

Exhibit No. CAT-16
Docket UE-152253
Witness: Chad A. Teply

**BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION**

WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,

Complainant,

v.

PACIFIC POWER & LIGHT
COMPANY,

Respondent.

DOCKET UE-152253

PACIFIC POWER & LIGHT COMPANY

EXHIBIT OF CHAD A. TEPLY

Synapse Comments on PacifiCorp's IRP Process

April 2016

Synapse Review of Duke Energy Indiana 2013 IRP Assumptions

Synapse Energy Economics, May 10 2013
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Introduction

On April 24, 2013 Duke Energy Indiana (DEI) held a 2013 Integrated Resource Plan (IRP) stakeholder workshop, outlining methodology and assumptions to be used in IRP modeling. Here we discuss these assumptions based on the DEI's slides from the April 24th meeting, and propose a series of recommendations designed to improve the final product.

Synapse has been asked to review IRP assumptions on behalf of a number of stakeholder groups, including Mullett & Associates, Citizens Action Coalition (CAC), Earthjustice, and Sierra Club. This memorandum is divided into a review of assumptions presented explicitly in the April 24th meeting, and a brief accounting of other important assumptions that should be made transparent to stakeholders that were not presented in the April 24th meeting.

Synapse has long history of participating and reviewing utility IRPs. The process is expedited and facilitated by an open flow of information back to stakeholders and participants, and a reasonable mechanism of accepting and responding to stakeholder comments and concerns. Some important IRP assumptions are considered confidential by the Company; in these cases, non-conflicted stakeholders should be offered the opportunity to sign non-disclosure agreements to facilitate a transparent process. Confidentiality should not become a reason that stakeholders are unable to review assumptions, inputs, or model results.

Scenarios Used for Evaluation

In the workshop, DEI explained to participants that it would run three scenarios in the 2013 IRP using the System Optimizer model (a resource optimization model provided by Ventyx). These three scenarios would explore three ostensibly internally consistent futures, where each scenario varied commodity price forecasts, as well as emissions prices, loads, and efficiency trajectories. Overall, the three of these scenarios represent a wide variety of assumptions, aggregated and compressed into three worldviews.

There are a wide variety of risks and uncertainties facing DEI – from a rapidly changing natural gas market to the building risk of legislative or regulatory limits on carbon emissions, a new centralized energy and expanded capacity market framework for MISO, falling wholesale energy market prices, new efficiency mandates from the IURC, the potential for new renewable mandates or incentives, and a different load outlook than even in 2011. To encapsulate all of these shifting risks and uncertainties in only three scenarios is imprudent planning, and ignores the vast majority of likely outcomes for the Company and its ratepayers. Combinations of high coal price with significant new requirements for renewable energy, or low gas prices even in the presence of a carbon price, or the ability to achieve high efficiency penetration even while gas prices climb are all not only possible, but far more likely than the three constrained scenarios explored by DEI here.

DEI has set up three scenarios that it presumably believes are internally consistent. The Reference Case represents DEI's base case assumptions. The "Low Reg" scenario and the "Environmental Focus" scenarios, however, are not necessarily internally consistent as they are based on predetermined relationships that will (a) blur the impact and importance of various risk factors, such as fuel costs and emissions prices, (b) underestimate risk imposed on the company by fuel costs and emissions prices, and (c) likely bias the Company's solution set towards status-quo outcomes. The effect of these linked assumption sets is that important decisions, such as coal/gas switching, investments in new emitting resources, and even the decision to invest in non-fossil-fired resources are convoluted, skewed, and likely biased. DEI has assumed a 100% correlation between multiple important variables with no reasonable justification, and no evidence that such correlations are warranted or reasonable.

In the DEI's recent CPCN filing (Cause 44217), Joint Intervenors' witness Frank Ackermann testified that:

It is not reasonable to assume highly correlated movements in gas and coal prices... [because] fuel prices are subject to numerous uncertainties over the multi-decade time span of analysis used in this case. Factors such as geological discoveries, innovations in mining and drilling techniques, the strength of export markets, and the evolving regulatory environment for the extraction and use of both fuels could drive either gas or coal prices in either direction.¹

The computational power and marginal effort required to run additional scenarios is truly *de minimis* on the scale of decisions and investments that will ride on this IRP. As the largest electric power company in the nation, Duke Energy assuredly has the ability to run a commercial, off-the-shelf model more than three times to ensure that risk and uncertainty are correctly and properly quantified, and that ratepayers are ensured reasonable service and costs.

PacifiCorp, a western utility just 30% larger than DEI (but less than 1/5th the size of Duke Energy) recognized the problem associated with a wide range of uncertainties, and subsequently used the very same modeling platform as DEI to run a far wider range of scenario options in their 2013 IRP. Ultimately PacifiCorp produced nineteen different scenarios (i.e. combinations of commodity prices, renewable incentives, and DSM) with 12 additional sensitivity cases (sensitivities on load growth and renewable policies), and ran these through five transmission alternatives – for a total of 106 unique portfolios. This stands in stark contrast to the three offered here. As noted in the 2013 PacifiCorp IRP:

PacifiCorp worked closely with stakeholders to define 19 core cases that were applied uniformly across five Energy Gateway transmission scenarios and developed an additional 12 sensitivity cases reflecting alternative assumptions for load forecasts, availability of renewable resource federal tax incentives, renewable portfolio standard modeling, Class 3 demand-side management (DSM) resource availability, and coal unit environmental investments. In total 106 portfolios, each analyzing unit-by-unit

¹ Testimony of Dr. Frank Ackerman, State of Indiana Utility Regulatory Commission, Cause No. 44217. Nov 29th, 2012.

environmental investments in existing coal resources, were developed and risk assessment studies were completed for 37 portfolios among three carbon dioxide (CO₂) tax levels..²

While it is not anticipated that DEI would require 106 separate resource portfolios (as there are transmission issues specific to PacifiCorp that do not apply here), a series of core scenarios and a reasonable number of additional sensitivities that allow the Company, the Commission, and stakeholders to examine the range of risks and forcing factors would be highly beneficial.

Recommendations:

1. Do not create mutually exclusive commodity price scenarios;
2. At a minimum, run all feasible combinations of gas and CO₂ prices to describe outer bounds of risk (9 scenarios), as well as other outcomes;
3. Run a combination of high and low coal prices in concert with mid and outer boundaries (6 additional scenarios), or simply run all combinations of all three commodities (27 scenarios in total);
4. Evaluate if others risks (e.g. capital costs, transmission, load) require additional boundary analyses.

Natural Gas Price Forecast

DEI's natural gas scenarios argue that the "range of published long term gas forecast views has tightened considerably in the past year." While it may be that third party baseline forecasts have narrowed, baseline long term gas price forecasts have also generally continued to fall over the last several years, with another significant drop predicted by the US Energy Information Administration (EIA) in the most recent 2013 Annual Energy Outlook (AEO).

In the long term, the DEI reference case forecast price is, for some years, similar to the EIA AEO 2012 gas price forecast, which can be considered a reasonable marker. It is notable that the EIA AEO 2013 price has dropped considerably from the previous year, and is now close to a dollar per MMBtu lower than DEI's prices shown here (see Figure 1, below). While natural gas futures in the last few months (discussed below) are somewhat higher than AEO 2013, all of these forecasts (AEO 2012, AEO 2013, and NYMEX futures) are below the DEI forecast in the 2017-2024 timeframe. The DEI forecast is \$0.74/MMBtu higher than AEO 2012 and \$1.23/MMBtu higher than NYMEX forwards – a wide margin when decisions are hedged on thin margins.

² *Emphasis added.* PacifiCorp 2013 IRP, April 30, 2013. Page 157. Available online at http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2013IRP/PacifiCorp-2013IRP_Vol1-Main_4-30-13.pdf

Comments on Preliminary Assumptions for Cleco's 2014/2015 Integrated Resource Plan

Strengths, Weaknesses, Implications and
Recommendations for Modeling Inputs

Prepared for Sierra Club

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to provide to its customers, and the associated costs. As a result, underestimating—or excluding outright—reasonably expected demand side resources will result in the company overbuilding or over-procuring energy and capacity.

4.1. Energy Efficiency and Demand-Side Management

In its stakeholder presentation, Cleco states that it plans to meet mandated demand response goals. However, these demand response goals should be treated as a minimum, not a maximum, for the company's long term planning. Based on the preliminary documentation, Cleco does not appear to be pursuing any energy efficiency above what is mandated by the PSC. If this is the case, Cleco has likely prevented its analysis from reviewing economically beneficial resources in energy efficiency.

Cleco should be treating energy efficiency like any other available resource and pursuing programs that are available and beneficial to ratepayers. As pointed out by PacifiCorp, one of the largest utilities in the country, "energy efficiency is a resource used to meet demand: its elements have costs, supply curves, and a load shape. As such, it is comparable, and directly compatible, with resource optimization modeling."²⁰ Energy efficiency can be, and should be, compared side-by-side with other new resource alternatives. Increased energy efficiency targets do not always translate to an increased per unit cost of saved energy--costs can actually drop with greater penetration of energy efficiency.²¹ Some studies have shown that energy efficiency is not only competitive with supply side resources, but that even half to one-third the cost of the next best alternative.²² Because efficiency can avoid the need for building new capacity and retrofitting existing resources, energy efficiency could also be used as a mechanism for compliance with forthcoming environmental regulations.

Recommendations:

1. Cleco should disclose the costs of energy efficiency to be assumed for this IRP and provide the underlining assumptions.
2. All of model runs should have Cleco meet any mandated energy efficiency and DSM goals.
3. Cleco should develop a supply curve for energy efficiency; the development of the supply curve should be disclosed for the Commission and stakeholders.

²⁰ PacifiCorp 2013 IRP, April 30, 2013. Page 4.

²¹ K. Takahashi and D. Nichols (2008). The Sustainability and Costs of Increasing Efficiency Impacts: Evidence from Experience to Date, proceedings of the 2008 ACEEE Summer Study on Energy Efficiency in Buildings, ACEEE; John. Plunkett, et al. An Empirical Model for Predicting Electric Energy Efficiency Resource Acquisition Costs in North America: Analysis and Application, proceedings of the 2012 ACEEE Summer Study on Energy Efficiency in Buildings, ACEEE.

²² Molina, M., "The best Value for America's Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs." (2014)