Environment

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Challenges to Improving Energy Security Abound: Part 1

The US power grid is an integral part of the clean energy transition and tied directly to US energy security. This author uses the framework of the four As,[1,2] and the International Energy Agency's Model of Short-term Energy Security (MOSE)[3] to measure progress in achieving energy security. The four As of energy security include the availability, accessibility, affordability, and acceptability of energy sources as determined by each country. There are no international standards to guide countries. Instead, every government will prioritize the four As according to their needs.

MOSES is a means to measure a country's energy security risks and resilience. The model recommends domestic and external actions that governments can take to reduce the risk of supply disruptions or grid failure and improve resilience.

Overall, there is no "one size fits all" definition of energy security. For example, the Biden Administration clearly emphasizes "acceptability" by encouraging extensive clean energy technologies and new high-voltage (HV) transmission infrastructure to deliver clean energy resources to market while discouraging traditional fossil fuel power generation. The European Union, United Kingdom, India, and China have strongly advocated decarbonization of energy systems to improve "acceptability." However, many countries change their energy security strategies and adjust as factors impact energy affordability, availability, reliability and accessibility. For example, both India and China are burning more coal for power generation to improve affordability and availability to support their economic growth.

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The emphasis on acceptability and the environment is warranted. However, if not

[1] Cherp, A., & Jewell J. (2014, December). The concept of energy security: Beyond the four As. *Energy Policy,* 75, 415–421. https://bit.ly/3saqmnV.

[2] APERC, A. (2007). *Quest for energy security in the 21st Century: resources and constraints.* Asia Pacific Energy Research Centre, Tokyo, Japan. https://bit.ly/31ORgXt.

[3] Jewell, J. (2011, December 1). The IEA Model of Short-Term Energy Security (MOSES): Primary Energy Sources and Secondary Fuels, *IEA Energy Papers*, No. 2011/17, OECD Publishing, Paris. https://bit.ly/3s421A6.

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overseen and managed properly, extensive environmental reviews may create delays and litigation, which can jeopardize overall energy security. This author is especially concerned about the lack of progress in siting and building HV transmission in the US.[4] On average, HV transmission projects in the US that transmit hydroelectric, wind, and solar power take 10 to 14 years to complete regulatory, environmental, and siting reviews and be shovel-ready.

Equally important is the Biden Administration's reliance on large solar and wind energy projects built on federal lands and waters. Failure to timely permit and construct these facilities will significantly harm US energy security, primarily if regulations discourage new investments in traditional fossil-fuel generating sources of electricity.

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It is very challenging to build any energy infrastructure in the US in a timely manner. This author believes that Congress, the Biden Administration, federal regulators, and electric grid operators have mainly discounted regulatory siting challenges and litigation risks. Despite the recent extreme weather events attributed to climate change in the western US and Texas, it is business as usual as far as environmental reviews are concerned. Duplicative federal and state environmental assessments, conflicts, opposition, and legal challenges will work to stifle any significant investment in renewable energy and energy transmission on federal lands and waters. If it does occur, it will prove to be more expensive and take many more years to complete environmental reviews.

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Smaller decentralized electric grids and microgrids closely aligned to host communities may find resolving issues and accommodating the tradeoff between the four As much easier. In this Part 1 Column, this author provides detailed reasons to support the above recommendation. Part 2, which will appear in a future issue, will provide examples of technologies and strategies used in community-based decentralized grids.

CHALLENGES TO IMPROVING ENERGY SECURITY

The dichotomy between federal and state policies and infrastructure permitting regulations developed over decades is striking. High-level policy objectives seem to be out of touch with many stakeholders and communities who oppose sizeable renewable energy projects sited near their communities and on federal lands and waters.

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While most wind and solar projects are on private land, most of the electric grids operated by Regional Transmission Organizations (RTO) and Independent System Operators (ISO) have long interconnection queues for new projects to connect to the electric grid. For several years,

[4] Russo, T. N. (2021). Improving US energy security: Granting FERC siting authority over interstate high voltage electric transmission. *Climate & Energy*, https://bit.ly/3oKUYKs.

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backlogs in interconnection queues have grown to 950 gigawatts (GW), comprised mainly of proposed solar, wind and storage projects awaiting the results of studies detailing what transmission system upgrades are needed to bring these clean energy generation facilities online. Getting through the studies is complex and can take years, delaying and, in some cases, killing potential projects.[5]

At the American Clean Power Association's Clean Power 2021 conference, panelists agreed that siting of new energy infrastructure and cost allocation among beneficiaries remains the thorniest issues when building transmission to transport electricity from renewable energy projects to load centers. On average, it takes between 10–14 years to permit HV transmission in the US and another 3–4 years to construct the transmission line.[6] Pattern Energy's SunZia transmission project took 14–15 years to develop. The HV Direct Current Southern Cross bidirectional line, which connects Texas and the southeast, took approximately 12–13 years.

Despite the challenges of transmission siting and cost allocation in transmission planning and long interconnection queues for wind and solar projects, the Biden Administration hopes to achieve its clean energy agenda.

The TransWest Express, a 1,500 megawatt (MW) capacity bidirectional transmission project, will begin construction in 2022. Nearly 13 years after starting the permitting process, it will finally deliver wind energy to California and the West.[7] The Champlain Hudson Express Project, finally permitted after 7 years, will be operational in 2025, producing 1,250 MW of low-cost renewable hydropower from Quebec directly into the New York City Metro area.[8]

Despite the challenges of transmission siting and cost allocation in transmission planning and long interconnection queues for wind and solar projects, the Biden Administration hopes to achieve its clean energy agenda. According to the *Ready to Go* report by Americans for a Clean Energy Grid,[9] advancing 22 identified HV transmission projects would enable a 50 percent increase in US renewable energy output, trigger $33 billion in investment and create approximately 600,000 new jobs.[10] If completed, these 22 transmission projects could add about 8,000 miles and 42,000 MW of transfer capacity to America's existing 280,000- mile transmission system (**Figure 1**).

The report devotes a single paragraph each to Streamlined Permitting and Regional Transmission Planning which transmission developers believe are critical to achieving the report's goals. On the matter of Streamlined Permitting, the report states, "While states hold the most authority for permitting transmission lines, federal agencies have authority over lines that cross federal lands. Federal agencies and developers can streamline and expedite that process, which can currently take a decade or more." This statement underscores the gap between the federal government and advocates of clean energy with the realities faced by renewable and transmission project developers.

[5] Howland, E. (2021, November 4). FERC's Christie calls for fixing interconnection "chaos" as first step in transmission reform. *Utility Dive*. https://bit.ly/3s0MoJH.

[6] Davidson, R. (2021, December 9). US transmission planning "needs to get beyond parochial interests". *Wind Power Monthly*. https://bit.ly/3pQoNsu

[7] Howland, E. (2021, December 7). Wind developer joins $3B transmission project poised to be "backbone" for Western power markets. *Utility Dive*. https://bit.ly/3dDyTXL.

[8] Champlain Hudson Express Project. https://bit.ly/3IFGe7A.

[9] Goggin, M., Gramlich, R., & Skelly, M. (2021, April 1). *Transmission projects ready to go: Plugging into America's untapped renewable resources.* Americans for a Clean Energy Grid and the Macro Grid Initiative. https://bit.ly/3q2ow5R.

[10] The White House: News and Updates. (2021, April, 21). Fact Sheet: *Biden Administration advances expansion & modernization of the electric grid.* https://bit.ly/3ybv5qi.

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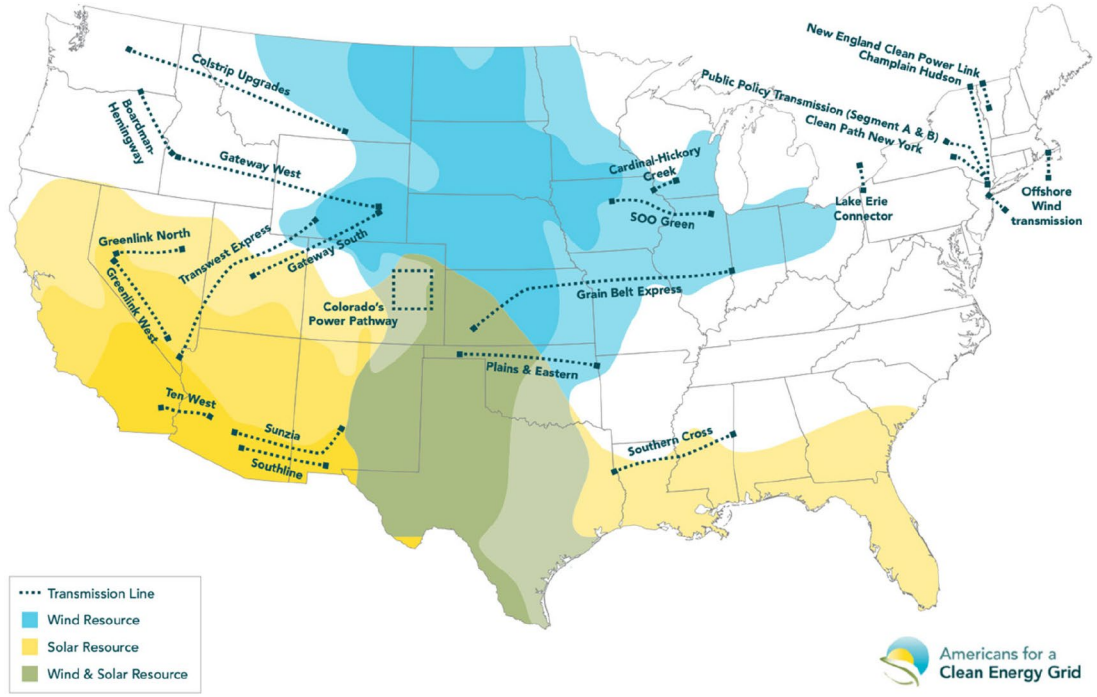
Figure 1. Map of 22 Proposed High Voltage Transmission Lines and Associated Wind and Solar Resources



Source: Goggin, M., Gramlich, R., & Skelly, M. (2021).

The Permitting Process and Environmental Reviews

Using "business as usual time frames," will clearly have an adverse effect on US energy security. Under this scenario, permitted HV transmission lines and renewable energy projects should be shovel-ready between 7–14 years and constructed in 3–4 years. Therefore, projects that have started permitting and have gone through the interconnection queues should be operational in the 2030s. More extensive transmission lines, wind and solar projects will require longer permitting times because of multi-state environmental reviews.

Permitting and Environmental Reviews on Federal Land are Rigorous

Renewable projects and HV transmission lines on federal lands and waters will also trigger federal reviews required by the National Environmental Policy Act (NEPA), Clean Water Act (CWA), Endangered Species Act (ESA), Coastal Zone Management Act (CZMA), and other federal environmental laws including the Bureau of Land Management's compliance with the Federal Land Management Policy Act and the US Forest Service's compliance with the National Forest Management Act of 1976. Both federal agencies must prepare environmental impact statements on proposed energy projects and issue special use permits allowing them on federal lands.

In addition, NEPA will trigger the CWA and allow state water quality agencies with authority delegated to them by the US Environmental Protection Agency (EPA) to review the projects. The states under CWA section 401 must either wave or certify that the projects will comply with their water quality standards by issuing a water quality certificate (WQC). Construction of projects that have federal approval may not be constructed until the State issues a WQC. If the State(s) deny the WQC, the project cannot be constructed.

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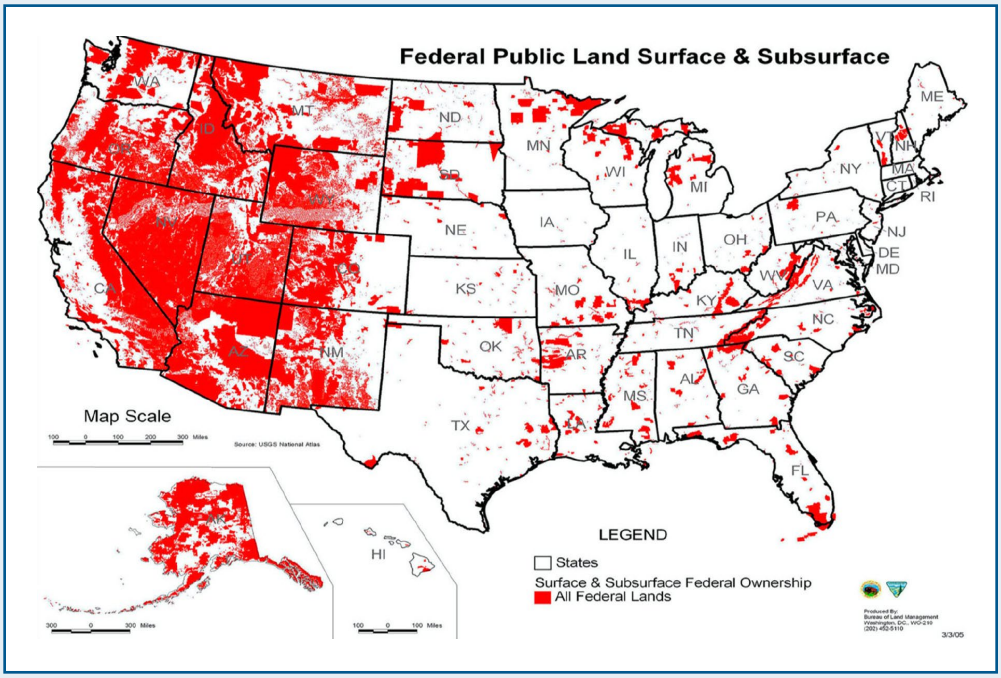
Figure 2. US Federal Lands that will Trigger NEPA Environmental Reviews



States also have an opportunity under the CZMA to determine whether an energy project is consistent with their coastal zone plan. The coastal zone includes the states bordering the great lakes. Offshore wind and floating solar projects and submarine transmission lines would also undergo state reviews. Under the CZMA, states have six months to respond to a request for a determination. If a state determines that the project is inconsistent with its coastal zone management plan, it cannot be constructed.

Federal lands are prevalent, especially in the western US, but are found throughout the country (**Figure 2**). This author believes that solar and wind projects will also face considerable headwinds when permitted on or near tribal lands and communities.

The Trump Administration's Council on Environmental Quality (CEQ) reformed and streamlined NEPA, and final regulations went into effect in September 2020. The EPA also improved rules implementing Section 401 of the CWA to limit the time for states to act to one year from the time a request for a WQC when an application is filed. Many states exceeded the one year because the WQC applications were not administratively adequate for review.[11]

The NEPA and CWA Section 401 reform efforts were controversial, and multiple lawsuits were filed against the Trump Administration's CEQ and EPA by environmental groups requesting the Courts to vacate the new regulations. The Court concluded that the groups' claims regarding new NEPA regulations were not justiciable both because the claims were not ripe and because the groups did not have standing. Concerning ripeness, the Court found that "[t]he potential applications and outcomes of the regulatory changes adopted are simply too attenuated and speculative to allow for a full understanding and consideration of how they may impact the plaintiffs."[12] CEQ issued an Interim Final Rule on June 29,

[11] See 913 F.3d 1099 (D.C. Cir.) (Hoopa Valley) (rejecting a coordinated withdrawal and-resubmission scheme between the applicant and the state certifying agency), *cert. denied*, 140 S. Ct. 650 (2019).

[12] See Wild Virginia v. Council on Environmental Quality, https://bit.ly/3eJD8lR.

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2021, which extended the deadline by two years (to September 14, 2023) for Federal agencies to develop or update their NEPA implementing procedures to conform to the CEQ regulations. This has created some uncertainty as how to comply with NEPA and increased project litigation risks.

On October 6, 2021, the Biden Administration's CEQ announced[13] Phase 1 of a proposed two-phase rollback of the most significant substantive changes in NEPA regulations finalized by the Trump administration in 2020. These changes would restore essential community safeguards during federal agency NEPA reviews and regain confidence in the acceptability of energy projects. The Phase 1 proposal includes requirements to analyze direct, indirect, and cumulative impacts of a proposed project on the environment and reasonable alternatives to proposed projects.

The Biden Administration's CEQ will likely adopt the Phase 1 announcement which will add to the regulatory burden mainly if the scope of the analyses covers greenhouse gas (GHG), climate change, and environmental justice (EJ) communities. However, this may reduce the litigation risk of projects and enhance energy security and acceptability of energy projects in the long run.

The CEQ has not announced any changes to the 2-year time limitation on completing environmental impact statements and NEPA reviews or page limits. Since most administrations have always tried to reduce delays and expedite decisions, CEQ may retain these or encourage federal agencies to exert their best efforts to complete NEPA reviews on renewable energy and HV transmission lines.

The CEQ is also working on revised guidance on analyzing the effect of projects on GHG emissions and climate change. The requirement will extend the permitting process further. Developers and federal agencies will have to determine a project's impacts on climate change. In addition, the analyses will also have to document the effects of climate change on the operation of projects. Therefore, HV transmission and renewable energy projects can be affected by greater frequency of wildfires, heat waves, water and wind droughts, winter storms, hurricanes, and tornadoes.

Further, the Biden CEQ is also working on revised guidance on analyzing project effects on EJ communities. EJ communities consist of communities of color, low-income communities, or Tribal and indigenous communities affected by transmission and renewable energy projects. EPA is also spearheading the need to serve these vulnerable communities across the countries.[14] New CEQ Guidance and oversight by EPA will increase developers' and federal agencies' burden and likely increase the permitting times and costs especially if HV transmission and large wind and solar project adversely affect EJ communities.

Regarding CWA Section 401, the US District Court for the Northern District of California, on October 21, 2021, remanded and vacated EPA's 2020 Section 401 CWA WQC rule that became effective September 11, 2020. The Court's action had the effect of reinstating the previous CWA Section 401 regulation issued in 1971.

CONCLUSION

Overemphasizing acceptability is appropriate in considering energy projects intended to improve a country's energy security. However, government at the federal and state levels must manage the environmental review and permitting process openly and fairly to ensure timely decisions on proposed projects. Congress, federal and state lawmakers and regulators must address the extensive interconnection queues that limit renewable generation facilities going online to ensure that renewable energy and HV transmission projects enhance overall energy security and deliver the benefits envisioned in the Americans for a Clean Energy Grid's Ready to Go Report.

[13] The White House: News and Updates. (2021, October 6). *CEQ proposes to restore basic community safeguards during federal environmental reviews.* https://bit.ly/3oIP4cG

[14] EPA's environmental justice webpage. https://bit.ly/3oPHH3o.

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