Tennessee Valley Authority
Regional Energy Resource Council
October 15, 2014
Meeting Minutes

The Tennessee Valley Authority (TVA) Regional Energy Resource Council (RERC or Council) convened for the fifth meeting of its first term at approximately 9:15 a.m. EDT on Wednesday, October 15, 2014, on a webinar.

Council members attending:

Dus Rogers, Chair	Jill Boxler	Chris Champion
Anne Davis	Wayne Davis	Catherine Glover
Rodney Goodman	Wes Kelley	Bob Martineau
Pete Mattheis	Len Peters	Joe Satterfield
Don van der Vaart	Lloyd Webb	Susan Williams

Designated Federal Officer: Dr. Joseph Hoagland

Appendix A identifies the TVA staff, members of the public, and others who attended.
Appendix B is the agenda for the meeting.
Copies of the presentations given at the meeting can be found at http://www.tva.com/rerc/.

The majority of the meeting was devoted to presentations by TVA staff about the current status of the Integrated Resource Plan (IRP). No formal consensus advice was provided by the Council at this meeting. No oral comment from the public was permitted during this meeting, but information was provided about how written comments may be submitted.

1. **Designated Federal Officer's Report**
   Joe Hoagland noted that the IRP process has been slightly delayed from its estimated schedule as a result of efforts to reflect energy efficiency (EE) as a resource in the model.

   Dr. Hoagland also informed the Council that TVA's agreement with EPA under the Clean Air Act requires TVA to inform EPA by December 31, 2014, of its plans for two units at Shawnee Fossil Plant. TVA may choose to install a scrubber or retire the units. TVA has begun the environmental review to support its forthcoming decision.

   Dr. Hoagland welcomed new Council member Pete Mattheis, who has replaced Dave Hrabosky as the Tennessee Valley Industrial Committee representative on the Council.

2. **Integrated Resource Plan: Update**
   Gary Brinkworth provided an update on the status of the IRP planning process.

   Mr. Brinkworth first provided a reminder of the resource planning construct and the scenarios and strategies selected for analysis. He noted that TVA continues to fine-tune the strategies, particularly the "Meet an emission target" and "Doing more EE" strategies.

Mr. Brinkworth then summarized the revised project schedule. Publication of the final IRP and environmental review are now expected in Summer 2015. The delay is almost entirely related to TVA's research and development efforts to represent EE as a supply-side resource in the model.

TVA is currently in the modeling stage of the planning process, which involves running cases, reviewing the results, and fine-tuning the model inputs. Mr. Brinkworth said that this modeling will produce over 1,800 20-year resource plans that TVA will analyze, reflect in scorecards, and use to make a recommendation to the TVA Board of Directors on the planning direction. He explained that one key change in the modeling for this IRP as compared to the 2011 IRP is the treatment of EE as a selectable resource that the model may choose in its optimization calculations. In 2011, the EE portfolio was pre-defined and fixed; in 2015, EE will be dynamically optimized with other resource options. Mr. Brinkworth explained TVA's view of what constitutes an "optimized" plan.

Mr. Brinkworth then summarized TVA's method for communicating the significant findings of the 1,800 cases run within the model. Scorecards will reflect various metrics in five categories: cost, risk, environmental stewardship, flexibility, and Valley economics. TVA is still in the process of developing metrics in the flexibility category and is trying to capture two critical aspects: whether energy supply is available when needed and whether TVA's system is agile enough to respond when demand changes quickly. The inclusion of this metric helps TVA model non-traditional assets that dispatchers wouldn't normally choose and aids in evaluating the impact that the modeling approach may be having on the analysis; in the current modeling tools the intermittent or non-dispatchable resources (e.g., wind and solar) are represented using fixed energy patterns to ensure that total energy production and the typical hourly pattern for these resources is properly captured in the analysis. In addition to the scorecard metrics, TVA will also develop "reporting metrics," which are secondary indicators that do not appear in the scorecards but help to interpret the performance of the strategies summarized on the scorecards.

Individual scorecards will be rolled up to a summary "dashboard" that will communicate the analytical results in a manner appropriate for a general, rather than technical, audience. The goal of the dashboard is clear communication of results in order to facilitate discussions around the trade-offs associated with various plans. TVA staff proposed a prototype dashboard to the IRP working group, and TVA is now in the process of reevaluating the form and format of the dashboard given the working group's feedback.

Finally, Mr. Brinkworth summarized the remaining process steps. RERC meetings are planned to present the preliminary results and draft IRP, review the public comments on the draft, and present the final recommendations.

3. **Integrated Resource Plan: Overview of Modeling Concepts for Solar, Wind, and EE**
   Mr. Brinkworth explained the modeling concepts under development to capture solar and wind energy and EE. In the 2011 IRP, solar, wind, and EE were represented in the analysis as a pre-defined portfolio for those particular resources that was created and evaluated

outside the IRP model; the IRP modeling then optimized around these pre-set "resource type" portfolios. Stakeholders suggested improvements to this method in the next IRP, and TVA has implemented changes in response to that feedback. In the 2015 IRP, solar, wind, and EE are selectable options within the IRP optimization modeling tool. However, the unique nature of these sources has required considerable research to determine how to properly reflect them in the analysis.

With respect to renewable energy sources, Mr. Brinkworth explained that TVA obtained current data on solar, wind, hydro, and biomass resources from another stakeholder group, the Tennessee Valley Renewable Information Exchange (TV-RIX), to help develop power resource options in these areas. For wind and solar, TVA has calculated capacity factors and net dependable capacity figures and has developed minimum capacity blocks that can be chosen by the model. As the modeling effort continues, TVA will monitor the renewable resource selection levels and may adjust its assumptions or modeling constraints.

With respect to EE, TVA is designing its model to reflect EE as a "supply-side" resource that competes with other traditional supply-side sources. To that end, TVA has designed blocks of EE that represents the general characteristics of program bundles by customer sector and has calculated those blocks' capacity factors. TVA's goal is to design the model to properly reflect uncertainties around cost, performance, and persistence. Because this type of analysis is new in the industry, Mr. Brinkworth explained that TVA sought review by an outside consultant to verify the model and inputs. The consultant (Navigant) identified no major concerns and concluded that TVA is relatively well-positioned in its innovative efforts to reflect EE as a selectable supply-side resource in IRP modeling. TVA used a March 2014 report by The American Council for an Energy-Efficient Economy to benchmark the costs of the TVA EE blocks. Using this benchmark data, most of TVA's EE blocks are cheaper than a natural gas combined cycle unit. In model validation runs, the model is choosing EE sources to serve about half of the load growth through 2034 in the current outlook scenario. What remains to be analyzed is what it means when the model chooses that amount and why the model chooses that amount. Len Peters asked what load growth figure TVA is using, and Mr. Brinkworth replied that TVA is using about one percent.

TVA is continuing to consider the best approach to reflect the uncertainties surrounding wind, solar, and EE resources. The goal of the modeling is to find the inflection points around price, capacity factor, and other variables in order to understand when the model will choose those sources versus other sources.

4. The next meeting of the Council will be held February 2-3, 2015, in Chattanooga, Tennessee, to review preliminary results and the draft IRP. A meeting is tentatively planned for April 20-21, 2015, in Nashville, Tennessee, to review public comments and TVA's response strategy. A firm date has not yet been set for the meeting to review the final IRP, but it is anticipated to be held in June 2015.

The meeting adjourned at 11:15 a.m. EDT.

Minutes Approved: Dus Rogers **Date:** 12/11/14

Dus Rogers, RERC Chair

Appendix A
Non-Council Meeting Attendees

TVA Staff			
Gary Brinkworth	Cathy Coffey	Beth Keel	Jo Anne Lavender
Kelly Love	John Myers	Liz Upchurch	

Members of the Public			
Taylor Allred	Allie Brown	Matthew Larson	Ernest Leung
Jonathan Levenshus	Natalie Mims	Jeffrey Paulk	

Other
Jessica Monroe – TVA Office of the Inspector General

Appendix B
Meeting Agenda

9:00	Welcome	Dus Rogers, Council Chair
	Meeting Purpose / Updates	Joe Hoagland, Designated Federal Officer
9:20	IRP Update	Gary Brinkworth
9:45	RERC Member Discussion and Q&A	RERC Members
10:00	*Break*	
10:15	Overview of Renewables and Energy Efficiency in the IRP Model	Gary Brinkworth
11:00	RERC Member Discussion and Q&A	RERC Members
11:30	Wrap up & Adjourn	Hoagland/Rogers