



Indiana Michigan Power Company
2021 Integrated Resource Plan
Stakeholder Workshop #4 Meeting Minutes
November 30, 2021

1. Welcome and Safety Moment – Andrew

Jay kicked off the meeting at 9:30 and covered slides 3-4.

Jay kicked off the meeting and welcomed participants to the 2021 I&M Integrated Resource Plan (IRP) stakeholder workshop. Greg reviewed a safety moment for season lights safety.

Greg introduced Steve Baker, Steve introduced himself to stakeholders as he took over I&M President role in August 2021 and explains his role and involvement in IRP so far.

2. Meeting Guidelines – Jay Boggs, Siemens PTI

Jay covered slides 5-8

Jay introduced the Meeting Guidelines section and its content and established the role of Moderator for the Stakeholder Meeting.

Meeting guidelines and agenda were discussed.

Jay also provided an overview of the Questions and Feedback process, including directing stakeholders to submit comments and stay informed at the I&M IRP Website:

<http://www.indianamichiganpower.com/info/projects/IntegratedResourcePlan>.

In addition, stakeholders are encouraged to submit questions via email to I&MIRP@aep.com

3. Recap of Previous Meetings – Jay Boggs & Peter Berini, Siemens PTI

Peter covered slides 9

Peter reviews the general IRP 5 stage process that was used throughout the I&M IRP process. He goes into brief detail on each of the 5 steps in the approach which has been covered in deeper detail in previous stakeholder meetings:

- 1. Determine Objectives*
- 2. Identify Metrics*
- 3. Create Candidate Portfolios*
- 4. Analyze candidate portfolios*
 - a. Explains this involves stochastic analysis which will be covered further in next section by Mike*
- 5. Balanced Scorecard and Report*

Jay covered slide 10

Jay reviews the stakeholder timeline and engagement including working with stakeholders to create assumptions and key inputs over the last 6-8 months, pointing out that the I&M IRP process has had multiple stakeholder meetings and taken a lot of stakeholder inputs into account, showing the 4 previous meetings that have been completed since March 2021. Jay reviewed the topics that were covered at each individual stakeholder meeting, as shown in the slide.

4. Portfolio Analysis - Michael Korschek, Siemens PTI

Michael covers slides 12-23

Mike overviews the stochastic process which includes specifying the major market drivers that were varied in the stochastic analysis and emphasized the benefit of this including risk of the 95th percentile.

Mike goes over the balanced scorecard and describes the benefit of using the “mean” of the stochastic iteration’s vs using the “median” or “deterministic approach”. He then outlines the factors that are varied and the multiple drivers that would vary each specific factor (Ex. Load can vary in the future due to weather/EV/Solar DG, etc.).

Mike goes through the stochastic input graphs, points out how the range of uncertainty grows over time, as we have a better estimate what these factors will be in the short term but there is a much wider range of uncertainty out in 2041.

Feedback and Discussion Oral Questions:

John Decuman – “In regard to the stochastic modeling you mentioned 5 drivers, for 200 iterations was the model able to vary each driver or only 1 driver per iteration?” Mike responds that each iteration has a different path in each driver.

5. Balanced Scorecard, Art Holland, Siemens PTI

Art covered slides 26-33

Art reviews the latest version of the balanced scorecard, specifying that it has gone through various stages and incorporated stakeholder feedback. He goes into detail of each of the metrics under each of the 6 classifications (Affordability, Rate Stability, Sustainability, Market Risk Minimization, Reliability, Resource Diversity). He then goes into the various portfolio summaries.

Art reviewed and compared the various slides of populated scorecards, specifying important differences between the portfolios. He then goes into detail regarding the various portfolios, and which were maintained as viable portfolios/or refined and those that were just used as an informative portfolio.

Andrew covers the OVEC analysis slide.

Alex Vaughn goes into detail on the costs included with the OVEC analysis including the model capturing energy cost changes and an out of model calculation to take the capacity costs into consideration for the analysis as well.

6. Metrics Deep dive – Peter Berini, Siemens PTI

Peter covers slides 36-43

Peter opens discussion with plan to go into more detail around the various metrics that are being focused on in analyzing the list of “focused portfolios”. In the NPV CTSL, various costs taken into account including generation related costs. Specified the cook 2050+ portfolios came out with the lowest NPV for 20 year NPV but reminded all that cook license extension costs are not included. He

gives a brief overview of the box & whisker plot and how to interpret. Notes that reference prime has different selection of near term resources, giving the cheapest option.

For rate stability objective, primary objective is 95th percentile NPV CTSL and 5 year net rate increase CAGR.

Regarding sustainability goals, all portfolios surpass the 32% objective and most are very close (if not below) the 80% reduction goal by 2040. Cook portfolios are continuously low as a gas resource is not needed to replace cook capacity.

Peter reviews the spot market sales and purchases and the risk associated with some of the portfolios on energy balance, largely for cook portfolios as well as the scenario portfolios with high renewable generation.

Peter then puts it all together with the view of the fully populated scorecard with all focused portfolios.

ORAL Questions:

Emily: looking at 10 yr. NPV, would you consider any of those cases within the margin of error in your forecast? Andrew responds that he cannot give definitive answer, but that we do our best to capture that in stochastics.

Emily: how has supply chain problems affected some assumptions associated with deliverability of new technology. Andrew responds that they are aware of supply chain issues, and they will have to continuously evaluate going forward.

Art adds to Emily questions that uncertainty is integral part of the decision-making process with resource planning and that is why we spend so much time on stochastics inputs as well as the percentile bands.

Anna Sommer: are these overnight costs? Jim responds that yes these are just day 1 spend.

Anna Sommer: do these costs include any profit component? Jim responds that yes, all components are in there.

Feedback and Discussion:

7. Path to Preferred Portfolio – I&M Management

I&M Covered slides 46-50

Dave Lucas kicks off the preferred portfolio discussion. Dave echoes comments expressing appreciation for the stakeholder engagement, all engagement has been integral to determining the preferred path. Reinforces that no decisions have been made regarding Cook extensions and that no analysis has been started on looking at the cost associated with the Cook extensions. A key consideration in the development of I&M's preferred plan is to keep optionality around the Cook extensions once the necessary studies have been performed. When considering Cook optionality, we took into consideration feedback from previous stakeholder meetings regarding the level of spot market sales in the portfolios that modeled Cook extensions and the risk associated with those sales.

To maintain future optionality at Cook and address the long term energy position, I&M set up the preferred portfolio in a way that allows short term resource decisions to be made while maintaining the Cook extension as a viable option in the future.

Dave goes into specific detail around preferred portfolio adjustments, including the reduction of early year renewable build to allow I&M to make significant progress in I&M's generation transition plan, yet still allow the flexibility for the option to extend Cook when the time comes. In the preferred plan, gas resource additions all consolidated into 2028. I&M recognizes there will be further analysis in adding these gas resources but given current assumptions and weighing options around Cook and future market exposure, I&M feels that some level of gas resources will likely be necessary to replace Rockport. Long term renewable additions will be re-evaluated in the future as those are currently assumptions that are replacements of Cook energy/capacity.

Dave reviews the scorecard metrics for the preferred portfolio along with other focused portfolios for comparison and then turns it over to Art to go into further detail of these metrics.

8. Preferred Portfolio – Art Holland

Art Covered slides 52-57

Art goes into greater detail on the cumulative additions in the preferred portfolio graph on an annual basis.

9. Closing Remarks, Andrew Williamson

Andrew concluded the meeting expressing thanks on behalf of the I&M leadership for the active participation in today's meeting. Andrew gives next steps about filing IRP.

10. Appendix A: List of Questions Answered on Call

List of questions addressed on the call:

Question Asked	Answer Given
The battery forecasts that you show are based on what hour duration?	As answered by Mike Korschek
It does not make sense to me that the reference prime case would have a lower NPVRR if all you are doing is removing the i/o limit. could you give some thoughts on this?	As answered by Art Holland
Could you give a description of the difference between NPVCTSL and NPVRR as that term is commonly used, if any?	As answered by Peter B
Did you assume any penalty or other opt-out cost for OVEC?	As answered by Alex V (AEP)
Have you calculated an estimate of the capital costs (the capital costs that you have not included in the Cook portfolios)related to relicensing Cook the last time (in present	As answered by Andrew

dollars)? I realize these costs are yet to be estimated, but just to give some sense of these costs.	
Using average annual purchases as a measure of risk would seem to potentially mask issues with "stressed" hours during which I&M might be relying on purchases at the same time that other utilities will also be expecting to rely on imports. Have you looked at that? Any thoughts on your ability to look at that using your modeling of resource expansion for neighboring/PJM/MISO utilities?	As answered by Art and Peter
Are you expecting to be able to give more consideration to the 2028 gas expansion as part of your next IRP?	As answered by Dave Lucas
Do the generation related O&M and fuel costs for natural gas combustion turbines include the additional maintenance and fuel consumption costs associated with unit start-up and cycling?	As answered by Peter B
Do all portfolios include the continued operation of the OVEC units? Are you doing any new portfolios in light of the recent decision from the MI commission?	As answered by Andrew and further commented by Alex Vaughan (AEP)
Did you assume customers would be have to pay all the ICPA costs in these scenarios?	As answered by Andrew
Has I&M had any conversations with the co-owners about amending the ICPA?	As answered by Andrew
Have you considered retirement as a compliance method with CCR/ELGs?	As answered by Andrew
I know that you evaluated 2030 but that would include the CCR/ELG costs. Did you look at whether it was better for ratepayers to retire and not incur those costs?	As answered by Andrew
Please remind us what you assumed about the relicensing/continuation or retirement of your hydro plants.	As answered by Peter Berini
Please explain whether the OVEC analyses assume the continuation or discontinuation of the Ohio SB 6 subsidies to OVEC	As answered by Alex V (AEP)
To confirm, IMP unlike DEI is not going to attempt to determine a rate impact using traditional rate-making methodology as opposed to using revenue requirements of levelized cost?	As answered by Andrew, we will address is more detail later in today's presentation
Please explain how sunk costs are included in the economic analysis?	As answered by Andrew, we will address is more detail later in today's presentation
Please define CTSL	Cost to Serve Load. See Footnote #2.

Is it based upon revenue requirements of levelized costs? Does it include costs related to retired plants that have not been fully depreciated?	As answered by Art
How about revenue requirements of levelized costs?	We will address in the metric deep dive section.
How were the proposed changes at Rockport 2 considered?	As answered by Peter B and Andrew W
Just wondering how the market changes in 2021 resulted into any changes in assumptions. Not sure if this is the right to raise.	As answered by Andrew
To ask again, is it levelized costs or costs based upon the undepreciated capital.	Invited Emily To come off mute and further refine questions for Art, Peter, Andrew and the team responded to.
And no residual costs related to plant retirements.	As answered by Andrew - if further clarification is needed, please raise your hand - thank you
Just confirming upstream emissions are not included for gas	As answered by Art
Mike, could you talk about how changes in peak and average load in Aurora relate to changes in energy?	As answered by Mike. Please raise hand at the end of the session if you would like to follow up on the topic. Thank you!
In Siemens' view, what is the impact of stochastically varying capital costs just for areas outside of I&M's service territory on the costs experienced by I&M customers?	As answered by Michael Korschek
And CTSL is net of sales and purchases?	We will address in the metric deep dive section.
On the reserve margin metric, I think you mean over and above the Forecast Pool Requirement (not Reserve) right? But doesn't that include the reserve margin requirement? So that metric isn't really the reserve margin but the capacity in excess of the coincident peak load + reserve margin, right? Can you change the name of that metric to reflect that?	As Answered by Art. Will consider a revision to the name of the metric. Thank you.
I'm disappointed that you didn't advance one of the N2G portfolios given how important the modeling of EE is to CAC.	Comments provided by Greg Soller
Did you consider limiting sales in some of these of focused portfolios to get a better indication of NPV?	As answered by Art
Did I mishear what Peter said? The Cook life extension portfolios don't assume any additional cost (over current costs?) for life extension? So why do they "provide valuable strategic insights into...cost estimates for the asset life extension"?	As answered by Andrew
Are the dispatch costs of these portfolios based on Zonal or LTCE runs?	As answered by Peter B

<p>Does the capital investment metric refer just to investment for new resources that will be capitalized or does it refer to any capitalized costs including maintenance or does it refer to any costs for new resources whether capitalized or not (but not maintenance) or does it mean something else entirely?</p>	<p>As answered by Andrew and Jim</p>
<p>Given that 2025 is three years out are you intending to start the all-source RFP process soon because you would consider advancing the online date for new capacity? Or is there some other factor at play?</p>	<p>As answered by Dave Lucas</p>
<p>This spot sales graph is really helpful because it shows much higher the average sales are in the years prior to the one - 2041 - that is reported in the scorecard. In at least one other IRP you've reported sales over most of the planning period instead of in one year, would you consider doing that here too?</p>	<p>As answered by Art and Greg</p>