

ADVISORY COUNCIL MEETING

RHODE ISLAND STATE ENERGY PLAN (RISEP)

Friday July 12, 2013

9:00 AM-11:00 AM

Narragansett Room

RI Economic Development Corporation

315 Iron Horse Lane

Providence, RI

ATTENDANCE:

Advisory Council Members: Abigail Anthony, Bob Chew, Doug McVay, Nick Ucci, Jerry Elmer, Melissa Long, Bob Tormey, Ian Springsteel, Julian Dash, Julie Gill

Steering Committee & Project Team Members: Marion Gold, Chris Kearns, Hannah Morini, Rachel Sholly, Dan Carrigg, Nancy Hess, Kristine Daly, Danny Musher

Other Attendees & Members of the Public: Ben Barrington, Matt Tanner, Stephan Wollenburg, Bruce DiGennaro, Rachel Henschel, Charles Hawkins, Pam Mandler, Charity Pennock, Kristina DiSanto, Mike Giles, Meghan Rowe, Mike Henry, Frank Stevenson, Ben Swanson, Mike Guerard, Lisa Frantzis (by phone), Lea Poquerusse (by phone), David Hill (by phone)

AGENDA:

9:00 Welcome – Danny Musher, RIOER

9:10 Scenario Modeling: Preliminary Results – Ben Barrington & Matt Tanner, Navigant Consulting

10:10 Questions & Discussion

10:40 Next Steps – Danny Musher, RIOER

10:50 Public Comment

11:00 Adjourn

MINUTES:

The meeting was called to order at 9:05 AM. Danny Musher welcomed everyone to the sixth meeting of the RI State Energy Plan (RISEP) Advisory Council (AC). Currently the AC is working on the third task (scenario modeling) of the first phase (research and data) of the RISEP. The RISEP, when completed will be incorporated in the State Guide Plan (SGP). Today the AC will hear the preliminary results of the scenario modeling which will inform the RISEP recommendations. These results are not final and the project team is seeking AC input on this data. This modeling is not a forecast and are not recommendations for the RISEP, rather it looks at different changes in RI's energy supply and demand energy profile and how they might impact directional objectives (DOs) with respect to the business as usual (BAU) forecast. Three unique, independently-viable scenarios were developed for the exercise to provide good data points. They focus on security, economics, and sustainability. The scenarios will look at the cross-sector impacts of significant transformations of our energy system.

The BAU forecast used existing RI policies like Least Cost Procurement (LCP), RGGI, the Renewable Energy Standard (RES) and federal CAFE standards. Danny M. then introduced Ben Barrington of Navigant to present the preliminary findings of the modeling.

Model Overview and Key Drivers

Ben B. introduced Matt Tanner, also from Navigant, who will also be presenting. Matt T. has worked on the modeling in the electric sector. The electric sector was modeled by Matt T. using Navigant's Portfolio Optimization Model (POM) while the thermal and transportation sectors were modeled using a modular flow model using a mix of low, moderate and aggressive resource targets. POM models the optimal unit buildout and dispatch needed to meet load and RPS requirements and additional operating constraints. For this study, the entire ISO-NE footprint is represented because you can not look at just RI. Constraints like Renewable Energy Credits (RECs) trading and RPS requirements are considered.

Nick U. asked if it was an economic dispatch of the system. Is it hourly? Matt T. said that each month is divided into six load periods totaling seventy-two for the year.

Frank S. cited generator retirements especially nuclear which have internal political factors.

The BAU used in the electric sector was created by benchmarking ISO-NE assumptions provided by Navigant to BAU results from ENE's Task 2 report. The BAU forecast shows a 25% reduction in demand from 2013-2035 caused mainly by an increased penetration of energy efficiency (EE). The RI build out is layered over New England in the BAU using the CELT report. Danny M said the OER worked to provide Navigant with information on how much renewable capacity will result from the Distributed Generation (DG) program and the long-term contracting program.

Frank S. asked if RGGI was factored in. Yes, in the BAU. Nick U.

asked if the assumption of off-shore wind power has all of that power going to RI and not Long Island or New York. While New England is an integrated market, it is impossible not to look at things occurring in the region like Long Island and Quebec hydro. The BAU shows 262MW of new RE in RI by 2035, 180MW of it off-shore wind. Julian D. asked if the capacity from RI's DG long term contracting program were included in the BAU.

Yes, it was. Matt T. said the cheapest way for RI to meet its RPS is through imported wind. Ian S. noted that the actual solar capacity in NE is twice what the BAU forecast shows. David H. said a useful reference point for this is a report done by Synapse on forecast of regional DG. It indicates that the DG build out in New England may be significant higher than in the CELT forecast. He suggested RISEP reference this report for their new build assumptions. Nick U. cited the 25% load reduction caused by EE. He asked if production cost increases were factored in the out years in these metrics. Abigail A. said that fairly conservative estimates were used for the out years in the BAU forecast. Matt T. said the model does take in the life time costs.

Ben B. then went on to the key drivers in the thermal and transportation sectors. One of the key drivers in the thermal sector is increased demand in the C&I sector with opportunities to convert to combined heat & power (CHP) and EE retrofits. While reduction in demand yields short term economic returns in these sectors, long term energy savings have negative repercussions for economic activities like fuel expenditures. Ian S. asked what accounts for the

substantial growth in C&I demand. Danny M. said that was a good question and he will check back with ENE.

Summary of Results by Sector

Electric Scenario 1 reduces price volatility by reducing natural gas (NG) to 50% down from 87% in the BAU. In Electric Scenario 2, costs rise in all sectors from the BAU. Electric Scenario 3 raises costs but it reduces greenhouse gas (GHG) emissions by 56%. While price is just the marginal cost of electricity, expenditures represent all of the infrastructure cost of electricity. Bob T. asked if weather is factored in. It is a weather normalized forecast. Stephan W. said that it is hard to look at energy expenditures and GHG reductions in each sector separately. There is substantial interplay between the sectors. Ian S. asked how they got at the 2,000 acres of land conversion for Electric Scenario 1. Ben B. said that to get NG down to 50% there would need to be a RI RE buildup and that would include solar.

The thermal & transportation scenarios were not able to push down the dominant fuel in the BAU. It was interesting to note that the dominant fuel source in the thermal sector was virtually the same for Scenario 1 and Scenario 2. Thermal storage, which is high in Scenario 1, could help in the electric sector with load shifts.

In the Scenario 1 transportation sector there was a lot of fuel switching, in Scenario 2, fuel efficiency & CAFE standards were emphasized and in Scenario 3 there was a big push for substantial increases in public transit, with ridership doubling. There is a large capital investment involved in this expansion but the impact on fuel consumption is huge. Bob T. asked what impact increased use of

alternative fuels will have on price. What happens to the price of gas? Ben B. said in the model they used a fixed forecast price for gas with no demand elasticity.

Dan C. asked if vehicle miles travel (VMT) get modeled. Ben B. said there were two resources used to reduce VMT, more public transit and the complete streets initiative,

which look to reduce VMTs by redesigning urban infrastructure.

Scenario 2 uses CAFE standards to get at more EE cars. Frank S. asked if the model used secondary use of increased disposable income impacts like the REMI model. Ben B. said the model is not like REMI which uses indirect impacts.

Scenario Setup and Results

Highlights of the changes modeled in Scenario 1 include: reduction of NG reliance to 50% to reduce RI's reliance on it for generation; and adding 200 MW of grid storage to make the grid more reliable and use in load shifting. In the transportation sector, a diverse portfolio of fuel options, (CNG, bio-fuels, and EVs) was emphasized with a goal of 40% RE in Scenario 3 by 2035, with 25% of it in-state. The constraint of 50% NG forces a lot of RE activity, much of it in-state. The overall costs are 24% higher than in the BAU but a lot of the costs are back loaded. Frank S. said a key factor in this scenario should be grid modernization but he does not see it as a highlight. Matt T. said the model put in 200 MW of grid storage so grid modernization was occurring. Frank S. said that grid storage and grid modernization are two different things. Stephan W. said it would be better if the model looked at what costs are in 2036.

In Scenario 1, NG is constrained to meet only 50% of generation, RE takes over 8% of the market in the thermal sector, and in transportation alternative fuel vehicles reach 34% of the market. Nick U. would like to see more detail in the RE charts. Break out the types of RE. David H. asked if in the thermal sector you would account for advanced heat pumps under solar/geothermal or would that show up under electric. Ben B. said advanced heat pumps were included in the original list of resource types.

Julie G. is concerned about the increased use of NG in the thermal sector as a means to reduce GHG emissions. She feels there could be future constraints on the NG distribution system. She cited a new RI law that mandates a 2% bio-fuel blend in oil that increase yearly to 5%; but she does not see bio-fuels in the thermal sector. She also feels if oil goes down to 27%, half of the oil companies in RI will go out of business. She also cited the methane problems associated with NG. Ben B. noted that biofuel was included in the DF oil category and that it can be broken out. Bob C. was discouraged to see that geothermal and solar was only 2% in the thermal sector in 2035. He thinks this is very small. Ben B. said that might come up higher if a different model for cost-effectiveness (CE) was used. He also said that the technical potential of those two technologies was not that high.

Dan C. said that the BAU model for NG in transportation is up to 13%, it is only 2% today, is this based on the ENE model. Ben B. said that if RI totally converted public transit vehicles and some commercial fleets to NG it would go above the 13%. The 27% in the Scenario 1

forecast would include private vehicles changing as well.

Scenario 2 prioritizes CE and economic development while hitting GHG targets. It assumes a stronger RPS and pushes hard on CAFE standards in the transportation sector. There is less happening the electric sector than in other scenarios and it gets to its goals through demand side management. In the thermal sector, deployment of CHP and EE drives down aggregate expenditures. Frank S. asked how RI can get at the extra vehicle EE. You can't vary from the CAFE standards from California. RI can't mandate CAFE standards. How does this happen? Will it be economically driven in RI? Ben B. said a higher state gas tax or a carbon tax may be a way to get there. Plus there is a market driven move to more EE vehicles. There could also be incentives for people to buy more EE cars.

In Scenario 2, total electric expenditures increase slightly to keep pace with increased RPS and electrification. But thermal and transportation expenditures drop to 90% and 41% of the BAU. Julian D. asked if they are just looking at costs in this scenario. A discussion then ensued about the cost of RE and the overall economics of RE, especially in regard to job creation. Julian D. would like to see this included in the modeling.

Scenario 3 gets to its goals through widespread deployment of RE, thermal alternatives, and vehicle electrification. The goal is the cheapest way to get to 75% RE by 2035. It appears the cheapest resource is on-shore wind that will need to be imported to meet the RPS. David H. commented that the in-state RE buildout was the same as in the BAU. Matt T. said there was slightly more in the model but

not very much. In the Scenario 3 transportation model, GHG was cut using widespread use of EVs, gains in vehicle EE, and expansive public transit options. In the thermal sector it includes a substantial switch to bio-fuels.

The highlight of Scenario 3 is a 54% decrease in CO2 emissions by 2035. In addition, 1,111 MW of out-of-state wind is financed to meet the RPS. For RI, the mix will be almost all wind, but for all of New England you would need more than wind to meet the RPS. The thermal sector shows a high penetration of solar and geothermal. In transportation emissions are cut 44% by increased use of public transit and city planning that discourages single occupancy vehicles. Frank S. said that most of the reduction in GHG was attributed to NG. What carbon intensity is assigned to NG that allow for this drop in emissions. Navigant used the carbon intensity data from the BAU forecast. Stephan W. would like to know what percent of NE's energy will be coming from RE in 2035. What does the BAU look like for the other NE states? Ben B. said the goal for NE is around 52% carbon free generation by 2035 and that includes nuclear. Nick U. asked how average expenditures factors in transmission growth and investment. Matt. T. said with load dropping 25% there will not be a lot of need for new transmission. Nick U. said the reason for his question is that there is not a lot of electric cost decrease in Scenario 3 as a result of such a robust RE portfolio which will require interconnections.

Next Steps

Navigant will solicit feedback from the AC, finalize the scenarios and model results, and facilitate handoff to the RISEP Steering

Committee. They would like to get the feedback from the AC by July 26th and it should be funneled through Danny M. Frank S. said once the report is done there needs to be a process to pick and choose recommendations and create a plan. Danny M. agreed with Frank S. that the next phase is the most challenging: to outline a process and develop final policy recommendations. They need to take the data and develop policy levers and tools, ways to mobilize the capital and expertise to achieve these scenario targets. Frank S. asked at what point do these recommendations fold back into the models and become more than scenarios. At some point will we be modeling what we will put forward as a plan? There is so much interconnection between the activities, you may get consequences you were not expecting. It would be good to tie the model back to the original assumptions in the BAU. He feels you will have a hard time selling it if you can't answer the questions we laid out here. You will have to have a handle on all the numbers presented in the plan. Danny M. said that was a good point and will be grappled with by the project team. Danny M. said the project team will be working on developing policy recommendations and hope to have them ready for an early September meeting.