Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902-1401

June 23, 2014

The Honorable Lamar Alexander
United States Senate
Washington, DC 20510

The Honorable Stephen Fincher
House of Representatives
Washington, DC 20510

Dear Senator Alexander and Representative Fincher:

Thank you for your letter of May 13, 2014. Before responding to the specifics of your inquiry, I would like to provide some context on TVA's decision-making parameters on the issues you have raised. As you know, TVA's mission focuses on low cost, reliable electricity, environmental stewardship, and economic development. On the energy front, TVA is mandated by Federal statute to provide electricity at rates as low as feasible. In addition, Federal law requires TVA to use least-cost planning and the selection of resources that leads to lowest system cost in the addition of energy resources. This standard requires analysis and consideration of many variables, including the effect of our environmental regulation, fuel diversity, load shape, and others, but the statutory mandate is to plan and execute to the lowest system costs.

This is the framework and standard we use in evaluating options like purchasing power via the proposed Clean Line Energy Partners' transmission line, self-build, and others. I note with respect to Clean Line that TVA has not yet received an actionable proposal from that entity; however, we have been engaged in both transmission studies and commercial discussions with Clean Line over the last several years.

The following responds to your specific questions.

1. Does purchasing electricity from this distance increase security threats to TVA's power supply? Former U.S. Secretary of State George Schultz has said we should pay attention to generating more energy where we use it because of national security risks.

   The power grid is a complex, interconnected network of generating plants, transmission lines, and distribution facilities. This system is designed with redundancy and resiliency at its core to ensure a reliable electric power system.

   Some increase in security risk is unavoidable as distance increases between generation and point of use. The extra distance provides additional exposure for natural or malicious events to force a transmission path out of service. The potential for an interruption with long duration to power supply increases if full transmission

network redundancy is not provided or as greater amounts of supply are obtained from more remote sources. The Department of Defense has become aware of this risk; it is implementing a program to make its major installations self-sustaining in energy to mitigate the potential interruption from the grid.

2. What is the cost of purchasing wind electricity compared to TVA generating or purchasing other types of electricity generation?

   TVA is studying the addition of new wind energy resources as part of the development of its new Integrated Resource Plan (IRP). This process provides opportunity for public participation. When TVA evaluates the cost of wind energy, we include the value of the energy itself, as well as the cost to transmit out-of-valley wind energy to the Tennessee Valley. In addition, there are costs associated with the intermittent nature of wind generation. Through the IRP, TVA will rigorously compare wind energy purchases against other alternative sources of energy (renewables, new and existing TVA generating assets, or purchased power) to serve local power companies and directly-served customers in a cost-effective manner.

   In FY2013, TVA's average fuel rates by asset type were as follows: nuclear, $6/MWh; coal, $32/MWh; and gas, $39/MWh. The TVA average system fuel cost, which includes hydro (no fuel cost) and purchased power, was $24/MWh. By comparison, off-system wind purchases were $80/MWh (including transmission).

   The cost of both wind and solar have trended steadily down in recent years. Lazard Freres and Company, LLC, a leading financial advisory firm, does a periodic study on the costs of renewable energy. Its most recent report states that the cost to generate wind with the Federal production tax credit (PTC) is as low as $23 MWh; without the credit, the costs are as low as $45 MWh. (Note that these are production costs that do not take into account the cost of delivery to or the impact on the TVA system.)

3. There is substantial opposition in Congress to the wind production tax credit. Will TVA ratepayers be at risk of increased rates if the wind production tax credit is not renewed?

   TVA does not benefit directly from the PTC. As noted in the prior response, the PTC has a material impact on the cost structure of wind developers and, in turn, the price they can offer to TVA or other purchasers of the wind energy. Any TVA purchase of wind energy would be under a long-term contract that would place risk associated with the tax credit on the seller.

4. What is the reliability of purchasing wind power as compared to other types of electricity generated by natural gas, nuclear, coal, or hydropower?

Because wind is an intermittent resource that lacks some of the dispatch capability of other resources, it does not eliminate the need for base load or dispatchable power plants like nuclear, natural gas, coal and hydropower. Adding intermittent generation resources like wind can be challenging to manage, particularly as the volume of generation from those sources increases. Wind patterns are fairly predictable, but not entirely so; in addition, weather and other factors can affect output. To maintain reliability, a wind energy purchaser must keep adequate capacity and spinning reserves to cover the variability inherent to wind. Spinning reserve is typically calculated as the amount of capacity available to cover the loss of the largest generation source on the system. Utilities across the country have been integrating more wind into their systems over the last several years, and TVA already integrates 1,515 megawatts of off-system wind power. The industry has growing experience with this issue, but it does make ensuring reliability more complex.

5. TVA's peak power demands tend to be between 4:00 p.m. and 7:00 p.m. and wind tends to mostly blow at night. How does wind power fit into TVA's overall demand structure if the electricity isn't being produced when TVA needs it the most?

   TVA analyzes historic and forecasted wind patterns to determine expected wind deliveries at our system peak. Our forecasting and planning processes reflect adjustment to wind generation at our summer peaks based on this analysis. Clean Line has told us that a production profile provided by the independent meteorology firm, 3Tier Oklahoma, shows that panhandle wind energy produces at about a 50 percent capacity factor between the hours of 4:00 p.m. and 7:00 p.m., thus contributing to meeting peak demand. TVA's current wind resources produced about 25 percent average capacity factor over that peak period last summer, with significant variation each day (between 5 and 65 percent capacity factor). TVA will take the seasonal and time-of-day energy patterns of wind into account when evaluating adding additional wind energy to its portfolio.

6. At a roundtable in September 2013, hosted by Senators Corker and Alexander, you said that TVA didn't need additional electricity generation capacity as the result of reduced electricity demand. Has this projection changed?

   Electricity demand is not expected to return to 2007 levels until the end of this decade. We are projecting growth in demand of approximately 0.6 percent per year, net of TVA's energy efficiency efforts. TVA believes that we have adequate supplies to meet the near- to mid-term energy needs of the Valley reliably. Cleaner energy sources, including nuclear, renewables, hydro and energy efficiency, provide diversity within TVA's existing balanced energy portfolio. TVA is evaluating future power needs and opportunities to meet them through the IRP. Wind and other generating resources are regularly evaluated against existing or planned asset additions to address changing conditions.

7. If the projection for TVA's electricity demand has changed since September 2013, does it make more sense to purchase this wind power from Clean Line Energy Partners, to build additional nuclear capacity, or to build additional natural gas or coal capacity?

   While demand over the next decade or so is predicted to be stable with low growth, the TVA generation fleet is in transition. TVA has retired or will retire a substantial portion of its coal fleet; we are committed to the completion of Watts Bar Nuclear Plant Unit 2 and to a large new gas combined cycle plant in Paradise, Kentucky. We have the potential to get incremental megawatts from the hydro system and a significant amount from power uprates in the nuclear fleet. We have to either retrofit, refire, or replace the Allen Plant in Memphis before 2019 under the terms of an agreement with EPA and others. (Clean Line cannot supplant Allen because of the need for a generation source physically located in that area to provide transmission support that imported wind generation cannot provide.) In addition, other market participants have approached TVA with expressions of interest to provide electricity from gas, nuclear, wind and solar assets. TVA also factors in energy efficiency and demand response programs into its resource decisions. The recently announced draft 111(d) rule from EPA, if enacted in its current form, will also have a national impact on future decisions.

   Clean Line will be evaluated in this context of low growth, transitioning fleet and other options by application of the statutory mandate and guidance noted in the preamble of this letter.

   Although TVA has not received a definitive proposal to buy power from Clean Line, we are currently evaluating the costs for Clean Line to connect to our system and the potential impact on our reliability. TVA's projects are regularly evaluated and updated as Valley energy needs and TVA system conditions change. The specific characteristics of each incremental generating opportunity are carefully evaluated with respect to the system conditions, projected load growth and patterns coupled with potential reliability and cost impact to the ratepayer. TVA will continue to evaluate offers as they are presented to us, while remaining focused on our mission to provide reliable, low-cost power to the Tennessee Valley.

8. Does Clean Line Energy Partners' proposal require the use of eminent domain in order to acquire any right-of-way for this project? How many landowners or homeowners will be impacted by the use of eminent domain, what specific lands will be acquired and where are they located?

   TVA's knowledge on this subject is limited to information that is either publicly available or has been provided to TVA by Clean Line. Clean Line has requested that the Tennessee Regulatory Authority grant it eminent domain power. Clean Line has submitted a proposed route and alternative routes to the Department of Energy

for consideration in the Environmental Impact Statement that the Department is preparing. Clean Line has stated that it is not aware of any homes that are located in the representative right-of-way within the proposed route it has submitted, and that the number of parcels affected by eminent domain cannot be known at this time. Clean Line has informed TVA that Clean Line will seek to acquire as much of the required right-of-way as possible through voluntarily negotiated transactions. Clean Line has stated that it will not seek to exercise the power of eminent domain unless and until it has exhausted reasonable efforts to acquire transmission line easements through negotiated agreement. Clean Line has stated that it has already acquired a majority of the easements needed to construct and operate the project in Tennessee, and remains in negotiations for easements on the remaining parcels.

9. Can you explain how Clean Line Energy Partners plans to compensate any landowners or homeowners who are affected by eminent domain?

   TVA's knowledge on this topic is limited to information that has been provided to TVA by Clean Line. Clean Line has informed TVA that it will not seek to exercise the power of eminent domain unless and until it has exhausted all reasonable efforts to acquire transmission line easements through voluntarily negotiated agreements. Clean Line also stated that any exercise of eminent domain authority would be consistent with applicable laws.

10. How will the price of compensation be determined? Does Clean Line Energy Partners have a specific formula when compensating for land purchased under the use of eminent domain?

    TVA's knowledge on this topic is limited to information that has been provided to TVA by Clean Line. According to Clean Line, if any parcels are acquired by eminent domain, compensation would be set by the courts and relevant laws, including the Federal Uniform Act. For voluntary easement acquisition, Clean Line stated that it has established a three-part offer. First, Clean Line is offering landowners 100 percent of the fee value of their underlying land, as determined by a third party market study or appraisal, in return for a limited transmission easement. Second, Clean Line is offering a one-time or escalating annual payment, at the election of the landowner, for each structure on a property. Third, Clean Line is offering compensation for any damages to crops or improvements resulting from the transmission easement. Landowners can continue to use their land for any purposes, such as farming and ranching that do not interfere with the safe and reliable operation of the transmission line.

11. What funding stream will Clean Line Energy Partners use to compensate landowners and homeowners for the land purchased under eminent domain?

    TVA's knowledge on this topic is limited to information that has been provided to TVA by Clean Line. According to Clean Line, all easement acquisition is funded by Clean Line's investors, which include National Grid, a major integrated utility with a current market capitalization of over $50 billion.

I hope that these answers are fully responsive to the questions you have raised, but I also recognize that these are complex matters that might require greater explication. We would be glad to respond to further inquiries and to meet with you and/or your staffs if that would be beneficial.

Sincerely,

William D. Johnson
President and Chief Executive Officer
Tennessee Valley Authority

cc: TVA Board of Directors
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