DRAFT Tennessee Valley Authority
Integrated Resource Plan Stakeholder Review Group
Working Session
MEETING MINUTES
February 24, 2011
Chattanooga, TN

Members Present:
Randy McAdams, Facilitator, Scott Madden
Lance Brown, Partnership for Affordable Clean Energy
Louise Gorenflo, Sierra Club
Richard Holland, Packaging Corporation of America
Tom King, Oak Ridge National Laboratory
Hank List, Commonwealth of Kentucky
David McKinney, Tennessee Wildlife Resource Agency
David Reister, Environmental Stakeholder
Stephen Smith, Southern Alliance for Clean Energy
Lloyd Webb, Tennessee Valley Industrial Committee
Deb Woolley, Tennessee Chamber of Commerce and Industry

Members Absent:
Ryan Gooch, State of Tennessee
George Kitchens, Joe Wheeler Electric Membership Corporation
Jan Simek, University of Tennessee
Jack Simmons, Tennessee Valley Public Power Association
Patrick Sullivan, Officer of Governor Haley Barbour

Guests:
Steve Adams, Tennessee Valley Public Power Association
Sam Gomberg, Southern Alliance for Clean Energy

TVA:
Bob Balzar, Gary Brinkworth, Ed Colston, Larry Cole, BJ Gatten, Jill Glenn, Mike Ingram, Randy Johnson, Jeff Parsley, Anda Ray, Mary Carlie Vaughn, Van Wardlaw, Beth Yetter, Steve Gilbert (Scott Madden)

I. Introduction

Randy McAdams, Facilitator, Scott Madden

Randy McAdams welcomed the SRG. The SRG was reminded that the final IRP and associated EIS will be sent to the Environmental Protection Agency (EPA) in early March.

Next, the agenda was reviewed. The first topic is a review of the Recommended Planning Direction. Then, will review the contents of the final IRP chapter by chapter. Next, will summarize input received from the SRG and how it has helped throughout the IRP process. Lastly, some closing comments from Van.

Reminded the SRG that this is the last working session prior to the publication of the final IRP document and associated Environmental Impact Statement (EIS). This is also the last SRG meeting before the April 14th TVA Board meeting.

Reviewed the SRG charter - SRG is meant to provide in-depth ongoing discussion, serve as source of information, coordination mechanism, provide real-time public input,

and validate the steps of the process. Today's meeting is a working session. Are now on step 6 of the IRP process – identify the Recommended Planning Direction.

II. **Review of recommended planning direction**

Gary Brinkworth, Senior Manager, Generation and Portfolio Optimization

- Will review the Recommended Planning Direction and its role in the final IRP document.
- Reminder that the IRP serves as a compass, not a GPS; meaning, the IRP sets strategic direction but does not define a specific path. Is not a prescriptive document, does not define specific timelines for asset additions/decisions.
- Reviewed the approach used to develop the Recommended Planning Direction: first, utilized the table of ranges (table is the output of the three strategies that were retained in the draft) → this table was used to create the boundaries for the blended optimization utilized in developing the Recommended Planning Direction; then, different levels of coal-fired idling capacity were identified and the one that performed the best throughout the different scenarios was used for the scorecard evaluation of the Recommended Planning Direction. After the coal-fired idling level for use in the scorecard evaluation was identified, levels of EEDR and renewables were chosen to be included in the scorecard evaluation of the Recommended Planning Direction.
- Reviewed observations from results – in the blended optimization step, chose either the 3600 MW or 5000 MW EEDR portfolios (from original Strategies C and E)
- Renewable additions (in the optimized step) - appears that the model tends to favor the amount of renewables that is the same as our current wind contracts; only a couple of instances which the larger portfolio was chosen (in high growth scenarios – Scenario 1)
- See consistency of nuclear being chosen in majority of portfolios; no nuclear additions in scenarios with nearly flat growth
- New coal capacity, when chosen, is only chosen after 2025 – if chosen, integrated gasification combined cycle (IGCC) with carbon capture
- Natural gas is chosen throughout the study period – simple cycle turbines chosen mostly for reliability issues; most additions were not until after 2024 (except in dramatic load growth scenarios)
- Next, reviewed the Recommended Planning Direction, at least how it is proposed (still has to be adopted by the Board in April); are showing the Board portfolios along with a range for both additions and target dates; Board will be asked to adopt that range and to give permission to implement.
    - EEDR – see the need to expand the amount of EEDR in our portfolio; still our goal to be Southeast leader in EEDR. Still working to address the complexity in expanding customer participation in EEDR efforts
    - Renewables – show range of 1,500 MW (current contracts) to 2,500 MW – plan to expand the contribution of renewables
    - Coal-fired capacity to be idled – range exemplifies what was done in the blended optimization step. There is ongoing analysis within TVA regarding exactly how much capacity will be idled and also concerning when and how we get there from where we are now – meaning, identifying specific units to idle
    - Energy storage – a pumped hydro unit addition is included in all the cases; currently, showing that a unit could come online any time between 2020 and 2024 based on current understanding regarding siting, permitting, etc.
- Uncertainties will continue to affect portfolio decisions in the future:

- Coal capacity idled – mostly influenced by the HAPS MACT
- Energy storage (pumped hydro) – several challenges involving siting, permitting and operation
- Nuclear additions – licensing/permitting timeline
- Coal additions – availability of carbon capture sequestration (CCS) technology
- Natural gas additions – cost and availability and grid stability

Stakeholder Comments and Questions:

- Do you assume immediate deliverability in terms of renewable Power Purchase Agreements (PPAs)? [**TVA**: Each individual contract describes when power is expected to begin to be delivered, etc.]
- Continue to have concerns regarding the forecasts of renewable costs used in the IRP; how were the high-voltage DC lines modeled into the analysis? [**TVA** – we have used the best information available on wind patterns to ensure the largest benefit is acquired; the one aspect in which iterations are still being considered is in how much of this contract value we will get credit for – so far, affecting the way the model optimizes capacity choices; TVA is actively engaged in discussions w/ several developers; is difficult considering there is still not a lot of historical trend information on wind data]
- In the document, there will not be specific numerical values for the Recommended Planning Direction (referring to the staff recommendation that will be presented to the Board in April) – [**TVA** – will present ranges to the Board; in the report presented at the April Board meeting, will state "based on our analysis, this number is a good value; and looking at the assumptions and how the scenarios play out, this is what we recommend." The idea of showing ranges goes back to the 6-lane highway visual – don't want to adopt a plan that is too prescriptive; don't want to revisit it every time something changes; want to be able to be flexible and effectively respond to uncertain changes in the future]
- The presentation of these recommendations is not effective. Still think growing EEDR past 2020 is missing in the IRP → if that were there, would not appear invisible [**TVA** – the EEDR target was set for 2020. This does not imply there will be no EEDR growth after 2020]
- Appears to us that the BLN decision was a floating choice in the draft but is now becoming a defined model input. If it was truly "floating," could slip to the 2024 timeframe – seems that it has been moved forward and locked in the model → how is BLN not a defined model input now? [**TVA** – BLN is not a defined model input, still a selectable choice; the model is free to make its own choice if it turns out to be a low-cost option; in some scenarios, BLN isn't chosen because it isn't needed and the economics will not work out; the BLN project team has not given us new numbers, but we have taken their numbers and escalated them → with that being said, there is more extensive analysis regarding the BLN site being done outside the IRP framework]
- A question that wasn't captured by the scenarios in the IRP – what if there is continued, low economic growth but because of temperature change, load growth increases – does TVA have the capacity to meet weather extremes by using EEDR or will this just mean higher rates or more capacity added to the system? [**TVA** – unlikely that we would get into a place that we would fail to capture a consistent trend of weather extremes that occur over time; outliers are missed at times, but that is because of the planning model

that was utilized that looks 20 years into the future of forward estimates; would be different if a short-term planning process was being utilized]

- A lot of times in the shoulder months, see temperatures rising possibly implying a need for additional generation – are these integrated into the modeling? [**TVA** - Yes, this is all included in the planning analysis]
- What is the current assumption of bringing a pumped hydro unit online? [**TVA** - Right now 12-15 years lead time; no sites have been identified, but there has been a fairly large amount of work done over the years. There will probably be a lot of national interest around pumped hydro especially regarding the issue we are having inside the agency – once you start laying up coal-fired generation, will have significant challenges in turning down the system at night (essentially, usually have to ramp the coal-fired fleet half up and half down between day and night – currently, intermediate coal gives us this flexibility but are trying to figure out how to address this especially considering retirements and idling); realistically, what the pumped hydro work team is finding from their assessments is that TVA probably can't make 2020 in terms of bringing on a pumped storage unit – mostly due to siting, permitting, construction time needed. Now, are looking at a way to compress that timeframe – not sure if that will happen); outside of the IRP, a lot of work is being done regarding where the unit could be and the size]
- In terms of nuclear additions, is there any discussion within TVA nuclear regarding the cost of units remaining the same/ decreasing/ escalating? [**TVA** - All of our analytics tell us that nuclear costs are going to continue to scale up; the B&W unit gets chosen instead of the AP1000 @BLN site – this is a result of cost]
- In terms of presenting this to the Board, is there a standing Board committee looking at this? [**TVA** – there are ongoing Board briefings and have been continuously sharing information with Board members]
- Elaborate more on the decision anticipated in the April Board meeting - Adopt and bless? Anticipate the Board to get into more detail on the ranges? What is it that the staff is looking for from the Board as a decisional point? [**TVA:** The IRP is our recommendation as a direction for the agency realizing that what we are trying to do is establish adequate NEPA coverage for decisions going forward; this plan presents decision makers with boundaries/ranges to work from. There is not an ultimate/individual decision in this package; the ranges show the general timeframe for potential asset additions to help identify the least-cost path going forward. The IRP, being a long-term planning process, will provide guidance for short term planning within TVA as well]

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III. **Preview of Final IRP Contents**

Gary Brinkworth, Senior Manager, Generation and Portfolio Optimization

- Now, will step through the document chapter by chapter
- Showed the table of contents – similar in structure to the Draft document but with some additions. There is some shifting in the chapters – added a chapter on the process (new Ch. 2) and constructed later chapters to address the draft results (Ch. 7), final results and recommendation (Ch. 8), and next steps (Ch. 9). Ch. 6 now describes the overall analysis process used for both the draft and final IRP.

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- Exec Summary - basic opening
- Ch. 1 – "TVA's Environmental and Energy Future" - TVA history, principles in the IRP; explains the broad objective of the IRP study
- Ch. 2 – "IRP Process" - basically, a chapter on the circle of life – explains the IRP process
- Ch. 3 – "Public Participation"– explains the SRG, SRG members, ongoing role of the SRG throughout the entire process and also explains the role of the general public throughout the process (talks about all the things that were done to ensure adequate public participation – SRG has been hugely instrumental in this process)
- Ch. 4 – "Need for Power Analysis" - discusses issue of capacity gap and the analysis around meeting future projected demand by selecting the most optimal mix of energy resources
- Ch. 5 – "Energy Resource Options" – discusses the resource options available to meet the projected demand identified in the IRP
- Ch. 6 – "Resource Plan Development and Analysis" - general discussion regarding how the analysis was done start to finish – identified preferred strategies in the Draft IRP; for the final, utilized a blended optimization to make the Recommended Planning Direction – used key component pieces from the three strategies retained in the Draft
- Ch. 7 – "Draft Study Results" - will contain the draft scorecards and explain the result of the draft process – retaining three strategies
- Ch. 8 – "Final Study Results and Recommended Planning Direction" - details results of the final analysis of the IRP and shows the Recommended Planning Direction; the illustrative portfolios also appear in this chapter along with the discussion as to how the Recommended Planning Direction plays out across the 8 scenarios that were tested for the final IRP
    - A section goes through the process of how the Recommended Planning Direction was constructed (choosing optimal coal-fired idling levels; next, renewables/EEDR levels were chosen; then, further resource additions necessary)
- Ch. 9 – "Next Steps" – This chapter describes the application of the IRP, its purpose - what it does and doesn't do.

Stakeholder Comments and Questions:

- How far are you in working on the message surrounding the Recommended Planning Direction? [**TVA**: Will send SRG members the press release and final IRP fact sheet]
- Has there been discussion on keeping an ongoing dialogue with some SRG members in terms of the next steps/recommendations? [**TVA:** Looking into hosting a SRG meeting in May – will document the process and want input from SRG; clearly some interest in "finishing up" with you guys so we can better plan/understand the process in terms of what worked and what didn't work]
- American Council for an Energy-Efficient Economy (ACEEE) produced a fact sheet on EEDR – would be happy to send to Randy
- There is a growing body of knowledge on measurement and verification of EEDR; propose to hold a workshop w/ some of these experts. [**TVA**: Are interested in any insights SRG members may have. Will look into this]

IV. **Summary of SRG Input and Influence on Process:**

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Randy Johnson, Enterprise Relations, Senior Project Manager – Integrated Resource Planning

- Went over a summary of input received from the SRG and the responses that have been provided
- The entire process has been a learning experience for the entire IRP project team; next step is to document lessons learned for the next IRP process
- SRG input that influenced the process includes (the below listing represents input received from the SRG that was addressed within the IRP, but not limited to this list):
    - Expanding use of natural gas
    - Energy storage capability should be increased
    - Renewable investment should be increased
    - Biomass is the most viable renewable resource within the valley
    - Including a strategy that does not include any more nuclear after Watts Bar 2
    - Idling a large amount of coal-fired generation
    - Increase contribution from EEDR
    - Price forecast of natural gas should be lower based on shale gas availability
    - Studies on combined heat and power (CHP) to be included as a resource option
    - EEDR and renewable portfolios with significant growth beyond 2020 should be evaluated
    - Explore alternatives for greater participation in public events and even more opportunities for the public to interact outside public meetings
    - Create a scenario that reflects the potential economic impacts of C-legislation being implemented
    - Some scenarios should reflect forecasts for demand that are flat and/or possibly negative
    - More engagement with distributors is key to successfully implementing EEDR programs
    - Distributor-owned generation should be increased
    - Requests to extend the 45-public comment period on the Draft IRP
    - The IRP should be a recurring shorter-term process for TVA (compared to the time between this IRP and EV2020)
- Today marks the 15th meeting of the SRG. TVA greatly appreciates the time and commitment that the SRG has devoted to this project over the past two years. The SRG has most definitely had a significant impact on the formation of the IRP and involving an entity such as the SRG has proven to be a successful approach for TVA planning processes.

Stakeholder Comments and Questions:

- This has been a much more robust and engaging process compared to other TVA advisory panels I have served on for TVA projects. The iterative process of this IRP is significantly better compared to EV2020; SACE has the opportunity to engage with many other utilities across the southeast and wants to give props to TVA for having a very informative process and including the SRG extensively – we have a better understanding of the pressures and challenges of running a utility that serves such a large number of customers
- Has been a very helpful process; hasn't been a "we" vs. "they," has been a learning process; the collaboration and learning from each other has been very beneficial

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- Great decision to utilize Scott Madden (consultants) to facilitate these meetings. Added structure – was critical to bring a third party in to effectively facilitate/structure.

V. **Closing Statements**

Van Wardlaw, Executive Vice President, Enterprise Relations

TVA has great appreciation for the SRG and has learned a lot from the SRG's involvement throughout this process. The SRG was formulated to include a variety of different stakeholders with different viewpoints. This facilitated for key discussions and meaningful input on the process. Also have great appreciation for the IRP project team and Scott Madden consultants for facilitating the meetings effectively. The IRP project team in conjunction with the SRG has achieved the IRP's goal of staying true to the process while remaining credible in the analysis.

Key outcomes of the IRP – IRP is a low cost planning analysis and in order to balance risk and cost, must identify approach that gives the greatest degree of success both for TVA and for its customers; key aspects of this include:

- Reducing environmental impacts of TVA's operations
- Maintaining flexibility in order to adapt to changing market conditions; all that is known for sure is that the future is uncertain; one goal of this IRP is to put the company in a position to navigate future uncertainty with a lot of flexibility and continue reliable operations by maintaining a diverse mix of resources
- Listening to and addressing stakeholder concerns, opinions, and questions
- Producing a credible result with the coordination of the SRG
- Producing a Recommended Planning Direction that focuses on a diverse energy portfolio and aligns with the TVA vision

Feedback from Stakeholder on Key Outcomes of the IRP Process:

- Other utilities in different parts of the country are doing IRPs and it is important to recognize that TVA has joined the rest of these utilities across the country; the IRP process is a best practice – TVA has worked hard and done well
- One major key outcome is the fact that TVA is committed to completing another IRP on a more near-term basis. Consider more emphasis regarding that this is a risk management tool along with a least-cost planning tool. Is driving towards lower cost but if an exercise like this is not utilized, potentially exposes the agency to more risk; would not be shy in emphasizing that one of the key outcomes of this exercise is to reduce risk exposure to TVA and its customers (risk mitigation process)
- In terms of discussion around what other utilities are doing/their goals – reliability is just as important as low-cost. Have an opportunity to stress that reliability was a big part of this process (i.e. developed strategy that is low-cost but balanced enough to lessen risk AND increase/maintain reliability)
- Would be helpful if TVA staff presented the link between various TVA planning studies [such as this IRP, Natural Resource Plan (NRP) and River Operations Study (ROS)]; TVA has a lot of opportunities that other utilities do not – would be helpful to coordinate TVA's various messages to its customers
- Very happy with the process – from the information attained in SRG sessions, has a lot more understanding/education on the planning process and analysis involved in producing an IRP

- Energy efficiency and demand response implementation is going to be more of a cultural change for customers - will be TVA's responsibility (stakeholder and distributor coordination, customer education, etc.)
- Again regarding issues with energy efficiency implementation with distributors/how to get them on board/ advocate to some distributors to set up a stakeholder review group of their own? Suggest this because the customers in the area that are paying the bills would like to have input to the distributor that serves them

VI. **Next Steps and Wrap-Up**

Randy McAdams, Facilitator, Scott Madden

In terms of timeline, are on track to send to EPA early March and to present Recommended Planning Direction at April 14, 2011 TVA Board meeting which will be held in Chattanooga. Kilgore is in his 6th read on some of the chapters – intimately involved.

- Plan is to have a hardcopy sent to all SRG members the same day it is sent to EPA
- Mandatory 30 day waiting period starts Mar. 11 (Fri) when the Notice of Availability (NOA) is published in the Federal Register (required by NEPA – NEPA requires 10 days for transmittal – why we are sending hardcopies to EPA on 3/2).
- Will send SRG the media press release and the final IRP fact sheet.