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Meeting Minutes

Resource Planning Advisory Council – Virtual Meeting

Date March 27, 2023
Time 9:00 AM – 10:30 AM MST
Location Online

Agenda

- 9:00** Modeling the Western Grid to Derive Wholesale Electricity Market Prices
- 10:00** Update on TEP Portfolio Modeling
- 10:15** RPAC Comments & Questions Regarding IRP
- 10:30** Adjourn

Attendees	Organization
Alex Routhier	Western Resource Advocates
Allison Moore	Fresh Produce Association of the Americas
Autumn Johnson	Arizona Solar Energy Industries Association
Caryn Potter	SWEEP
Catalina Ross	Sierra Club
Chaunce De Roos	Arizona Corporation Commission
Claire Michael	Wildfire
Damian Rueda	Davis-Monthan Air Force Base
Dr. George Hammond	University of Arizona
Jake Jones	IBEW 1116
Jeff Powell	Sun Corridor
Kathy Knoop	General Motors
Kevin Koch	Technicians for Sustainability
Lance Jungmeyer	Fresh Produce Association of the Americas
Luke Hutchinson	Arizona Corporation Commission
Sandy Bahr	Sierra Club
Sarita Morales	IBEW 1116
Stephen Cassidy	Davis-Monthan Air Force Base
Stephen Jennings	American Association of Retired Persons
Armando Yanez Peralta	
Lee Alter	TEP
Nonso Emordi	TEP
Victor Aguirre	TEP
Jenny Crusenberry	TEP
Ilse Morales Duarte	TEP
Brianna Robles	TEP
Sam Rugel	TEP
Joe Barrios	TEP
Karen Kansfield	TEP
Rhonda Bodfield	TEP

Seth Wheeler	TEP
Nathan Miller	E3
Tristan Wallace	E3
Vivian Le	E3

Nathan Miller (E3- Director of Asset Evaluation and Practice) – Southwest Market Price Forecast E3 Core Case

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- Question: *RPAC Member: I am assuming this is installed capacity as of 2023?*
 - Response: Yes, that is the installed capacity.
- Question: *RPAC Member: You stated all coal capacity would be retiring by 2040, Salt River project had no retirement date for Springerville 4?*
 - Response: We have used the latest coal retirement commitments, for our forecast we did use some policy forward elements for the sake of future builds laws that would make all coal to be retired by 2040. For coal resources with no retirement date, we still retired those units by 2040 for the purposes of this forecast.
- Question: *TEP Member: Did your model retire coal by 2040 based on economics?*
 - Response: Would have to investigate that to confirm.

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- Question: *TEP Member: Does this mean no wind is used to serve Arizona load or that some wind is being built in the New Mexico BA to be sold to Arizona's BA? Would look at this and say the wind shown here is not strictly for New Mexico use but also for Arizona's use?*
 - Response: The generation mix is the sum total of generation occurring within each state. Not all wind generated here is strictly for New Mexico. Wind that is generated in New Mexico, is not necessarily all being used in New Mexico, a lot is being built in NM to be used in other states such as AZ.

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- Question: *RPAC Member: Could you run through the gas price forecast one more time, got a little lost on how this all works*
 - Response: Yes, we have a commodity price for gas (Henry Hub), then a commodity price delivered at different regional hubs across the US. We take the market forwards for Henry Hub and use that as an anchor point near term for the forecast. Then transition those to a long-term Henry Hub forecast, we take the long-term Henry Hub forecast and that is our gas price base. We add the difference between Henry Hub and different delivery points to form a forecast for regional hubs.

- Question: RPAC Member: We keep seeing that with the conflict in Ukraine we are being exposed to the international market and those prices are a lot higher. Meaning domestic sellers want to export gas to get higher prices on the international market than the domestic market. Why are we seeing a decline in prices in the domestic market if we are increasing exposure to the international market. What are the ranges to these prices? There must be some sensitivity here, running the model with one single gas price seems irresponsible, there should be some sort of low and high gas scenario.
 - Response: The near term, does show the Ukraine issue, the international market and strong demand for international gas prices does play a role in US domestic gas prices. When delivery of gas occurs, there must be a feasible consumer or supplier. When demand in Germany goes up, that price is not 1 to 1 with Henry Hub gas, no one can buy the same unit of gas at two different locations. The cost of converting US natural gas on shore to US LNG and delivering to Germany adds a lot of cost on top of the Henry Hub price and makes that cost competitive. Fundamentally, EIA released an update to their Annual Energy Outlook recognizing that demand for UNS LNG is supporting the gas price over time.
 - On gas sensitivity side, we see fuel prices as continuing to be an important driver of electricity prices in the US. Gas prices are still going to be an important driver for marginal hours. Presenting now the base case market forecast, but do model high and low
- Question: RPAC Member: How do you modify the gas prices for the high and low cases and what effect does it have on the electricity market prices?
 - Response: Higher gas prices will increase the electricity market and a lower gas price will lower the electricity market prices. The cases are subjected to informed judgement. We don't specifically have a high and low case in this specific use case.
- Question: RPAC Member: Why do you think gas prices will keep declining for so long in the face of sustained inflationary factors?
 - Response: This is just one scenario of many potential scenarios for natural gas, having some sensitivity scenarios is useful, but what we are presenting is the base case.

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- Question: TEP Member: How does the Duck Curve change from season to season
 - Response: The right side of the graph is going to drop in the lower load months where solar generation is high, storage is available, but evening loads aren't as high, therefore there will be lower and flatter prices during the evening ramp. During high load season, it will look a lot steeper.

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- Question: RPAC Member: Is TEP using aurora as a capacity expansion model? Is E3 doing the modeling? Or what is the role of E3 in this IRP?
 - Response: E3 is using Aurora's Capacity Expansion Model to come up with these regional prices, TEP is using capacity expansion indirectly through Aurora. TEP is using the usual 8760 production cost model because that has to be run regardless if the Long-Term Capacity Expansion is run or not. We use these prices as inputs for our modeling,

Next Steps

- Question: RPAC Member: Are you allowing RPAC members to present at this (Market) workshop?
 - Response: The workshop is specifically for the utilities to present to stakeholders on their involvement in markets.
- Question: RPAC Member: It would be valuable to be able to present on that E3 study. April 12th is an open meeting day and (April) 13-14 is on your rate case. Do you have a timeline when that NDA is ready to go?
 - Response: Will talk to legal, but no exact timeline yet.
- Portfolio modeling of approximately 4 portfolios: Reference Case, Heavy Solar, Heavy Wind, and TBD.