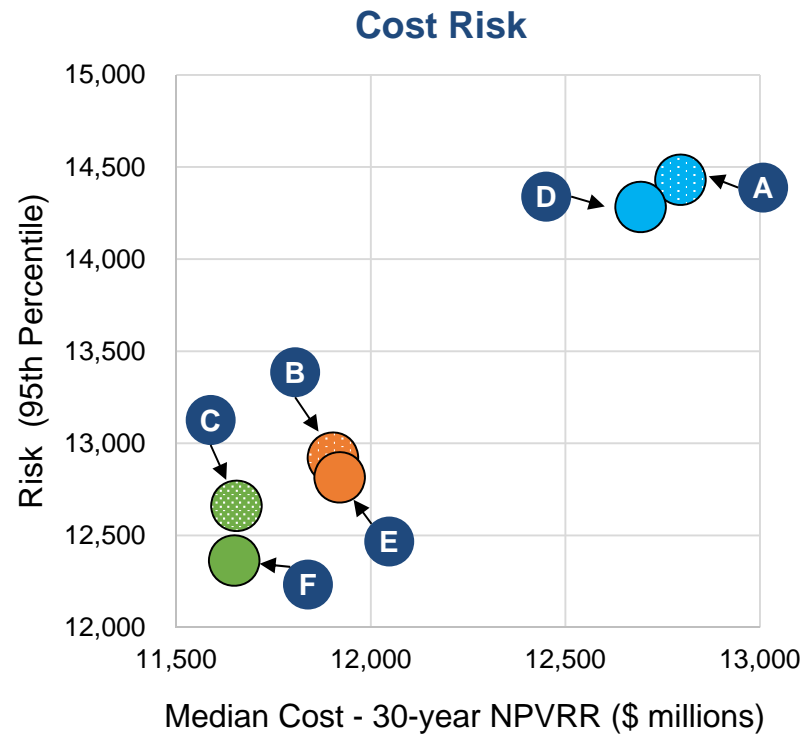
Replacement Analysis: Scenarios



Replacement Analysis: Stochastics



Replacement Analysis: Stochastics



		Diversity		
		Higher Carbon Emissions	Average Carbon Emissions	Average-Low Carbon Emissions
Ownership / Duration	Short Duration	A	B	C
	Long Duration	D	E	F

Replacement Scorecard

2018 Replacement Scorecard

Criteria	Description
Cost to Customer	<ul style="list-style-type: none"> • Impact to customer bills • Metric: 30-year NPV of revenue requirement (Base scenario deterministic results)
Cost Certainty	<ul style="list-style-type: none"> • Certainty that revenue requirement falls within the most likely range of distribution of outcomes (75% certainty that cost will be at or below this level) • Metric: 75th percentile of cost to customer
Cost Risk	<ul style="list-style-type: none"> • Risk of extreme, high-cost outcomes • Metric: 95th percentile of cost to customer
Fuel Security	<ul style="list-style-type: none"> • Power plants with reduced exposure to short-term fuel supply and/or deliverability issues (e.g., ability to store fuel on-site and/or requires no fuel) • Metric: Percentage of capacity sourced from resources other than natural gas (2025 installed capacity MW sourced from non-gas resources)
Environmental	<ul style="list-style-type: none"> • Annual carbon emissions from the generation portfolio • Metric: Total annual carbon emissions (2030 metric tons of carbon dioxide, or "CO₂") from the generation portfolio
Employees	<ul style="list-style-type: none"> • Net impact on NiSource jobs • Metric: Approximate number of permanent NiSource jobs added
Local Economy	<ul style="list-style-type: none"> • Property tax amount from entire portfolio • Metric: 30-year NPV of estimated modeled property taxes from the entire portfolio

Replacement Scorecard and Preferred Replacement Portfolio

- Replacement portfolios with renewables are more cost effective than portfolios without renewables
- Portfolio F is the preferred replacement portfolio for NIPSCO as it performs well across cost and risk metrics: Cost to Customer; Cost Certainty, and Cost Risk while lowering emissions and fuel security risk

	A	B	C	D	E	F
Ownership / Duration	Short Duration	Short Duration	Short Duration	Long Duration	Long Duration	Long Duration
Diversity:	Higher Carbon	Average Carbon	Average-Low Carbon	Higher Carbon	Average Carbon	Average-Low Carbon
Cost to Customer delta from least	\$12,985 \$1,222 10.4%	\$12,028 \$265 2.2%	\$11,769 \$6 0.1%	\$12,956 \$1,192 10.1%	\$12,121 \$357 3.0%	\$11,763 \$0 0.0%
Cost Certainty delta from least	\$13,360 \$1,477 12.4%	\$12,254 \$371 3.1%	\$12,007 \$124 1.0%	\$13,286 \$1,403 11.8%	\$12,245 \$362 3.0%	\$11,883 \$0 0.0%
Cost Risk delta from least	\$14,431 \$2,067 16.7%	\$12,922 \$558 4.5%	\$12,661 \$297 2.4%	\$14,284 \$1,920 15.5%	\$12,815 \$452 3.7%	\$12,364 \$0 0.0%
Fuel Security % non-gas capacity	45%	79%	86%	40%	72%	87%
Environmental 2030 CO ₂ emissions 2005 baseline = 18.2M	2.18M	0.97M	0.97M	3.13M	2.03M	0.97M
Employees	0	0	0	<30	<30	<30
Local Economy	Dependent on project selection and location; currently under evaluation					

Preferred Replacement Path

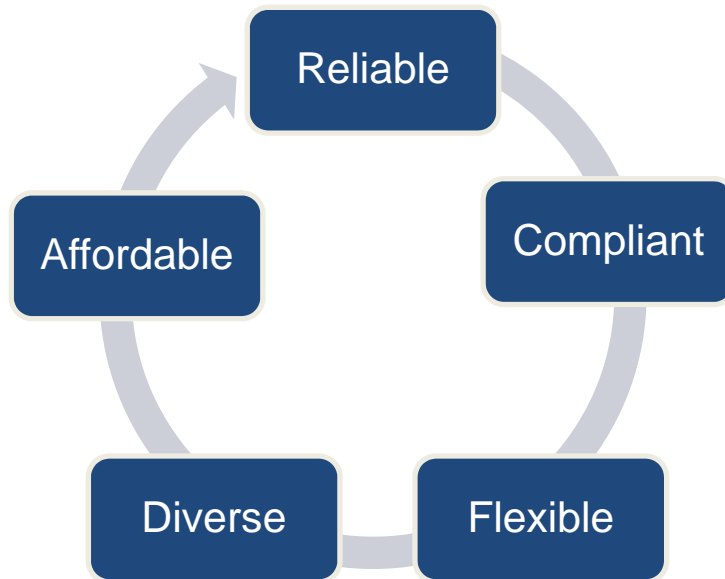
Lunch



Preferred Resource Plan

Dan Douglas
Vice President, Corporate Strategy & Development

NIPSCO Preferred Supply Portfolio Criteria



Requires careful planning and consideration for all of NIPSCO's stakeholders including the communities we serve and our employees

The IRP is an informative submission to the IURC; NIPSCO intends to remain engaged with interested stakeholders

Action Plan For Current Supply Resources

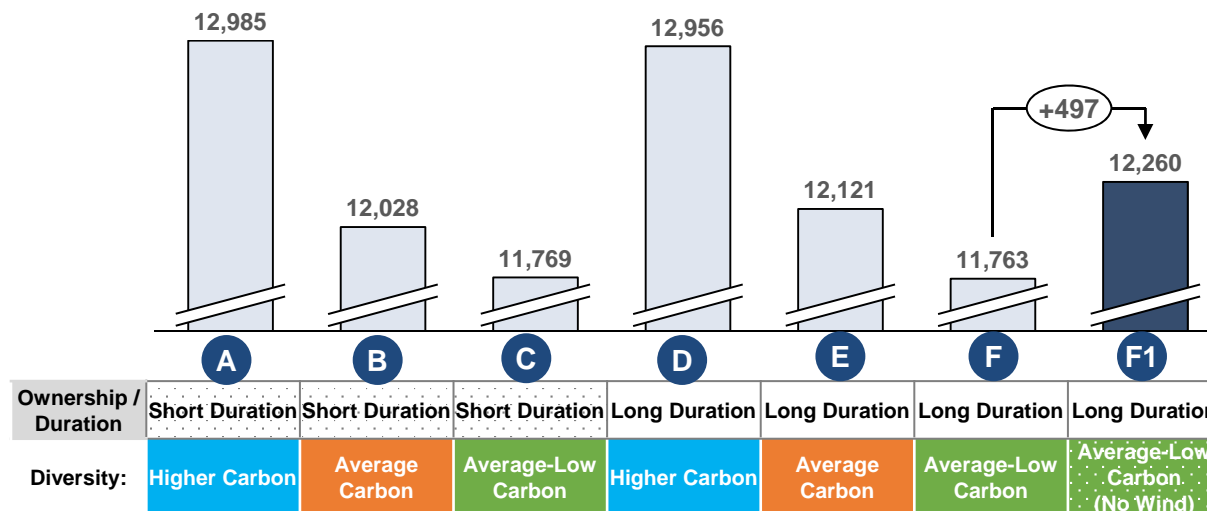
- **Retire all of NIPSCO's coal capacity by the end of 2028**
 - Pursue most viable path, consisting of the retirement of Schahfer 14,15,17,18 by the end of 2023 and Michigan City 12 by the end of 2028, subject to MISO and other considerations
- **Maintain current gas fueled generation**
- **Maintain current wind Purchase Power Agreements**
- **Implement filed 3 year Demand Side Management plan for 2019 to 2021**

NIPSCO Supply Resource Plan And Timing

Timing	Near Term 2018 – 2020	Mid Term 2021 – 2023	Long Term 2024 – 2037
NIPSCO Activity Description	<ul style="list-style-type: none"> Initiate retirement process of Schahfer Units 14,15,17,18 Identify and begin implementation of required reliability and transmission upgrades Select initial replacement projects identified from the 2018 RFP evaluation process, prioritizing resources that have expiring federal tax incentives to achieve customer savings Actively monitor technology and market trends and evolution 	<ul style="list-style-type: none"> Fully implement required reliability upgrades Actively monitor technology and market trends, and continue engagement with project developers and asset owners to understand landscape Conduct subsequent RFP to identify preferred resources to fill the remainder of the 2023 capacity need; procure replacement resources Implement Schahfer coal retirement with a focus on interests of customers, employees and local communities 	<ul style="list-style-type: none"> Monitor market and industry development and refine future IRPs
Retirements	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Schahfer Units 14/15/17/18 (2023) 	<ul style="list-style-type: none"> Michigan City Unit 12 (2028)
Expected Capacity Additions	~150-200MW (UCAP)	~1,100-1,150MW (UCAP)	~400MW (UCAP)
NIPSCO's Preferred Replacement Plan	<ul style="list-style-type: none"> Demand Side Management PPA / Market purchases Primarily Wind 	<ul style="list-style-type: none"> Demand Side Management Wind/Solar/Storage Market Purchases 	<ul style="list-style-type: none"> Demand Side Management Wind/Solar/Storage Market Purchases
Expected Regulatory Filings	<ul style="list-style-type: none"> Approvals for replacement capacity projects 	<ul style="list-style-type: none"> Approvals for replacement capacity projects DSM Plan for 2022- 2025 (file in late 2020) 	<ul style="list-style-type: none"> Approvals for replacement capacity projects

Procuring Wind In 2020 To Realize Tax Benefits Leads To Lower Customer Cost

- Indiana wind resources bid into the All-Source RFP are attractive replacement options that have increasing demand and are subject to near-term phase out of tax incentives
- NIPSCO would need to procure these wind resources in 2020 to realize Production Tax Credit benefits and lower customer cost
- What is the value of these wind resources (or alternatively, if we elect not to procure, what is the incremental cost)?
 - A new “No Wind” portfolio F1 was constructed from Portfolio F with no wind and instead relying on the next set of most attractive solar tranches
 - **Excluding wind would raise the 30-year NPV by about \$500 million**, resulting in a higher cost than the optimized wind/solar/CCGT option (Portfolio E)



- Portfolio F with no wind removes the lowest-cost energy resources (which tend to have an LCOE in the \$25-35/MWh nominal range) and replaces with slightly higher cost solar resources that produce far less energy
- The impact is that the “No Wind” portfolio relies much more heavily on market purchases over the forecast horizon (up to ~35-40% in 2030 versus ~15% when wind is in the portfolio)

2019 to 2021 DSM Plan Summary

Eleven Residential and five Commercial and Industrial (“C&I”) programs with a total 392,839 MWh Gross Energy Efficiency Goals over the three year period.

Residential Programs

- Heating, Ventilation and Air Conditioning Energy Efficient Equipment Rebates
- Residential Lighting
- Home Energy Assessment
- Appliance Recycling
- School Education
- Multifamily Direct Install
- Home Energy Report
- Residential New Construction
- HomeLife Energy Efficiency Calculator
- Employee Education
- Income Qualified Weatherization

C&I Programs

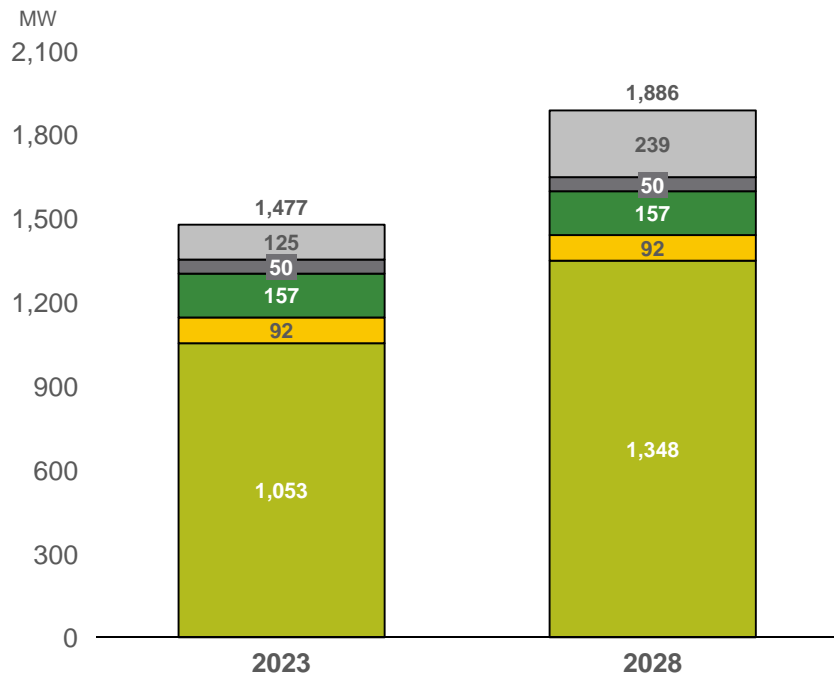
- Prescriptive
- Custom
- C&I New Construction
- Small Business Direct Install
- Retro Commissioning

2019 – 2021 NIPSCO Electric DSM Plan was approved by the IURC on September 12, 2018

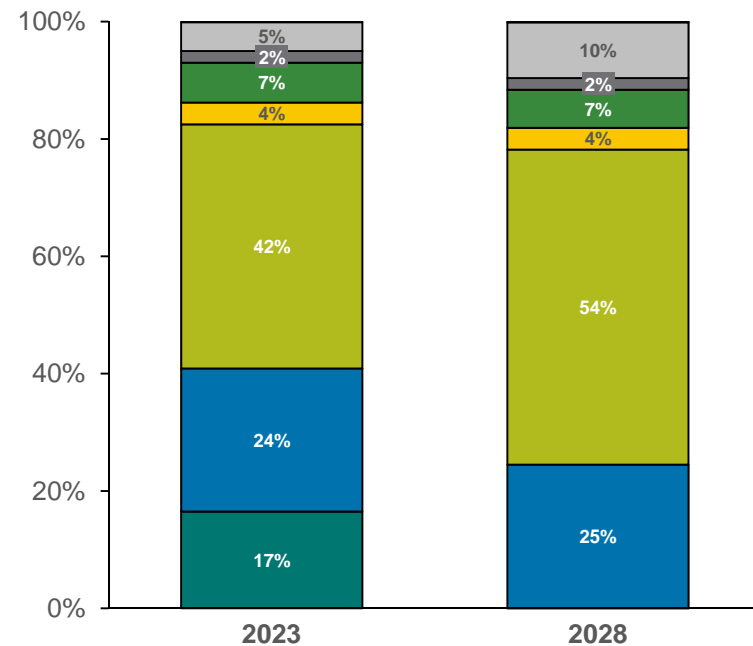
NIPSCO Cumulative Replacement Resource Mix

- By 2023, the IRP preferred plan calls for adding approximately 1,150 MW of solar and solar+ storage, 160 MW of wind, 125 MW of DSM and 50 MW of market purchases to the NIPSCO supply portfolio
- In 2028, an additional 300 MW of solar and 114 MW of DSM resources is expected to be added

Preferred Replacement Plan Cumulative Additions
(UCAP MW)



NIPSCO Supply Resource Mix



■ Coal
 ■ Solar
 ■ Wind
 ■ DSM
■ Gas
 ■ Solar + Storage
 ■ Market Purchase

Preferred Resource Plan

NIPSCO Preferred Plan

Short-Term (2019-2022)

- Initiate retirement of Schahfer Units 14,15,17,18
- Identify and implement required reliability and transmission upgrades resulting from retirement of the units
- Select replacement projects identified from the 2018 RFP evaluation process, prioritizing resources that have expiring federal tax incentives to achieve lowest customer cost
- File for Certificate(s) of Public Convenience and Necessity and other necessary approvals for selected replacement projects
- Procure short-term capacity as needed from the MISO market or through short-term PPA(s)
- Continue to actively monitor technology and MISO market trends, while staying engaged with project developers and asset owners to understand landscape
- Conduct a subsequent All-Source RFP to identify preferred resources to fill remainder of 2023 capacity need (likely renewables and storage)
- Continue implementation of filed DSM Plan for 2019 to 2021
- Comply with North American Electric Reliability Corporation, U.S. Environmental Protection Agency, and other regulations
- Continue planned investments in infrastructure modernization to maintain the safe and reliable delivery of energy services

Long-Term (2023+)

- Retire Schahfer Units 14,15,17,18 by the end of 2023 and Michigan City Unit 12 by the end of 2028
- Monitor market and industry evolution and refine future IRP plans

Stakeholder Presentations

Public Advisory Feedback/ Next Steps/ Wrap Up

Next Steps

IRP	RFP
<ul style="list-style-type: none">• Submit IRP by October 31st 2018• Meeting summary available November 2, 2018• NIPSCO IRP website: www.nipsco.com/irp• NIPSCO IRP email: nipsco_irp@nisource.com	<ul style="list-style-type: none">• Counterparty outreach indicating if NIPSCO is intending to move forward with their proposal in the fourth quarter of 2018• Begin commercial negotiations that aligns with IRP preferred plan• Future RFP event(s) – Given the number of potential transactions there will likely be a need for at least one additional RFP

Closing Remarks

**Violet Sistovar, President, NIPSCO and
Executive Vice President, NiSource**