

Indiana Michigan Power Company

# RESOURCE CONSIDERATIONS FOR HYPERSCALER CUSTOMERS

August 8, 2024

**INDIANA  
MICHIGAN  
POWER**

An **AEP** Company



# Welcome & Introductions

## I&M Leadership Team

David Lucas | Vice President, Regulatory and Finance  
Andrew Williamson | Director, Regulatory Services  
Stacie Gruca | Manager, Regulatory Services  
Austin DeNeff | Regulatory Consultant Senior

## 1898 & Co.

Brian Despard | Senior Project Manager

## I&M IRP Planning

Greg Soller | Manager, Resource Planning  
Dylan Drugan | Manager, Resource Planning

## I&M Infrastructure Development

Tim Gaul | Director, Regulated Infrastructure Development

## I&M Infrastructure Development

Nick Fisher | Managing Director, Engineering

# Agenda

Time (EST)	Agenda Topic	Lead
2:00-2:10	<b><u>Welcome &amp; Introductions</u></b> <ul style="list-style-type: none"> <li>Meeting Objectives</li> </ul>	Andrew Williamson
2:10-2:20	<b><u>Portfolio Performance Indicators</u></b>	Greg Soller
2:20-2:30	<b><u>Going-In Position Review (Capacity)</u></b>	Dylan Drugan
2:30-2:50	<b><u>Market Assessment of Existing and New Resources</u></b> <ul style="list-style-type: none"> <li>Queue Analysis Of New Resources</li> <li>Existing Market Resources Assessment</li> <li>Market Pricing Pressures</li> </ul>	Tim Gaul
2:50-3:10	<b><u>Technology Assumptions</u></b> <ul style="list-style-type: none"> <li>Proposed Modeling Parameters</li> <li>Advanced Technology Potential and Timing</li> </ul>	Dylan Drugan
3:10-3:20	<b><u>Scenarios and Sensitivities</u></b>	Dylan Drugan
3:20-4:00	<b><u>Open Discussion</u></b> <ul style="list-style-type: none"> <li>Feedback From HSL Customers</li> </ul>	Andrew Williamson

# Portfolio Performance Indicators

IURC Pillar	IRP Objective	Performance Indicator	Metric Description
Reliability	Maintain capacity reserve margin and the consideration of reliance on the market for the benefit of customers.	Energy Market Exposure – Purchases	Cost and volume exposure of market purchases (Costs and MWhs % of Internal Load) in 2033 and 2044
		Energy Market Exposure - Sales	Revenue and volume exposure of market sales (Revenues and MWhs % of Internal Load) in 2033 and 2044
		Planning Reserves	Target Reserve Margin
Affordability	Maintain focus on cost and risks to customers	Net Present Value Revenue Requirement (NPVRR) Levelized Rate (\$/MWh)	Portfolio 30yr NPVRR  Portfolio 30yr Levelized Rate (NPVRR/Levelized Energy)
		Near-Term Rate Impacts (CAGR)	7-year CAGR of Annual Rate
		Portfolio Resilience	Range of Portfolio NPVRR and associated Rate Impact (\$/MWh) (at reqd IRP Planning Period) costs dispatched across all Scenarios
Resiliency	Maintain diversity of resources and fleet dispatchability	Resource Diversity	Diversity Index inclusive of Capacity and Energy Diversity
		Fleet Resiliency	% Dispatchable Capacity of Company Peak Load
(Grid) Stability	Maintain fleet of flexible and dispatchable resources	Fleet Resiliency	% Dispatchable Capacity of Company Peak Load
Environmental Sustainability	Maintain focus on portfolio environmental sustainability benefits and compliance costs	Emissions Change	CO2, NOx, SO2 emissions change compared to 2005 levels
		Total Portfolio Costs (NPVRR)	Considered under Affordability Pillar above



# Preliminary PJM ELCC and FPR Forecasts

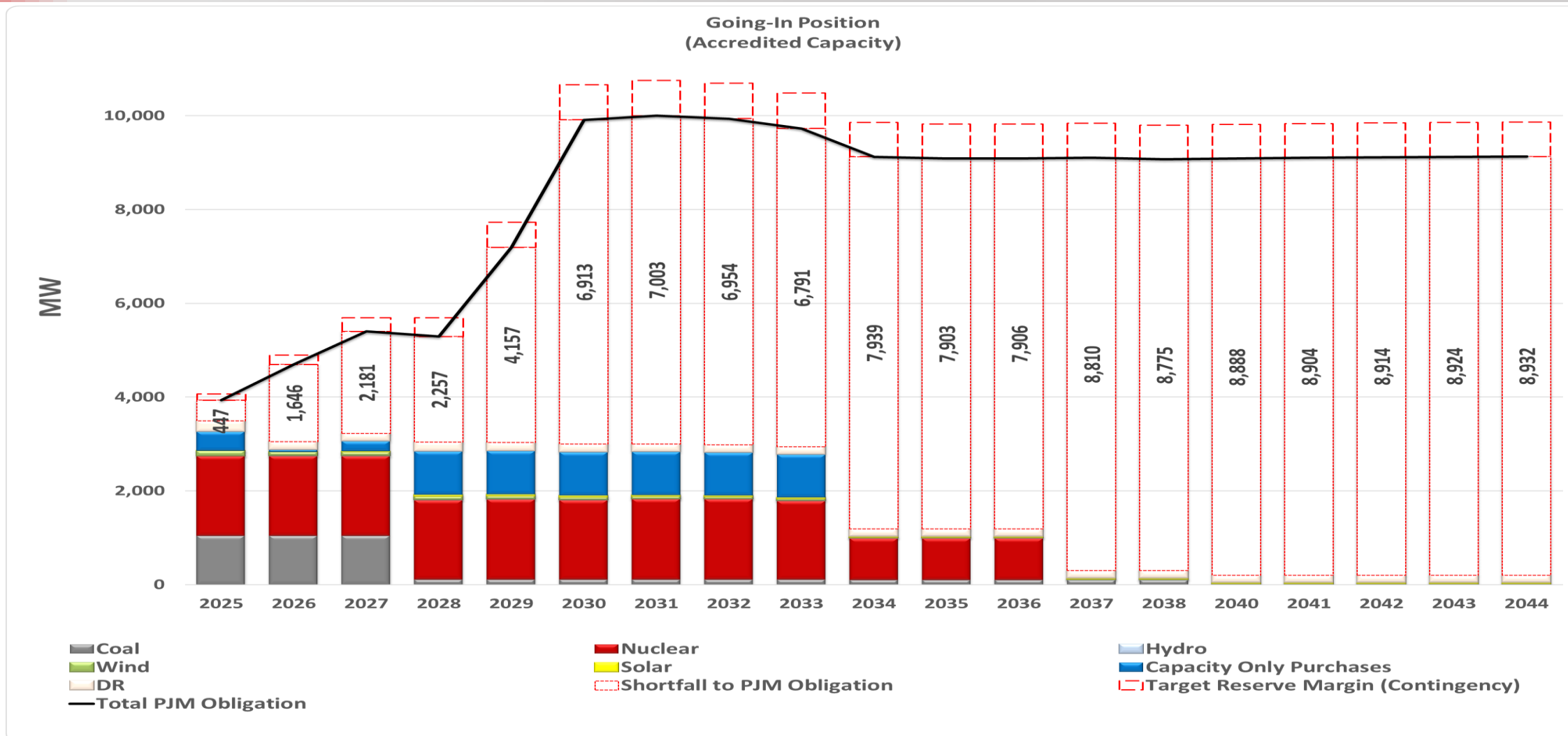
ELCC Class	2026/ 27	2027/ 28	2028/ 29	2029/ 30	2030/ 31	2031/ 32	2032/ 33	2033/ 34	2034/ 35
Onshore Wind	35%	33%	28%	25%	23%	21%	19%	17%	15%
Offshore Wind	61%	56%	47%	44%	38%	37%	33%	27%	20%
Fixed-Tilt Solar	7%	6%	5%	5%	4%	4%	4%	4%	3%
Tracking Solar	11%	8%	7%	7%	6%	5%	5%	5%	4%
Landfill Intermittent	54%	55%	55%	56%	56%	56%	56%	56%	54%
Hydro Intermittent	38%	40%	37%	37%	37%	37%	39%	38%	38%
4-hr Storage	56%	52%	55%	51%	49%	42%	42%	40%	38%
6-hr Storage	64%	61%	65%	61%	61%	54%	54%	53%	52%
8-hr Storage	67%	64%	67%	64%	65%	60%	60%	60%	60%
10-hr Storage	76%	73%	75%	72%	73%	68%	69%	70%	70%
Demand Resource	70%	66%	65%	63%	60%	56%	55%	53%	51%
Nuclear	95%	95%	95%	96%	95%	96%	96%	94%	93%
Coal	84%	84%	84%	85%	85%	86%	86%	83%	79%
Gas Combined Cycle	79%	80%	81%	83%	83%	85%	85%	84%	82%
Gas Combustion Turbine	61%	63%	66%	68%	70%	71%	74%	76%	78%
Gas Combustion Turbine Dual Fuel	79%	79%	80%	80%	81%	82%	83%	83%	83%
Diesel Utility	92%	92%	92%	92%	92%	93%	93%	93%	92%
Steam	74%	73%	74%	75%	74%	75%	76%	74%	73%

<https://www.pjm.com/-/media/planning/res-adeq/elcc/preliminary-elcc-class-ratings-for-period-2026-2027-through-2034-2035.ashx>

Delivery Year	Forecast Pool Requirement (% of Peak Load)
<b>2026/27</b>	93.67%
<b>2027/28</b>	92.69%
<b>2028/29</b>	92.75%
<b>2029/30</b>	93.47%
<b>2030/31</b>	92.96%
<b>2031/32</b>	92.72%
<b>2032/33</b>	92.10%
<b>2033/34</b>	89.99%
<b>2034/35</b>	87.09%

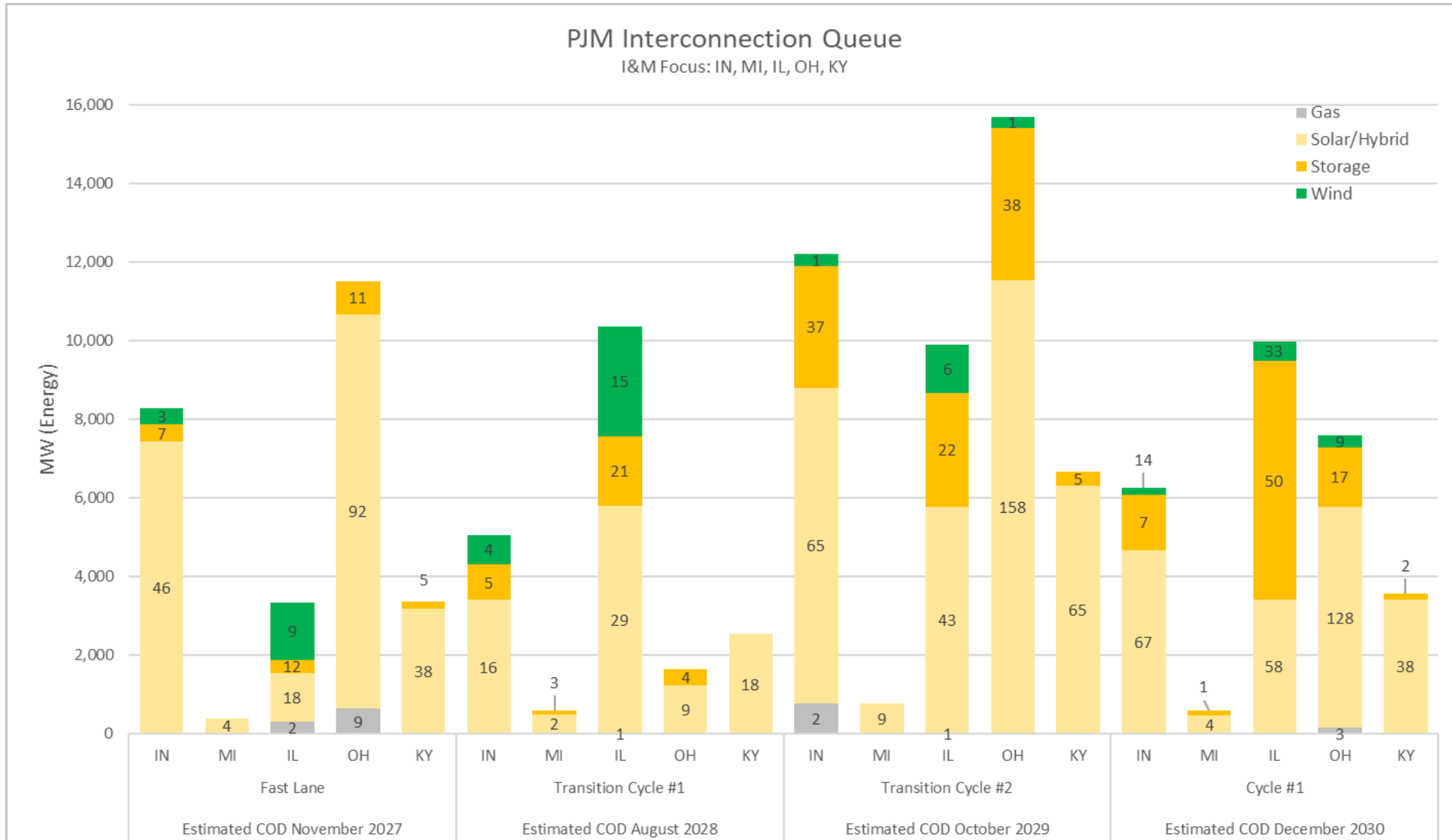
- I&M’s forecasted capacity need is influenced by the accredited capacity PJM recognizes for I&M’s resources (i.e., ELCC Class values) as well as by the load requirement PJM sets (i.e., the “FPR” or Forecast Pool Requirement).
- PJM’s forecasted decline in ELCC class values for resources such as wind, solar, and storage is offset, in part, by a lower forecasted peak load requirement (i.e., a lower FPR).

# Capacity Needs Assessment (Preliminary Going-In Position)



To reasonably capture contingency risk around future uncertainties such as changes to load obligations and available capacity, a probabilistic risk analysis is being performed to evaluate a 'Target Reserve Margin. The final Target Reserve Margin is still under development and is shown above for illustrative purposes.

# Resource Availability – IN, MI, IL, OH, KY



**NOTE: Stacked Bar Chart Labels Represent Project Counts**

# Proposed Resource Modeling Parameters

Resource Type	First Year Available	Nameplate Capacity (MW)	2025-2029 Cumulative Build Limit (MW)	2030 - 2045 Cumulative Build Limit (MW)	Overnight Cost Range <sup>1,2</sup> \$/kW
<b>Base Load</b>					
NUCLEAR SMALL MODULAR REACTOR	2036	600	0	4,800	\$11,400 - \$14,300
NEW NG COMBINED CYCLE <sup>3</sup>	2029	1,100	1,100	9,900	\$1,300 - \$2,100
NG COMBINED CYCLE, H- Class (Single Shaft) W/90% CO2 CAPTURE	2030	430	0	9,890	\$3,600 - \$4,500
EXISTING NG COMBINED CYCLE	2027	600	2,400	2,400	\$1,300
<b>Peaking</b>					
NG COMBUSTION TURBINE F CLASS	2029	240	1,920	4,800	\$1,100 - \$1,400
EXISTING NG COMBUSTION TURBINE	2027	500	2,000	2,000	\$500
COMBUSTION TURBINES AERODERIVATIVE	2029	100	300	1,200	\$1,800 - \$2,200
RECIPROCATING INTERNAL COMBUSTION ENGINES (RICE)	2029	20	100	400	\$2,800 - \$3,500
<b>Intermittent</b>					
BATTERY ENERGY STORAGE SYSTEM, 4hr	2027	50	1,000	4,000	\$1,700 - \$2,100
BATTERY ENERGY STORAGE SYSTEM, 6hr	2027	50	250	4,000	\$2,700 - \$3,300
BATTERY ENERGY STORAGE SYSTEM, 8hr	2027	50	100	4,000	\$3,300 - \$4,200
BATTERY ENERGY STORAGE SYSTEM, 10hr	2027	50	20	4,000	\$4,200 - \$5,200
BATTERY ENERGY STORAGE SYSTEM, 100hr	2029	20	20	1,000	\$2,700 - \$3,400
ONSHORE WIND	2029	150	1,050	4,950	\$2,400 - \$3,000
SOLAR	2027	150	4,050	4,950	\$1,800 - \$2,200
SOLAR WITH BATTERY SYTEM, 4hr	2027	150	1,050	4,950	\$2,400 - \$2,900
<b>Other</b>					
SHORT-TERM MARKET PURCHASE (1-Year Term)	2025	TBD, Under Development			
<b>Note 1: Costs represent nominal dollars in the first year that the resource is available.</b>					
<b>Note 2: Overnight cost ranges do not include any developer fees or AFUDC.</b>					
<b>Note 3: New NG CC assumptions reflect a blend of F-class, H-class, and single/multi shaft proxy units.</b>					

Assumptions shown above are preliminary and subject to further refinement and updates.



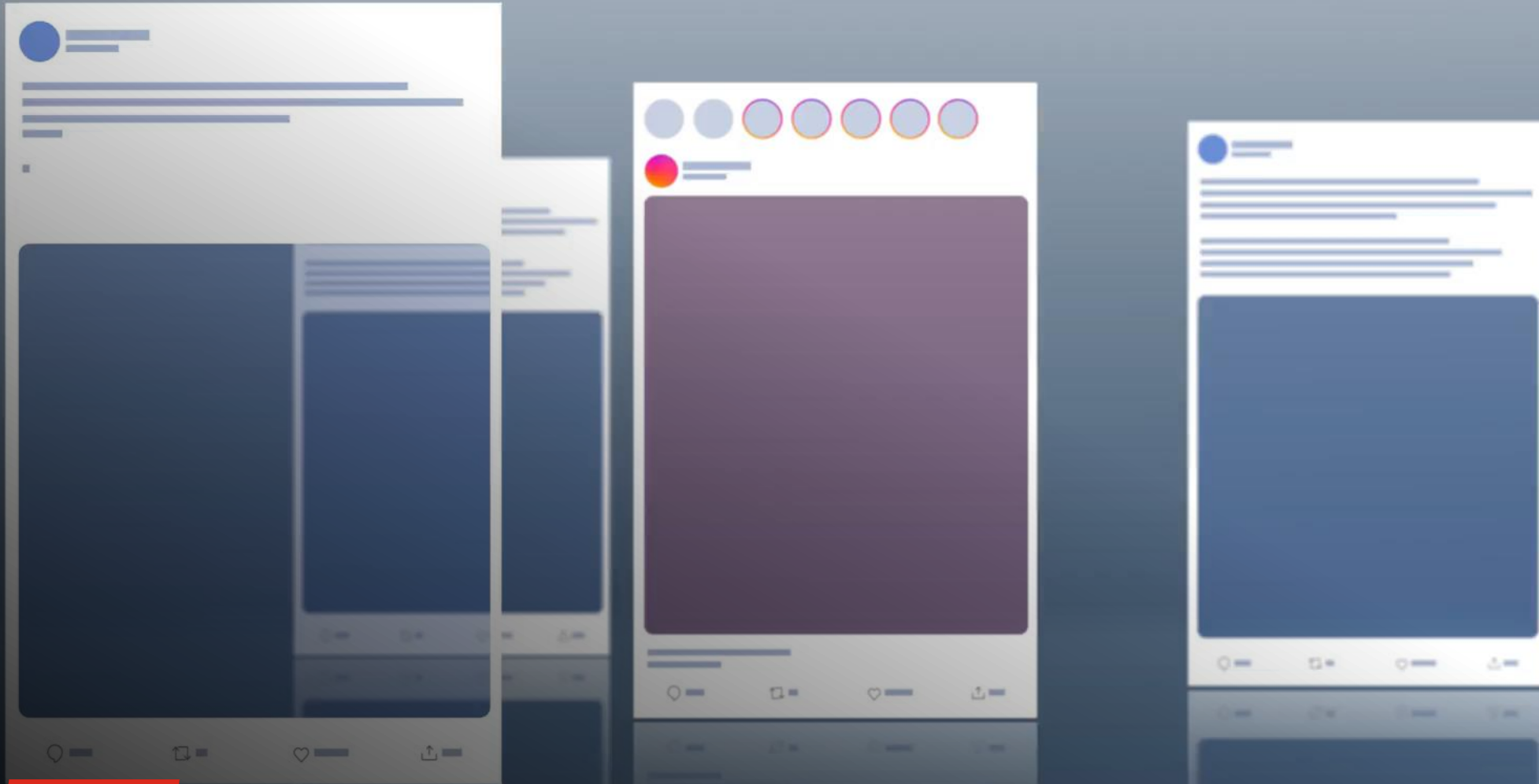
# Market Scenarios

Scenario	Load	Gas Price	Environmental Regulations
<b>Base</b>	Base	Base	Pre-EPA 111d 2023 Proposed Rules
<b>High Economic Growth</b>	High	High	
<b>Low Economic Growth</b>	Low	Low	
<b>Enhanced Environmental Regulations (EER)</b>	Base	Base	EPA 111d 2023 Proposed Rules

# Proposed Market Sensitivities

Sensitivities	Load	Gas Price	Environmental Regulations
Base under EPA 111d Requirements	Base	Base	EPA 111d 2024 Final Rules
Base with High IN Load	High	Base	Pre-EPA 111d 2023 Proposed Rules
Base with Low IN Load	Low	Base	
Rockport Unit 1 Retires 2025	Base	Base	
Rockport Unit 1 Retires 2026	Base	Base	
Exit OVEC ICPA in 2030	Base	Base	
High Technology Cost	Base	Base	

# Feedback and Discussion



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