

**OUCG COMMENTS ON
2019 INTEGRATED RESOURCE PLAN OF
INDIANAPOLIS POWER & LIGHT COMPANY**

A. INTRODUCTION

In addition to standard IRP stakeholder meetings, the OUCG appreciates the opportunity to participate in separate technical meetings. Additionally, we appreciate IPL posting data files in Kiteworks as the data became available, the responsiveness to questions the OUCG asked, and the presence of an independent facilitator during IRP stakeholder meetings. However, the ultimate modeling decisions and choice of preferred resource plan ("PRP") are IPL's and not stakeholders. Finally, IPL has made some progress responding to criticisms from the 2016 IRP Director's report.

The OUCG Comments address the following areas of concern: Modeling, Environmental, Battery Energy Storage System ("BESS"), Avoided Transmission and Distribution ("T&D") Capacity Costs, and Petersburg Units 1 & 2: Early Retirements vs. Gas Conversions.

B. MODELING

While the OUCG made a good faith effort to evaluate IPL's IRP modeling, in preparing these comments it should be noted that such modeling is complex and not every modeling aspect was evaluated. Therefore, these comments represent the OUCG's best judgment based on information available at this time.

Comments:

IPL's 2019 preferred resource plan is a significant departure from its 2016 plan.

IPL's 2016 plan had no early coal facility retirements. In sharp contrast, IPL's 2019 PRP has Petersburg Units 1 and 2 shutting down approximately ten years earlier than IPL planned just three years ago. Such a major shift in a short timeframe makes the OUCG wonder whether such major shifts will occur again, possibly rendering IPL's 2019 IRP PRP uneconomical when IPL submits its next triennial IRP.

It is unclear from IPL's IRP why a major shift in its PRP occurred so suddenly.

The difficulty in seeing reasons behind the sudden major shift in IPL's PRP is due, at least in part, to its 2016 IRP not clearly separating "scenarios" from "portfolios," something IPL modified in its 2019 IRP based on changes discussed in the 2016 Director's Report.

It would be helpful for IPL to devote a significant section of its 2019 IRP to identifying and explaining the changes in economic assumptions and/or modeling approaches that led to the significant changes in its 2019 PRP. While the improvements in IPL's modeling since 2016 likely improved its 2019 analysis, a comparative analysis of these two consecutive IRP PRPs would provide needed clarification for the sudden direction change since IPL's last IRP. Given the

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irreversible nature of a decision to retire units early, transparency is important regarding the reasonableness and accuracy of IPL's IRP modeling inputs and results.

IPL has a historical record of over-forecasting demand and energy sales.

If IPL's over-forecasting trend continues in its 2019 IRP, it would cause IPL to build too much new capacity, thereby causing utility rates to be unreasonably high. Figures 4.28 and 4.29 in IPL's IRP show consistently high demand and energy sales forecasts for many years.

Attached Figures OUCC-1, OUCC-2, OUCC-3, and OUCC-4 show a nearly unbroken string of reductions in IPL's actual demand and energy sales over the past decade, while also showing a nearly unbroken string of forecasted increases in demand and energy sales over the next two decades. Attached Figures show in almost every year over the past decade IPL forecasted growth in demand and energy sales in each subsequent 5-year period, but demand and energy sales actually declined in each of those 5-year periods. The most recent forecast (2017) for which we have weather-adjusted actual data is the only forecast predicting a reduction in energy sales (although that year's forecast predicted growth in demand for 2018). To summarize, IPL has almost exclusively forecasted growth in weather-adjusted demand and energy sales, but has consistently experienced reductions in weather-adjusted demand and energy sales. While energy efficiency measures - especially LED light bulbs - have grown in penetration over the past decade, it is unclear why expectations for such growth were not incorporated into IPL's IRP modeling process to improve the subsequent demand and energy sales forecast accuracy.

IPL has not provided any analysis to show or explained why its past projections have consistently over-forecasted these variables. IPL should perform a critical analysis of its forecasting methodology before making decisions about future capital investment or retiring its generating plants early. Another issue the OUCC identified in evaluating IPL's load forecasting model is an unrealistically high level of expected real income growth in its service territory over the next 20 years. IPL's forecast predicts Marion County's average real annual income will grow by 2% every year for the next 20 years.¹ This is more than double the growth seen by the 90th percentile of income earners in the U.S. from 1979 to 2018.² All else being equal, income growth increases electricity sales. IPL's high expectation for growth in real income may partially explain IPL's historical tendency to over-forecast sales. IPL should evaluate this issue as part of its comprehensive forecasting methodology review.

There are potential issues with IPL's expansion plan modeling the OUCC has not resolved from the information IPL provided in its IRP and related workpapers.

The OUCC is concerned with the high level of forced outage rates modeled for Petersburg Unit 2. We have the same concern, to a lesser extent, with Petersburg Unit 3. The OUCC asked

¹ Page 36 of Volume 1 mistakenly presents the income growth rate as 0.8%. PDF page 56 of Volume 2 correctly states an income growth rate of 2%. The OUCC verified the income growth rate to be 2% and the housing starts growth rate to be 0.8% using data in Excel spreadsheet Confidential Attachment 4.4a (Moody's Q4 2018 Base).

² U.S. Congressional Research Service. Real Wage Trends, 1979 to 2018 (R45090; Jul. 23, 2019), by David H. Bradley, Sarah A. Donovan. Text in: FAS.org; Accessed: March 10, 2020.

IPL to support the forced outage data in its resource plan modeling. IPL responded by providing reasons for the forced outages, which were caused almost [REDACTED].³ This problem could be addressed during IPL's next major overhaul, which would only occur if IPL decides not to retire Petersburg Unit 2 (unlike retirements in IPL's PRP, Portfolio 3). If, instead, IPL selects Portfolio 1 or 2, it would unreasonably harm the economics of continuing to operate Petersburg Unit 2.

It is not clear the retirement dates for the Petersburg units are optimal, since the model IPL used was not designed to select an optimal retirement date. Rather, fixed plant retirement dates were evaluated in each of the five portfolios. While such an approach is comparable to that used by some other Indiana electric investor-owned utilities ("IOUs"), the related potential for sub-optimality should be recognized in evaluating IPL's early retirement proposals. One approach to understanding the potential benefits and costs of alternative retirement dates would be to run the model with delayed retirement dates equal to the amount of time needed to reach that unit's next major overhaul. The OUCC expects the effect on the present value of revenue requirements ("PVR") would be small and a delay of a number of years could result in a higher PVR. However, even if the PVR from waiting a few years to retire is higher, relaxing IPL's imposed retirement constraints in a sensitivity run may highlight for decision makers the flexibility value of waiting a few years to implement IPL's proposed (and irreversible) generation retirement decisions. Should responses to IPL's request for proposal ("RFP") contain renewable prices higher than IPL modeled⁴ then delaying retirements would be more economically attractive.

While IPL's load forecast incorporated its electric vehicle ("EV") and distributed solar forecasts, it did not modify its expected load shape resulting from those forecasts. If implemented in the model, such modified shapes would affect the relative attractiveness of different resource options and thus could change the optimal resource mix over time.

IPL's load forecast includes a large jump in EVs during the year 2020 (from approximately 500 to 5000 in a single year). IPL did not explain that sudden increase in its IRP. In conversation between OUCC and IPL's technical staff, IPL did not dispute the above projected 10-fold increase was included in its load forecast. However, in the conversation, IPL represented that any effect the increase might have on the optimal resource plan would be ameliorated by IPL's treatment of EV load over the entire 20-year time horizon. The OUCC would like to see that treatment explained in IPL's IRP. EV forecasts can vary depending on the source. Within Indiana, EVs still represent a miniscule minority of vehicles on the road. In 2018, EV market share in Indiana was only 0.82%.⁵ A statistically significant market share is not predicted until 2040. Even the market forecasts can significantly vary from current projections.⁶

³ Confidential Attachment OUCC-5C.

⁴ See the following figures for assumptions used for Wind, Solar and Storage: (1) Figure 5.17, page 74 Vol 1. (2) Figure 5.30, page 86 Vol 1. (3) Figure 5.33 page 88, Vol 1..

⁵ <https://evadoption.com/ev-market-share/ev-market-share-state/>.

⁶ <https://qz.com/1620614/electric-car-forecasts-are-all-over-the-map/>.

IPL's selected portfolio "3b" (retiring Petersburg 1 in 2021 and Petersburg 2 in 2023) represents the lowest or close-to-lowest NPVRR across all five scenarios modeled.

While forecasting is an inexact science, having the chosen portfolio be attractive across a range of scenarios can provide some degree of comfort.

IPL correctly incorporated reductions to capacity value related to growth in solar installations in its modeling to reflect MISO's recent research.

MISO studied integrating increasing levels of intermittent resources into its system. The effects are related to shifts in the peak summer hour as additional solar capacity is added and MISO's movement to impose planning reserve margin requirements outside of the summer months (MISO's Renewable Integration Impact Assessment ("RIIA") and its Resource Availability and Need ("RAN") initiatives).

Validation of assumptions.

Validation of assumptions regarding the availability and replacement generation costs can occur when IPL shares responses to its recently completed Requests for Proposals ("RFP").

IPL modeled capital costs in the year 2020 to cover the cost of [REDACTED]

As discussed below, the OUCC has concerns about modeling costs to [REDACTED] because the OUCC may dispute the reasonableness of the costs the utility seeks to recover from ratepayers. To the extent these costs are improperly included in IPL's proposed modeling, Portfolios 1 and 2 would be inappropriately disadvantaged in IPL's economic modeling.

C. ENVIRONMENTAL

Refer to 6.3.4 New Source Review ("NSR"), page 117.

IPL's IRP submission states: "At the time of this filing, IPL is now close to concluding a settlement to resolve the Notice of Violations ("NOV") pending required approvals by management at EPA and DOJ. Unless and until a settlement is approved and made public by DOJ, the discussions and proposed terms are confidential."

Comments:

In the OUCC's experience, [REDACTED]
[REDACTED] The OUCC has not reviewed the potential [REDACTED]
[REDACTED]. However, the OUCC is concerned IPL may have [REDACTED]
[REDACTED] made against IPL, and this in turn may have
influenced decisions [REDACTED] IPL and other Indiana electric IOUs
are incentivized to [REDACTED] because they may be able to reduce [REDACTED]
[REDACTED]. The OUCC has argued
any [REDACTED] should not be recovered from
ratepayers through utility rates. In addition to the reasons listed above, if IPL [REDACTED]

[REDACTED]

Refer to 6.4 Summary of Potential Impacts at Vol. 1, pg. 118 and the 2019 IRP Technical Appendix, Data Release 5 (November 6, 2019) (Results V1).

The OUCC noticed IPL included additional capital costs for Petersburg Units 1 and 2 in its NPVRR model for 2020, 2022, and 2024. When OUCC staff met with IPL regarding its IRP modeling, IPL indicated the additional capital costs were for [REDACTED] projects related to a [REDACTED] between IPL, the [REDACTED]

[REDACTED]

The OUCC appreciates IPL working with OUCC technical staff and other stakeholders to provide a high-level understanding of the additional environmental costs included as capital costs in its IRP model runs. However, since a [REDACTED] has yet to be publicly released, the OUCC finds it potentially inappropriate to treat the [REDACTED] as capital costs in the IRP model when IPL cannot state with certainty they will occur.

[REDACTED]

The OUCC has no information on whether any [REDACTED] that the Indiana Utility Regulatory Commission should [REDACTED] the dollar amount IPL is permitted to include in rate base as a capital cost for state ratemaking purposes. Further, the terms of a [REDACTED] could be approved, rejected, or approved with fewer, additional or altered terms by the reviewing Court.

Additionally, the OUCC has concerns regarding the input values IPL used. First, with regard to the [REDACTED] IPL informed the OUCC that it cannot [REDACTED]; however, the OUCC and stakeholders are placed in a difficult position when attempting to verify IPL's IRP model input values. If the OUCC is not aware of the equipment required [REDACTED], it is not in a position to determine whether the cost estimate [REDACTED] assumed in the model is reasonable. The OUCC is also concerned about whether the 2020 timeline to install the equipment for Petersburg Units 1 and 2 to allow operation beyond 2021 and 2023 complies with any potential [REDACTED]. The OUCC questions

⁷ 2019 IRP Technical Appendix, Data Release 5 (November 6, 2019) (Results V1). Each Excel document in this data release for all Scenarios has a tab labeled "Petersburg CapEx," which contains this information.

whether it would actually be possible to complete those projects in 2020, since many projects require implementation lead times longer than one year.

Second, the OUCC is concerned with the costs assumed for 316(b) compliance. The range IPL provided for possible 316(b) costs is broad [REDACTED]. The higher end of the compliance cost range assumes IPL is required to install closed-cycle cooling, which is unlikely to happen.⁸ It appears IPL assumes compliance with 316(b) will require installation of [REDACTED]. Based on the OUCC's knowledge and experience, IPL appears to be assuming costs for [REDACTED] that are [REDACTED]. The OUCC is less concerned with the estimated cost to [REDACTED] as it appears IPL completed a more thorough analysis in determining a reasonable range for those costs.⁹ However, the OUCC notes the [REDACTED] costs assumed are preliminary and are not based on any detailed [REDACTED]. If IPL assumes inflated future [REDACTED] capital costs for Petersburg Units 1 and 2, it could unreasonably shift the results of the IRP to select the early retirement of those resources.

D. BATTERY ENERGY STORAGE SYSTEM

Refer to Section 2.1.2 Resource Capacity Credit, p. 8.

As indicated in IPL's IRP: "IPL does not include capacity credit for its existing Battery Energy Storage System ("BESS"). While it has the capability to provide capacity credit, IPL operates the BESS to provide Primary Frequency Response and other reliability services."

Comments:

In IPL's previous rate case proceeding, (Cause No. 45029), IPL claimed the BESS would provide a number of beneficial functions such as capacity credit and black start capabilities. IPL should explain why it did not include a capacity credit for BESS. It should also explain why it operates the BESS to provide Primary Frequency Response.

IPL should elaborate on the "other reliability services" it claims the BESS provides.

IPL should provide comprehensive information regarding the function, operation and benefits, or drawbacks of the BESS, because IPL recovers both a return of and return on the investments it made on the BESS through rates, ultimately burdening ratepayers.

⁸ IPL's Confidential Response to CAC's Data Request 3-15(b).

⁹ IPL's Confidential Response to CAC's Data Request 3-15(a).

E. AVOIDED T&D CAPACITY COSTS

Comments:

The OUCC is concerned about the excessive amount of avoided T&D capacity costs IPL assumed. T&D capacity benefits are created when DSM programs alleviate capacity issues on specific circuits. None of IPL's DSM programs target specific circuits.

Certain circuits are being addressed though IPL's Conservation Voltage Reduction Program, which IPL is implementing as part of its \$1.2 billion TDSIC Plan approved in Cause No. 45264. IPL's TDSIC Plan projects will affect both current and future T&D capacity issues.¹⁰ DSM programs should not receive credit for benefits obtained through TDSIC projects. Because T&D capacity issues will be addressed directly by IPL's TDSIC Plan, no "avoided" T&D costs should be attributed to DSM. IPL estimated its avoided T&D capacity costs based upon 2016 estimates of an average new 10,000 kW IPL distribution circuit. IPL assumed transmission capacity costs are an additional 10%, but provided no justification for that assumption. Methodology flaws are discussed below.

There is no connection between circuit load reductions due to DSM and estimates of new circuit construction costs. New circuit projects include components unrelated to capacity, such as poles, service transformers and system controls. Facility construction costs to serve new load have no relationship to the load reductions caused by DSM effects spread over the IPL system. The fact IPL may expend capital to extend service to a new load, such as a new residential subdivision or a shopping center, has no connection to DSM activities instituted elsewhere in the system.

IPL made an assumption, unsupported by any evidence, the solution to capacity issues on a distribution circuit is to build a new circuit. Capacity upgrades involving those components related to capacity are more appropriate.

Despite delivering DSM programs for approximately 25 years, IPL has no evidence supporting its assumptions concerning any relationship between DSM and avoided T&D costs. IPL has not identified any circuits at capacity. IPL simply assumed approximately 20% of its circuits are at *or near* capacity.

The Great Recession commencing in 2008 far exceeded any effects of IPL's energy efficiency programs on its T&D system. IPL's weather normalized summer demand dropped from 3,206 MW in 2007¹¹ to 2,813 MW in 2008 and to 2,812 MW in 2018.¹² If IPL had any T&D capacity issues at that time, the significant drop in load would have greatly relieved them.

No two Indiana electric IOUs use the same methodology to estimate avoided T&D capacity costs, and none provide any evidence quantifying a relationship between DSM and avoided T&D capacity costs. Since IPL offered no evidence confirming T&D capacity savings exist, at best, it is a theoretical concept. Four of the five Indiana electric IOUs are involved in TDSIC programs,

¹⁰ Cause No. 45264, Petition Exhibit A, page 1.

¹¹ IPL 2016 IRP, Figure 4.23.

¹² IPL 2019 IRP, Figure 4.29.

which, aside from upgrading existing T&D systems, also include new construction, designed to alleviate system capacity constraints. A common example is the replacement of 4 KV distribution systems with 12 or 13.2 KV systems, which are, sized to satisfy current and anticipated capacity needs.

F. PETERSBURG UNITS 1 & 2: EARLY RETIREMENTS vs. GAS CONVERSIONS

Refer to Section 5.4 Summary of Supply-Side Resources, Figure 5.35 – Supply-Side Resource Summary Table, p. 90.

Resource Type:	Natural Gas
Description:	Coal to Gas conversion of Pete 1 and 2
Included in 2019 IRP:	No

In Section 5.4 on Supply-Side Resources in IPL's 2019 IRP IPL wrote:

Conversion of Pete 1 and 2 was not considered for this IRP. The age of the units and the location were the two primary limiting factors. Pete 1 and 2 are 52 and 49 years old, respectively, and are nearing age based retirement dates. Planning, engineering, procurement, and actual conversion work would take several years while the units incur millions of dollars in maintenance and overhaul costs. Additionally, one of the most important factors that led IPL to convert the Harding Street steam units to gas was their location on the IPL 138 kV distribution system. The Harding Street units play a critical role in maintaining reliability on the IPL distribution system. Due to the location of Petersburg, conversion of Pete 1 and 2 would not provide the same reliability benefits.

Lastly, conversion of Pete 1 and 2 to natural gas would cause IPL to have nearly half of our capacity tied to natural gas steam units with pending retirement dates in the next decade.

(IPL 2019 IRP Section 5.4, page 90.)

Comments:

IPL indicated the near retirement age of Petersburg Units 1 and 2 restricts these units from the possibility of converting its coal-fired boiler to gas-fired. However, the basic premise in developing the (natural) gas conversion technology for coal-fired boilers is to provide an alternative option that will further extend the units' life and use. IPL should not use the units' age as a primary factor to eliminate the option of repowering Units 1 and 2 without providing a comprehensive study supporting its conclusion.

IPL specified the location of Petersburg Units 1 and 2 (which is the sister unit to Harding Street Unit 7) prohibits it from considering natural gas conversion for these units. However, IPL did not provide any system impact and/or feasibility studies to support its

conclusion. Absent such technical studies, IPL should not eliminate the possibility of repowering these units with natural gas, especially given its recent success completing a similar conversion at Harding Street Unit 7. IPL indicated initiating an engineering project to convert Petersburg Units 1 and 2 to gas would take years and cost millions of dollars. Latest utility cost estimates provided to the OUCC by other utilities are within a range of \$90 to \$180 per kilowatt (kW). IPL converted Harding Street Units 5 and 6 (100 MW each) at a cost of \$180 per kW (see Cause No. 44339), and Harding Street Unit 7 at a cost of \$173 per kW (see Cause No. 44540). It is unfair for IPL to deny its ratepayers cost-effective repowering options available for these units without a comprehensive study supporting IPL's position.

Regarding reliability, IPL indicated converting Petersburg Units 1 and 2 to gas would not provide the same benefits as the Harding Street units. However, IPL did not provide any system impact and/or feasibility studies to support its conclusion. Absent such technical studies, IPL should not eliminate the possibility of repowering either of these units with natural gas.

IPL should provide a comprehensive study regarding the feasibility of converting or repowering any of its coal-fired generating units to gas-fired. Absent such studies, IPL provided no support for its conclusions. Likewise, it is unfair to deny ratepayers cost-effective technologies available today as an alternative to shutting down and retiring coal-fired units paid for by ratepayers before the end of a unit's useful life.

G. CONCLUSION

The OUCC would like to see a more rigorous analysis of converting Petersburg Units 1 and 2 to natural gas performed before it commits to early retirement of those units. To guard against unnecessary overbuilding, the OUCC also hopes to see a thorough analysis of IPL's historical over-forecasting of energy sales and demand. The OUCC appreciates IPL using an RFP to ensure any new resources it obtains are at the lowest cost reasonably possible.

The reasonableness of IPL's IRP modeling results will be tested when prices and availability of renewable resources are compared to those submitted in response to its recently issued all-source RFP. If the projects bid into the RFP are different from the modeled costs, IPL should reconsider its preferred plan. The OUCC believes it would be prudent to wait a few months before finalizing the IRP to see whether the results of the recently completed RFP validate the conclusions IPL reached in its IRP modeling.

Respectfully submitted by:

The Indiana Office of Utility Consumer Counselor

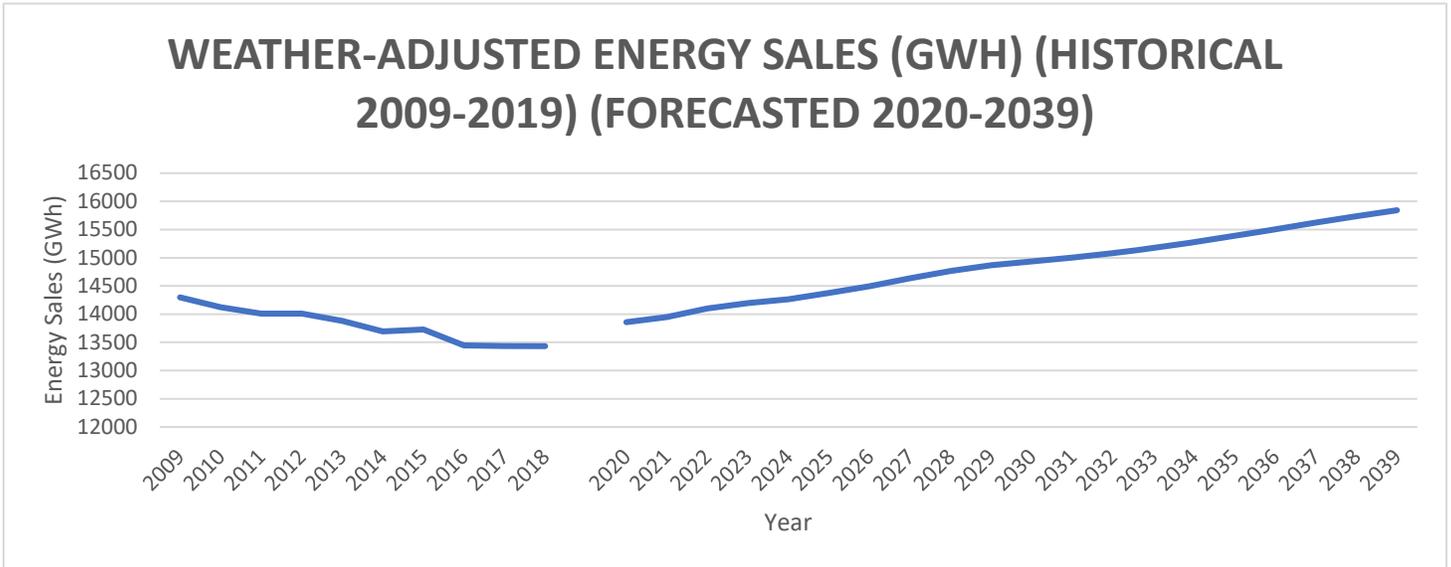
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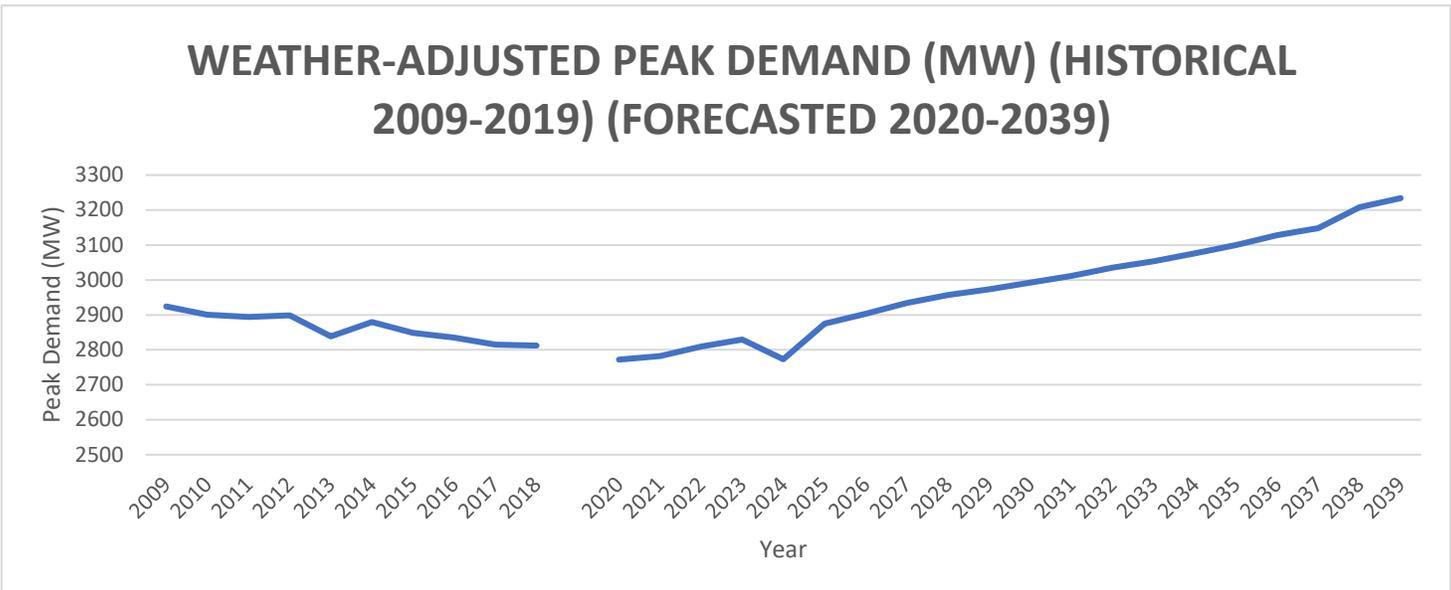
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Figure OUCC – 1



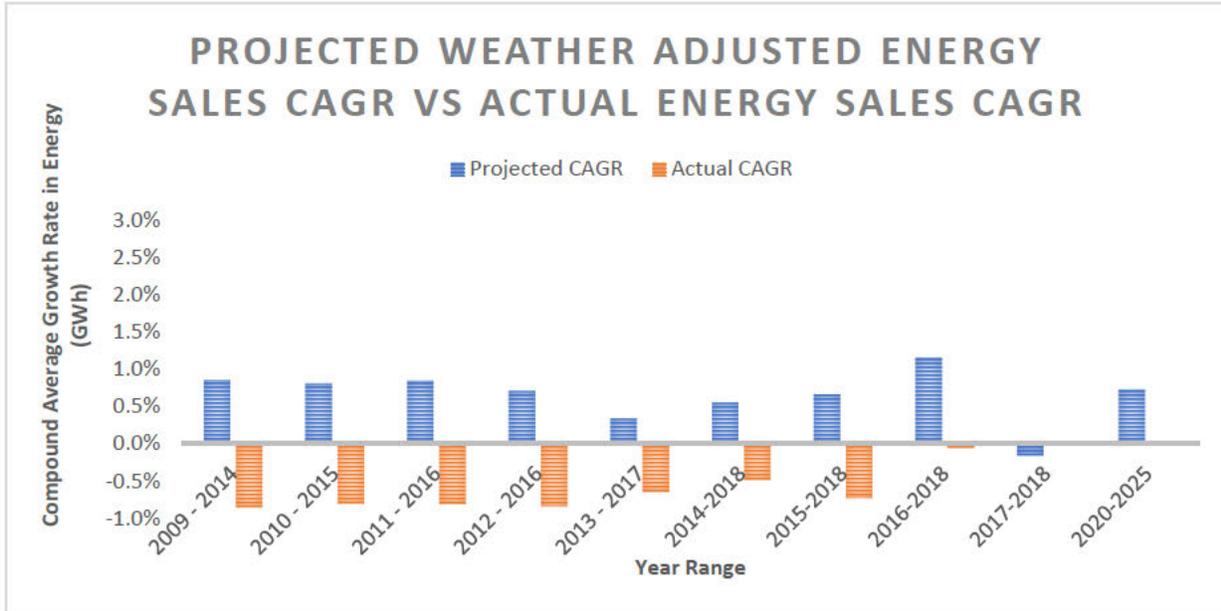
Source: IPL 2019 IRP - Load and PRMR Forecast with EV and CVR-ACLM-Rider17
(IPL IRP Volume 1; Figure 4.29)

Figure OUCC – 2



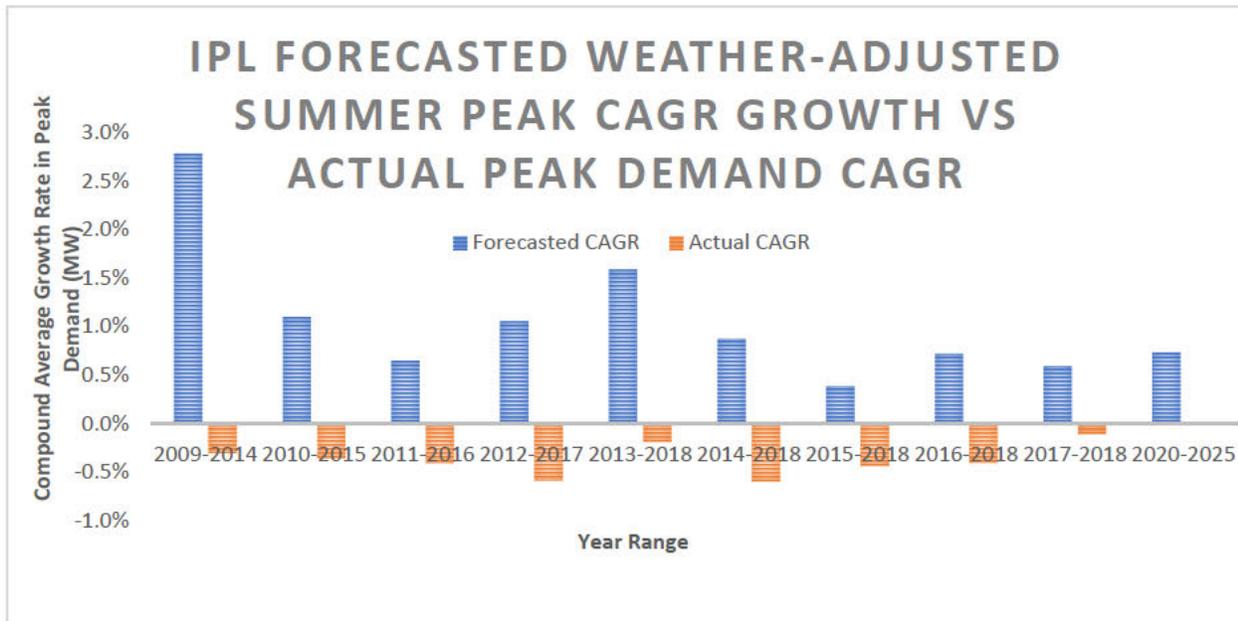
Source: IPL 2019 IRP - Load and PRMR Forecast with EV and CVR-ACLM-Rider17
(IPL IRP Volume 1; Figure 4.28)

Figure OUCC – 3



Source: IPL 2019 IRP - Load and PRMR Forecast with EV and CVR-ACLM-Rider17
 (IPL IRP Volume 1; Figure 4.28)

Figure OUCC - 4



Source: IPL 2019 IRP - Load and PRMR Forecast with EV and CVR-ACLM-Rider17
 (IPL IRP Volume 1; Figure 4.29)