



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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June 29, 2023

Ms. Chevy Williams
NEPA Specialist
Tennessee Valley Authority
1101 Market Street BR2C-C
Chattanooga, Tennessee 37402

Re: EPA Comments on the Draft Environmental Impact Statement for the Kingston Fossil Plant Retirement, Roane County, Tennessee; CEQ No: 20230067

Dear Ms. Williams:

The U.S. Environmental Protection Agency (EPA) reviewed the referenced document in accordance with Section 309 of the Clean Air Act (CAA) and Section 102(2)(C) of the National Environmental Policy Act (NEPA). The CAA Section 309 role is unique to the EPA. Among other things, CAA Section 309 requires the EPA to review and comment publicly on any proposed federal action subject to NEPA's environmental impact statement requirement.

The Tennessee Valley Authority (TVA) issued a Draft Environmental Impact Statement (DEIS) to evaluate the impacts of the proposed retirement and demolition of nine units of the Kingston Fossil Plant (KIF) and the addition of increased generation capacity as compared to the retired units. KIF is situated on a 2,254-acre reservation at the confluence of the Clinch and Emory Rivers in Roane County, Tennessee (TN). The nine-unit, coal-fired steam-generating plant was designed with a summer net generating capacity of 1,398-megawatts (MW). According to the DEIS, the purpose of the proposed action is to retire and decommission the nine coal-fired units by the end of 2027 and provide replacement generation that can supply at least 1,500 MW of firm, dispatchable power with the capacity for modest load growth, which the DEIS identifies as consistent with TVA's 2019 Integrated Resource Plan (IRP) and near-term energy production goals. The DEIS states that the proposed action is needed because "KIF has experienced significant decline in material condition over the last five years." TVA specifies that replacement generation is needed at the KIF site because "retirement of KIF would create a large gap in the power system in the Knoxville area and decreases the system stability for Watts Bar and Sequoyah nuclear plants."

TVA developed and analyzed the proposed action, the no-action alternative, and one additional alternative. TVA considered various additional resource alternatives, as well as alternative fuels, but eliminated these alternatives from further discussion. Under the No-Action Alternative, TVA would continue to maintain and operate coal-fired boilers at KIF. The alternatives TVA analyzed in detail include:

- **Alternative A:** Retirement and demolition of KIF and construction and operation of a 1,500 MW minimum capacity plant, using a single unit Combined Cycle (CC) combustion turbine gas

plant paired with 16 dual-fuel Aeroderivative (Aero) Combustion Turbine (CT) units (CC/Aero CT Plant); a supporting 122-mile natural gas pipeline extending through Roane, Morgan, Fentress, Overton, Jackson, and Smith counties, TN; and a 3 to 4 MW solar site and a 100 MW battery energy storage system (BESS) on the Kingston Reservation.

- **Alternative B:** Retirement and demolition of KIF and construction and operation of solar generation and energy storage facilities, at alternate locations in East Tennessee.

In the DEIS, TVA identifies Alternative A as the preferred alternative because it “would be the best overall solution to supply low-cost, reliable, and cleaner energy,” provide flexibility to integrate solar onto the system by 2035, would be operational sooner to reduce risks, and would replace coal-fired generation consistent with the 2019 IRP and 2021 Aging Coal Fleet Evaluation. According to the DEIS, the “proposed pipeline to provide natural gas to the Alternative A CC/Aero CT Plant is subject to Federal Energy Regulatory Commission (FERC) approval and FERC will prepare a separate EIS on the proposed natural gas pipeline and associated structures.”

As a cooperating agency, the EPA provided recommendations on sections of the DEIS prior to publication. Our recommendations concerned the limited range of alternatives evaluated by TVA, the failure to show how the tax and other incentives provided by the Inflation Reduction Act (IRA) affect the costs of each option, the costs of future regulations on new fossil fuel generation, the methodology for the evaluation of Social Cost of Greenhouse Gases (SC-GHG), Federal greenhouse gas emissions reduction policy and goals, and the incomplete assessment of Environmental Justice (EJ).

Based on our review of the DEIS, TVA acknowledged the EPA’s comments and improved the transparency in several sections. As discussed in our enclosed detailed comments, TVA’s analysis continues to be constrained by the 2019 IRP and the 2027 timeline identified in the project’s purpose and need, such that TVA fails to analyze in detail reasonable alternatives that could reduce greenhouse gas and other emissions. The preferred alternative for Kingston does not reflect events since the development of the 2019 IRP and in the EPA’s view is inconsistent with national policy to address the climate change crisis. While the EPA recognizes that TVA is developing a new IRP, the current state of energy markets, forthcoming regulations on fossil fuel plants, subsidies, and tax incentives available for renewable power, and other factors have dramatically changed the economics of power generation since 2019. The cost analysis in the Final EIS (FEIS) should reflect the significant subsidies from the IRA, should include the cost of future regulations that will apply to new natural gas plants, and should fully account for expected cost decreases of renewable energy and higher future natural gas prices. Furthermore, TVA has proposed 5,900 MW of new gas generation since 2021, and although this buildout is within the 2019 IRP’s range, it is only consistent with continued high load growth. After a decade of flat growth, only the last two years have seen higher levels. By not fully and transparently accounting for these factors in the DEIS, decision makers, the public and TVA ratepayers cannot be sure if TVA is fulfilling their statutory least-cost mandate.

The EPA has developed recommendations for TVA that would reduce the environmental impacts of the proposed action, lower the costs to the ratepayer, and improve the EIS analysis. These recommendations include:

- The purpose and need should be defined broadly enough that it is not only met by the preferred alternative.
 - A short 2027 timeline, which is partially determined by an outdated 2019 IRP, prevents meaningful consideration of other alternatives.

- The analysis should fully account for the expected cost decreases of renewable energy from the IRA and other changing market conditions. TVA’s current analysis centers on the longer implementation timeline for renewables, with only limited attention on long-term cost implications.
- The analysis should assess a reasonable range of alternatives to the proposed action that meet a properly defined purpose and need, in order to include more meaningful consideration of options that would reduce emissions. For example:
 - The analysis should consider one or more additional blended alternative that uses a more balanced mix of renewables and natural gas, such as larger solar power systems than proposed in Alternative A in combination with smaller new natural gas capacity.
 - The analysis should consider a transition strategy that meets generation capacity requirements until sufficient renewable energy generation is available, including whether a longer transition period could be gained by a combination of energy efficiency, demand-side management, and maximizing the generating capacity of all other TVA power plants until planned renewable generation projects are on-line and able to fulfill demand.
 - The analysis should also reassess wind power as a viable part of the TVA system, as an alternative, or in combination with existing alternatives.
 - For all options involving natural gas, plant designs should consider increased carbon capture and hydrogen fuel blending technology incorporation as a means of mitigating emissions and complying with future climate change regulations.
- The analysis should evaluate the potential cost implications of reasonably foreseeable future air quality and greenhouse gas regulations on natural gas units, noting any uncertainties, as appropriate.
- The analysis should follow best practices regarding the quantification of SC-GHG and should omit the outdated 2020 SC-GHG estimates.

The EPA identified that while the preferred alternative would result in significant GHG emissions reduction compared to the current coal plant, it falls substantially short of the potential GHG reduction associated with an alternative that does not rely on a large natural gas plant. Consistent with previous comments and recommendations, the EPA believes that TVA should assess one or more alternatives that blends the two current action alternatives in the Final EIS.

The concerns raised herein are substantial in the EPA’s view, and we look forward to continuing to work collaboratively with TVA in the coming months to share our expertise with the goal of addressing them; as you know, in circumstances where deficiencies in an environmental impact statement prevent meaningful analysis, the remedy is supplementation to ensure adequate disclosure and analysis (please see 40 C.F.R. § 1502.9).

The EPA appreciates the opportunity to review the DEIS and looks forward to continued participation with the Kingston KIF Retirement project. To discuss our technical recommendations further, please contact Douglas White of my staff at White.Douglas@epa.gov or (404) 562-8586.

Sincerely,

Carol L. Kemker
Acting Deputy Regional Administrator

Enclosure
Detailed Technical Comments on the Draft Environmental Impact Statement (DEIS)
for the Kingston Fossil Plant Retirement
CEQ No: 20230067

I. Purpose and Need

The DEIS states in the purpose and need for the proposed action that there is a 2027 timeframe to decommission the KIF units and have replacement generation in place. The stated reasons are the anticipated costs of operating and maintaining the KIF coal units beyond their planned retirement date, significant monetary investment to comply with the EPA's 2020 Steam Electric Effluent Limit Guidelines (ELGs), operational and reliability risk due to the deteriorating condition of the coal units, and "cascading delays" in TVA's phase coal fleet retirement plan.

The EPA recommends the DEIS fully disclose the assumptions behind the 2027 timeframe identified in the purpose and need, including whether the assumptions underlying these timeframes are consistent with recent significant changes in the energy markets and statutory and regulatory developments, notably the IRA. The EPA also recommends that the DEIS quantify or provide additional information related to its statement in Section 1.2.4 that delaying the KIF retirement will require additional costs and increase risk. (See Section VI of this enclosure for a discussion of the Steam Electric ELGs).

The EPA recommends greater disclosure given the 2027 timeframe substantively narrowed the purpose and need and thus limited the consideration of alternatives and available mitigation options in the DEIS. The DEIS states that Alternative B does not "fully meet" TVA's purpose and need for firm, dispatchable generation by the end of the 2027 due to transmission-related time constraints (DEIS Section 1.2.2). If only the preferred alternative fully meets the purpose and need, that indicates that TVA may have defined the purpose and need too narrowly.¹ Additionally, the DEIS identified the 2027 timeframe as a rationale for excluding multiple alternatives from further discussion, such as a blended alternative that includes greater renewable energy generation combined with a smaller amount of natural gas (Section 2.1.5).

Increased disclosure about these timing constraints, including the anticipated costs associated with incrementally delaying the KIF coal unit retirements, would allow greater insight into whether other reasonable alternatives or mitigation measures requiring incrementally longer timeframes may be available to TVA. As drafted, the public and decisionmakers do not have adequate information to evaluate the costs and impacts of meeting or delaying the 2027 deadline stated in the purpose and need section of the DEIS.

II. Range of Alternatives and Consideration of IRA Incentives

The range of alternatives considered within the DEIS is limited to only two action alternatives, the preferred alternative and an alternative consisting of 100% renewable energy generation. The EPA recommends that TVA consider a reasonable range of alternatives that reduce the size of their future carbon liabilities, among other concerns. Only considering two alternatives fails to disclose the available options between those two "endpoints" of a 1,500 MW natural gas fueled CC/Aero CT Plant and 100%

¹ See, e.g., *Citizens Against Burlington v. Busey*, 938 F.2d 190 (D.C. Cir. 1991) "Yet an agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action, and the EIS would become a foreordained formality."

renewable energy. The EPA recommends that TVA consider at least one blended alternative for formal analysis that combines a more balanced mix of renewables and natural gas, such as larger solar power systems than proposed in Alternative A in combination with smaller new natural gas capacity. TVA eliminated this alternative from consideration without discussion, only briefly noting in Section 2.1.5 that a “blended alternative that includes a substantial renewable component or combines a lower amount of natural gas with other technologies, such as solar and storage” would require transmission work over eight to nine years, like Alternative B, and thus not meet the purpose and need to have commercial operation by 2027. This alternative, which may require only four additional years to implement beyond the 2027 timeframe, even under a similar timeframe to 100% solar, warrants more complete consideration and discussion given it could result in significantly lower greenhouse gas emissions and lock in smaller amounts of fossil fuel consumption. As part of this alternative, or as another alternative, TVA should consider a transition strategy (perhaps comprised of a combination of peak shaving, increased generation from other production units, energy efficiency, and demand-management) to meet capacity requirements until greater renewable energy generation is available.

Additionally, other companies have plans to retire coal plants in similar timeframes but do not rely on construction of new natural gas to replace the generation as they transition to renewable energy resources. Colorado Springs Utilities is decommissioning some coal plants and temporarily installing natural gas generators to bridge the gap until they transition to new wind and solar generation. Tucson Electric Power in Arizona is replacing capacity at the Springerville Power Station with wind and solar power systems.^{2,3} DTE Electric in Michigan is retiring coal assets and replacing the generation with a substantial proportion of renewables.⁴

In addition to the CC/Aero CT Plant, Alternative A includes a 3-5 MW solar site and a 100 MW battery storage site. This is a comparatively small use of solar and does not seem to reflect future forecasts of increasing use of renewables. Moreover, the description of Alternative A in the “Draft Air Quality & GHG” section does not include solar, and Appendix I does not include any solar-related calculations. The EPA recommends considering a more substantive solar and battery component with Alternative A. The EPA recommends that the solar facility and battery storage facility be appropriately reflected in the calculations supporting Alternative A.

Additionally, the analysis should assess wind power as a viable part of the TVA system, as an alternative, or in combination with existing alternatives. Wind potential in the southeast is growing and as the costs of technology decreases, several modeling efforts find that an expansion of wind is optimal for this area. Wind energy resources:

- <https://www.nrel.gov/gis/wind-supply-curves.html>
- <https://www.biologicaldiversity.org/programs/energy-justice/pdfs/TVAs-Clean-Energy-Future.pdf>
- https://www.rff.org/events/rff-live/future-generation-exploring-the-new-baseline-for-electricity-in-the-presence-of-the-inflation-reduction-act/?mc_cid=fb2ba4aca8&mc_eid=73413f18e1

If TVA believes that these wind energy models are incorrect about wind potential in the southeast, the TVA analysis should provide its support for this determination and explain why wind power is not being evaluated.

²See, e.g., https://www.gem.wiki/Springerville_power_station

³ See, e.g., <https://www.solarpowerworldonline.com/2020/06/tucson-electric-power-renewable-commitment-irp/>

⁴See, e.g., https://dtecleanenergy.com/downloads/IRP_Executive_Summary.pdf

The EPA is concerned that the DEIS does not adequately explain the rejection of other potential alternatives. For example, the EPA had recommended an alternative that generates the required baseload and peaking capacity needed to transition to greater renewable energy generation, and that does not require the construction of a new 122-mile pipeline. Given the capacity of the TVA system, it is unclear why this transitional and/or peaking capacity cannot be generated at TVA sites that would not require this extensive investment in long-term pipeline infrastructure. As noted above, in addition to being used as a criterion for ruling out Alternative B, the 2027 retirement date is used to rule out other blended alternatives with a smaller natural gas component and larger renewables component since it would take longer to put in place. However, a proper analysis would compare the costs and risks of maintaining the coal-fired units beyond 2027 with the long-term outcomes of a more balanced option.

TVA continues to argue that the alternatives considered, including the preferred alternative, align with the 2019 IRP. However, there have been significant statutory, regulatory, and technology changes since the development of the non-binding 2019 IRP and the choice of generation for this plant is inconsistent with these changes. The IRA and future policies significantly affect the analysis of each alternative by impacting aspects of the energy market, such as energy prices and demand and supply, as well as the underlying cost of technologies. The EPA notes that the Department of Energy has estimated the impacts of the IRA on clean energy and GHG emissions.⁵ The DEIS states that the tax incentive provisions of the IRA are likely to take more time to implement than is available to TVA, given the 2027 timeframe identified in the purpose and need, and available guidance. The EPA recommends that TVA consider the proposed regulations and guidance released by the IRS on June 14, 2023, about the Direct Pay tax credits under the IRA.⁶ TVA is an applicable entity, and the new direct pay provision will let TVA receive a payment equal to the full value of tax credits for building qualifying clean energy projects. TVA should consider updated resources such as the U.S. Treasury Department's Final Rule on Section 45Q Credit Regulations, that provide clarity on how to use the credit for qualified carbon sequestration.

The EPA remains concerned that the analysis does not fully account for expected cost decreases of renewable energy and higher future natural gas prices. The costs of renewable energy production and battery storage will continue to fall along the timeline of this project due to subsidies from the IRA and other market factors. Similarly, the price of natural gas is projected by the Energy Information Administration to be higher than estimated in the 2019 IRP. Appendix I, for instance, conducts system-wide Life Cycle Analysis (LCA) modeling to project future GHG emissions. The DEIS notes that this "system-wide LCA reflects TVA's broader asset strategy and target power supply mix set by the 2019 IRP." However, it still does not present the full assumptions that underlie the model or report the modeled distribution of future power generation. Furthermore, the EPA recommends a more thorough comparison of the system-wide and non-system-wide LCA results, which paint a different picture of GHGs and suggest different long-term outcomes in the mix of electricity generation between the two approaches.

The DEIS should consider reasonably foreseeable costs, taxes, regulations, and subsidies that have changed or are reasonably likely to change before a replacement plant is built. Every cost-effectiveness

⁵ See, e.g.,

https://www.energy.gov/sites/default/files/2022-08/8.18%20InflationReductionAct_Factsheet_Final.pdf and <https://www.energy.gov/policy/methodological-appendix>.

⁶ White House Guidance can be found at: <https://www.whitehouse.gov/cleanenergy/directpay/>. See also the proposed regulations from the IRA: <https://public-inspection.federalregister.gov/2023-12798.pdf> <https://www.irs.gov/pub/irs-drop/n-23-44.pdf>

analysis needed to make a least cost decision should include updated cost parameters and assumptions. Specifically, the DEIS should still include (a) the costs of reasonably foreseeable future regulations on greenhouse gas emissions; (b) the cost reductions realized because of the IRA programs; and (c) the expected changes in the costs of renewables, energy storage, and natural gas over time.

III. Social Cost of Greenhouse Gases

The outdated 2020 SC-GHG estimates, which do not reflect the best available science, continue to be applied in this DEIS. The interim SC-GHG estimates developed by the Interagency Working Group (IWG) represent the best available science. The Council on Environmental Quality (CEQ's) interim guidance on consideration of GHG emissions and climate change in NEPA analyses notes that agencies "should apply the best available estimates of the SC-GHG" to the GHG emissions from a proposed action and its alternatives. In TVA's response comments, "presenting estimated social costs as a range of values from successive Administrations provides decision-makers and the public with better information in an area fraught with uncertainty." As detailed below, the use of the outdated SC-GHG is misleading to decision-makers and the public as it depicts an incomplete picture of the scope of environmental impacts.

As stressed previously by the EPA the SC-GHG estimates developed in 2020 under Executive Order 13783 fail to reflect the full impact of GHG emissions in multiple ways. First, those estimates fail to capture many climate impacts that can affect the welfare of U.S. citizens and residents. Examples of affected interests include direct effects on U.S. citizens and assets located abroad, international trade, tourism, and spillover pathways such as economic and political destabilization and global migration that can lead to adverse impacts on U.S. national security, public health, and humanitarian concerns. Assessing the benefits of U.S. GHG mitigation should also incorporate how those actions may affect mitigation activities by other countries, as those international actions will benefit U.S. citizens and residents. Scientific and economic experts have emphasized reciprocity as support for considering global damages of GHG emissions. Using a global estimate of damages in U.S. analyses allows the U.S. to continue to actively encourage other nations, including emerging major economies, to take significant steps to reduce emissions. CEQ's interim guidance on consideration of greenhouse gases states that: "Given NEPA's mandates to consider worldwide and long-range environmental problems, it is most appropriate for agencies to focus on SC-GHG estimates that capture global climate damages and, consistent with the best available science, reflect a timespan covering the vast majority of effects and discount future effects at rates that consider future generations."

Additionally, the DEIS claims that there are "legal and other uncertainties regarding the propriety of" SC-GHG estimates. The EPA does not agree that there is any legal uncertainty regarding SC-GHG values. To date, the government has prevailed in both the Fifth and Eight Circuits in challenges to the IWG's interim SC-GHG estimates. There is potentially greater legal risk in using SC-GHG estimates that do not reflect the best available science.⁷ Executive Order 13990 directed the IWG to publish the interim SC-GHG estimates for agencies to use "when monetizing the value of changes in GHG emissions resulting from regulations and other relevant agency actions until final values are published." Estimates of the social cost of carbon (SC-CO₂) have been published in the peer reviewed academic literature for decades, and the SC-GHG metric has been regularly incorporated into federal policy analysis since the late 2000s. While the interim estimates proposed by the IWG have been the subject of litigation, there are currently no legal constraints on the use of these estimates, which were developed

⁷ See the 2017 report by the National Academies of Science: <https://nap.nationalacademies.org/catalog/24651/valuing-climate-damages-updating-estimation-of-the-social-cost-of>

under a robust and transparent process, represent the best available science and economics, and provide essential impact information to the public and decisionmakers.

The EPA recommends that TVA remove any language from the DEIS indicating that there are “legal and other uncertainties” around the SC-GHG estimates.

Finally, TVA uses a “proxy approach” to compare emissions, on a percentage basis, to state and national values. While CEQ’s interim guidance encourages agencies to contextualize greenhouse gas emissions, as noted in TVA’s response to the EPA, it specifically cautions against this type of approach: “NEPA requires more than a statement that emissions from a proposed Federal action or its alternatives represent only a small fraction of global or domestic emissions. Such comparisons and fractions are not an appropriate method for characterizing the extent of a proposed action’s and its alternatives’ contributions to climate change.” CEQ further stresses “such comparisons and fractions also are not an appropriate method for characterizing the extent of a proposed action’s and its alternatives’ contributions to climate change because this approach does not reveal anything beyond the nature of the climate change challenge itself—the fact that diverse individual sources of emissions each make a relatively small addition to global atmospheric GHG concentrations that collectively have a large effect.” Rather, CEQ recommends providing context for GHG emissions and climate impacts by “monetizing climate damages using the estimates of the SC-GHG, placing emissions in the context of relevant climate action goals and commitments, and providing common equivalents.”

IV. Calculation Methods and Social Cost of Greenhouse Gases

Although the description of the LCA models has improved, the EPA recommends providing additional background documentation used to estimate life cycle GHG emission for each alternative, especially on the system-wide basis.

The EPA continues to recommend against presenting the SC-GHG as a point estimate at one discount rate, i.e., in Tables 3.7-6 and 3.7-8, the SC-CO₂, SC-CH₄ and SC-N₂O are only presented at the 3% discount rate. This has not changed since the previous version of the document. As emphasized in the IWG Technical Support Document, the discount rate is an important parameter in estimating the SC-GHG and to reflect uncertainty in that parameter, a range of discount rates should be considered. For transparency and to help the public understand the impacts, the EPA recommends that the climate damages be presented for each GHG from 2028-2050 at discount rates of 2.5%, 3.0%, and 5.0%. The EPA is willing to help with calculating the climate damages using the appropriate SC-GHG estimates.

The current annual SC-GHG values are in 2020 dollars. The values reported in the 2021 IWG Technical Support Documentation (TSD) are identical to those reported in the 2016 TSD adjusted for inflation to 2020 dollars using the annual Gross Domestic Product (GDP) Implicit Price Deflator values in the U.S. Bureau of Economic Analysis’ (BEA) National Income and Product Accounts. The GDP Deflator should be used to adjust SC-GHG to 2021 or 2022 dollars. The values should not be adjusted for inflation to create a nominal value as has been done in the DEIS (adjusted for 2% annual inflation). The EPA is willing to help with adjusting the SC-GHG correctly. The EPA continues to emphasize that a 2% annual inflation adjustment is the incorrect approach.

For transparency and replicability of results, the EPA recommends TVA provide more details on the system-wide modeling and lifecycle modeling. In particular, the results of the system-wide LCA modeling are not fully presented. While more information and tables have been added about the other LCA, there is not a similar level of detail about the system-wide model. Only the emission-related

outputs are presented. The EPA recommends also presenting the distribution of electricity generation in the system-wide model outputs. It is still not clear if the LCA system-wide model outputs satisfy TVA's commitments towards achieving Net Zero GHG emissions, as well as other policy goals. What do the modeled renewables look like in this model? What assumptions are made about the rest of the system? This would help serve as a check on the results. The EPA recommends presenting the full details about the assumptions of the model and the outputs across the TVA system.

Given that there are substantial differences in the monetized costs of CO₂ emissions across the alternatives, the EPA recommends TVA address and justify its conclusion that "the SC-GHG results for TVA system-wide effects essentially show that both action alternatives are relatively close regarding their overall potential GHG effects." (Section 3.7.1.1.8.3). For example, in Section 3.7.2.3.1.4, TVA calculates that Alternative A has substantially higher estimated greenhouse gas emissions and social costs of approximately \$7 billion compared with \$1.05 billion for Alternative B.

V. Net Zero/GHG Emissions Reduction Policy and Goals

The DEIS acknowledges the national net-zero emissions goals laid out by the Administration and notes the U.S. national reduction targets in the Paris Agreement. However, there is limited differentiation from a policy standpoint between the alternatives, and local plans are not addressed. The EPA believes it is essential for TVA to improve the proposed action and EIS because of the urgency of the climate crisis. TVA's DEIS overlooked options to take meaningful, cost-effective action to reduce GHG emissions and help conform TVA's action to science-driven policy goals. The most recent scientific reports by the Intergovernmental Panel on Climate Change reinforce the urgent need to take climate action. TVA's proposal provides an important opportunity to do so.

CEQ's interim guidance on GHG emissions and climate change notes that "[w]here helpful to provide context, such as for proposed actions with relatively large GHG emissions or reductions or that will expand or perpetuate reliance on GHG-emitting energy sources, agencies should explain how the proposed action and alternatives would help meet or detract from achieving relevant climate action goals and commitments, including Federal goals, international agreements, state or regional goals, Tribal goals, agency-specific goals, or others as appropriate." According to Table 3.7-3 of the DEIS, the preferred alternative would result in an estimated 1,750,705.5 tons of CO₂e per year of operation over a projected 30-year lifetime (more than 50 million tons), while Alternative B would release no direct annual emissions. The EPA recommends that the FEIS include a discussion of whether and to what extent the estimated GHG emissions from the proposed alternatives are consistent with TVA taking action to help achieve science based national GHG reduction targets.

The FEIS should also discuss alignment with agency GHG reduction goals and policies, including TVA's 2021 Strategic Intent and Guiding Principles document. It is not clear from the DEIS that the preferred alternative is consistent with achieving TVA's aspiration of net-zero carbon emissions by 2050. Additionally, per 40 CFR 1506.2(d), and consistent with CEQ's guidance, the FEIS should disclose and discuss any inconsistency of the proposed action with State, Tribal, or local plans or laws, including local GHG emissions reduction goals.⁸

⁸ See, e.g.,

https://www.knoxvilletn.gov/government/city_departments_offices/sustainability/climate_change#:~:text=Our%20new%20goal%20to%20reduce,which%20are%20outside%20City%20control

VI. Future Regulations

The DEIS notes that “a significant monetary investment would be required to comply with the requirements of the 2020 ELGs Operation beyond 2027” which “would also inject operational, and therefore reliability, risk back into the TVA system due to the deteriorating condition of the coal units” and later estimates that \$665 million in upgrades will be required. The Steam Electric ELGs promulgated in 2020 requires, where applicable, the permanent cessation of coal combustion to be completed by December 31, 2028, not 2027. In early 2023, the EPA proposed revised Steam Electric ELGs, 88 Fed Reg 18824. The proposed 2023 ELG rule includes implementation flexibilities where appropriate. Recognizing that some coal-fired plants were in the process of closing, the 2023 proposed rule includes flexibilities that allow the plants to continue to meet the 2020 requirements instead of the new requirements contained in the 2023 proposed rulemaking. Furthermore, a plant that is in the process of closing and has filed a Notice of Planned Participation (NOPP) to permanently cease coal combustion may be able to modify the retirement schedule in the NOPP if the facility is unable to retire a plant by December 31, 2028, due to reliability concerns. Given that TVA has until 2028 to retire the Kingston plant in addition to the time flexibilities included with the 2023 proposed rule, TVA should explain how they estimated the costs of upgrades as well as an acknowledgment of any uncertainty because these regulations are not finalized.

The DEIS also does not appear to evaluate the potential implications of reasonably foreseeable air quality and greenhouse gas regulations on natural gas units. The EPA recommends including a discussion of their expected impacts, particularly in terms of costs, on the preferred alternative.

VII. Mitigation

The DEIS states that the plant design proposed under the preferred alternative “enables and accommodates future modifications necessary for incorporating CCS (Carbon Capture and Storage) and will obtain combustion equipment that can utilize hydrogen fuel blending (at least 30 percent hydrogen) as these technologies mature. TVA anticipates the efficiency, effectiveness, scalability, and economics of these systems will improve in the future, allowing for incorporation of one or more of these technologies when adequate storage locations, pipelines, or another technology for carbon storage are identified to implement CCS and/or the delivery of hydrogen.”

If TVA intends to install carbon mitigation measures in the future, these costs should be included in their analysis. The EPA also believes functional carbon capture and hydrogen fuel blending technologies should be included in the initial plant design. Utilities similar in size to TVA’s Kingston plant are displacing some portion of their natural gas generation with these technologies in a comparable timeframe. For example, the Intermountain Power new natural gas generating units, which will begin operation in 2025, will be designed to utilize 30 percent hydrogen fuel at start-up, transitioning to 100 percent hydrogen fuel by 2045 as technology improves (see <https://www.ipautah.com/ipp-renewed/>). While smaller in scale, other utilities are displacing a portion of their natural gas use with hydrogen (see <https://dailyenergyinsider.com/news/34040-florida-power-light-taps-cummins-for-its-green-hydrogen-facility/>). Additionally, Competitive Power Ventures is constructing a CC natural gas generation facility using carbon capture technology (see <https://cpv.com/2022/12/12/cpv-selects-doddridge-county-for-location-of-3-billion-carbon-capture-project-in-west-virginia/>).

The lifecycle of Sulfur Hexafluoride (SF₆), starting from manufacturing, produces significant SF₆ emissions. The EPA has partnered with utilities to reduce and phase out the use of this pollutant, as have

other countries. In addition, SF6 free switchgears are reported to have lower operation and maintenance costs and higher reliability. The EPA recommends that TVA monitor the evolving technology and commercial availability of SF6-free switchgears and, where equipment availability and project requirements allow, use SF6-free switchgear in new construction and replacement installations. For SF6-containing switchgear, the EPA recommends that TVA implement a program of best maintenance practices, inspection, leak detection and repair.

VIII. Environmental Justice

The DEIS notes that TVA “did not identify any disproportionate impacts” on environmental justice communities. The EPA recommends that the discussion of climate change and GHGs acknowledge the disproportionate impact, both in exposure and vulnerability, that GHG emissions have on already overburdened and vulnerable communities.⁹ This would be consistent with Executive Order 14096, *Revitalizing Our Nation’s Commitment to Environmental Justice for All*, which affirms the national policy to advance environmental justice for all and defines environmental justice as “the just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other Federal activities that affect human health and the environment so that people are fully protected from disproportionate and adverse human health and environmental effects (including risks) and hazards including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systemic barriers.” (Section 2(b)(i)).

The DEIS does not appear to identify disproportionate impacts from noise. However, Section 3.17.2.3.8 states “[n]oise-related effects, including vehicular traffic, in the ETNG Construction ROW would generally be experienced by EJ populations more than other populations. Further, some of the loudest activities and components are located in EJ population areas. While these effects would be mitigated by ETNG, to the extent practical, it is TVA’s current assessment that noise effects are likely to be amplified for EJ populations.” Section 3.17 identifies potential noise and vibration effects from both pipeline construction and operation (including the associated compressor station), but notes noise modeling has not yet occurred. Additionally, Section 3.4.3.3.6 states “196 residences are located within 50 feet of [the natural gas pipeline] construction activities, and of those, approximately two-thirds are within 25 feet.” The EPA recommends the FEIS further analyze construction and operation noise impacts, and practicable mitigation, from the proposed pipeline and compressor station to EJ populations. If disproportionate noise impacts are not identified in the FEIS, please provide a clear rationale for the basis of this determination.

IX. Climate Adaptation and Resilience

In the draft EIS, TVA notes that it has developed a Climate Action Adaptation and Resiliency Plan to identify risks associated with and plan for climate change effects. The EPA recommends that the final EIS disclose and consider whether and the extent to which the alternatives are consistent with TVA’s Adaptation Plan.

In Section 3.7.1.1.8.2 and associated text in Table 2.2-1, Regional Climate, the analysis looks at how climate change impacts (such as increases in temperature, flooding, and drought events) may affect operations of the preferred action and alternatives. The EPA recommends that this analysis use climate projections specific to the study area rather than using national or global climate projections.

⁹ See, e.g., *Climate Change and Social Vulnerability in the United States*, the EPA (2021).

This analysis should also consider that increased heavy precipitation and flooding could potentially expand the existing 100-year floodplain, which may affect appropriate siting and elevation of Project components. Furthermore, in Section 3.7.2.3.1.5, the gas pipeline in Alternative A is described as being buried and thus not exposed to flooding. Climate change may heighten the risk of landslides due to both higher wildfire risk and flooding, the compounding effects of which may result in destabilized soil and resulting debris flows. This heightened risk of landslides should also be considered in the climate impacts analysis.

The EPA also recommends that in addition to the climate analysis on operations, TVA considers how alternatives may exacerbate climate change impacts to surrounding areas. For example, increased drought could reduce local water availability, heightening any impacts the preferred alternative has on water resources as well. For all the above, the EPA recommends that TVA consider adaptation measures to reduce impacts.