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Indianapolis Power and Light Company's Reply to the IURC and Stakeholder Comments on the 2014 Integrated Resource Plan

Introduction

Indianapolis Power & Light Company ("IPL") submitted its 2014 Integrated Resource Plan ("IRP") on November 1, 2014. IPL appreciates the Commission staff's thorough review of its 2014 IRP and comments to improve the IRP process. As described in the pending Proposed Rule to modify Indiana's Guidelines for Electric Utility Integrated Resource Plans (170 IAC 4-7) IPL submits this response to the 2015 Draft Report of the Indiana Utility Commission Electricity Division Director Dr. Bradley K. Borum Regarding 2014 Integrated Resource Plans ("Draft Report") and comments from interested parties. IPL also participated in the development of joint comments to be submitted by the Indiana Investor owned utilities.

Executive Summary

IPL recognizes the evolution of IRP process in Indiana including engaging stakeholders in the development phases, assessing risks and determining robust ways to meet a variety of objectives in the resultant long-term plan. These comments generally follow the order of the Draft Report as shown below:

- Risk Analysis
- Load Forecasting
- Demand Side Management (DSM) Consideration
- Distributed and Customer Owned Generation
- Incorporation of Probabilistic Methods
- Stakeholder Process
- Organization of IRP

IPL seeks to clarify misunderstandings and provide answers to specific questions in each of these areas. In addition, improvements expected in the next IRP are described, such as increased stakeholder engagement, clearer scenario descriptions, load forecasting improvements, DSM modeling changes, distributed generation sensitivity analysis, increased use of probabilistic methods, utilizing public proxies for confidential data and better readability. IPL looks forward to technical discussions with stakeholders in the meantime, especially regarding DSM modeling considerations. IPL combined its response to DSM comments as an appendix to this document.

Notwithstanding, IPL's 2014 IRP reflects the 20 year view of expectations based on the information and expected probable risks known at the timing of the submission which have remained largely constant. Subsequent IRPs will reflect changes in inputs, assumptions, requirements, resource options, and resultant resource plans.

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I. *RISK ANALYSIS WAS TOO CONSTRAINED*

A. At the outset, a consistent and detailed narrative to explain the rationale for the scenarios or the sensitivities is lacking.

As described in IRP Modeling Scenarios starting on page 50 of the IRP, IPL aligned scenarios with these three drivers: CO_2 regulation/legislation (four scenarios), natural gas prices (three scenarios), and load variation (three scenarios). While a detailed narrative is provided on the rationale for CO_2 prices and load variation, IPL recognizes that a detailed description on the natural gas prices is not provided until Confidential Attachment 5.1. IPL will provide this information more transparently in future IRPs along with more intuitive scenario names and narratives. Below is the rationale for the natural gas price forecast.

Natural Gas Prices

- The Base Gas prices are established using Ventyx's base reference case assumptions.
- The Low Gas prices represent Ventyx's subjective view of the 10th percentile of probability distribution that corresponds to production costs for best shale plays.
- The High Gas prices represent Ventyx's subjective view of 90th percentile of probability distribution that corresponds to limited shale supply scenario.
- Environmental and Mass Cap natural gas prices were developed by Ventyx and represent the correlated natural gas prices based on the Waxman-Markey and ICF Mass Cap CO_2 prices.

For all natural gas sensitivities, IPL's consultant, Ventyx created correlated market prices based on the natural gas prices.

B. The DSM programs were incorporated in the load forecast and the programs were not allowed to change in the resource expansion modeling. As a result, only supply-side resource alternatives were considered in the modeling.

Please see the DSM appendix at the end of this document which addresses this comment.

C. The relationship between the five resource plans created by IPL for further analysis and the initial resource plans developed for each of the eight scenarios is not obvious. For example, one scenario had Petersburg 1, 2, and 4 retiring in 2020 and another scenario had Petersburg 1 retiring in 2024. But three of the five plans created by IPL for additional analysis locked in the retirement of Petersburg 1 and 2 in the year 2024 and the other two plans created by IPL had no retirements. The creation of the plans for further analysis appears to be arbitrary which creates serious doubt about the conclusions IPL derives as to the preferred resource plan.

The creation of the five resource plans is not arbitrary, but based on results and knowledge from a number of analyses. With no additional build out over the next 15 years in five of the eight scenarios, IPL identified five different resource plans to determine the impact of Petersburg 1 and 2 retiring early, symbolic of the Low Gas and High Environmental results. As shown in the Capacity Expansion Results, Petersburg Unit 1 was retired in the Low Gas and High Environmental Scenarios while Petersburg Units 2 and 4 were only retired early in the low natural-gas price scenario, demonstrating the retirement of three coal-fired units only be economic in the low gas scenario. The capacity expansion modeling only identifies the best plan for a given scenario, not the runner ups, which could represent the overall least cost plan across multiple scenarios. Therefore, additional planning judgment is needed.

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Thus, when determining the creation of the plans for further analysis, IPL also incorporated additional information, including the size and age of the units and the results gathered from the analysis conducted for the National Pollutant Discharge Elimination System ("NPDES") NPDES, compliance filing (Cause No. 44540). This analysis involved an extensive life-cycle economic evaluation of the Petersburg units, accounting for NPDES compliance costs along with other potential environmental regulations, and compared them to resource alternatives (switching to gas-fired or CCGT-replacement). The results identified retrofitting all four Petersburg units as the reasonable least cost plan and is consistent with the IRP results. In particular, the PVRR associated with retrofitting Petersburg Units 3 and 4were substantially better than the alternate resource options, thus providing additional basis for retaining both Petersburg 3 and Petersburg unit 4 in the resource plan evaluation phase of the IRP.

Due to these results, IPL limited the retirements when creating the scenario resources plans to Petersburg Units 1 & 2 as a way of creating plans that could be more competitive in multiple scenarios. These resource plans were shown to be economically less favorable compared to IPL's base resource plan. A resource plan that further adds the retirement of Petersburg Unit 4 would be even less economically competitive. Additionally, the retirement of Petersburg Units 1, 2, and 4 would fail to accomplish IPL's goal of a low-cost diversified portfolio, as the plan would create a portfolio that is predominantly natural gas fired generation.

More broadly, IPL includes multiple planning inputs into its scenario resource plan developments and modeling and believe this process and interpretation provides better insight from a resource-planning perspective. IPL will work to be more transparent with this step in the process in its next IRP.

D. ***The PVRR analysis on the resource plans created by IPL was done over a 50 year planning horizon when original eight scenarios were done using a 20 year planning period.***

The Capacity Expansion Plan was conducted over a 30 year period, made up of the 20 year IRP forecasting period and an additional 10 years to capture the end effects of resources decisions made in the forecasting period. The PVRR analysis was extended to 50 years in order to capture the full economic life of new resources put into service near the end of the 20 year forecasting period. By extending the time period to 50 years, the PVRR analysis incorporates the full impact of capital, taxes and depreciation, allowing IPL to view all plans on a consistent basis and without bias toward plans with resource additions.

E. ***The inclusion of carbon prices or taxes in the scenarios is confusing. On page 51 IPL states the EPA shadow pricing landscape "applied EPA's shadow prices to IPL's coal unit emissions above the Indiana target emission rate commencing in 2020 using a fixed ($/kW) cost based on the CO_2 building block shadow prices." This implies that IPL did not properly include the carbon price as a variable cost which would affect the dispatch of units. Inclusion of a variable cost as a fixed cost biases the results. If our understanding is accurate than it raises concerns about how carbon is modeled in other scenarios and casts additional doubt on the robustness of the company's analysis.***

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IPL modeled 4 CO_2 futures, as identified on page 51 of the IRP, to robustly analyze possibilities including no CO_2 costs, the EPA shadow price landscape as a fixed cost, and an ICF Mass Cap landscape and the more extreme proposed Waxman-Markey legislation as variable costs. IPL's analysis incorporates both fixed and variable CO_2 costs to reflect two ways in which future CO_2 regulations may be enacted. For example, compliance through physical measures such as renewables and energy efficiency would not likely directly impact unit dispatch.

The first CO_2 landscape based on the Clean Power Plan ("CPP") which IPL named the EPA Shadow Price landscape, reflects fixed compliance costs based on a $/kW which do not directly affect unit dispatch but do affect the PVRR analysis. The second CPP CO_2 landscape, which IPL named ICF Mass Cap, assumes a CO_2 tax applied as a variable cost to existing generation which directly affects unit dispatch. The variable costs modeled as $/MWh were correlated to market and gas prices.

The use of a no CO_2 landscape and a CO_2 landscape representative of the Waxman-Markey legislation provide an effective bound around the potential CO_2 futures.

F. ***The high and low Load Forecasts, as discussed further below, were not designed for IPL's IRP analysis.***

IPL concurs that the application of the State Utility Forecasting Group derived (IPL-specific) load range to IPL's Base Forecast was not specifically intended for IRP analysis. However, IPL viewed this range as a reasonable proxy to represent a multitude of potential differences from our base forecast, including but not limited to DSM adoption rates, economic growth, and Distributed Generation ("DG") growth. IPL recognizes that this is an area for potential improvement for future IRP iterations and will look to improve upon this methodology.

G. ***The analysis of Distributed Generation was also baked into the analysis and it was unduly constrained. The model should have been allowed to objectively select DSM. Moreover, IPL acknowledges their planning models are not sufficient for analyzing demand response or DG page 102). IPL recognizes the installed costs for solar are decreasing, however, modeling limitations do not allow dynamic costs to be included.***

While increased Distributed Generation was not explicitly modeled, as mentioned in the response above, IPL did model a Low load scenario, which as discussed in the IRP could represent a multitude of differences from the base case, including but not limited to increased DSM participation, slow economic growth and increased Distributed Generation.. While IPL recognizes that some customers may wish to install distributed generation for reasons other than financial economics,

IPL's experience over the past several years shows very little DG growth other than the growth emerging from our Rate REP. IPL will continue to monitor DG growth and plan to model high DG penetration in future IRPs as a sensitivity.

H. ***Consistent with IPL's comment modeling limitations do not allow dynamic costs to be included and a prior concern raised by the Commission staff, IPL's planning process might benefit from probabilistic analysis in addition to their current modeling analysis that is deterministic. While the Commission staff recognizes that deterministic planning is traditionally used for analysis of long-term resource planning and resource adequacy, the Commission staff would ask IPL to consider using probabilistic analysis to provide additional insights. Co-optimization of different***

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resources might also be used to provide additional perspectives on long-term resource requirements.

The modeling limitations IPL refers to pertain to the Capacity Expansion Model that is run for each scenario. IPL uses this scenario analysis to determine the optimal resource plan for the various scenarios. This optimization process in itself is deterministic as one resource plan is selected for each scenario. However, when critical for decision making, IPL does perform probabilistic analysis for specific resource decisions such as the response to the environmental wastewater requirements described in its NPDES filing.

While IPL agrees that the scenarios developed do not establish the ultimate bounds for all variables, the scenarios used provide reasonable range of risks based upon fundamental deterministic models. The Low Gas Scenario represents Ventyx's subjective view of the 10th percentile of probability distribution that corresponds to production costs for best shale plays. The High Gas Scenario represents Ventyx's subjective view of 90th percentile of probability distribution that corresponds to limited shale supply scenario. These subjective views establish dynamic prices and a wide bound around our base scenario, representing approximately a -40% to +110% range in the year 2025. Additionally, as mentioned above, the use of a Low Environmental, or no CO_2, and a CO_2 representative of the previously proposed Waxman-Markey bill provides an effective range of risks around the potential CO_2 price futures. Dr. Borum also identifies the reasonableness of this range later in his comments to IPL's 2014 IRP in his statement, "IPL's use of the Waxman-Markey Climate bill may be a reasonable proxy for the upper bound of the CO_2 risk in the Environmental Scenario." While understanding 'under what conditions, would these units not be viable' would be informative, the results of a scenario formed based on outlier assumptions would not impact the resource planning decisions of IPL, due to the low probability assigned to these scenarios.

Other Comments

IPL's IRP might have asked the question: What would be the ramifications to IPL and its customers if the price for CO_2 compliance / mitigation was higher than the previously proposed legislation? Does IPL agree that, if CO_2 regulation sustains legal challenges, is there a reasonable probability that a market will develop? If so, IPL might have considered a more expansive range of CO_2 prices. The relatively narrow risk band was seemingly inconsistent with IPL's comments on page 5 and other statements that "The future impacts on IPL's generation resources to continue to be uncertain amidst potential legislation and U.S Environmental Protection Agency ("EPA") regulations."

IPL agrees there is a reasonable probability that CO_2 regulation will come to fruition and because of this belief, IPL utilized a CO_2 price in seven of the eight scenarios developed. However, there is still much uncertainty regarding the details of the final regulation, -implementation and potential market development. Because of this uncertainty, IPL included four distinct CO_2 landscapes each with different costs and timing of effective dates for proposed CO_2 regulation. These landscapes are described in detailed on page 51 of IPL's IRP. IPL does however disagree that these landscapes form a "relatively narrow risk band' around CO_2. The use of a Low Environmental, or no CO_2, and a CO_2 representative of the previously proposed Waxman-Markey bill provide a very effective bound around the potential CO_2 price range. Dr. Borum also identifies the reasonableness of this range later in his comments to IPL's 2014 IRP in his statement, "IPL's use of the Waxman-Markey

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Climate bill may be a reasonable proxy for the upper bound of the CO_2 risk in the Environmental Scenario."

Comments from Synapse Energy Economics on behalf of Sierra Club

- ***IPL's Preferred Portfolio (Plan 1) is Based on Flawed Modeling***
  - ***The structure of the scenarios does not allow for unit-by-unit evaluation***
    The Capacity Expansion Module evaluates each unit against markets prices for energy and capacity. In addition, IPL also allowed the Capacity Expansion Model to select individual retirement dates for Petersburg Units 1 through 4 based on economic viability. By performing this unit-by-unit evaluation and evaluating all resource options simultaneously, IPL was able to determine the optimal resource mix in each of the scenarios developed.
  - ***The Company dismisses Plan 2 because of the uncertainty surrounding wind, even though this is the lowest cost plan under most scenarios.***
    IPL did not dismiss Plan 2 as an option. Plan 2 embodies IPL's existing resources (Plan 1) with an additional 200 MW of wind resources built in 2025. IPL will continue with its existing resources and analyze developments pertaining to wind and other renewable technologies from the contexts of market-performance and regulatory environment. This will consider the final rule of the Clean Power Plan which expected prior to IPL's 2016 IRP.

    The Company continues to model off-system sales as if 100% flows directly to ratepayers.

    In the PVRR modeling of the IRP, all revenues and costs associated with off-system sales are reflected in the annual revenue requirements. Any margins associated with the off system sales will reduce the annual revenue requirements. This treatment of off-system sales is consistent with how off-system sales are treated for retail ratemaking purposes in Indiana as it has been the Commission's practice to reduce the retail revenue requirements by embedding a reasonable level of off-system sales margins in the rate case proceedings. IPL modeled off-system sales appropriately and traditionally -- PVRR analysis values the asset from the customers' perspective and must include the energy value for sales into the market to capture the full value of the asset.

In Section 3 the Company's carbon price is not applied properly in most scenarios and "as a result, the Company's analysis biases the results towards continued operation and investment in its coal fleet. Future Environmental spending is not all included in IPL's modeling. The Company provided a range of estimates for compliance with upcoming environmental regulations such as Coal Combustion Residuals (CCR), Effluent Limitation Guidelines (ELG). Cooling Water Intake (Section 316 (b) of the Clean Water Act, Cross-State Air Pollution Rule (CSAPR), and National Ambient Air Quality Standards (NAAQS). However, it appears that most or all of these future costs were not included in the IRP modeling." **On page 10, Synapse sates** ***"It also appears that the Company's eight modeling scenarios failed to account for all of the potential costs associated with these environmental compliance obligations." (Synapse Energy Economics, Inc. on Behalf of Sierra Club)***

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Since the IRP analysis is a much broader resource planning evaluation focused on future resource needs, IPL included the base-case/most probable capital costs pertaining to the stated environmental regulations in the evaluation of the existing coal-fired units. In IPL's NPDES analysis (Cause No. 44540), IPL considered a wide range of scenarios surrounding Greenhouse Gas Regulation, National Ambient Air Quality Standards, Coal Combustion Residuals, Effluent Limitation Guidelines and 316 (b) by using a range of cost-estimates for compliance and a probabilistic approach to derive a weighted expected value. This analysis supported IPL's decision to retrofit the Petersburg Units and convert Harding Street 7 to natural gas.

"After the capacity expansion modeling, IPL evaluated five portfolios (Plan 1 -5) under multiple scenarios of natural gas and carbon prices. This analysis was limited to simply testing five portfolios against different commodity price variations... the IRP lost the opportunity to review how different explicit variable changes impact the choices of portfolio. By only changing gas and carbon costs, individually, it is impossible to see the results with combinations of risks (e.g., High Gas / High Environmental)." On page 9 Synapse explains that the Base, Low Gas, and High Gas scenarios only apply carbon costs as a fixed cost rather than as a variable cost. As a result, dispatch of coal units aren't affected. This favors coal-fired units in the dispatch.

IPL utilized Ventyx to create correlated market prices and natural gas prices based on the sensitivity applied. As a part of the PVRR analysis, IPL ran each of the resource plans against six future landscapes. The six future landscapes (Base, Low Gas, High Gas, Low Environmental, High Environmental, and Environmental) were formulated to represent significantly diverse futures around natural gas and CO_2. These landscapes were not limited to isolate one variable. For example, the High Environmental landscape was based on Waxman-Markey CO_2 costs, which resulted in the landscape having the highest power prices and second highest natural gas prices. Composite scenarios with combinations of these risks were incorporated in the analysis supporting the NPDES filing (Cause No. 44540). This analysis involved an extensive probabilistic evaluation of IPL's coal-fired units to derive a definitive compliance plan, whereas the IRP is a broader tool to provide snapshots of possible future scenarios. IPL will however take this comment in consideration for future IRPs.

Application of Carbon Costs: See IPL's Response to I. Risks Too Constrained Comment E. on Page 4.

With regard to IPL's consideration of wind resources, Synapse states: "Given that the Company's original Plan 2 was the lowest cost plan – even with conservative assumptions for wind performance – it should not dismiss the addition of an entire resource type based on such vague and insufficient reasoning."

Please see IPL's response to the comment *"The Company dismisses Plan 2 because of the uncertainty surrounding wind, even though this is the lowest cost plan under most scenarios."* on Page 6.

Comments from CAC, Earthjustice, Indiana DG, and Sierra Club on page 1 state: "*The most recent revisions to the IRP rule were intended to recognize the increasing regional*

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interconnectedness of Indiana utilities, and to facilitate a collaborative process for evaluation of the potential ramification of a range or risk and uncertainties facing the electric sector, such as increasingly stringent environmental regulations (including region of greenhouse gas emissions) and increasingly low –cost and available demand-side renewable resources…[A]s detailed, the three utilities* [NIPSCO, IPL, and Vectren]*.each undervalue, and in some cases disregard, clean, low-cost energy and resources by failing to analyze demand-side and supply-side resource alternatives on a consistent and comparable basis."

IPL recognizes multiple stakeholder interpretations of the intent of the proposed IRP Rule. Please see the DSM appendix at the end of this document which addresses IPL's analysis of resource alternatives.

The OUCC (page 1) observed "*The utilities did not demonstrate in a clear manner whether these qualitative elements [e.g., political outlook, risk, portfolio mix, and human behavior] were considered and, if so, how they were accounted for in the modeling process. It also is unclear whether the utilities' modeling considered the availability of renewable resource at peak load or the need for and cost of available back-up energy through spot or long-term contracts for purchased power.*"

While the elements mentioned above were not explicitly quantified and modeled in the IRP, IPL recognizes the potential impact of these qualitative elements. . In fact, the "Changing Business Landscape" section of the IRP includes a discussion of specific risks with mitigating measures. (See pages 18 through 21) For example, environmental regulations resulting from political and legislative influences are identified in this section and the subsequent dedicated section of the IRP, and production cost risk is described along with IPL's deliberate diverse portfolio as a mitigating measure. In addition, the DSM forecast includes assumptions about human behavior through estimated customer participation IPL regularly evaluates business risks and identifies means to mitigate these risks.

Regarding renewable resource availability during peak load periods, IPL assumed a 10% capacity credit for new wind resources as discussed in IPL's third Public Advisory Meeting and a 30% capacity credit for solar resources as stated on page 96. The IRP model mimics the MISO market, so all energy was sold and purchased based on forecasted IN-HUB spot market prices therefore, long-term energy contracts are not needed. The capacity expansion results indicate market purchases in multiple plans on page 57. IPL also described bi-lateral capacity purchase transactions on page 82.

II. Load Forecasting

A. ***Is the Commission staff's understanding correct that average temperatures are calculated from daily minimums and maximums? If so, why didn't IPL use a 24 hour average? What base temperature is used for CDD and HDD? In attachment 6.9 (Peak Forecast Drivers and Input Data), it appears that 50 degrees is used for HDD. Is this correct? If so, how was 50 degrees chosen?***

Degree day information used in the energy forecast is calculated based on the average of daily maximum and minimum temperatures. This is the approach used by the National Oceanic and Atmospheric Administration (NOAA). IPL evaluated the net difference between degree-days

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calculated based on 24-hour averages and those calculated using the average of daily max and min temperatures. The calculation performed for 2013, displayed in Table 1 below, shows this difference to be small.

Table 1: Degree-day comparison: Using 24-hour temperature averages vs. NOAA averages

	24-hr average based HDDs	Avg. of max-min based HDDs	24-hr average based CDDs	Avg. of max-min based CDDs
	5717	5647	1096	1160
Net Difference:	-70		+64	

The base temperature for the degree-day calculation is 65 degree Fahrenheit. For the peak forecast, heating degree days were calculated using a base of 50 degree Fahrenheit as it better captures the correlation between customer usage and extremes in winter weather.

B. IPL uses the most recent 30 year averages of monthly CDD and HDD "normal." By placing Normal in quotes, is the Commission staff's inference accurate that this is not really a normal but, rather, a simple average? If so, perhaps using a true Normal would be better.

Weather-normals are used as weather bases for the forecast period. The use of 30-year averages as weather-normals is an industry standard practice. The normals published by the National Oceanic and Atmospheric Administration (NOAA) are not simple 30-year averages of degree days. However, IPL uses rolling 30-year averages of degree days as normals instead of the NOAA normals as the NOAA values are updated only once in ten years. This captures the most recent weather-patterns which IPL believes are significant to the load forecast.

C. IPL said that data constraints in "economic data availability" was the reason the original forecast was only for 10 years rather than the 20 years required by the IRP Rule. The Commission staff has never encountered this before. Could IPL please clarify?

IPL utilizes economic data from Moody's Analytics for the retail forecast. The data received from Moody's currently extends up till 2025. IPL will consider the options to procure an extended forecast of economic data in order to create a 20-year forecast for the IRP.

D. IPL recognizes there may be a significant change in the amount of electricity consumed by its customers over the short and longer term that may not be as credibly captured by using only econometric models; so IPL (Itron) also uses end use modeling. The Commission staff isn't, however, sure how the EIA information (and other) is actually integrated into the residential and commercial forecasts. The Commission staff would appreciate a discussion of the integration of Itron – EIA data into the forecast. The Commission staff would also like a discussion of when and how IPL's intends to integrate price elasticity in the forecasts. Commission staff believes that IPL agrees that one of the needed improvements for the entirety of the load forecast is the integration of price effects (price elasticity). With potentially significant changes in IPL's cost and resulting rates, it is increasingly important to be able to anticipate the extent to which customers will reduce their use (including energy efficiency, demand response, and customer-owned generation). Knowing when customers use electricity and when they reduce their use is increasingly important to a credible load forecast that has a consistent narrative.

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End-use efficiency trends: The EIA publishes regional appliance saturation and efficiency data for residential and commercial sectors as part of their Annual Energy Outlook (AEO). Efficiency data reflect several implemented and upcoming federal standards that mandate energy-intensities (consumption per unit) of common appliances.

Based on this EIA data for the east-north central region, an energy-intensity (kWh/unit) is computed on an annual basis for each appliance. Forecasted intensity values reflect changes in efficiency of the appliance. Appliance intensities are grouped based on end-use and scaled to match the usage levels of IPL's rate classes. Trends embedded in end-use based data sets are interacted with weather variables to create integrated statistically adjusted end-use (SAE) variables. In this way, organic efficiency trends and structural shifts in average use are captured. More information and further details on formulas can be found in IRP Attachment 6.9.

Price elasticity: IPL integrates the impact of price in its load forecast. The correlation between historical price and observed energy consumption is captured in the average use model for residential classes and the sales model for commercial classes, and projected into the future based on estimated price curves. IPL recognizes the significance of the potential impact of increasing prices on its load forecast and plans to incorporate this by embedding growth rates in the price curves and refining the modeling of price-elasticity.

E. On page 146, IPL states "The inclusion of more drivers generally causes a collinearity problem which degrades the predictive power of the model. The Commission staff suggests that multicollinearity affects the significance of individual drivers but it doesn't affect overall model accuracy. If our interpretation of multicollinearity is correct, it should not be used as a reason to keep important drivers out of the model. Moreover, from the Commission staff's perspective, the C&I forecasts may be too simplified. IPL should consider whether it is possible to increase the credibility and explanatory capabilities of the forecasting models to stratify the Commercial and Industrial customers into more homogenous groups which, then, may entail different (perhaps more) drivers. Regardless, continual effort should be made to improve the quality of data that supports the drivers.

Multicollinearity: While IPL concurs that multicollinearity may not affect the significance of the overall model's accuracy, it could cause errors by undermining the impact of a significant driver over others that are similar. It reduces the ability of the model to isolate the importance of individual drivers and can cause the correlation coefficients to be sensitive to fluctuations in data.
C&I forecasts: The forecasts for the commercial and industrial sectors are created on a rate-class basis, which are designed to classify customers based on character of service and size. This is consistent with the structure of billed energy sales and revenue information, which is done on rate-class basis. All the commercial rate classes use a hybrid model which involves both econometric drivers and end-use based trend impacts. The industrial classes are driven predominantly by economics, and hence use econometric models. Table 2 details the individual economic drivers used in the major rate-classes of the commercial and industrial sectors.

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Table 2: Rate-class specific economic drivers for C&I

Rate-Class	Economic Driver
SS	Indianapolis Non-Manufacturing Employment
SH	Indianapolis Total Employment
SL	Indianapolis Non-Manufacturing Employment
PL	Weighted combination of Indianapolis Non-manufacturing Employment and US GDP
HL1	Indianapolis Manufacturing Employment

F. ***As an example of reevaluating the model specifications and consideration of different groupings for C&I customers to make them more homogeneous, the "output" measure used for the C&I models appears to be manufacturing and non-manufacturing employment. Have other measures – such as some measure of gross product – been tried? If so, what were the results? The large C&I model uses manufacturing employment as a driver for the PH and HL rates. Since manufacturing employment can be a problematic driver for sales because, as manufacturing processes become automated, manufacturing employment and sales typically move in opposite directions.***

Yes, IPL has evaluated Gross State Product along with other drivers. The Indianapolis total output (gross product equivalent) has a growth rate of 2.1% over the next ten years, as compared to employment that has a growth rate of 0.8%. Although production and output correlate to energy usage, IPL has found that employment is a better correlated driver to forecast usage in the major rate-classes.

G. ***On page 145, it states that "simulation models are then created to convert billing cycle information into a calendar month format." Because credible system planning is predicated on consistent chronological information and increasing granularity, the Commission staff would like more explanation of these simulation models, how they are used to do the conversion of billing data to calendar data, and a discussion of the efficacy as to continuation of this practice.***

The forecast is created on a billing-cycle basis, i.e. based on actual billed energy and revenue information instead of on a calendar-month basis, in order to utilize accurate historical data, eliminating errors pertaining to unbilled-sales estimations. The forecast is then converted to a calendar-month basis for internal budgeting and variance analysis purposes. Correlations between the independent variables and actual billed consumption is computed and applied to the same variables scaled to a calendar-month basis, the main difference being in the degree-day normals specification. The following table shows the assumed weather-normals on a billing-cycle and calendar-month basis:

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Table 3: Degree-days normals based on Calendar month and billing cycle

Month	Calendar-month HDDs	Billing-cycle HDDs	Calendar-month CDDs	Billing-cycle CDDs
Jan	1120	1133	0	0
Feb	908	1060	0	0
Mar	682	715	4	0
Apr	358	550	15	2
May	135	269	77	35
Jun	14	72	244	156
Jul	1	3	350	316
Aug	3	1	307	341
Sep	64	25	136	227
Oct	316	166	18	71
Nov	627	441	0	4
Dec	1013	805	0	0
Total	**5241**	**5241**	**1151**	**1151**

H. There is no mention of other sales categories such as street lighting, public authorities, or even station use. Does IPL not have these sales categories? If the Commission staff's interpretation is correct, in addition to concerns for the lack of comprehensiveness and questions about the credibility of the forecast, the Commission staff believes this category of uses has significant opportunities for energy efficiency, demand response, and distributed generation that are missing from IPL's planning.

Trend models are used to forecast street and traffic lighting; there are no rate classes identified as public authorities or station use. The forecasted values can be found in the electronic IRP Attachment 6.1. IPL has not formally analyzed the opportunity or potential impacts of energy efficiency, demand response and distributed generation on these sales, but is committed to researching LED street light technology for possible consideration in future DSM proceedings.

I. Commission staff would like more detail on the Peak Demand forecast (page 147). It isn't clear how the peak demand was developed. In Section 7 – Attachment 6.9 for example shows the Peak Model including a variable "Aft09." Would IPL please tell us what this variable is and how it is integrated into the model? The Peak Model also appears to include 2 specific day dummy variables although the Excel is formatting the cells incorrectly and showing them as numbers. What are these variables?

The peak forecast is developed using a ten-year history of actual peaks and corresponding degree-days. Independent variables used to drive the peak-forecast were based on end-use specific trend-variables derived from the energy forecasts. The energy forecasts are broken out into heating, cooling and base load specific usage trends. These usage trends, that have the impact of economic drivers and efficiency variables embedded, are interacted with peak-producing weather variables to come up with integrated driver variables. Fifteen-year averages of the degree days corresponding to the monthly peaks are used as weather-normals. By using these energy-trends to drive the peak forecast, the same economic and efficiency parameters are applied consistently to both the energy and peak forecasts. Correlations between the independent variables and observed historic peaks are projected into the forecast period.

The forecast models use binary variables to adjust historical data when required. They are used to identify subsets of observations, extract specific trends (e.g. from a given point in history) and reduce the impact of outlier variables. They are created based on the evaluation of the model's mean error (predicted value vs. observed) and used as appropriate to improve the model's accuracy.

J. ***Also, with regard to the Peak Model, the selection of peak day weather is unclear as is the "Normal / Weather _ Data" tab in Attachment 6.9 (Peak – Forecast Drivers and Input Data) .xlsx. Why was 2001 used.***

The model keeps the weather basis (normals) constant throughout the forecast period. The normals need to be specified as an input for any 12-month period, and 2001 was chosen as the input year.

K. ***While the Commission staff is gratified by IPL's use of forecasts generated by the State Utility Forecasting Group as an impartial expert source, hopefully IPL would agree that, for future IRPs, IPL should develop their own high and low load forecasts. It is Commission staff understanding that SUFG high and low forecast bands are driven by changes in growth assumptions but IPL appears to interpret the bands as representing economic uncertainties, inclusion of DSM, as well as technological and behavioral changes. If this is IPL's understanding, it is inaccurate. Rather, SUFG's forecast bands are based solely on changes to real personal income, non-manufacturing employment, and Gross State Product. If the Commission staff correctly characterizes the SUFG forecast, we would like to know if this misunderstanding of the SUFG's forecast may have been the cause of IPL having the same DSM forecast in all three cases. In other words, if IPL knew the purpose and limits of the SUFG forecast, would IPL have made more of an effort to appropriately incorporate DSM and other risk factors into the high and low forecasts? This could have important implications for the IRP. Again, if the Commission staff is accurately characterizing the SUFG methodology, did this become a limiting factor in the IPL forecast since there was only about 200 MW difference between the high and low load forecasts for 2034 (pages 52-53 and on page 141)? Regardless, since the SUFG forecasts were not prepared for the purposes of IPL's IRP, the use of the SUFG forecasts may not fit well with stakeholder driven process and the range of forecasts.***

IPL concurs with the Commission staff's interpretation of the SUFG's high and low forecast ranges. IPL used the IPL-specific forecast-range developed by the SUFG as a representative spread of forecast uncertainty, and will continue to refine the robustness of its forecast by incorporating specific risk factors, such as a range of possible DSM resource levels and Distributed Generation growth.

L. ***On page 139, for example, IPL states Energy sales have consequently recovered since the recession, but have not mirrored the overall growth in economic parameters. This is in part due to the structural shift in energy-consumption induced as a result of increasing appliance – efficiencies. This low load growth in IPL's baseline forecast is depicted on page 142 Figure 4D.4. Given that IPL recognizes the importance of significant changes that are likely to affect long-term load forecasting and resource planning as well as the recognition that improvements in forecasting and planning take time, the Commission staff was disappointed there wasn't more***

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discussion of how the load forecasting process would be improved. Hopefully, IPL will offer a plan for improved load forecasting processes, databases, and modeling in their next IRP.

IPL has a detailed bottom-up approach to its retail load forecasting process. The forecast model is constructed at a rate-class level, with driver-variables evaluated for each class. IPL strives to continually improve its forecasting process. This includes improving model-precision by refining variable specifications, monitoring market trends and activities of customers and incorporating these in the forecast as appropriate. The significance of price elasticity will be evaluated and enhanced as the impact of increasing prices is reflected in energy consumption. IPL will also continue to benchmark its forecast trends against industry expectations for reasonableness and consistency.

III. DSM Consideration

A. DSM was baked into the analysis instead of allowing it to compete with supply-side or resources or other customer-side resources. Does IPL agree with the assessment?

Please see the DSM appendix at the end of this document which addresses this comment.

B. While not an uncommon practice, treating DSM (and other customer-owned resources) as reductions in load (reducing the Net Internal Demand) rather than as a resource has implications for resource adequacy calculations and, as a result, for the evaluation and integration process with other resources. The Commission staff invites IPL and others to discuss the appropriate treatment of DSM (and other resources).

Please see the DSM appendix at the end of this document which addresses this comment.

C. IPL recognizes that avoided costs are starting to rise (page 109) but it's not clear how avoided cost information is used in forecasting the potential effects of energy efficiency. The Commission staff would welcome IPL's comments. The Commission staff agrees with IPL (page 108) that if DSM programs are not justified in states like California and New York that have higher electricity costs, these programs won't be cost-effective in Indiana.

IPL provided the rising avoided costs to its consultant, Applied Energy Group, to develop IPL's long-term DSM Potential Forecast which comprises Attachment 4.7. Rising avoided costs are one of a number of factors and, all else equal, that may result in an increase in the customer adoption of DSM measures.

D. How many customers are projected to opt-out in the future (numbers, percent of total usage etc.)? How was this number projected?

As part of the IRP forecast development, IPL projected a reduction of approximately 20,000 MWH to recognize that there would be less participation in DSM programs by the Business Customers. As IPL's experience with the impacts of the opt-out on customer participation improves, we will be better able to reflect the impact of opt-outs in future forecasts. As of January 1, 2015, 101 of the 169 opt-out eligible customers have opted out of participation in the IPL DSM programs. These 101 customers represent approximately 80% of the opt-out eligible sales.

E. How many customers are projected to participate in each program? In the description of each program the number of participants wasn't specified in the IRP text or the Attachment 4.1.

The 2015-2017 DSM Action Plan that was filed in Cause No. 44497 identified potential savings by program which correlate to the estimated participation shown in Table 4 below.

Table 4: 2015-2017 DSM Action Plan Details

Program	Estimated Number of Participants	Additional Description
Residential Lighting	36,212	Assumes 14 bulbs per participating household / Point of Purchase Program
Residential Income Qualified Weatherization	2,500	
Residential Air Conditioning Load Management	40,847	Forecast Participation Year End 2015
Residential Multi Family Direct Install	10,000	
Residential Home Energy Assessment	4,000	
Residential School Energy Efficiency Kit	9,000	
Residential Online Energy Assessment	2,345	
Residential Appliance Recycling	2,800	
Residential Peer Comparison Reports	200,000	
Business Energy Incentives – Prescriptive - PER MEASURE	184,510	Number of Participants not estimated - based on Measures Installed
Small Business Direct Install - PER MEASURE	22,000	Number of Participants not estimated - based on Measures Installed
Business Energy Incentives – Custom	325	
Business Air Conditioning Load Management (TONS)	4,344	Number of Participants not estimated - based on TONS of capacity controlled

Beyond the three year Action Plan, specific programs and customer participation by program have not been developed. For some of the IPL DSM program offerings the number of participants is not as significant as the number of measures installed. For example, Business Prescriptive Lighting is dependent on the number of fixtures installed by each participant which can vary significantly by customer. Therefore, IPL focuses on the total number of measures expected to be installed for the prescriptive program.

F. Is there a potential for a double counting problem when considering some measures that overlap between each other? Is this something that IPL considered in the DSM Plan?

No, while IPL recognizes that some programs do overlap, particularly in the residential segment, IPL has reviewed the available research and to this point does not consider this to be a problem. Prior to issuance of the Indiana Residential Baseline report in 2012, IPL did have some concerns in particular about CFL saturation. For example, the baseline report indicated that there is low to

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moderate CFL socket saturation in the state, which provided IPL with reliable impetus to continue delivering CFLs through IPL's various program offerings. Relevant findings from the report are listed below:

- CFL penetration rates, meaning at least one CFL or tube fluorescent was present in sample homes, are relatively high (83%). Therefore, it is safe to conclude that customer acceptance of fluorescent lighting is relatively high.

- CFL saturation rates, meaning the percentage of sockets in a home that contain CFLs, are significantly less than CFL penetration rates (18%). Therefore, barriers have prevented customers from installing fluorescent lighting in a large or even moderate proportion of their homes' sockets.

- Incandescent saturation rates, meaning the percentage of sockets in a home containing incandescent bulbs, remains high in Indiana (62%).

  Therefore, moderate CFL saturation and high incandescent saturation revealed the significant potential for continued CFL measure installations through IPL's program offerings. Households surveyed had a mean of 54 total light bulbs in use. By bulb type, the mean number of bulbs per household statewide was 35 incandescent bulbs, 10 CFL bulbs, six tube fluorescent bulbs, and two halogen bulbs. As additional information becomes available, IPL will continue to routinely review the findings and will make appropriate adjustments to our program offerings.

<u>IV. Distributed and Customer Owned Generation</u>

A. ***On page 78, IPL seems to recognize that there is a potential interest nationally and within Indiana that may not be justified by using cost-effectiveness tests. Nationally, IPL noted on page 94, The total U.S. market grew more than 120% in 2010 –from 349 MW to 782 MW – and included approximately 48,000 photovoltaic ("PV") systems. These were mostly rooftop systems, but there were also a significant number of utility-scale projects, with eight projects greater than 10 MW. For IPL's service territory, IPL has experienced a large influx of early adoption of DG solar due in large part to its feed-in-tariff, Rate REP as describe in Section 4 A. Additional DG is not included in the short-term forecast absent further financial incentives. The need for greater consideration of customer-owned and other distributed generation was noted by stakeholders during the various meetings. However, with little explanation, beyond a general statement that IPL expects to see little growth in customer-owned generation due to Indiana's climate, IPL asserts that distributed generation will not affect their resource planning. As a result, IPL on page 49 states that solar is projected as being a constant 30 MW from 2015 through 2034; despite IPL's recognition that the costs are declining and interest is increasing.***

   IPL concurs that additional consideration should be given to a higher potential of DG penetration. IPL is monitoring customer interest in DG, the costs of DG, and the rate of adoption in other jurisdictions and will look to apply this information to future planning and IRPs.

B. ***The Commission staff, however, believes that the response by customers suggests that customers may wish to install distributed generation for reasons other than the utility's cost-effectiveness tests;***

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IPL agrees that some customers have installed distributed generation for reasons other than economics. Based on conversations with customers considering DG and recent adopters, IPL's experience indicates this is a small subset of customers which is not expected to significantly reduce retail load in the short-term. IPL's experience over the past several years does not support a projection or opinion that DG will expand in any significant way without significant financial incentives or subsidies. IPL historically provided significant financial incentives through Rate Renewable Energy Production (REP), DSM Renewables Incentives Program; however, these programs are fully subscribed and are no longer available to customers. The price of Solar Renewable Energy Certificates ("SRECs") should also be considered when evaluating project economics. In total, the decrease in the cost of panels will likely be offset by reduced federal tax incentives after 2016 as well as the lack of available Rate REP pricing and DSM incentives such that the complete economic analysis may be less attractive than it was just a few years ago. IPL remains open to potential future incentives and expects future IRPs to include sensitivity analysis related to more aggressive customer-owned generation growth.

C. ***In addition to a need for a consistent narrative, the Commission staff also believes that a more expansive – but still objective and reasonable - risk analysis (including higher CO_2 prices, relatively low natural gas prices, different avoided cost to reflect the changing composition of the resource mix, declining cost of technologies) would be appropriate. Moreover, given the composition of IPL's service territory, the downtown area – including major buildings, high tech industries, IUPUI, city – county facilities including water and waste water treatment, and the hospital complexes may be good candidates for a bolder vision for CHP, micro-turbines, and other customer-technologies. If IPL's relationship with their large customers is as good as they say it is, their input could be very valuable. In sum, IPL should have been able to construct a scenario and sensitivities that would have resulted in a plausible resource plan where customer-owned generation would beneficially affect IPL's resource planning. To be clear, such a resource plan may not be the preferred plan or the most likely. However, in the Commission staff's view, it should have been given thoughtful analysis.***

While not detailed in the IRP narrative, the topic of Combined Heat and Power was discussed at the May 16, 2014 IPL Public Advisory Meeting. The primary local roadblock to CHP expansion, especially in the downtown Indianapolis area, is the availability of competitive local steam and chilled water services provided by Citizens Energy. IPL analysis indicates it is simply more economic for customers to subscribe to these thermal products than to invest and operate independent thermal systems. IPL will refresh this analysis and discuss this topic explicitly in future IRPs.

D. ***IPL's capacity avoided costs are $87 (in 2014 dollars) throughout the entire planning horizon. A more in-depth analysis of avoided costs might result in more Distributed Generation in the long-term resource mix. IPL, in contrast to some other utilities, hasn't provided a comparable level of detail about the elements that go into their avoided cost calculations (Discount Rates, System Losses, Electric Generation Capacity (summer), Transmission & Distribution Capacity Cost, Energy Cost, and MISO Ancillary Charges.***

Please see IPL's response to DSM Consideration item C.

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Other Comments

Comments from CAC, Earthjustice, Indiana DG, and Sierra Club on page 8 "IPL appears to view renewable resources as fundamentally different from other supply-side resources. According to IPL '[r]enwables technologies represent a resource that primarily targets potential future requirements for GHG regulation, and specifically any federal or state RES legislation. IPL at 80". On page 29, commenters said "Although solar costs are declining and IPL has experienced a large influx of early adoption of solar generation, IPL believes its service territory will see little growth in distributed generation ("DG"). IPL IRP at 78, 95. IPL should provide a more detailed discussion of DG in its IRP, explaining its position in light of current customer and technology trends.

Renewable resources were modeled in a comparable and consistent manner as the other supply-side resources. The model selects the most economic resource, based upon the expected costs and revenue, by minimizing the PVRR. This modeling treatment allows the resources to be evaluated on the same metric and on a consistent basis, while achieving our mission of providing low-cost reliable energy. Please see comments above related to planned DG sensitivity analysis in future IPL IRPs.

V. Stakeholder Process

IPL recognizes that the stakeholder process will evolve and continue to improve and is appreciative of the active participation experienced to date. The joint utilities' comments are responsive to the first four issues and concerns under the Stakeholder Process section of the Draft Report. Discussions related to stakeholder roles and expectations are expected to enhance future IRPs.

- ***As part of the stakeholder education process, IPL should consider using more load shape and load duration curves to explain resource planning and how DSM / DR, customer-owned generation might affect IPL's resource requirements. The Commission staff believes that better graphics could be used to explain difficult concepts.***

  IPL will work to incorporate such tools in future stakeholder interactions. IPL will include customer owned and distributed generation sensitivity analysis in subsequent IRPs as described in this document on page 17.

- ***As part of the initial stakeholder meeting for the next IRP, it would be useful to provide the stakeholders with a context for planning that includes the MISO such as the planning reserve margin, the importance of broad diversity, transmission planning, security constrained economic dispatch, etc.***

  IPL will address MISO participation and effects on resource planning more explicitly in future IRPs.

VI. Organization of IRP

A. ***The Commission staff recognizes that the IRPs are evolutionary and we certainly don't want to be prescriptive on how the organization of the Report. However, from the Commission staff's perspective, IPL's IRP was not an easy read.***

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IPL appreciates this feedback and is committed to improving the readability of future IRPs. IPL is reviewing IRP document from Indiana and other utilities throughout the United States to identify good examples and glean best practices. Any suggested references from the Commission are most appreciated.

VII. Conclusion

IPL's 2014 IRP represents the reasonable least cost plan to continue to provide reliable service to its customers in the future based upon risk analysis and the probability of likely outcomes. IPL will continue to monitor the development of external influences including environmental regulation developments to determine future resource options and specific project plans. IPL developed the 2014 IRP to best service its customers while implementing a new stakeholder participation process that was designed to educate, openly inform and provide transparency. IPL benefited from this process and is proud of the product while recognizing room for continuous improvement. IPL is deeply appreciative of Dr. Borum's comprehensive and thorough review and suggestions to improve the IRP process and results. Some of the responses in this report were intended to explain or justify the IRP analysis. Rest assured that IPL will thoughtfully review the comments and implement improvements in the development of future IRPs.

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DSM Modeling Appendix

IPL agrees with the Commission staff that DSM should be considered a resource, and as such should be evaluated and selected consistently, comparably, and objectively versus supply side resources in order to provide a reliable, low cost, low risk portfolio to all its customers. The issue identified in the Draft Report appears to be in the methodology as to how best achieve those objectives. IPL believes it has targeted best practice methods in its *evaluation, selection, and integration* of DSM resources in its integrated resource planning, including its 2014 DSM filing and 2014 IRP. The Commission staff comments, "DSM was baked into the analysis instead of allowing it to compete with supply-side resources" suggests DSM was not treated and evaluated as a resource by IPL. It was. Furthermore, the Commission staff comment "Hopefully….future IRPs will fully integrate energy efficient into the IRP modeling and let the model decide resource choices objectively" fails to recognize the resource planners limitations in identifying DSM programs longer term and the models limitations in evaluating, selecting, and integrating DSM resources with supply resources *objectively*. IPL will address these concerns, will clarify its methodology, and also identify areas of improvement.

IPL maintains that the *evaluation* of demand side resources should use the multiple [California] standard DSM cost effectiveness tests (UCT, TRC, RIM, PCT) that considers multiple planning objectives when comparing to supply resources. The Commission staff seems to agree based on comments encouraging use of the multiple DSM tests in the Draft Report.

There are varying opinions on how best to *select* DSM programs and *integrate* DSM resources with supply resources. While the supply and demand resource objectives should be consistent, comparable, and objective, the methodology to achieve that is influenced by the resource differences. Demand resources are smaller in size, have shorter implementation times and generally have shorter lives than supply side resources. They require customer participation, usually have customer costs, have participants and non-participants, include free ridership impacts, can create customer fairness issues, reduce retail load, and involve programs that are very difficult to predict more than 3 to 5 years out. These attributes, specific to demand resources, have significant ramifications on the *selection and integration* of DSM programs in order to meet the same objectives as targeted for supply resources. IPL will address these one at a time in explaining its resource planning methodology:

(1) EVALUATING AND SELECTING DSM RESOURCES
(2) INTEGRATING DSM RESOURCES
(3) DSM PLANNING AND DELIVERY CONSIDERATIONS

(1) <u>EVALUATING AND SELECTING DSM RESOURCES</u>

<u>For supply side resources</u>, resource "optimization" can be obtained by minimizing the present value of revenue requirements (PVRR). For supply side resources, this results in the utility least cost solution, the most cost effective resource solution, and the lowest customer electric rates. Thus modeling and optimizing for <u>one</u> metric (lowest PVRR) for supply resources maximizes <u>all</u> objectives for all customers. Very convenient. Modeling for this single metric can be achieved by production cost optimization PVRR models (such as Ventyx's Capacity Expansion model) when paired with production cost scenario analysis that can effectively "optimize" supply resources. This is not so for demand side resources.

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For demand side resources, optimizing one metric (PVRR) in the model is usually associated with the Utility Cost Test. The optimization model results do not necessarily provide the most cost effective solution, nor does it consider electric rate impacts. As such, IPL's DSM evaluation and selection process appropriately includes multiple customer-focused objectives as identified by the five standard DSM cost effectiveness tests. The use of multiple tests, from multiple customer objectives results in a more effective/robust DSM program evaluation and selection process that balances cost effectiveness and rate impacts. More specifically, IPL's DSM objectives include cost effectiveness, customer equity, and rate impacts, and thus for DSM program evaluation and selection, the use of the TRC and RIM tests to achieve these results. *Balancing* these objectives has always been an issue in DSM program selection. To assist with that balancing, IPL derived and applied in its most recent DSM filing the Customer Balance Test (CBT). This test seeks to balance negative DSM rate impacts against positive DSM program cost effectiveness to assist in DSM program selection. This is the very issue the Commission, Legislature, and utilities have been grappling with over the last several years. This DSM evaluation and selection process was described in more detail in IPL's most recent DSM filing (Cause No. 44497) and presented by IPL at the October 2014 Contemporary Issues Forum.

(2) INTEGRATING DSM RESOURCES

The critical planning goal is getting the large, capital intensive, supply resources selected, sized, and timed right. This is best done by trying to forecast the total load and load risk (include multiple load risk scenarios) that then need to be served by those very same supply resources. Mistakes here can be costly.

While Market Potential Studies can be useful with respect to forecasting long-term DSM levels, predicting specific DSM programs, much less DSM program costs and designs, can be difficult to forecast beyond three to five years out. Integrating DSM becomes even less practical when these "TBD programs" are incorporated into a Capacity Expansion (optimization) Model that is not capable of appropriately (based on multiple planning objectives) evaluating, selecting, and thus effectively integrating DSM programs. The *false precision* of inputting unknown DSM programs into an ineffective integration model could actually hinder the effective long term planning that is more critical for the long lead time, long life, capital intensive supply resources.

As such, IPL's position is that multiple DSM tests (including TRC and RIM B/C tests) should be used both to evaluate and select nearer term DSM resources. These selected DSM measures would be included in the IRP directly, and reduce load accordingly. And long term, DSM resource consideration for integrated planning is best captured in a robust load risk evaluation specifically including a forecast range of scenario-focused DSM resource levels, likely based on DSM Market Potential Study scenarios, in addition to the load risk from econometric/end-use sensitivities.

(3) DSM PLANNING AND DELIVERY CONSIDERATIONS

There are additional considerations beyond effective DSM economic evaluation and selection that favor a two-step resource integration process that integrates DSM resources first.

- Supply resources are generally much larger than DSM programs with much longer lead times and much higher capital costs. These resources are best deferred, sized, and installed after all cost effective DSM is achieved. Thus, it makes good planning sense that longer term supply planning

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adjusts (sizing, deferral, etc.) to the levels of cost effective DSM that can be accomplished and included first (baked in), and not the other way around.

- DSM is more optimally offered/delivered on a more continual basis to customers than only on a "as needed" basis like supply resources. A model with a target reserve margin may results in a start-and-stop DSM program offering if treated comparably to supply resources. Of course this would not result in effective DSM program delivery and/or customer satisfaction. In this sense, DSM implementation as an ongoing load reduction gives preferential treatment to DSM over supply resources.

SUMMARY

The evaluation and selection of DSM resources is a complicated undertaking balancing multiple objectives and using multiple tests compared to supply resources. IPL has considered incorporating DSM in its production cost optimization model for the selection and integration of DSM. However, its conclusion is that this methodology is less effective due to the limitations of optimization models to evaluate and select DSM appropriately, plus the lack of visibility of DSM programs to effectively model beyond the three to five year timeframe. While trying to use a one-size fits all integrated modeling for *selection and integration* may sound like a planning panacea, it simply does not provide the most effective DSM selection/integration resource solution. IPL believes proper nearer term DSM resource *selection* is best achieved in a multi-step process that focuses on the same multiple customer objectives of supply resources (cost effectiveness and low electric rates), and is evaluated against supply side resources using the standard DSM cost effectiveness tests, and further balanced using IPL's CBT test. In using these tests, IPL uses best practices to evaluate and select DSM resources over the more visible nearer term. Longer term, with little DSM program visibility, DSM resource consideration for integrated planning is best captured in scenario analysis and included specifically (as a load reducing resource) in multiple load impact scenarios in addition to other load forecasting considerations. This focus area is targeted for improvement in IPL's resource planning and included in future IRPs. IPL welcomes the opportunity to discuss the alternative methods to select and integrate DSM in the IRP with its stakeholders.

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Certificate of Service

IPL certifies that on April 2, 2015, a copy of these Response Comments were submitted electronically to the Director of the Electricity Division of the Commission and served via electronic mail on the Office of the Utility Consumer Counselor and the following interested parties that submitted written comments:

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