

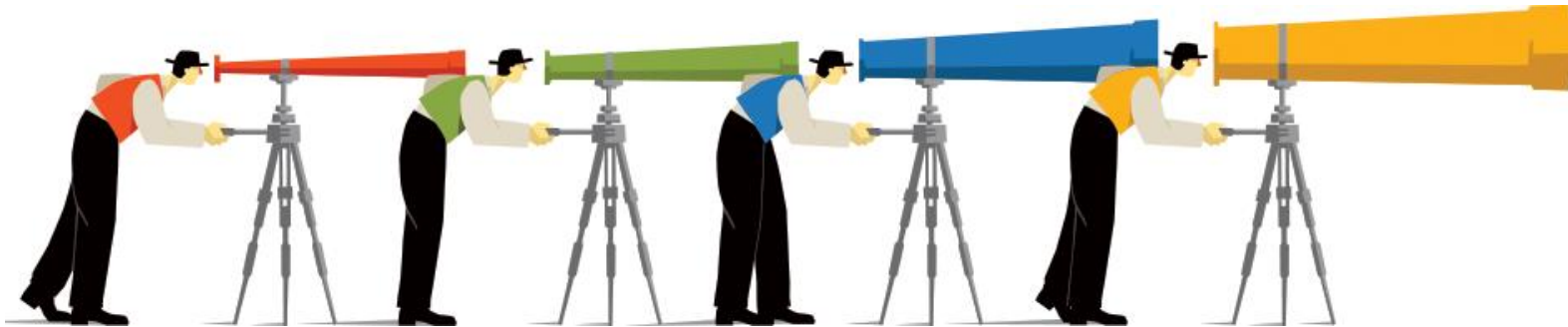
**ATTACHMENT:
NAVIGANT CONSULTING'S INDEPENDENT REVIEW OF
RESOURCE GENERATION PLAN
Overview of Methodology and Assumptions**

INDEPENDENT REVIEW OF RESOURCE GENERATION PLAN

Overview of Methodology and Assumptions (Version 1)



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Background	4
AE 2014 Generation Resource Plan Summary	5
Terminology	6
Modeling Methodology and Analysis Metrics	7
Model Assumptions	9-9
Market Scenarios	10-11
Resources Assumptions	12
Alternative Resource Portfolios	13
Risk Analysis	14

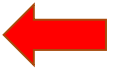
Austin Energy's ("AE") 2014 Resource Plan update identifies potential retirements and additions to its generation fleet. The purpose of this presentation is to present the key input assumptions we have developed for our independent review.

- » In particular, the 2014 Resource Plan projects the construction of a new combined cycle gas unit with a nominal rating of 500 MW by the beginning of 2018 ("Gas Plant").
- » As part of its plan, AE committed to sponsoring this independent economic, financial and environmental review of a new Gas Plant and other options.
- » Austin City Council awarded the contract to perform the independent review to the Navigant team which includes two subcontractors: Quality Power, LLC and Energy Utility Group, LLC.
- » The Navigant team is performing this independent review of the Gas Plant and other alternative portfolios.
- » An overview of our scope of work includes:
 - Gas Plant costs (capital and operating costs) and performance characteristics.
 - Projected operation and dispatch of the gas plant facility.
 - Impact to revenue, cost and associated risks in the AE load zone under different market scenarios and different portfolios.
 - Alternative resource portfolios to a Gas Plant.
 - Analyze indirect and non-modeled impacts.
 - Analysis and recommendations to the Council.
- » The Navigant team has developed the assumptions to use in the review.

AE 2014 Generation Resource Plan Summary

Our review focuses primarily on the addition of a Gas Plant or alternative resources. We assume AE pursues the other elements of it's plan.

Action	Capacity	Resource	Description	Timing
Retire	735 MW	Natural gas (ST)	Decker Steam Unit	2018
	602 MW	Coal	AE's share of the Fayette Power Project	By end of 2023
Add	500 MW	Natural gas (CC)	The Gas Plant at Sand Hill Energy Center or Decker	By beg. of 2018
	100 MW	Demand Response/Demand-Side Management	Incremental	By 2025
	450 MW (min)	Wind	Contracts for coastal and western wind resources	By 2025
Maintain	800 MW	Energy efficiency and Demand Response	Current goal	By 2020
Increase	950 MW (min)	Solar	<ul style="list-style-type: none"> Reaching the City's goal of 200 MW of local solar including at least 100 MW of customer-sited local solar Adding 600 MW of utility-scale solar from its RFP Assuming the full build-out of the announced 150 MW of solar power currently contracted with Recurrent Energy 	By 2025
Obtain	30 MW (min)	Thermal and electrical storage	Local	by 2025



To clearly articulate our review, we established the following terminology to differentiate between market scenarios and alternative resource portfolios.

- » Our review entails modeling the entire ERCOT market and key assumptions such as natural gas prices, changes to the generation mix. In addition, we model alternative resource portfolios.
- » To delineate this difference we use the following terminology:
 - **Scenario:** means a broader ERCOT market scenario (e.g., high solar or high gas price) that is independent of Austin Energy's generation planning.
 - **Portfolio:** means variations in Austin Energy's generation plan (e.g., 500 MW of solar in lieu of 500 MW Gas Plant).

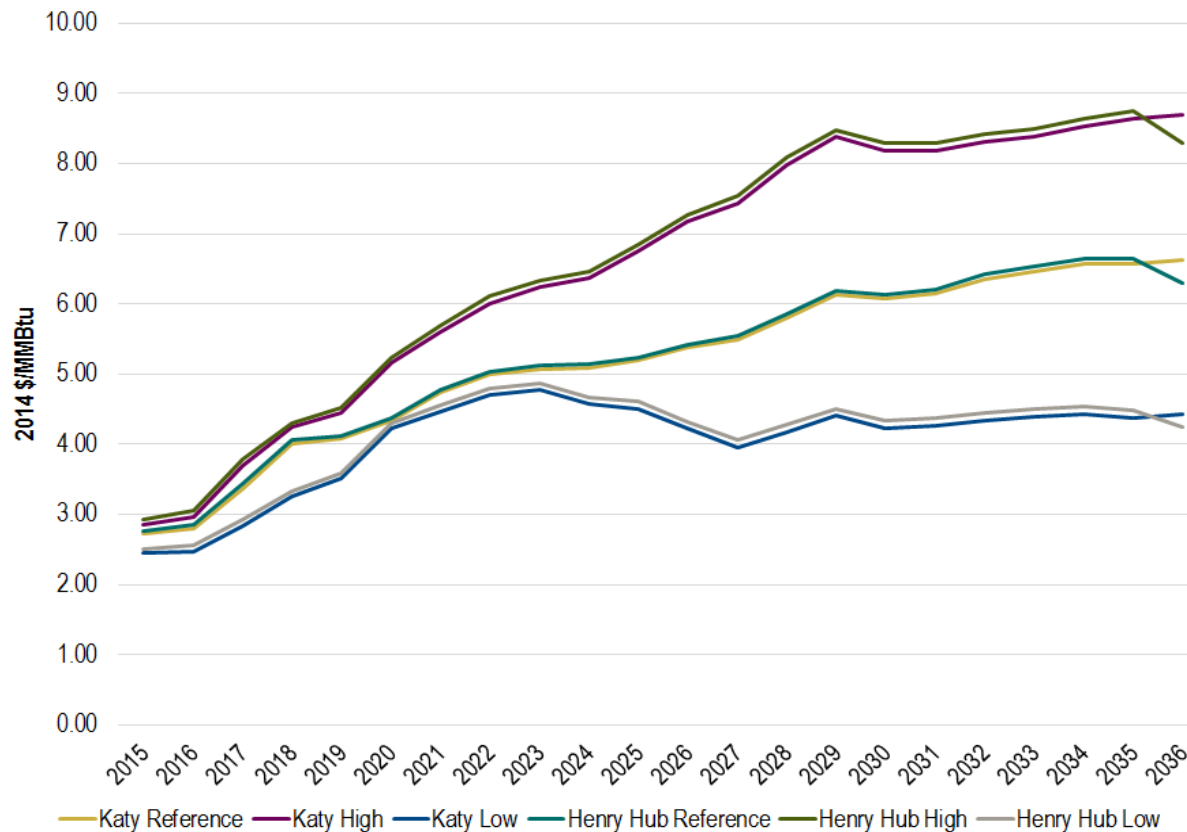
Our modeling methodology employs industry standard methods and tools and assumptions developed by the Navigant team. To assess financial and environmental impacts to AE, we model all of ERCOT including AE load and generation.

» Our analysis will consider the following metrics:

Metric	Analysis Methodology
Cost	Calculated directly from modeling results.
Maintain rate competitiveness	Evaluate impact on rates of the portfolios.
Exposure to Risk	Evaluate spread of outcomes between market scenarios.
Renewable Generation	Calculate share of load served by renewables.
CO ₂ Emissions	Calculate total impact of portfolio on CO ₂ emissions.
Water Usage	Calculate the water usage of generation units.
Local Economic Impacts	Estimate the economic impacts in Austin.

Natural Gas Price Forecasts

Natural Gas prices are the single largest driver of risk and changes in the cost of Austin Energy's market purchases. Navigant developed 3- gas price scenarios.

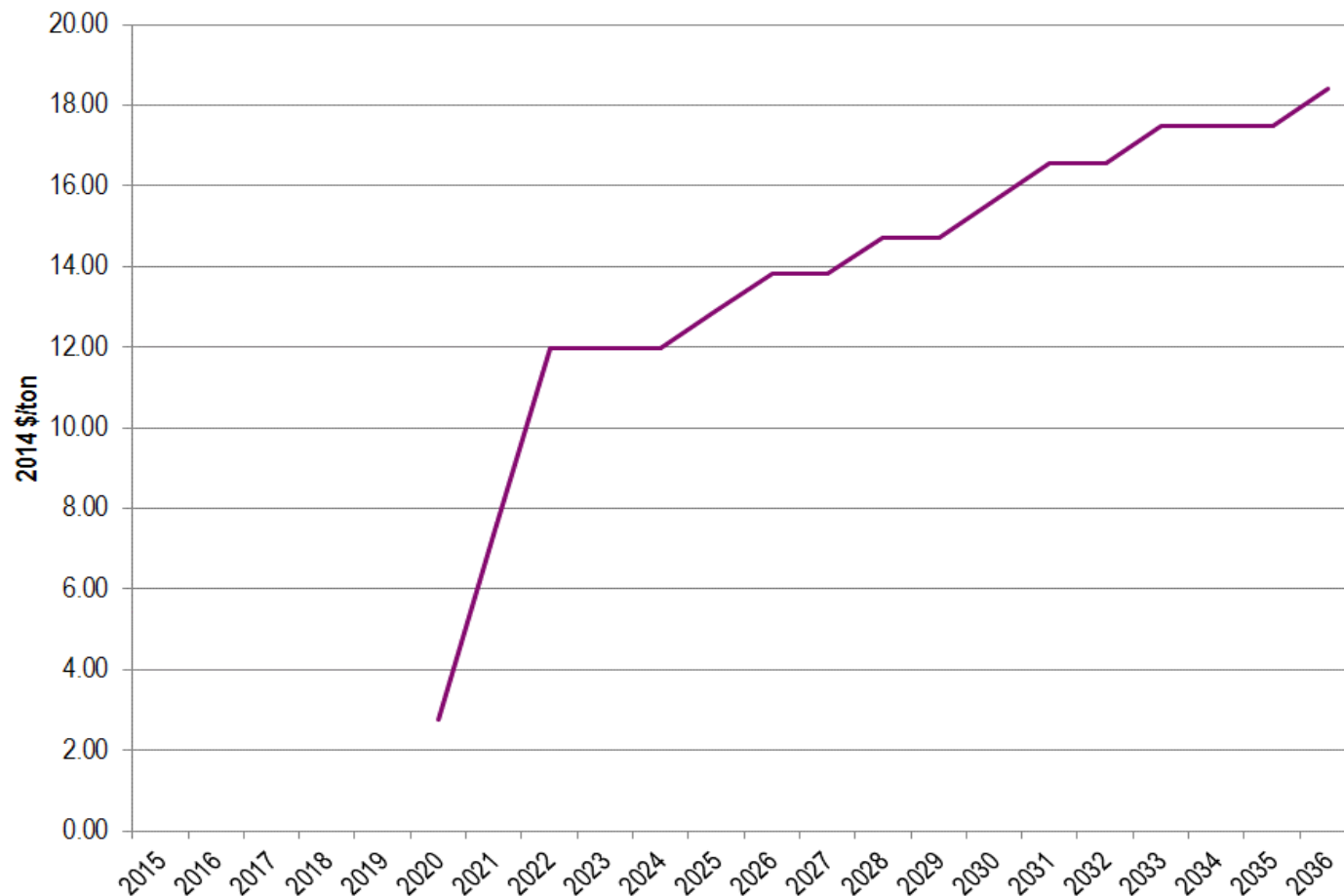


Source: Navigant (reference) and EIA/Navigant high and low

¹Details of Navigant's outlook for Natural Gas prices is available in Navigant's March 2015 [Oil & Gas Market Notes](#).

Clean Power Plan (CPP) and Carbon Allowance Price Forecast

To model the impacts of the CPP and future carbon prices, Navigant assumes carbon allowance pricing begins in the 2020-2022 time-frame.



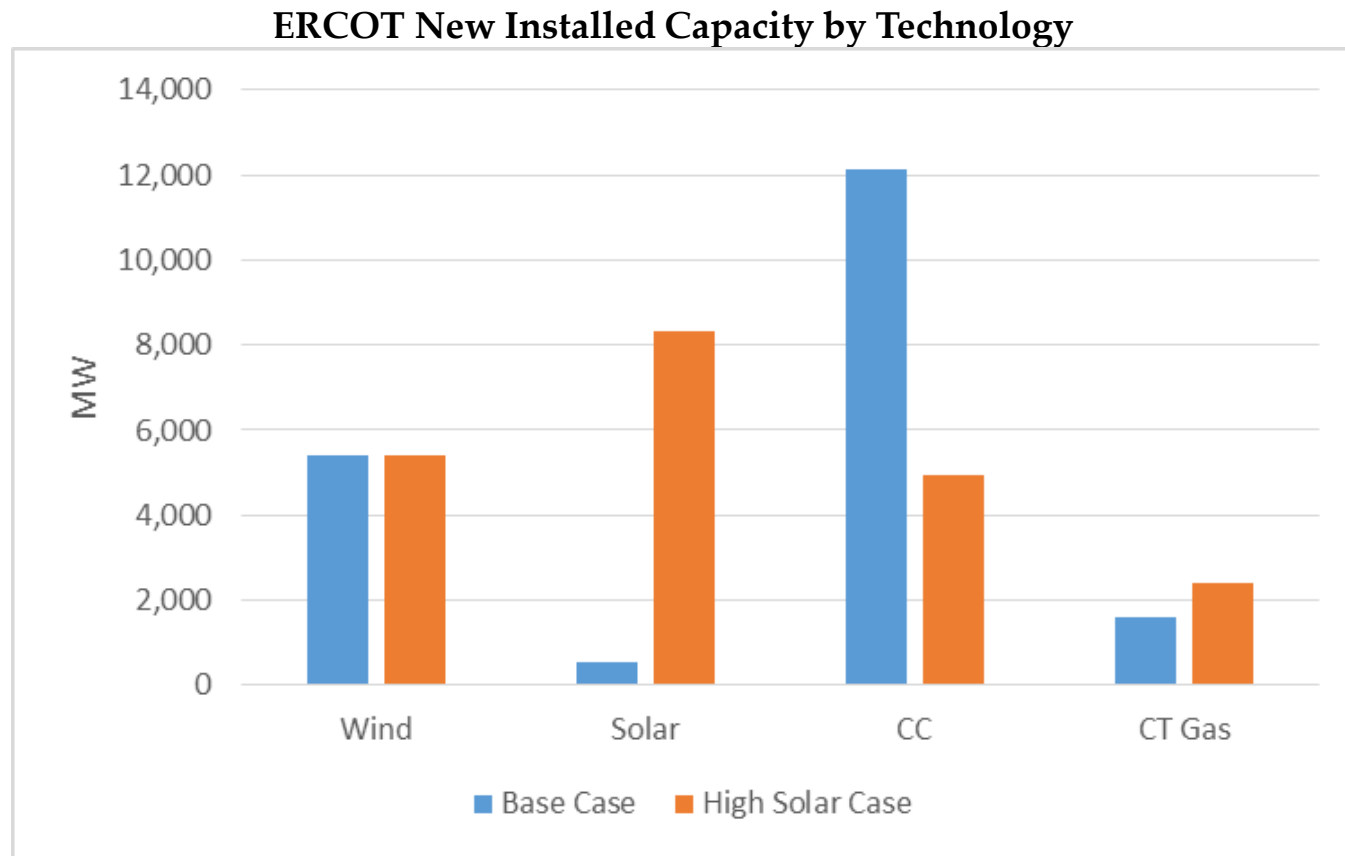
Source: Navigant

Navigant developed four ERCOT market scenarios to assess risk for each of the alternative portfolios. The scenarios address uncertainty of natural gas prices and impact of increased grid-tied solar PV.

Market Scenario	Rationale
1. Base scenario	<ul style="list-style-type: none">Developed from Navigant's reference case.
2. Low natural gas price scenario	<ul style="list-style-type: none">Developed utilizing the EIA's low and high gas resources casesReflects the volatility of gas prices and the uncertainty of key drivers in the natural gas market, such as shale gas supply.
3. High natural gas price scenario	
4. High solar scenario	<ul style="list-style-type: none">Adds ~8.3 GW of utility-scale solar PV in lieu of new gas fired generation.

Scenarios to Address the Future ERCOT Generation Mix

To assess market risks to each portfolio our analysis will look at a high solar scenario in which much of the new gas development in ERCOT is replaced with grid tied solar PV.



Source: Navigant

Resource Assumptions

Navigant has developed portfolios with a mix of resources including the Gas Plant and alternatives which range from all power market purchases to solar, wind storage, demand response. We developed independent assumptions for the 500 MW Gas Plant.

Solar

- Single-axis tracking grid-tied solar PV tends to generate during peak periods.
- Assume ~\$1,130/KW installed costs and \$0.25/KW-yr for operating costs (projected price curve in following slides).
- Assumes the investment tax credit (ITC) drops to 10% at end of 2016. Post 2016 we assume Austin Energy will own new solar.

Storage

- Assume the storage operates in the wholesale market.
- Comparing Li-ion batteries and CAES. New project orders are heavily favoring Li-Ion chemistries.
- Assume ~\$1,800-2,000/KW fully installed costs for Li-ion battery storage – declining over time.
- Did not consider local distribution level applications of storage.

Wind

- Wind tends to generate during off-peak power.
- Assume ~\$1,670/KW installed costs.
- The analysis assumes the production tax credit (PTC) expires at end of 2017 and that Austin Energy enters into PPAs for new wind.

Demand Response

- Demand response (DR) is a contract with customers to curtail their load during peak pricing times based on price signals from the ERCOT market.
- We assume an annual incentive of \$52/KW-yr for customers to participate in the program.
- DR program shifts load from peak times to off-peak times

Note: Assumed costs in 2018 using real \$2014

Navigant has developed 7 portfolios to run in each of the 4 scenarios.

- » The portfolio analysis is a financial assessment of the costs and benefits of alternative resource portfolios that AE can consider.
- » Designed to be 500 MW nominal capacity despite varying energy production to be consistent with the generation plan
- » All aspects of the generation plan are in each of the portfolios, except the Gas Plant.

Portfolio	Description
Case 1	AE current 10-year plan without the addition of a 500 MW CC
Case 2	Case 1 + 500 MW CC addition at Decker
Case 3	Case 1 + 500 MW CC addition at Sand Hill
Case 4	Case 1 + 500 MW of additional solar
Case 5	Case 1 + 500 MW of additional wind
Case 6	Case 1 + portfolio of renewable resources and DR with energy storage (200 MW wind, 200 MW solar, 50 MW DR, and 50 MW storage)
Case 7	Case with 600 MW of AE 10-year plan solar additions coming online for 2017

Risk Analysis

- » The outcome of this analysis is a set of scorecards for Austin Energy for each alternative portfolios across the 4 market scenarios.
 - These scorecards will report the results of the portfolio across the metrics considered in the analysis.
- » The scorecards provide an accounting of the tradeoffs between different portfolios in each scenario and also allow for comparison between scenarios.
- » This approach is designed to identify portfolios that best meet AE's range of metrics.

Illustrative Scorecard for Single Scenario

Portfolio	Minimize Costs	Rate Benchmark	Renewable Power	CO ₂ Reduced	Water Use
Case 1					
Case 2					
Case 3					
Case 4					
Case 5...					