2021 INTEGRATED RESOURCE PLAN UPDATE

to the:

Indiana Utility Regulatory Commission

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I&M 2021 Integrated Resource Plan Update

Executive Summary

Following the initial submission of Indiana Michigan Power Company's (I&M or Company) 2021 Integrated Resource Plan (IRP, Plan, or Report) on January 31, 2022, the Company is updating its 2021 IRP to reflect changes to its Preferred Portfolio (Modified Preferred Portfolio) and Short-Term Action Plan (Modified Short-Term Action Plan).

The Company's Modified Preferred Portfolio reduces I&M's natural gas peaker additions in its near-term plan and replaces the resource requirement with stand-alone storage resource additions. This modification supports further diversification of I&M's generation resources and sustainability benefits while maintaining similar affordability and reliability benefits for I&M's customers. Additionally, the Modified Preferred Portfolio is consistent with the 2021 IRP approved by the Michigan Public Service Commission (MPSC) in Case No. U-21189. Finally, the Modified Preferred Portfolio does not result in changes to resource additions beyond 2028 and the Modified Preferred Portfolio continues to maintain the optionality regarding the future operations of the Cook Nuclear Plant.

The Modified Preferred Portfolio reflects the following adjustments to the Preferred Portfolio:

- The gas peaker additions in 2028 were reduced from 1000 MW to 750 MW
- A series of 85 MW Stand-Alone Storage resources were added in 2026, 2027 and 2028 for a total of 255MW

The Modified Preferred Portfolio scorecard metrics were compared to the Preferred Portfolio scorecard metrics to estimate the impacts of the modifications and are shown in the updated Table 25R below. Table 25R is an update to Table 25 found on page 143 of the 2021 I&M IRP. Also of note is that the extended benefits from the Inflation Reduction Act (IRA) were not known at the time the 2021 IRP was conducted and therefore not reflected in the analysis. However, the addition of Stand-Alone Storage resources would be eligible for additional ITC credits which is expected to further benefit the Modified Preferred Portfolio cost and affordability metrics.

Table 25R. Modified Preferred Portfolio Scorecard Metrics

Portfolio	20-Year NPV CTSL	10-Year NPV CTSL	95th Percentile Value of NPV CTSL	Difference Btw. Mean & 95th Percentile	5 Year Net Rate Increase CAGR	Capital Investment Through	Percentage Reduction of CO2e	Purchases as a % of Load	Sales as a % of Load	Surplus Reserve Margin	Number of Unique Generators
					(2025-2029)	(2028)	(2005-2041)	(2021-2041)	(2021-2041)	(2041)	(2041)
PP	6.76	3.89	8.10	19.7%	1.40%	3.83	76.2%	7.20%	19.80%	4.7%	66
PP w/Storage	6.80	3.91	8.14	19.7%	1.60%	3.90	76.9%	7.29%	19.50%	3.4%	68

The following section updates, as itemized in Table 1, discuss the impacts to the Preferred Portfolio and the scorecard metrics of the Company's 2021 IRP.

Table 1. 2021 IRP Section Updates Reference

2021 IRP Section	2021 IRP Update Section
Executive Summary	IRP Update Executive Summary
Section 9.4	Section 1.2
Section 9.5	Section 1
Section 9.6	Section 1.1
Section 9.7	Section 1.2
Section 9.8	Section 1.3
Section 9.9	Section 1.4
Section 9.10	Section 1.5
Section 10	Section 2
Section 10.1	Section 2.1

Note: Section updates supplement discussions in the Company's 2021 IRP.

1 Description of the Modified Preferred Portfolio

Figure 54R illustrates I&M's UCAP capacity position for the Modified Preferred Portfolio that retains a similar level of capacity above the Company's minimum PJM capacity obligation in 2041. In addition to the existing resources, nameplate capacities of new supply-side resources in the Modified Preferred Portfolio include 1,600 MW of wind resources selected through 2038, 1,900 MW of stand-alone solar resources selected through 2041, the selection of hybrid paired solar + storage resources in 2027 of 60 MW storage / 300 MW Solar in 2027, 1,070 MW of Gas CC selected in 2037, 1,500 MW of Gas CT resources and 255 MW of Stand-Alone Storage resources through 2041. Demand Side Management (DSM) resources were not changed in the Modified Preferred Plan. Additionally, the Modified Preferred Portfolio only results in resource changes during the period 2026 through 2028 and continues to maintain the optionality regarding the future operations of the Cook Nuclear Plant.

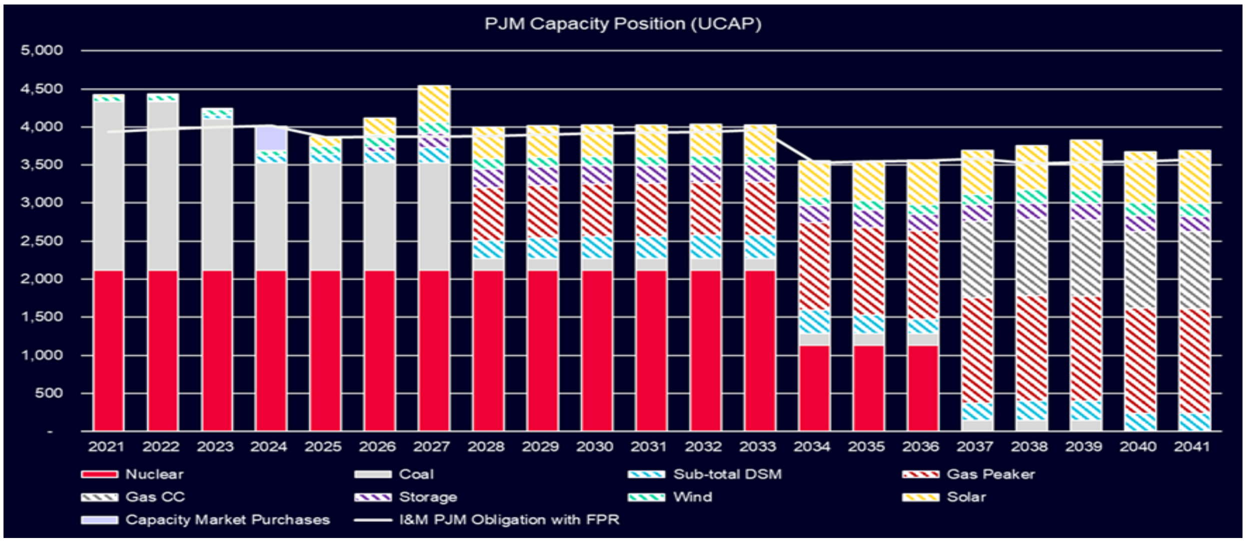

Figure 1R: I&M's Modified Preferred Portfolio PJM Capacity Position (MW-UCAP) New and Existing Resources

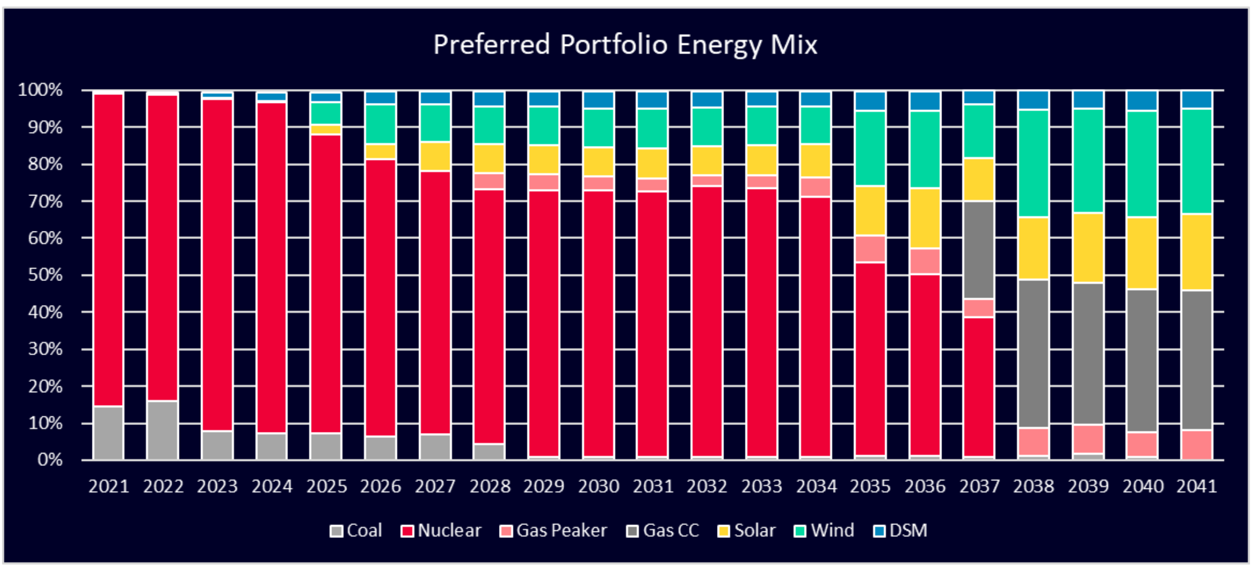

Figure 2R: Modified Preferred Portfolio Energy Mix

The forecasted energy mix by resource type contribution in the Modified Preferred Portfolio over the planning period is illustrated in Figure 55R. From an energy perspective, the reduction of the gas CT resource in 2028 results in a small reduction to the overall energy profile for the Company due to the limited amount of energy expected to be produced from this resource. The Modified Preferred Portfolio resources continue to include the addition of energy rich renewable resources and DSM resources that serve to mitigate future risks related to fuel price uncertainty and potential carbon emission prices. Additionally, the Modified Preferred Portfolio continues to include, with further resource diversification and sustainability benefits, incremental dispatchable generation resources to support resource adequacy and reliability during periods when renewable resources are not providing energy to meet the Company's load obligation.

The Modified Preferred Portfolio performs well across the range of metrics used in the Balanced Scorecard, retaining as well as enhancing the benefits I&M's resource plan is expected to bring to the Company's customers and Stakeholders, including:

1.1 Affordability

The Modified Preferred Portfolio remains as one of the least cost Portfolios with its Net Present Value Cost to Serve Load (NPVCTSL) being within 0.5% of the Preferred Portfolio and diversifies I&M's energy cost profile to support long-term customer affordability.

1.2 Rate Stability

The Modified Preferred Portfolio remains as one of the least cost Portfolios with the Capital Investment through 2028 increasing by less than 2% and the 5-year Compound Annual Growth Rate (CAGR) metric increasing by 0.2%. Additionally, the updates made to the Preferred Portfolio resulted in an upper boundary of cost risks (95th Percentile) to be within 0.5% of the Preferred Portfolio.

Table 26 in Section 9.4 on page 146 of the 2021 IRP has been updated to include the results of the Modified Preferred Plan. The updated results, provided in Table 26R, below show the forecasted impacts of each rate component on the metric in 2029. As shown on line 6, the Total Gross Revenue Requirement of the Modified Preferred Portfolio remains close to the Preferred Portfolio and significantly lower than the Reference' portfolio. The Modified Preferred Portfolio also continues to support managing the risk associated with higher levels of energy margins and market sales associated with the Reference' Portfolio. Additionally, the extended benefits from the Inflation Reduction Act (IRA) were not known at the time the 2021 IRP was conducted and therefore not reflected in this analysis. However, the addition of Stand-Alone Storage resources would be eligible for additional Investment Tax Credits (ITC) which is expected to further benefit the Modified Preferred Portfolio Net Cost of Service analysis.

Table 26R: Retail Rate Impact Comparison

		2029 Single year Cost of Service Components and Net CAGR components		
		Preferred Portfolio	Reference'	Modified Pref Port. w/Storage
Line				
	Ratemaking Revenue Requirement - 100% owned			
1	Pre-Tax Return on Rate Base	$249	$354	$250
2	Depreciation Expense	$118	$170	$139
3	Fixed O&M	$126	$169	$133
4	Subtotal, prior to PTC/ITC	$493	$693	$523
5	Less: Grossed Up PTC/ITC	($72)	($142)	($72)
6	Total Gross Revenue Requirement	$421	$552	$451
7	Less: Variable Energy Margin (Revenue-Fuel-VOM)	($269)	($409)	($266)
8	Net Cost of Service Impact	$151	$143	$185
9				
10	Year over year Gross COS change	($6)	($11)	($4)
11	Year over year Net COS change	($12)	($18)	($10)
12				
13		**5 Year CAGR end year 2029**		
14		Net	Net	Net
15	2020 Base Year Retail & FERC Revenues	$2,181	$2,181	$2,181
16	2029 Projection, New Resource Cost of Service	$151	$143	$185
17	Total 2029 Net Cost of Service	$2,332	$2,324	$2,366
18				
19	Gross / Net % Cumulative Increase over 2020 Base yea	6.9%	6.6%	8.5%
20	Net CAGR 2025-2029	1.40%	1.30%	1.60%
21				
22	2025-2028 Cumulative Capital Investment	3.83	5.52	3.90

1.3 Sustainability

The Sustainability objective is improved with the Modified Preferred Plan as a result of the removal of one of the gas peaker resources and the addition of carbon-free stand-alone storage resources.

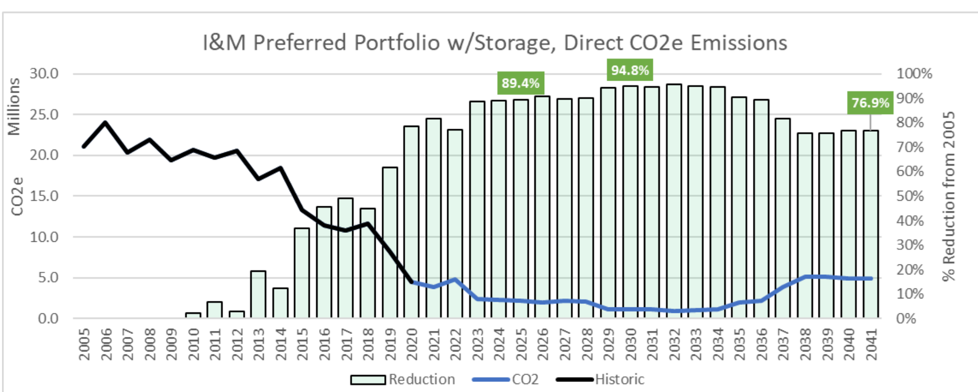

Figure 3R. I&M Modified Preferred Portfolio CO_2 Direct Emission

The Modified Preferred Portfolio retains the dramatic reductions of SO_2 and NOx emissions as illustrated in Figure 59R and further reduces NOx emissions by almost 8% compared to the Preferred Portfolio.

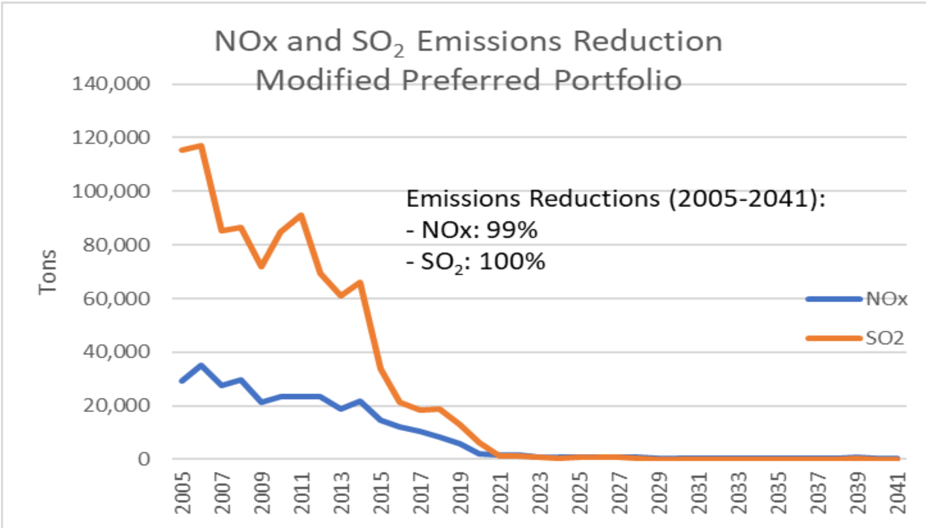

Figure 4R: I&M Modified Preferred Portfolio SO_2 and NOx Emissions Reductions

1.4 Market Risk Minimization

The Company expects the Modified Preferred Portfolio to continue to perform well in terms of energy market risk mitigation. The energy contribution in 2028 from the CT that was removed was approximate 1.1% of the total energy production of the Preferred Portfolio. The Company assumed a portion of the replacement energy would be purchased from the market and the amount of surplus energy available for off-system sales would be reduced. The estimated impact to market minimization metrics were less than 0.3%.

1.5 Reliability and Resource Diversity

The Modified Preferred Portfolio further increases resource diversity and maintains I&M's IRP Objectives associated with reliability. Specifically, the Modified Preferred Portfolio increases the Fuel and Technology Mix to account for up to nine fuel types, increases the number of unique generators and continues to result in surplus capacity above the PJM's Reserve Margin Obligation (2041). Additionally, the storage resource will complement the natural gas generation by providing the additional ability to store energy during low energy price periods and discharge during the higher load and higher energy price periods that serves to mitigate gas price risk. Storage also complements gas with its ability to be nearly instantaneously dispatchable when charged with negligible start up. Such storage also provides the opportunity to participate and provide value in the ancillary services market, including regulation and reserves, for the benefit of customers.

2 Short Term Action Plan Update

The Company's short term action plan was revised to adjust the All-Source RFP plans to reflect the resource targets under the Modified Preferred Portfolio. Specifically, the 2023 All-Source RFP reflected a 250 MW reduction to gas peaking resources and a 255 MW increase to storage resources.

2.1 Conclusion:

This Modified Preferred Portfolio incorporates modest changes to I&M's near-term resource plan that further improve I&M's Diversification and Sustainability metrics, and maintains customer and stakeholder benefits associated with Affordability, Rate Stability, Market Risk Minimization and Reliability.