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

Strengths, Weaknesses, Implications and Recommendations for Modeling Inputs

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INTRODUCTION

Synapse Energy Economics was retained by Sierra Club to provide feedback on the Cleco Power's modeling inputs and direction for its 2014 Integrated Resource Plan, and to provide recommendations to improve the planning process. Comments herein are based on the limited information Cleco has made publicly available during the stakeholder engagement process in I-33015, as well as public information presented in the concurrent application by Cleco to install various environmental controls at their solid fuel units (LPSC Docket U-32507).

Sierra Club has identified six major issues it believes will be important to address moving forward during the IRP process: commodity price forecasts, carbon-dioxide price forecasts, treatment of existing coal asset risk, treatment of demand-side and renewable resources in the model, the overall model structure, and transparency. How the company chooses to handle these assumptions, and its willingness to vet current assumptions, materially affect the outcomes of this IRP. Sierra Club believes that incorporating the suggestions made in this report will help ensure that Cleco provides its customers with more robust planning decisions. Moreover, it will help ensure that the company is appropriately accounting for the risks associated with an uncertain future.

1. COMMODITY PRICES

Based on our review of the materials that Cleco Power has made available in this docket, it is not clear if the Company expects to use $Aurora_{XMP}$ as an optimization (capacity expansion) model.[1] However, regardless of whether the utility uses an optimization model or a less robust planning tool, the commodity forecasts Cleco uses in its model will have a dramatic impact on what resources are considered optimal on a forward-going basis. While no forecast is perfect, there are often estimates which either represent an industry consensus, or are at least based on public methodologies that have undergone some vetting and critique.

1.1. Natural Gas

In its 2014 IRP Data Assumptions filing, Cleco presents three natural gas price forecasts—"low," "reference" and "high"--which increase 2.5%, 4%, and 5.3% on average each year, respectively.[2] This

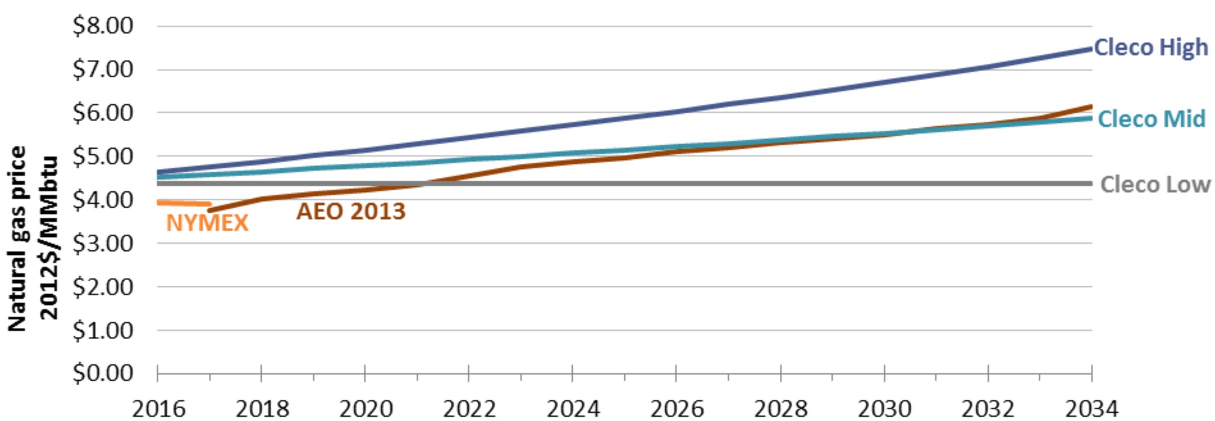
[1] $Aurora_{XMP}$ potentially offers a platform to review economic additions and retirements from the Cleco system. However, based on Cleco's single bullet point regarding the use of this model ("Base Run – Additions & Retirements – Re-run – Convergence") it is not clear the extent to which Aurora will be allowed to choose optimal resources, versus the Company filtering or selecting the resources and running those through a production cost framework, rather than a linear program optimization framework.

[2] These all assume a 2.5% inflation rate, consequently, the low case natural gas projection is actually flat in constant dollars.

construct is an improvement over the more simplified high and low “bounds” the company presented in the concurrent MATS approval docket.[3] Although the basis for Cleco’s natural gas forecasts is unclear and some underlying assumptions are questionable, the Company’s decision to present its natural gas forecasts in a public forum is a positive step.[4]

As shown in Figure 1, Cleco’s gas price forecasts starts significantly above present-day prices – nearly a dollar per MMBtu above 2013 historic prices, and well above natural gas futures quotes from NYMEX for Henry Hub. In addition, the forecast begins well above Henry Hub prices forecast in the 2013 Annual Energy Outlook released by U.S. Energy Information Administration, although Cleco’s mid-case tracks the 2013 AEO forecast beginning in 2026. The AEO forecast is a public, highly vetted forecast based on extensive data and modeling; it underlies the assessment of U.S. energy policies. It is not clear if Cleco’s gas prices represent delivered or hub trading prices, and what, if any, differential Cleco experiences in gas prices relative to Henry Hub.

Figure 1. Cleco natural gas projection compared to NYMEX and AEO 2013



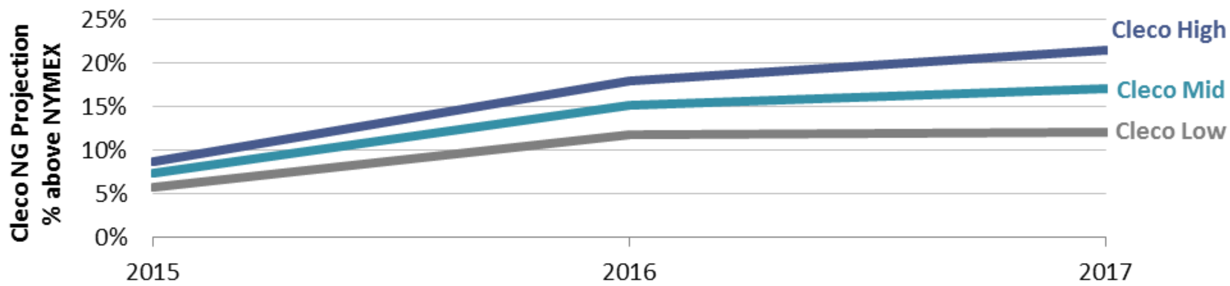
Source: EIA AEO 2013, NYMEX Futures, Cleco 2014 IRP stakeholder presentation

As shown in Figure 2, Cleco’s three forecasts are between six to nine percent higher than NYMEX in 2015 and between 12 to 21 percent higher in 2017. Realistically, none of the natural gas forecasts should substantially deviate from NYMEX in the 2014-2017 timeframe because they represent the industry’s short-term outlook for natural gas prices.

[3] See Application of Cleco Power LLC for: (1) Authorization to install Emission Control Equipment on Certain of its Generating Facilities in Order to Comply with Federal National Emission Standards for Hazardous Air Pollutants from Coal-Fired Electric Utility Steam Generating Units Rule, Docket No. U-32507 (Aug. 16, 2012) (hereinafter Cleco 2012 MATS Approval Docket).

[4] We assume, based on Cleco’s proximity to Henry Hub, that the prices shown in Cleco’s presentation represent the prices at this national trading hub, rather than as delivered to Cleco’s units. As such, our comparisons are all against Henry Hub prices.

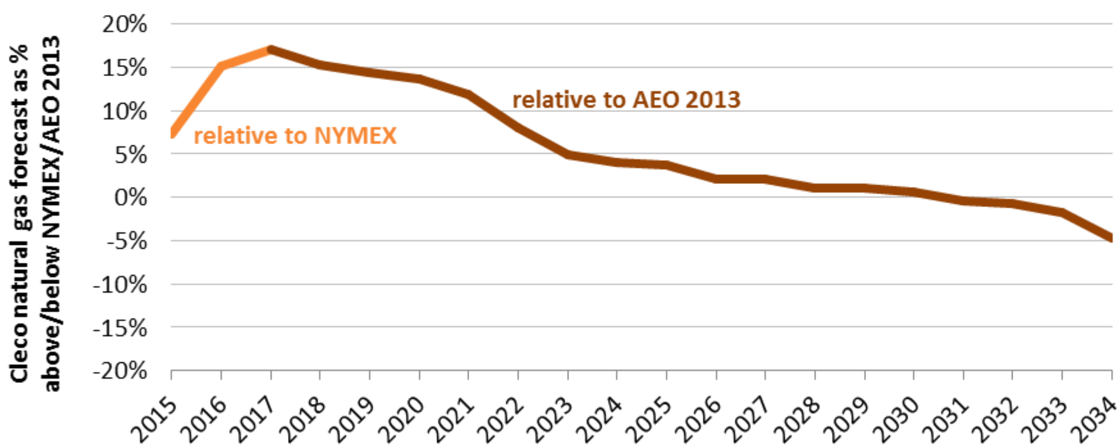
Figure 2. Cleco's natural gas projection as a percentage above NYMEX in years 2015-2018



Source: Analysis of Cleco 2014 IRP stakeholder presentation

In out years, from 2023 to 2034, Cleco's reference case forecast is within five percent of the EIA AEO 2013 reference forecast, and is therefore a reasonable forecast for those years. However, as shown in Figure 3, Cleco's reference case forecast is more than 10% higher than the AEO forecast from 2018 through 2021. Such a significant deviation from a widely used, public forecast warrants explanation.

Figure 3. Cleco's reference case natural gas projection as a percent relative to AEO 2013 and NYMEX



Source: Analysis of Cleco 2014 IRP stakeholder presentation

A consequence of this high natural gas forecast in the early years is a selection bias against natural gas resource choices; in the case of Cleco, this is a particularly important consideration in the assessment of the value of their existing solid-fuel assets. In the concurrent approval application for MATS compliance, Cleco values the existing coal fleet against natural gas alternatives; therefore, a reasonable natural gas price is an essential component of forward planning for this utility.

Cleco's high and low gas prices deviate from its baseline forecast increasingly over future years. This planning assumption represents a more realistic and likely sensitivity outcome than a simple absolute high and absolute low as used in the concurrent MATS retrofit approval application.

Recommendations for Natural Gas Forecasts:

1. Present Cleco's historical delivered natural gas prices.
2. Reflect reasonable market trading prices (i.e., NYMEX) over the short term, or near-variations thereof. This reflects the reasonable expectations that Cleco should be able to secure natural gas at Henry Hub prices traded on the forward markets.
3. Ensure that forecasts are accurate and up-to-date prior to substantive modeling.

1.2. Solid Fuels (Coal, Petcoke, Lignite)

At the time of this report, Cleco has supplied stakeholders with one coal price forecast even though Cleco's fleet burns at least five different types of solid fuel: bituminous coal from the Illinois basin (Rodemacher), petcoke, sub-bituminous coal from the Powder River Basin and biomass (Madison), and lignite (Dolet Hills). Each of these solid fuels currently has very different prices, and would be subject to different market trends over the planning period.[5] Furthermore, Powder River Basin and Illinois Basin coals are subject to significant transportation charges, whereas lignite is mined nearby by a related company and the petroleum coke is a waste product acquired from within the region. In addition, coal prices are becoming more uncertain as some mines experience lower demand and push higher fixed costs into their coal prices. Appalachian coal has risen in price significantly recently, while numerous coal mines in the Powder River Basin region are starting to raise prices as well.

Cleco's coal units represent approximately one-third of its capacity and two-thirds of its generation.[6] Company documents assert that continued investment in and operation of these units is required to maintain fuel diversity.[7] Consequently, developing a forecast for each one of these fuels will be important in order to properly use long term planning models and to properly value Cleco's current fuel mix. While Cleco's 2014 IRP Data Assumptions suggest that the company plans on running a high coal case in the "renewables scenario," the company does not present that forecast in the current set of publicly available documents, nor does it indicate why a high coal price would be expected in a "renewables scenario" versus in any other circumstance. Cleco could experience rising coal prices regardless of whether it is also subject to regulatory requirements to serve a certain percentage of its load with renewable energy resources.

Recommendations:

1. Present historic prices and price forecasts for each of the five solid fuels.

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[5] The demand for PRB and Illinois Basin coal is subject to constraints on sulfur emissions by coal units across the country, and the supply fluctuates with the entry and expansion of new mines, as well as the decline and closure of existing mines. Since different units require different coal specifications, the demand for these different coals are not equivalent over time.

[6] Estimated from EIA 860.

[7] Cleco 2012 MATS Approval.

2. For each year in the study period, present the value for all fuels in the high and low projections, as done with natural gas projections.

3. Evaluate these sensitivities independent of other variables (such as the existence of a renewable portfolio standard).

2. CO_2 PRICE

Cleco's current IRP data assumptions include a CO_2 price that starts in 2023 at roughly $6 per ton and increases to approximately $19 by the end of the study period in 2034.[8] There is no record of a CO_2 price being used in Cleco's 2007 or 2012 IRP, and a CO_2 price was excluded from the base analysis for the company's MATS retrofit application. Cleco's use of a carbon price in their IRP represents a significant improvement over previous IRPs and their concurrent MATS approval filing.[9] Cleco's IRP data assumption filing correctly recognizes the potential for a carbon cost by including a non-zero CO_2 price in their modeling. However, it is unclear how this price is incorporated into each scenario. It is important that Cleco use a non-zero CO_2 price in all of their model runs and not just a select few.

Incorporating a price for carbon dioxide is crucial for prudent utility planning. Almost all of the large investor-owned utilities reviewed by Synapse in both docketed proceedings and IRPs include a carbon price in their planning.[10] Moreover, other utilities in Louisiana (Entergy and SWEPCO) are currently using a carbon price in long term planning.[11,12] Shown in Figure 4, Synapse has also assembled utilities' CO_2 price forecasts from across the country. Cleco's price forecast is far below that of most utilities and below its neighboring utilities in most years. Cleco also assumes that the CO_2 price won't take effect until 2023, while SWEPCO assumes it will take place in 2022. We suggest that 2020 is a reasonable timeframe for the start of CO_2 prices for planning purposes.[13]

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[8] Prices are presented in constant 2012 dollars, discounted at 2.5% per Cleco's 2014 IRP assumptions.

[9] Cleco 2012 IRP Appendix I Abridged IRP, Cleco 2007 IRP, Cleco 2012 MATS Approval.

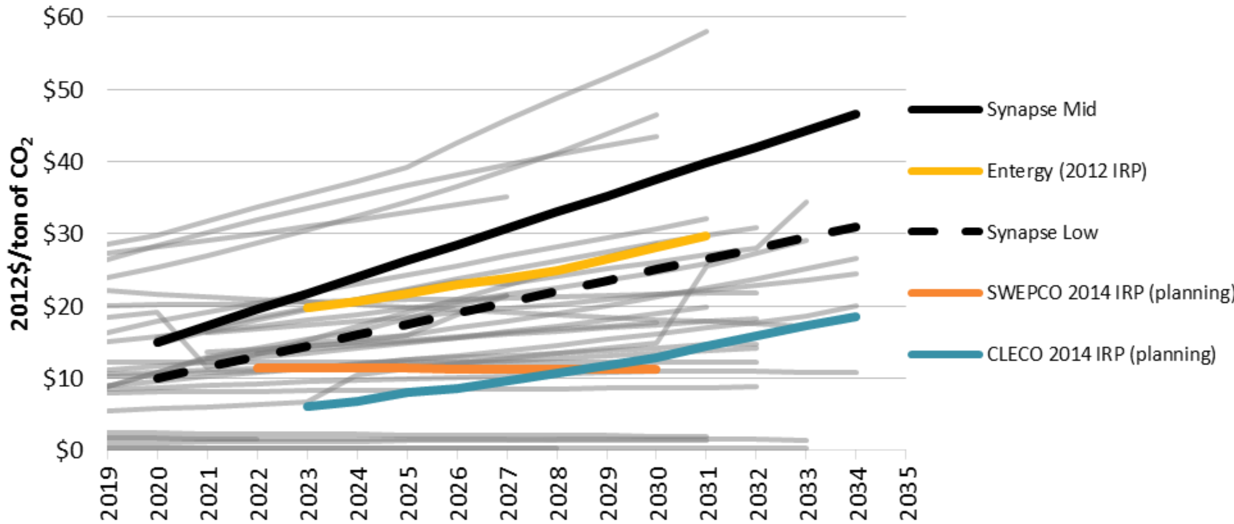
[10] Luckow, P., et. al. "2013 Carbon Dioxide Price Forecast." (2013).

[11] Entergy System Integrated Resource Plan. October 2, 2012. *Available at* https://spofossil.entergy.com/ENTRFP/SEND/2012Rfp/Documents/2012%20System%20IRP%20Report%20-%20Final%2002Oct2012.pdf

[12] SWEPCO 2014 IRP Stakeholder Presentation.

[13] Luckow, P., et. al. "2013 Carbon Dioxide Price Forecast." (2013), available at http://www.synapse-energy.com/Downloads/SynapseReport.2013-11.0.2013-Carbon-Forecast.13-098.pdf.Attached as Exhibit A.

Figure 4: Recent utility CO2 forecasts with Cleco, SWEPCO, Entergy, and Synapse forecasts highlighted



Source: Synapse, only select years shown.

In 2008, the Lawrence Berkeley National Laboratory evaluated how utilities manage regulatory risk of carbon, and offered an explanation for why nearly every utility in the Western Electricity Coordinating Council incorporates future carbon regulations into their decision-making process.

> The long economic lifetime and development lead-time of many electric infrastructure investments requires that utility resource planning consider potential costs and risks over a lengthy time horizon. One long-term and potentially far-reaching financial risk currently facing the electricity industry is the uncertain cost of future carbon dioxide (CO_2) regulations.[14]

The Regulatory Assistance Project (RAP)—a well-respected organization of former utility regulators that advises public officials on utility policies—paper on "Best Practices in Electric Utility Integrated Resource Planning" and "Addressing the Effects of Environmental Regulations: Market Factors, Integrated Analyses, and Administrative Processes"[15] both discuss the critical and fundamental role of the assessment of carbon prices in long-term utility planning.

The carbon price used for planning is not meant to exclusively represent the likelihood of carbon legislation imposing a fee on carbon emissions. EPA's existing authority under Section 111(d) of the Clean Air Act would create an alternative pathway for carbon costs to be imposed on utilities. In June

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[14] Barbose, G., et. al. "Reading the Tea Leaves: How Utilities in the West Are Managing Carbon Regulatory Risk in their Resource Plans." (2008)

[15] Wilson, R., Biewald, B., "Best Practices in Electric Utility Integrated Resource Planning." (2013); Regulatory Assistance Program, "Addressing the Effects of Environmental Regulations: Market Factors, Integrated Analysis, and Administrative Processes," http://www.raponline.org/featured-work/resource-planning.

2014, EPA is expected to release a draft New Source Performance Standard (NSPS) for existing stationary sources of CO_2. While the structure of this proposal is yet unclear, a number of parties have suggested that the flexibility inherent in the best system of emission reduction standard and EPA's stated preference for a least cost mitigation framework suggest that EPA may use carbon pricing to reach carbon reduction goals.[16]

Over the long term, the inclusion of a carbon cost in utility resource modeling protects Cleco and its ratepayers from unplanned-for exposure to the costs from greenhouse gas regulations. If Cleco fails to include a reasonable carbon price forecast in its planning, the result will be a carbon-intensive fleet more vulnerable to escalating costs under either Section 111(d) regulation or legislative action on carbon. Cleco has only presented a single CO_2 price forecast. The same way utilities hedge against uncertain fuel prices by running sensitivities with "high" and "low" natural gas prices, many utilities use multiple CO_2 prices to account for different possible stringency of CO_2 restrictions.[17] In addition, the Cleco forecast is below even the Synapse "low" case (and most other utility reference cases), suggesting that this forecast represents only a floor estimate.

Recommendations for CO_2 Forecasting:

1. We recommend using the Synapse 2013 mid-case forecast as a reasonable starting point for reference case forecasts. Utilities that use the Synapse forecast include Louisville Gas and Electric (2014 CPCN), Idaho Power (2013 IRP), Kansas City Power and Light (2013 IRP Update), Portland Gas Electric (2013 IRP), and BC Hydro.

2. Cleco should use a non-zero CO_2 price in all scenarios, or only run a zero CO_2 price as a low-bound estimate.

3. In modeling, CO_2 cost should influence the dispatch of Cleco's units, and not be treated as a cost "after the fact."

4. We recommend bounding the reference case forecast with high and low options, representing different levels of stringency.

5. Sensitivities should be conducted independently of other variables (i.e. not correlated) and then in combination with select variables to explore bounds of risk. This process is described in detail in Section 5, below.

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[16] See Resources for the Future, July 2011. Prevailing Academic View on Compliance Flexibility under § 111 of the Clean Air Act. "EPA appears to have authority to include many specific flexible or market-design tools in § 111 regulation, including tradable performance standards operating across sectors, price floors, banking of credits or allowances, and, in principle, nationwide cap-and-trade. Regulations likely can also increase in breadth or stringency over time—EPA appears to have the authority (and the opportunity) to achieve ambitious environmental goals while providing regulatory predictability to industry. These tools can make CAA policy more effective and more efficient."

[17] Southwestern Public Service Co. (Excel), 2013 IRP; El Paso Electric, 2012 IRP; Progress Energy Carolinas, 2012 IRP

3. COAL PLANT RISK

Utilities across the country are looking forward at a number of regulations that will result in significant costs to continued operation of coal plants. As a result many utilities are opting to retire their coal plants in the near future, rather than continue operation of these risky assets. Prudent planning would suggest that any Company that owns a power plant that is coal-fired would rigorously and thoroughly investigate the risk its coal plants pose to its ratepayers.

3.1. Regulatory Risk

In order to continue operations, Cleco's coal units will face significant environmental compliance costs (in addition to potential greenhouse gas regulation) from regulations such as National Ambient Air Quality Standards (NAAQS), Clean Air Interstate Rule (CAIR) and/or a new version of the Cross-State Air Pollution Rule (CSAPR), Mercury and Air Toxics Standards (MATS), Clean Water Act section 316(b), Effluent Limitation Guidelines (ELG), and Coal Combustion Residuals (CCR).[18] While Cleco discusses most of these regulations in its IRP data assumptions, it does not put forward the compliance dates or costs for its units that it will use in its modeling.

Complying with these regulations will cost Cleco's ratepayers significantly, and it would be detrimental to ratepayers for Cleco to ignore these costs. The difference between properly accounting for the risks these regulations present to continued operation of coal units, and discounting these risks is significant. Accounting for all of these costs will be critical to properly modeling Cleco's resources and optimizing a reasonable lowest cost plan for Cleco's customers. If the costs are unreasonable, or the compliance dates unrealistic, the model will not appropriately optimize decisions to either add or remove resources from Cleco's portfolio costing its ratepayers in the long run.

Recommendations for Environmental Regulatory Risk Assessment:

1. Cleco should present findings from a detailed financial analysis including the costs of compliance with MATS, NAAQs, and all proposed and emerging regulations.

2. This analysis should also include sensitivities for compliance costs and the resulting effect on the fleet's operations.

3.2. Retirement Potential

Decisions surrounding the continued operation or retirement of existing plants are fundamentally the same as those surrounding new asset procurement. The need for capital investments, variable costs, fuel costs, fixed costs, and regulatory costs influences the decision to build new units or shut down old

[18] Cleco First Stakeholder Presentation (Mar. 4, 2014).

units. However, in its 2014 IRP data assumptions, Cleco seems to have ignored even the potential for idling or retiring any of its existing generation units. The Company should engage in optimization of the build-out of new resources while accounting for the changes in load and the possible retirement of existing resources. This means that coal retirements will should be optimized compared to other options in the modeling (such as MISO market purchases), not pre-defined or "hardwired" into the model. While hardwiring resources in a model to meet state and federal regulatory requirements may be reasonable (e.g., an existing or proposed Renewable Portfolio Standard), by assuming the continued operation of all coal units, Cleco denies its ratepayers the opportunity to find cost-effective alternatives its existing resources. Hardwiring the model to avoid the retirement of potentially non-economic units is deeply antithetical to prudent planning. Failing to allow economic coal plant retirements would effectively render this IRP process meaningless.

A retirement assessment would reasonably include an assessment of reasonable replacement resources, including a portfolio analysis (i.e., not a single replacement unit, but a portfolio of replacement energy and capacity from least-cost resources), as well as decommissioning and demolition costs for the remediation of non-economic units.[19]

Recommendations:

1. Cleco should allow the model to determine unit retirement decisions endogenously.
2. Such retirement decisions should be made in the context of portfolio replacement options, rather than single one-off replacement assumptions (i.e., a single NGCC unit) to capture least-cost resource options.
3. Cleco should develop estimates for decommissioning and demolishment of its units. These estimates should be open to vetting by the commission and stakeholders and should be presented in terms of net costs (the cost of decommissioning and demolition less the revenue generated from sale of scrap metal, salvaged equipment, and land value).

4. DEMAND SIDE MANAGEMENT, RENEWABLES, AND LOAD

Distributed generation, renewable energy resources, energy efficiency, and other demand side resources all can have a direct influence on load shape and load forecasts. Consequently, appropriately accounting for these resources is necessary to ensure least cost resource planning. Increases in distributed generation and energy efficiency will reduce the amount of energy and capacity Cleco needs

[19] Some utilities use the historic costs of retiring units to develop a cost estimate but will skew the price by including the costs to decommission nuclear plants. Other utilities will develop cost estimates but ignore important aspects like economies of scales or the ability to recoup scrap metal or salvaged equipment. All of these practices should be avoided by the company in estimating post-retirement costs and are examples of why not just the assumption, but the method to develop the assumption, should be transparent.

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 pursing 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 exiting 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)

4. Cleco should model efficiency as a resource (i.e., equivalent to a supply-side resource) not as an exogenous demand reduction.

4.2. Renewable Energy Policies and Costs

Renewable Portfolio Standard

Cleco's "renewable" scenario appears to reflect its expectation for a state Renewable Portfolio Standard (RPS) in the future that includes a mandate of 10% renewables (by capacity) in 2023. It is certainly reasonable for Cleco to evaluate the potential for significant renewable resource procurement on its system, considering the rapidly declining costs of those resources. The manner in which Cleco has done so here may skew the analysis, however. For external purposes, evaluating a 10% renewable procurement standard might look like a reasonable mechanism to assess renewable resources. However, if the RPS scenario does not reflect a reasonable expectation of what a state or national RPS might look like, then the assessment is not meaningful from an IRP standpoint. We generally recommend that utilities model their current mandates at a bare minimum, and then optimize other resources, including renewables to meet demand at a least cost. To this end, renewables should be accurately characterized for cost and availability. As noted below, Cleco has not provided costs for more than a handful of renewable energy resources, thereby limited the options the model can choose. Cleco also does not appear to be modeling its mandate under Louisiana's renewable energy pilot program as part of every scenario.

Net Metering

Cleco makes no mention of the changing landscape of state policies that will have material impacts of Cleco's long-term plans, namely changes in net metering policy. Currently, stakeholders in Louisiana are pushing for changes in the net metering policy, including lifting (or potentially removing) the current 0.5% cap on net metered facilities.[23] Increased penetration of net metering will impact Cleco in at least two ways: 1) it will reduce both energy and capacity demand and 2) it may also require investments in the distribution grid.

Recommendations for Incorporation of Renewable Energy Policy:

1. All model runs should plan for Cleco meet the legislative mandate for a renewables pilot program.

2. Cleco should provide assumptions it has made about changes to the state net metering policy, including if it assumed there would be no change, and any supporting documentation for its assumptions.

[23] Owens, D., "One Regulated Utility's Perspective on Distributed Generation." Entergy presentation at Southeast Energy Power Summit. (2014)

Cost

The cost associated with installing solar resources over the past decade has dropped significantly and is expected to continue to decline.[24] The cost of wind turbines has declined and is also expected to continue to do so.[25] Additionally, wind technologies are allowing for increased capacity factors and reliability. These renewable energy trends, unfortunately, do not seem to be accounted for in Cleco's IRP data assumptions. It is not reasonable to assume that the costs of renewable energy will remain the same over the 20-year planning horizon given recent trends. At least one of Cleco's neighbors, SWEPCO, is modeling the declining costs of wind and solar as part of its 2015 IRP.[26] This observed (and expected) continuing cost decline has generally been termed "learning effects" in the literature.[27]

Recommendations:

1. Cleco should include a cost projection for wind and solar resources that reflects current (2014) industry understanding and expectations, reasonable parameters for learning effects.

4.3. Load Forecasts

Testing resource plans against different load forecasts, both high and low, is a critical sensitivity and provides the company, the Commission, and stakeholders with valuable information. However, that value is reduced when the high and low forecasts are not meaningful alterations to the reference case. In the 2014 Data Assumptions, Cleco presents a reference case forecast for energy and load in detail. For the "high," and, "low" forecasts, the company only presents the constant average growth rate (CAGR). The high and low forecasts are only slight alterations that will not result in meaningful results. The Company's lowest load forecast (its "limited" scenario) includes a 1% annual peak load growth, which appears unrealistic for a low bound. Several other utilities that provide load forecasts which include no significant growth in capacity demand and even peak load reductions over the study period. Just a few public examples of this are SWEPCO's 2015 IRP proposed assumptions,[28] Minnesota Power's 2009 Electric forecast, Nova Scotia's 2010, 2011, and 2012 IRPs, and Alaska Railbelt Regional IRP.[29] Indeed, the Energy Information Administration forecasts anywhere from a 0.8% to a 1.2% CAGR for Cleco's service territory region, driven by assumptions regarding residential and industrial growth.

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[24] U.S. Department of Energy "SunShot Vision Study" (2012)

[25] U.S. Department of Energy "Wind Technologies Market Report" (2012)

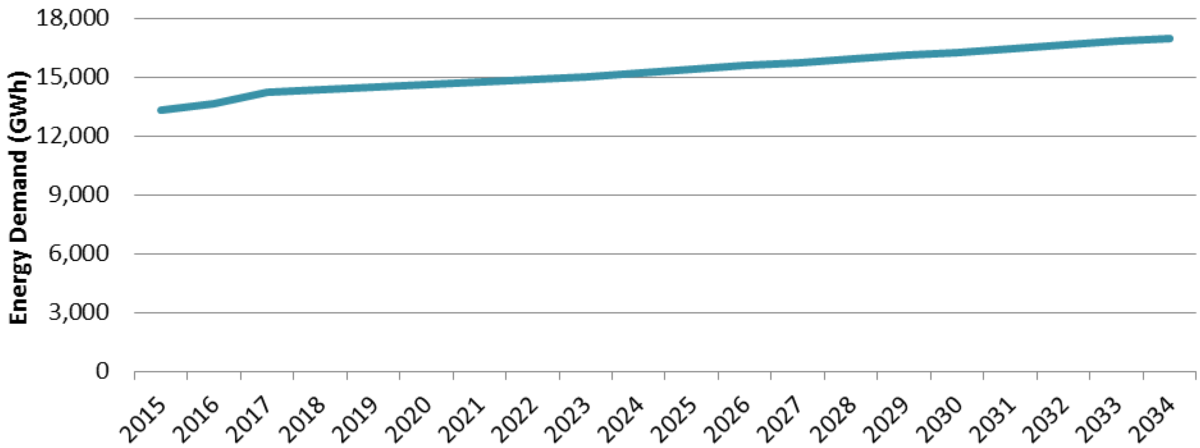
[26] 2015 SWEPCO Integrated Resource Plan, Initial Stakeholder Meeting (2014)

[27] See, for example, Assumptions to the Electricity Market Module in EIA's Annual Energy Outlook, 2013. Available at http://www.eia.gov/forecasts/aeo/assumptions/pdf/electricity.pdf

[28] 2015 SWEPCO Integrated Resource Plan, Initial Stakeholder Meeting (2014)

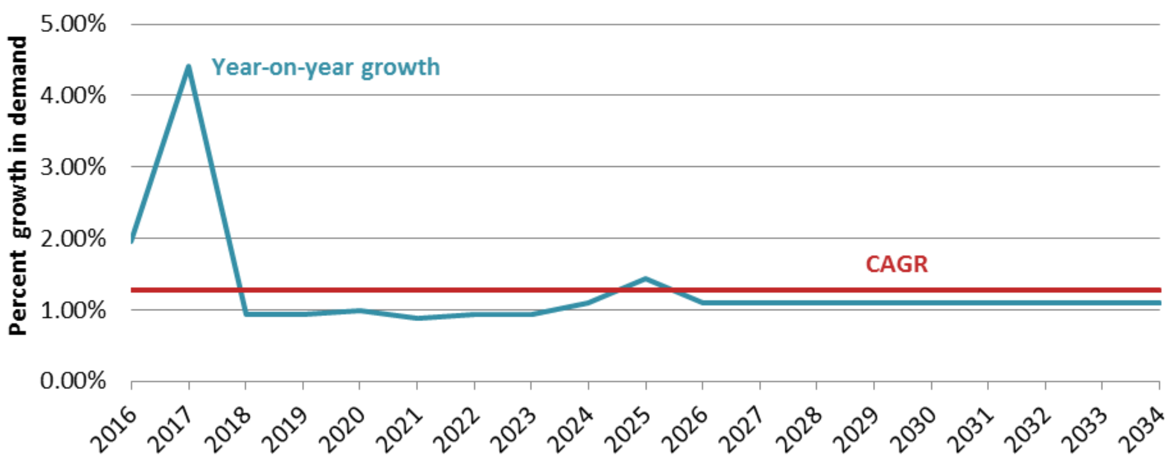
[29] "Synapse 2013 Technical Training, Session 2: Best and Worst Practices in IRP and CPCN." (2013)

Figure 5. Cleco's Energy Demand Forecast, reference case



Source: Cleco First Stakeholder Presentation (March 4, 2014)

Figure 6. Year-on-year growth rate and constant average growth rate (CAGR) for energy Demand



Source: Cleco First Stakeholder Presentation (March 4, 2014)

The Company's peak load underlies the capacity reserves it is required to maintain. In Cleco's application to the LPSC to join MISO it stated that its reserve margin would drop from 13.64% to 5.94%.[30] Cleco has, in past proceedings, planned for reserve margins above what was strictly necessary. For example, when Cleco was still a member of the Southwest Power Pool (SPP), members were required to carry a 12% reserve margin target; nonetheless, in the company's 2007 IRP Cleco asserted a 15% reserve margin was

[30] See LPSC Docket No. U-32631, Dec. 6, 2012 application, page 16.

needed and claimed that it required a 20% reserve margin in the IRP before that.[31] Sierra Club would be concerned if the Company was planning on reserve margin above what is required by MISO and agrees with Staff comments on earlier RFPs that Cleco should provide detailed justification for its assumed reserve margin.[32]

The Company should not plan on meeting a reserve margin above what is required by MISO. Resource investment decisions based on reserve margins that are higher than necessary will place an undue burden on ratepayers and should not be an accepted practice.

Furthermore, including DSM in load forecasts can materially alter the load forecast. Both Sierra Club and Synapse have engaged in proceedings where companies fail to account for known or expected demand side resources in their forecast; such forgetfulness can have a material impact in the resources a model might choose during long term planning optimization.[33] Cleco has struggled to appropriately account for DSM in the past—such as in the 2007 IRP. For the 2014 IRP, Sierra Club proposes the following recommendations:

Recommendations for Load Forecasting:

1. Provide all inputs and justifications to load forecast.
2. Provide high and low demand sensitivities that deviate materially from the reference case, considering a low load growth scenario that sees little to no growth in peak demand.

5. MODEL STRUCTURE

Setting up long term, least cost planning typically involves the modeling of existing and potential resources on an economic basis to minimize the costs of providing power to ratepayers. These resources typically include internal supply and demand-side resources, market purchases, and power purchase agreements (PPA's). Existing resources are dispatched in the order of ascending cost of operation (given load levels and other constraints) while new resources are selected for construction when economic to do so. Reasons for new construction may include needs for new capacity or energy, or that existing plants are no longer economic (or cannot economically meet regulatory constraints). To ensure that the company is appropriately accounting for future uncertainties, the system must be tested under reasonable ranges of variables that will influence the outcome of the modeling. At the very least, resource planning should be conducted under a range of variables including (but not limited to): fuel

[31] See Comments of Commission Staff on Cleco Power LLC's 2007 Long Term Request for Proposals for 2010 Resources (Nov. 1, 2007) (hereinafter "Staff 2007 RFP Comments"), at, page 4. Attached as Exhibit B.

[32] Staff 2007 RFP Comments, page 4.

[33] "Synapse 2013 Technical Training, Session 2: Best and Worst Practices in IRP and CPCN." (2013)

prices, energy prices, capacity prices (where applicable), environmental regulations, and demand.[34] Cleco appears to have chosen not to run true sensitivities, where the base reference case is developed and variable are changed independent of one another. Rather, Cleco characterizes these variables into clustered futures termed “scenarios.” Each scenario comprises a pre-determined combination of assumptions regarding the future of these variables.

5.1. Scenarios

Cleco outlined for its stakeholder meeting the four scenarios it plans on evaluating in the 2014 IRP using the $\text{Aurora}_{\text{XMP}}$ model. These four scenarios represent a wide range of assumptions simplified into just the four independent “worldviews.” While the company has developed assumptions regarding the trajectories of emissions prices, loads, efficiency trajectories, and renewables requirements, some of the assumptions underlying these scenarios are unreasonable. For example, it is unreasonable to assume that variations in commodity prices are so highly correlated--such as natural gas and coal prices. In fact, because the Company assumes that all of these variables must be correlated perfectly, it is extremely unlikely that any of the scenarios run by the Company will actually transpire. Changes in the regulatory environment, developments in technology, and global demand, push and pull the market price of coal and natural gas; these prices do not necessarily move in lockstep. By forcing these four worldviews, the Company denies the Commission the opportunity to review the real risks entailed in uncertain commodity price futures.

For variables where Cleco has developed high, mid, and low forecasts, it should run sensitivities with those projections that are independent of the other variables and in combination with other variables. Regrettably, Cleco has chosen to employ a mechanism that systematically biases modeling results and confuses reasonable decision-making. Given the scale of decisions and sizeable investments that will ride on this IRP, the marginal effort required to set up and run additional scenarios is truly *de minimis*. Moreover, additional runs provide important information to the Company, Commission and stakeholders.

Recommendations for Modeling Scenarios:

1. Decouple commodity prices, emissions prices, and other assumptions. Choose the most important sensitivities and provide reasonable corner or end members of these sensitivities. Provide more than four optimization runs.

5.2. Blocks of resources

Developing a reasonable range of resource alternatives is a critical step for long-term planning. Some utilities mistakenly prevent the model from making optimized decisions by forcing the model to choose

[34] Wilson, R., Biewald, B., “Best Practices in Electric Utility Integrated Resource Planning.” (2013)

blocks of resources instead of partial blocks of resources. As an example, Cleco provides cost estimates for 100 MW block of solar PV, a partial block might consist of 50 percent of the 100MW (50MW).

Reasonable development of alternative resources includes providing the model with multiple variations of various technologies of different sizes. Cleco performs this exercise for natural gas turbines (both single cycle and combined cycle); however, the Company has not developed such a range of options for renewable technologies. It appears that Cleco will allow the model to choose from seven different types of natural gas plants but only one type of solar and only one type of wind resource. It is also unclear if Cleco plans on allowing the model to pick portions of blocks of resources, and if so, at what cost. It may be the case that an optimization would choose 50 MW of solar each year, but if the model isn't allowed to pick partial blocks of the resource it may end up selecting 0 MW of solar in every year. Based on the limited information that Cleco provided stakeholders, it appears that Cleco may be also constraining the model from making optimal decisions for resource additions.

In Cleco's current MATS approval docket, Sierra Club and Staff have both noted that Cleco failed to review reasonably sized capacity as replacement options for the existing solid fuel units, suggesting that this deficiency can have important analytical impacts about critical investment decisions.

Recommendations for Resource Increment Options:

1. Cleco should ensure that the model is allowed to either pick partial blocks of resources wherein block size is not a barrier (such as solar and wind), and pick reasonable partial blocks of other resources where capacity can be shared between utilities.

6. TRANSPARENCY

The stakeholder engagement process is facilitated by transparency and the free flow of information between the company, the PSC, and other stakeholder participants. All of the assumptions should be spelled out and presented as early as possible, during the first steps of the stakeholder process. Some of these omissions are described above, but Cleco has not provided to stakeholders assumptions regarding the following issues, depriving itself and the Commission of meaningful feedback from stakeholders:

- How energy efficiency and other demand-side management resources will be modeled, including the costs for and amounts of these resources that Cleco believes are foreseeable.
- Reference case and sensitivities for Cleco's various solid fuel supplies.
- Influence of MISO participation on Cleco's resource planning decisions, including participation in energy and capacity markets, and changes in reserve margin requirements.
- How Cleco's active pursuit of wholesale load contracts affects its resource planning

- Foreseeable environmental regulatory compliance costs.
- Planned retirements of any of Cleco's existing generation units, including net decommissiong costs.

For those assumptions that Cleco does provide information on, it does so in both table and chart form. Providing information in table form is helpful to stakeholders that wish to compare Cleco's forecasts and vet their assumptions. Sierra Club urges Cleco to provide underlying information in a form usable by stakeholders going forward, such as providing model inputs in electronic, spreadsheet form and avoiding the use of passwords to prevent stakeholders from viewing or printing reports. Transparency requires not only disclosing information, but doing in a format that enables stakeholders and Commission Staff full use of Cleco's underlying data.

Recommendations:

1. Cleco should make all documents available in electronic, unprotected formats
2. Cleco should provide documentation for historical data and other data and assumptions that are enumerated in the PSC order.
3. All data should be provided at the first step of the stakeholder engagement process and be updated promptly throughout that process.

CONCLUSION

Sierra Club appreciates the opportunity to provide comments and feedback on Cleco's initial IRP assumptions. Integrated resource planning is a crucial part of the Company's responsibility to ratepayers, and provides a mechanism by which stakeholders, the Company and the Commission may have an informed, deliberative, and collaborative process that takes into account the Company's interests and requirements, stakeholder concerns, and is ultimately in the best interests of Louisiana's ratepayers. The IRP ideally offers an opportunity to probe assumptions and uncertainties, and debate how to handle risk before key decisions are executed. By this measure, IRP is not only an academic exercise meant to fulfill the letter of the law, but is the process by which the Company can demonstrate a prudent approach to planning. An effective process engages stakeholders throughout the stages of planning – in reviewing initial assumptions (as in these comments), in finding a common frame of reference for analysis, in reviewing draft model outcomes, and in vetting the action items that emerge from this analysis. To that end, Sierra Club offers the recommendations here as an initial engagement, and asks that Cleco strongly consider additional stakeholder meetings at key stages of analysis.

Incorporating the recommendations that are listed above will help ensure that the ratepayers of Louisiana continue to enjoy the reliability and affordability that Cleco has provided in the past. Revising the Company's input assumptions will aid the Company in accounting for the increased risk and variability that currently exists in the utility planning landscape. Sierra Club looks forward to a continued engagement with Cleco's planning process.

Figure 4 (increased resolution). Recent utility CO_2 forecasts with Cleco, SWEPCO, Entergy, and Synapse forecasts highlighted