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DETERMINATION OF NEPA ADEQUACY

PROPOSED CHANGES TO POWER SUPPLY FLEXIBILITY POLICY (FLEXIBILITY 2.0)

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The Tennessee Valley Authority (TVA) is proposing to include additional commercially viable options under the Power Supply Flexibility (Flexibility) policy. These additional options would address constraints to the deployment of energy resources under the current Flexibility framework, with a collective goal of optimizing outcomes consistent with an evolving public power model. This assessment evaluates whether TVA's 2020 environmental review of the Flexibility policy is adequate to address the potential effects associated with the proposed commercial frameworks and whether additional environmental review under NEPA is necessary.

In June 2020, TVA completed the *TVA Power Supply Flexibility Proposal Final Environmental Assessment* (EA) and issued a finding of no significant impact (FONSI) addressing its proposal to provide flexible power generation options to local power company (LPC) customers that have entered into Long-Term Agreements (LTA) with TVA (these LPCs are referred to as Valley Partners). The LTA, first offered in August 2019, includes provision for those Valley Partners who adopt the agreement to meet a portion of their power needs (3 to 5%) through their own generating sources (referred to as Flexible Generation). To date, 147 of the 153 LPCs served by TVA have adopted the LTA.

The 2020 EA considered a Flexibility policy that is based on six principles that guide Valley Partners interested in adding generation.¹ The Flexibility principles resulted from structured engagement with LPCs and reflect their feedback to ensure the outcome provides a viable solution to their needs. LPCs expressed the greatest interest in opportunities to develop solar generation, although the principles allowed other types of generation as long as the Flexible Generation sources were consistent with those approved under TVA's 2019 Integrated Resource Plan.

In the EA, TVA analyzed a policy framework based on these principles that would allow a total of approximately 800 MW to be developed by Valley Partners. The 800-MW maximum is the amount of power that could be generated by Valley Partners if all LPCs across the Valley participate and develop their maximum allowable capacity under the policy. Under the policy, TVA would apply a technology factor of 0.4 to the nameplate capacity of solar installations, which would result in a potential of 2,000 MW of solar generation that could be developed by Valley Partners.

¹ These principles were approved by the TVA Board of Directors in February 2020. The board approved the policy contingent upon the completion of appropriate environmental review.

After the Final EA and FONSI was issued in June 2020, TVA began implementing the policy by establishing Flexible Generation agreements with Valley Partners. To date, 84 of the 147 Valley Partners have signed such agreements and 28 Flexible Generation projects have been initiated. As the energy marketplace in the Valley is dynamic and fast evolving, the ability to adapt is key. As the policy was implemented, Valley Partners and TVA identified constraints to the deployment of energy resources under the Flexibility framework and begun discussing potential changes to the framework to address these constraints. In August 2022, the TVA Board of Directors delegated authority to the Chief Executive Officer to revise the Flexibility principles to address these constraints and improve the policy's implementation, subject to the completion of any applicable environmental reviews and consistent with TVA transmission policies.

TVA, with input from its Valley Partners, identified changes to the original Flexibility principles pertaining to commercial elements regarding size, location, benefit allocation, and other contractual terms. TVA would not change the original capacity allocation (i.e., up to 5% of a Valley Partner's energy), the pricing framework, and energy resources options (i.e., those consistent with TVA's 2019 Integrated Resource Plan). The proposal to modify the current Flexibility framework is commonly referred to as "Flexibility 2.0" or "Expanded Flexibility" within TVA.

Proposed Changes under Flexibility 2.0

TVA is proposing three changes to its Flexibility policy, described below.

Valley Partner Hosted Projects

TVA is proposing to develop a new commercial option under the Flexibility principles to allow two or more Valley Partners to collaborate on generation projects. Under the initial Flexibility principles, a Valley Partner's Flexible Generation project must be "located within the LPC's service territory, except when circumstances such as restrictive siting can be demonstrated." (2020 Final EA, page 2-1). This location requirement effectively meant that Valley Partners were not permitted to collaborate with other Valley Partners on most Flexible Generation projects.

Since 2020, numerous Valley Partners, including those with siting limitations, have expressed a desire for TVA to allow aggregation of Flexible Generation projects. Under the current proposal, TVA would change its Flexibility principle to allow for Valley Partners to collaborate on aggregated Flexible Generation projects by removing the current requirement that a project be located within a Valley Partner's service territory.

Under the proposed change, two or more Valley Partners may collaborate on a Flexible Generation project, with one Valley Partner serving as a "host" and other partner(s) having the opportunity to subscribe and receive economic benefits consistent with their contributions. TVA would not be involved in the transaction and commercial structure, which mimic the initial framework of Flexibility. This Valley Partner Hosted approach would leverage the locally-driven efforts of renewable project development where the energy flow would stay on the distribution system via a power purchase agreement (PPA) or other ownership structure between the host Valley Partner and a solar project/developer. The "allocation" of the solar capacity (MW) could be "subscribed" to the specific Valley Partner's Flexible Generation capacity, without that capacity being exceeded.

End Use Hosted Projects

TVA is proposing to include an additional technology factor under the Flexibility principles for qualifying on-site installations. As noted above, under the original Flexibility proposal, TVA applies a 0.4 technology factor to the nameplate capacity for solar installations, which discounts the Flexible Generation capacity allocation for solar generation by 60 percent. Applying this factor enables Valley Partners to self-generate approximately three percent of their total energy from solar generating facilities, consistent with the LTP agreement.

Since 2020, Valley Partners and TVA have discussed whether the Flexibility policy provided sufficient opportunities for smaller scale solar generation. Given that the adoption rate of small scale residential and small on-site commercial solar continues to increase across the TVA region, Valley Partners have been considering programs in which they can offer their customers who own such installations a solution that is broader in scope than TVA's Dispersed Power Providers program. These programs (to be developed and implemented by Valley Partners) may involve the purchase of excess generation by Valley Partners from end use consumers in a manner that is consistent with the TVA net metering policies and with some guardrails on the programmatic elements. The purchase of excess generation by Valley Partners would be counted as part of the Valley Partner's Flexible Generation capacity.

On-site rooftop solar has a fundamentally different generation profile when compared to larger scale solar projects; as such, a review of these resources was undertaken by TVA to determine if an adjusted technology factor should be applied to these specific applications. TVA examined data from over 80 rooftop solar installations over a multi-year period and found that the average system size was approximately 8 kW, was paired with a 5 kW/10 kWh battery system, and had a system size that is highly correlated with "native" load to maximize end use (behind the meter) benefit. Data and analysis showed that up to 20% of projected solar usage was "excess generation." Based on this analysis, TVA is proposing to apply a new 0.2 technology factor adjustment specific to qualifying on-site installations. The 0.4 technology factor would continue to be applied to other solar facilities.

TVA estimates that only a minor portion of Flexible Generation projects may fall under this option in the future, based on initial discussions with Valley Partners about their preferences. Unlike other types of solar generation that Valley Partners are pursuing, some of the installations under this defined threshold are likely existing installations on existing facilities.

TVA Interconnected Projects

The third proposed addition to the Flexibility policy would be to create an option for Valley Partners to work directly with developers to deploy solar generation projects. Facilitated through a back-to-back PPA commercial structure, each Valley Partner would enter into a PPA with a solar developer and subsequently enter into a Flexibility Option PPA (FOPPA) with TVA. TVA would take title to and physical delivery of the power from the projects and interconnect the power to TVA's bulk transmission system. These TVA Interconnected projects and associated commercial framework would provide Valley Partners with an opportunity to purse utility scale projects and assume PPA implementation and on-going management obligations.

As discussed in greater detail below, any proposed TVA Interconnected project would be subject to additional site-specific environmental review under NEPA (and other applicable

federal law and requirements) because such projects would be major federal actions as a result of TVA's intervention, unlike Valley Partner Hosted or End Use Hosted projects that are downstream actions conducted by Valley Partners without TVA's intervention.

Discussion of NEPA Adequacy

Introduction

To determine whether the proposed changes are adequately addressed under existing NEPA documentation, TVA's NEPA Compliance staff must determine whether: the new actions are essentially similar to the previously analyzed action(s); the alternatives previously analyzed are adequate for the new actions; the effects of the new actions were addressed in the previous analysis; and there are significant new circumstances or information relevant to environmental concerns that would substantially change the analysis in the existing NEPA review. (18 CFR 1318.101(d)).

The *TVA Power Supply Flexibility Final Environmental Assessment* and associated FONSI are the primary NEPA documents relevant to this review of NEPA adequacy. In the Final EA, TVA analyzed a "Flexibility Proposal" that would allow Valley Partners to generate between 800 MW to 2,000 MW of Flexible Generation across the Tennessee Valley, depending on the types of generation used. Valley Partners would be able to use a variety of generation sources, consistent with TVA's 2019 Integrated Resource Plan (IRP). Both the EA and FONSI are incorporated herein by reference.

In section 1.5 of the Final EA, TVA identifies other relevant NEPA reviews related to the proposal, with emphasis on the 2019 IRP Environmental Impact Statement (EIS). The Final EA tiered from the IRP EIS and relied in part on the EIS' analysis. Like the IRP's environmental analysis, the Final EA's analysis is generic in nature as site- and project-specific information about the location or type of power generation resources developed by Valley Partners is unknown. The generic analysis is also appropriate given that TVA would not have approval authority over Flexible Generation projects implemented by Valley Partners. As explained in section 1.5, "Tiering to the 2019 IRP EIS allows TVA to rely on the assessment in that EIS of the IRP Power Target Supply Mix and the types of generation considered during its development. It allows TVA to tier its analysis to address more localized impacts that may occur based on likely LPC deployment scenarios. The 2019 IRP EIS provides general, non-site-specific information in Section 5.2 about the environmental impacts of solar generation "(Final EA, page 1-4). The Final EA's analysis also addresses the impacts of Flexible Generation program on the overall environmental performance of the TVA power system.

Analytical Framework of the Final EA

Understanding the framework of the environmental impact analyses TVA included in the Final EA is helpful context in determining whether the proposed changes to the Flexibility policy are adequately addressed in the Final EA. The analytical framework is described in section 3.1 of the Final EA. TVA made reasonable assumptions regarding the types and scale of generation that Valley Partners are likely to deploy and considered the maximum potential impacts of Flexible Generation. The impact analysis sections of the Final EA addressed the potential

impacts of eligible generation sources under three scenarios on energy production and use, socioeconomics, air resources, water resources, land resources, and waste generation.

Under Alternative B, analyzed in the Final EA and implemented by TVA since July 2020, Valley Partners could enter into Generation Flexibility agreements for power supply flexibility up to their calculated capacity.² While a total of approximately 800 MW of Flexible Generation was assumed to be available to Valley Partners under the policy, TVA would apply a 0.4 technology factor to nameplate capacity for solar installations, which would discount the Flexible Generation capacity allocation for solar generation by 60 percent. When applying this technology factor, up to 2,000 MW of solar generation would be possible under TVA's Flexibility policy if only solar generation is developed by Valley Partners (note: applying the 0.4 factor to 800 MW of available power equates to 2,000 MW).

TVA analyzed two alternatives by applying the following generation and development scenarios and noted that Scenario 2 is the most likely deployment scenario:

- Scenario 1 (100% solar) = up to 2,000 MW of solar (i.e., 800 MW x 2.5);
- Scenario 2 (90% solar, 10% natural gas) = 1800 MW solar (i.e., 720 MW x 2.5) and 80 MW gas and;
- Scenario 3 (50% solar, 50% natural gas) = 1000 MW solar (i.e., 400 MW x 2.5) and 400 MW gas.

Each of the Final EA's scenarios assumed that all 153 LPCs would eventually sign long-term agreements with TVA and that all Valley Partners would then fully develop generation up to its Flexible Generation capacity. The analysis, then, considers the maximum build-out and maximum potential impacts of Flexible Generation. This conservative analytical approach was necessary because the actual development potential for Flexible Generation is unknown.

While up to 2,000 MW of solar generation is analyzed in the Final EA, to date the level of adoption of Flexible Generation is low. To date, only 84 of the 147 Valley Partners have signed Generation Flexibility agreements with TVA. These 84 partners have Flexible Generation capacities accounting for over half of the 2,000 MW that would be allocated for solar (1,096.35. MW of the 2,000 MW capacity). To date, there are only seven Flexible Generation projects that are in operation generating 31.3 MW. In addition, 21 projects have been approved or are in the approval process that would generate an additional 151.55 MW. Twenty-seven projects are solar generation projects. Thus, only about 9.1 percent of the Flexible Generation potential analyzed in the Final EA is operational, in the approval process or has been approved (182.85 MW of the 2,000 MW capacity).

In addition, the six LPCs (of 153 in total) that have not entered into long-term agreements account for about 15% of the Flexible Generation capacity combined. Thus, the actual available Flexible Generation is currently about 15% less than the 800 MW total that was reviewed by TVA in the Final EA. While TVA continues to promote the long-term agreement to the remaining LPCs, it is not known whether the remaining LPCs will enter into long-term agreements and

² Valley Partners would have to be eligible for flexible generation of up to five percent of their average total hourly energy sales over the last five TVA fiscal years (FY 2015 to 2019), converted to capacity basis (with a minimum availability of one MW per Valley Partner).

then choose to sign Flexible Generation agreements. Therefore, it is not known whether the entire Flexible Generation capacity will be utilized in the future.

For the foreseeable future, the conservative analysis included in the Final EA, with its maximum build-out/maximum impacts discussion, easily bounds the potential impacts associated with foreseeable Flexible Generation projects. The Final EA would therefore adequately address the proposed changes to the policy that are currently under consideration, as discussed below.

Valley Partner Hosted Projects – Discussion of NEPA Adequacy

As described above, TVA is proposing to change its Flexibility principles to allow Valley Partners to aggregate Flexible Generation projects, which would remove the restriction that a project must be located within a Valley Partner's service territory (except under limited circumstances).

The new proposal is materially the same as the Flexibility proposal previously analyzed by TVA, and the alternatives analyzed in the Final EA are adequate for the new proposal. The proposal would not modify the primary components of the Flexibility policy. It would be a minor change in how Valley Partners may implement Flexible Generation projects. The new proposal would not affect Valley Partners' ability to deploy their own power generation projects, the generation options Valley Partners may select, the capacity approved for each partner, or the total flexible generation capacity under the policy.

Because the proposed change would not affect (i.e., increase or decrease) the total Flexible Generation capacity, there are no environmental impacts that would result from the change that were not previously addressed in the Final EA. As noted above, TVA's environmental analysis assumed that all LPCs would become Valley Partners and would fully develop their flexible generation capacity. The analysis, therefore, is a conservative, maximum build-out scenario.

While the previous analysis adequately addresses the impacts of this policy change, the change has potential to influence the location of some future projects implemented by Valley Partners. TVA's environmental analysis in the Final EA did not specify where projects were most likely to occur within the TVA service area (page 3-16). It was implicit in the analysis under the initial principles that development and the associated impacts would be dispersed across the entire TVA service area. Under the proposed change in these principles, it is likely that the aggregation of Flexible Generation projects would result in more flexible solar generation projects being located in the western and southwestern portions of the TVA service area, where solar generation potential is greater than other areas of the service area. Potential impacts of the proposal, then, are likely to be more concentrated in a region than previously disclosed. Although the change may influence the location of some future projects, the impacts would generally be the same as those disclosed in the Final EA because of the analytical framework used by TVA to disclose impacts. The impacts associated with these projects would be the same as those described in the Final EA, with a greater potential for impacts to occur in the southwestern portion of the TVA service area.

There are no significant new circumstances or information relevant to environmental concerns that would substantially change the analysis in the existing NEPA review. The assumptions and information relied upon by TVA in the Final EA (including assumptions relating to the generic impacts to air, water, waste, and land resources) remain valid to support TVA's policy decision.

End Use Hosted Projects - Discussion of NEPA Adequacy

As described above, TVA proposes a change to Flexibility principles to allow Valley Partners to acquire generation from end use customers while applying a new technology factor. TVA's Flexibility policy with this change is essentially similar to TVA's proposal addressed in the Final EA. As with the first proposed change described above, the addition of an End Use Hosted option would be a minor change in how Valley Partners may implement Flexible Generation projects; the proposal would not modify the primary components of the Flexibility policy.

TVA estimates that such projects or programs would not initially be widely implemented by Valley Partners. TVA estimates that End Use Hosted projects could be applied to approximately 2.5% of potential solar generation under the TVA's Flexibility policy (50 MW of the 2000 MW capacity). Thus, creating an End Use Hosted option for Valley Partners would represent a minor change to TVA's Flexibility policy and would affect a very small amount of Flexible Generation.

Valley Partners would have the option to administer a program for end use customers consistent with the general framework of TVA's Flexibility policy. Like the initial policy, a technology factor for solar generation would be applied. Rather than applying a 0.4 technology factor (per the current policy), a 0.2 technology factor would be applied to capacity for End Use Hosted projects. The alternatives considered in the Final EA are adequate for the proposal to establish End Use Hosted projects with a differing solar technology factor under the Flexibility policy. Under both Alternatives A and B, TVA identified dispersed small residential solar installations as a likely Flexible Generation source and recognized that a solar technology factor that is proposed represents a minor administrative change to how TVA would and has implemented the policy analyzed in the Final EA. The proposal is intended to implement the same general principles of TVA's Flexibility policy. There is no need to analyze an additional alternative.

In addition, there are no foreseeable effects that would result from the proposal that were not addressed in the Final EA. As noted above, TVA anticipates that the proposal would apply to a small portion of Flexible Generation and would not result in substantial changes to TVA's environmental impact analysis or conclusions. The Final EA's analysis addresses the potential impacts of small, residential solar installations. Unlike other types of Flexible Generation options, the End Use Hosted option is expected to be applied primarily to rooftop solar installations on homes or facilities. These type of installations are likely to have fewer impacts to land, water or air resources than impacts from other types of solar power generation facilities addressed in the Final EA. Unlike other Flexible Generation options (Valley Partner or TVA Interconnected), End Use Hosted sources are also unlikely to induce new construction or development that would result in environmental impacts (i.e., homes or facilities would not be constructed solely in order to serve as generation sources).

However, there is potential that applying the smaller technology factor to End Use Hosted solar installations would result in a greater number of small, residential solar installations than initially foreseen under the Flexibility principles. Applying the 0.2 factor to these types of solar installations has the potential to result in a greater amount of total capacity under a Valley Partner's Flexible Generation capacity than applying the 0.4 factor.

Most notably, applying a new technology factor of 0.2 to End Use Hosted projects has the potential to increase the total amount of power available to partners under the Flexibility policy. As noted above, a total of approximately 800 MW of Flexible Generation is available to Valley Partners under the Flexibility policy (if all LPCs become Valley Partners and develop Flexible Generation). Under the initial Flexibility framework, applying the 0.4 technology factor to nameplate capacity for solar installations makes up to 2,000 MW of solar generation available to Valley Partners. This change in technology factor could have a marginal increase to the overall solar volume installed under the policy.

Although TVA is not proposing to limit the amount of End Use Hosted projects implemented by Valley Partners, TVA does not anticipate widespread adoption of such programs by Valley Partners. Given current information, it would not be reasonable to assume that a large portion of solar generation in the future would be subject to the 0.2 technology factor. Rather, as noted above, TVA estimates that End Use Hosted projects would account for only a marginal impact to the overall adoption rate for solar. For example, one scenario analyzed assumed that 2.5% of solar generation under Flexible Generation would be subject to an End-Use Hosted technology factor of 0.2. Applying the 0.2 technology factor to 2.5% of the total Flexible Generation would result in 100 MW of solar potential (i.e., 2.5% of 800 MW, multiplied by 5 to apply the 0.2 factor), which is 50 MW of solar potential greater than the current potential of 2000 MW applying the 0.4 factor to these installations.

Under this scenario, the maximum solar generation potential under the Flexibility policy would be 2,050 MW rather than 2,000 MWs (a 2.5% increase). Since the Final EA analysis considers a maximum of 2,000 MWs of solar power generation, this scenario quantified an additional 50 MWs of any incremental solar installations under the End Use Hosted technology that are not addressed in the Final EA, while the qualitative analysis would remain valid. However, TVA estimates that it is very unlikely that full solar deployment would be realized in the foreseeable future under the Flexibility policy, given that six LPCs have not entered into long-term agreements and only 84 Valley Partners have signed Generation Flexibility agreements with TVA to date. The analysis of the Final EA remains valid to support TVA's consideration of this minor change until additional LPCs become Valley Partners and more Valley Partners sign Generation Flexibility agreements. Currently, then, the Final EA's conservative analysis easily bounds the potential impacts associated with foreseeable Flexible Generation projects.

While TVA's NEPA Compliance group has determined that the End Use Hosted proposal is adequately covered under the Final EA and associated FONSI, NEPA Compliance will consult regularly with the Commercial Energy Solutions group for updates on Valley Partner interest in Generation Flexibility, the number of projects being implemented by partners, and the total Flexible Generation to be developed. TVA will continue to review the Flexibility policy and progress by Valley Partners in implementing the associated projects and will conduct additional environmental review under NEPA if development potential approaches or exceeds the scenarios analyzed in the Final EA or should other circumstances arise.

In addition, there are no significant new circumstances or information related to this proposed change to the policy or relevant to environmental concerns that would change TVA's previous analyses. The assumptions and information relied upon by TVA in the Final EA (including assumptions relating to the generic impacts to air, water, waste, and land resources) remain valid to support TVA's policy decision.

TVA Interconnected Projects – Discussion of NEPA Adequacy

The third proposal change would revise the Flexibility policy to create an option for Valley Partners to work directly with solar developers to deploy Flexible Generation projects that interconnect directly to the TVA transmission system. Valley Partners would receive the benefits from these generating resources (primarily solar resources) in a manner that replicates the financial and risk profile of local generation, as intended when the Flexibility program was initially implemented.

This change would not modify the primary components of the Flexibility policy. The proposal would not affect the total Flexible Generation capacity, the capacity approved for each Valley Partner, or the resource options available to partners.

This proposal is essentially the same as the Flexibility proposal previously analyzed by TVA, except for the administrative changes and requirements that would fall upon TVA. The alternatives analyzed in the Final EA are adequate for the new proposal. The administrative change would not result in different environmental impacts than those generically described in the Final EA. As discussed above, the Final EA provided a generic and conservative analysis of potential impacts associated with foreseeable development scenarios. The analysis in the Final EA remains adequate to support the policy decision because the generation would be a portion of the allotted Flexible Generation available to Valley Partners that was previously analyzed. While TVA would become involved in the commercial framework by purchasing and taking title to any power that uses TVA transmission, there would be no change in environmental impacts resulting from the change.

However, changing the policy to establish a TVA Interconnected option would have a notable effect on TVA's obligations under NEPA relating to implementing the Flexibility policy. TVA would be required under NEPA to consider the site-specific environmental impacts of TVA Interconnected projects because, unlike the other Flexible Generation options (i.e., Valley Partner or End Use Hosted), TVA Interconnected projects would be major federal actions. The completion of NEPA to consider site-specific impacts of TVA Interconnected projects would ensure that any impacts not adequately analyzed in the Final EA would be analyzed appropriately in any subsequent NEPA review.

TVA's Commercial Energy Solutions estimates that there is interest by Valley Partners in future Flexible Generation projects that would fall under the TVA Interconnected option, based on discussions with Valley Partners about their preferences and local constraints.

Conclusion

Based on this evaluation, I conclude that TVA's previous NEPA documentation, namely the *TVA Power Supply Flexibility Proposal Final Environmental Assessment*, with the associated finding of no significant impact, provides an adequate analysis of the potential impacts associated with the proposed changes to the principles of TVA's Flexibility policy relating to Valley Partner Hosted, End Use Hosted, and TVA Interconnected generation options for Valley Partners with Generation Flexibility agreements. TVA has determined that the proposed changes to the Flexibility principles are substantially similar to the proposed actions previously reviewed, and there are no new circumstances or information relevant to environmental concerns that are significant.

The conservative analysis in the Final EA addresses foreseeable development by partners, and many projects under the revised policy will require additional site-specific verification. Thus, additional NEPA review is not necessary except for certain projects in the TVA Interconnected projects category for which a FOPPA is necessary. The requirements for evaluating and documenting this determination at 40 CFR 1502.9(d)(4) and 18 CFR 1318.101 have been met.

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