I&M 2015 IRP Public Summary

Indiana Michigan Power Company (I&M or Company) serves 586,000 customers in Indiana and Michigan, including 458,000 in eastern and north central Indiana. I&M also sells and transmits power at wholesale to other electric utilities, municipalities, electric cooperatives, and non-utility entities engaged in the wholesale power market. The Company is headquartered in Fort Wayne, Indiana with external affairs offices in Indianapolis, Indiana and Lansing, Michigan.

Figure 1. I&M Service Territory and Major Generating Facilities

I&M maintains over 5,300 miles of transmission lines, including 615 miles of highly efficient 765 kV lines – part of the extensive American Electric Power (AEP) network considered by many to be the backbone of the eastern U.S. transmission grid. I&M also operates
over 20,000 miles of distribution lines and approximately 5,000 megawatts (MW)\(^1\) of generating capacity. I&M operates a two unit coal-fired generation plant, Rockport; Michigan’s largest nuclear facility, Cook Plant; and six hydroelectric generating stations along the St. Joseph River – two in Indiana and four in Michigan. The Company also purchases wind energy from the Fowler Ridge, Headwaters, and Wildcat wind farms, and is entitled to purchase energy from the Clifty Creek and Kyger Creek coal plants. I&M’s large-scale pilot solar power project is currently underway at four separate locations throughout the I&M service territory – two projects in St. Joseph’s county, Indiana, one in Grant County, Indiana, and one in Berrien County, Michigan. These locations will provide a total of 15 MW of nameplate capacity solar power when placed into service over the next year.

I&M’s energy and peak load requirements are expected to grow at a compound annual growth rate (CAGR) of 0.1% and 0.2%, respectively, through 2035. I&M (in cooperation with its AEP affiliates Appalachian Power and Kentucky Power) is required to maintain an adequate reserve margin to satisfy its load obligation as a member of the PJM regional transmission organization. To meet its future capacity and energy requirements, I&M solicited input from stakeholders to develop several resource portfolio alternatives for further evaluation.

Figure 2 shows the projected capacity requirements of I&M compared to the available resources, assuming no resource additions. While this starting point assumes that no additional investment is made in new generating resources, I&M’s existing resources would continue operation. The license to operate Cook Unit 1 expires near the end of 2034 which explains the reduction in capacity in 2035.

To determine the appropriate resources required to meet its future capacity need, I&M used a sophisticated optimization model to develop a “least-cost” resource plan. The greatest variables in I&M’s planning process involve decisions regarding Rockport Unit 2, which is leased through 2022, and potential installation of Flue Gas Desulfurization (FGD) equipment on both of the Rockport units. Accordingly, I&M also evaluated cases which removed one or both Rockport units from its resource portfolio. I&M used the results of the modeling to develop a

\(^1\) Includes AEP Generating Company’s (AEG) 50% share of Rockport Plant (1,310 MW).
“Preferred Portfolio”.

Figure 2. I&M Capacity Position Assuming No Capacity Additions

Planning Assumptions

The selection of a resource plan is dependent on a variety of input assumptions. In addition to the rate of growth in customer load, these input assumptions include the future cost of:

- Natural gas;
- Coal, by region;
- Energy – peak and off-peak;
- Capacity purchased on the open market;
- Constructing or retrofitting new generation facilities; and
- Various forms of renewable energy

Assumptions regarding the nature of future environmental regulations play an important role in developing these cost projections, as regulations will often affect supply and demand of various generating technologies and commodity prices. For example, in keeping with the U.S. EPA’s recently published Clean Power Plan, I&M assumed that there will be a cost associated with emitting CO₂ beginning in 2022. This cost will result in coal generation across the country being partially replaced with natural gas fired generation resulting in higher off-peak energy prices (as coal generation normally sets the off-peak price). It may also result in the retirement of
more coal plants as they will be less economical to operate, which will result in increased demand for natural gas.

Another important assumption concerns how quickly Energy Efficiency (EE) and Demand Response (DR) measures are adopted by I&M’s customers. While I&M can offer programs to incent the adoption of such programs, ultimately customers must participate in these programs to achieve demand and energy reductions. The Company also made assumptions as to customer behavior with regard to installation of solar panels on their homes or businesses. As the cost of these panels continue to decline, I&M expects to see increasing numbers of customers installing these devices.

**I&M’s Preferred Portfolio**

- Maintains I&M’s two units at Rockport Plant, including the addition of Selective Catalytic Reduction (SCR) systems in 2017 and 2019; as well as FGD systems in 2025 and 2028
- Continues operation of I&M’s carbon free nuclear plant through, minimally, its current license extension period
- Add 600MW (nameplate) of large-scale solar resources
- Add 1,350MW (nameplate) of wind resources
- Adds 1,253MW of Natural Gas Combined Cycle (NGCC) generation in 2035
- Implements end-use EE programs so as to reduce energy requirements by 914GWh and capacity requirements by 70MW in 2035
- Adds 27MW of natural gas Combined Heat and Power (CHP) generation
- Recognizes additional distributed solar capacity will be added by I&M’s customers, starting in 2016, and ramping up to 5MW (nameplate) by 2035

**Indiana IRP Stakeholder Process**

This is the second I&M IRP to be developed under the Commission’s proposed IRP rule and is the result of analyses performed by I&M that includes consideration of stakeholder input. I&M initiated a stakeholder public advisory process in February 2015 in order to provide an
opportunity for public participation in the IRP development process. I&M provided electronic notice and invitations to participate in the stakeholder process to the Indiana Utility Regulatory Commission (IURC) Staff, the Office of Utility Consumer Counselor, the interveners in I&M’s most recent general rate case in Indiana and stakeholders that participated in I&M’s 2013 IRP public advisory process. I&M also provided invitations to participate to its thirty largest commercial and industrial customers. I&M established an IRP webpage on its website to allow customers, stakeholders and interested persons to participate or follow the IRP public advisory process. The IRP webpage provided stakeholders with the 2013 IRP, 2015 registration information, meeting documents and agendas.

Stakeholders were presented information at Stakeholder meetings in March and June of 2015 and, based on those sessions, provided useful feedback which has been considered and incorporated in the analysis, where warranted. The feedback included suggestions such as modeling of the following: additional Combined Heat and Power (CHP) resources, removing constraints on solar and wind additions, lowering solar cost options by extending the Investment Tax Credit (ITC), adding a carbon free portfolio model run, modeling extreme weather events, and evaluating the closing of existing fossil-fuel resources earlier than their estimated useful life. This feedback was used by I&M to modify the suite of cases that were analyzed. I&M addressed additional stakeholder comments pertaining to EE, CO₂ cost estimates, load assumptions, Distributed Generation (DG) assumptions and provided general transparency to its assumptions and modeling EE programs on the same basis as supply resources. In addition, stakeholders and Staff filed comments on I&M’s previous IRP report issued in November 2013. I&M considered all stakeholder input collected throughout the process.

Summary of the I&M Resource Plan

An IRP explains how, at this point in time, a utility company anticipates meeting the projected capacity (i.e., peak demand) and energy requirements of its customers. By Indiana rule, I&M is required to provide an IRP that encompasses a 20-year forecast period (2016-2035).

Specific I&M capacity and energy decisions and their relative impacts to I&M’s capacity and energy positions are shown on the following figures. For I&M this includes the addition of environmental controls on the Rockport Plant, the addition of solar, wind and CHP resources...
beginning in 2020, and the continued implementation of EE and DR initiatives. Figure 2 illustrates the importance of solar, CHP, Demand Response and EE to I&M, the levels for which are largely established through I&M’s optimization modeling. Figure 3 illustrates I&M’s annual capacity position with respect to the Company’s load obligation factoring in PJM’s capacity margin requirement, after incorporation of the Preferred Portfolio. Due to its intermittent nature, as well as the emerging PJM rules, the ultimate capacity contribution from renewable resources is assumed to be fairly modest. However, such renewable resources can contribute a significant volume of energy resources, I&M’s optimization modeling selected these wind and solar resources because they were projected to add more relative value (i.e., lowered I&M’s net energy cost) than alternative resources examined, including the purchase of energy from the PJM market.

Figure 4 and Figure 5 show I&M’s energy output attributable to coal-based assets decreases from 40% to 33%; while nuclear generation shows a decrease from 53% to 38% over the period. Likewise, in addition to energy from new NGCC (15%), renewable energy would be anticipated to increase from 6% to 13% over the planning period.
This 2015 I&M IRP provides for reliable electric utility service, at reasonable cost, through a combination of existing resources, renewable energy and demand-side programs. I&M will provide for adequate capacity resources to serve its customers' peak demand and required PJM reserve margin needs throughout the forecast period.

The following Table 1 provides a detailed summary of the Preferred Portfolio resource optimization modeling developed by I&M with stakeholder input:
Table 1. Preferred Portfolio Cumulative Capacity Additions over Planning Period (2016-2035)

<table>
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<tr>
<th>Year</th>
<th>New-Build</th>
<th>Energy Efficiency (EE)</th>
<th>EECO</th>
<th>DR</th>
<th>Solar</th>
<th>(Cumulative) NET RESOURCE CHANGE</th>
<th>R&amp;M Reserve</th>
<th>P/M Reserve Margin %</th>
<th>Total Reserve</th>
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**Notes:**
- R&M Planning year is effective 6/24/XXX.
- R&M Reserve, P/M Reserve, and total reserve are calculated for capacity resource determination purposes.
- **NR** No reserves required.
- **R&M** R&M reserve.
- **P/M** P/M reserve.
- **R&M** and **P/M** reserve programs are also reflected in the company's long-term load and demand forecast.
- Due to the intermingling of solar resources, utility, and distributed solar, reserve is a 5% of nameplate rating for capacity resource determination purposes.

**Total Energy Efficiency (2016-2035):** 300