Blueprint for a National Electric Transmission Authority

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The authors developed this paper to flesh out ideas described in a white paper by the Energy Systems Integration Group (ESIG), "Transmission Planning for 100% Clean Energy."[1] The present paper reflects the views of the authors and has not been formally adopted by ESIG or the working groups of its membership but is posted to further constructive discussion and ideas by all.

The Need for a National Perspective on Transmission

Every analysis of the pathways to decarbonizing America's society and economy by 2050 calls for the combination of massive development of renewable energy powering electrification of current fossil-driven energy uses. Widespread adoption of clean energy goals by many U.S. states and businesses is underway, spurred by accelerating commitments to combat climate change and the growing cost-competitiveness of renewable resources. In January 2021, the Biden administration adopted ambitious decarbonization plans for 100 percent clean electricity by 2035 and net-zero emissions across the economy by 2050 [1]. Reaching these goals efficiently will require a doubling or tripling of the size and scale of the nation's transmission system.

Decarbonizing the electricity system, and ultimately achieving net-zero emissions, will require action on a transformative scale. The nation's share of clean electricity has already increased rapidly with the addition of approximately 200 gigawatts (GW) of wind and solar to the U.S. power system. Dramatic amounts of additional utility-scale and distributed zero-carbon generation will be needed to decarbonize the power system and maintain grid reliability to meet the 2035 and 2050 goals (Figure 1).

[1] Energy Systems Integration Group, "Transmission Planning for 100% Clean Energy" (February 2021).

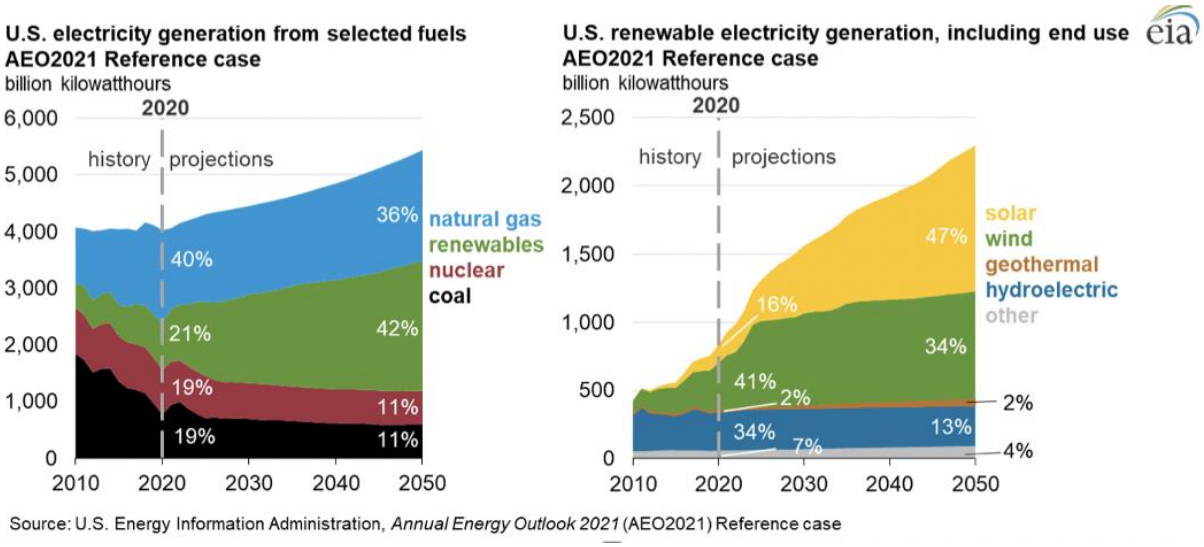


Figure 1: U.S. growth in clean electricity over the past two decades.

The United States has vast clean energy resources and the technical ingenuity to leverage existing low-carbon technologies and create new ones. But proactive national transmission planning and development are critical to meet the current goals quickly and affordably. In a 100 percent clean electricity future, some wind, solar, and storage will be needed in varying densities in many locations, and transmission will be critical to ensuring that energy can be delivered from where it is produced to where it is needed. As the continent pushes to decarbonize, significant geographic pockets of wind and solar resources will be built, primarily in remote areas with the strongest wind and solar resource potential. However, to decarbonize the urban load centers far from these renewable resources requires a well-designed transmission infrastructure to interconnect vast swaths of the country so that clean, renewable energy can be delivered where it is needed at the lowest cost, any hour of the day or night.

Why a National Electric Transmission Authority?

Even though most visions of a decarbonized world anticipate huge growth in distributed resources (generation, storage, demand response, and demand flexibility) and energy-efficient end uses, many recent studies show that the United States will need to increase high voltage and extra-high voltage electric transmission by at least 50 percent and as much as 300 percent above current levels. [2][3][4] Much of this new transmission infrastructure will need to span multiple regional planning authority boundaries, many states, and the existing electric interconnections. Only the federal government has the capacity to support and coordinate the planning and development of a cross-country network of high voltage and extra-high voltage transmission that unites the country to achieve common clean energy policy goals. Because generation siting and development approval lies with state authorities while most interstate transmission decisions and funding lie under federal authority, national transmission planning and development should be led by an organization with a national view that includes state authorities. Interregional transmission decisions should be based on the best available information on renewable resource potential and other clean energy options, and a consistent long-term vision and strategy.

Current transmission planning is conducted by regional entities (mostly regional transmission organizations (RTOs)) working in a collaborative effort with local stakeholders (mostly incumbent electric utilities and the generators that want to interconnect new projects to the grid). Most of these

planning processes take years to work through and involve sound engineering and economic impact analyses but are justified narrowly based on whether they lower delivered energy costs or improve reliability for local customers—and in some regions, whether they support state policy goals such as increasing clean renewable generation. In some cases, the region can propose a portfolio of generation projects that collectively serve most of the region and allocate the costs across all affected customers; however, often transmission projects are analyzed and approved on a stand-alone basis, which means that not all beneficial projects are built.

Many of the proposals for new transmission policy offer incremental recommendations that build on the current patchwork of transmission planning institutions, methods, and processes. But since those processes have not yielded substantive transmission expansion over the past ten years or more, continuing attempts to make incremental changes to those institutions, methods, and processes is unlikely to yield the transformative increase in scale and speed required for new transmission to enable the rapid renewables build-out needed for effective decarbonization. Therefore, it is time to develop a new model and capabilities for how to plan, coordinate, build, and manage national-scale extra-high voltage transmission at the speed needed to support the nation's decarbonization goals.

Like the national highway planning and construction effort America began in the1950s, transmission at the scale proposed in these studies requires a national-scale effort to create and coordinate the vision, analysis, tools and resources required for decarbonization-scale transmission.

North America's current transmission planning and investment institutions are incapable of delivering enough new transmission to support these goals. Over the past three decades, transmission construction has been moderate but well short of that needed to support a high-renewables future on any accelerated timeline.

In a recent white paper summarizing ESIG stakeholder workshops on transmission and renewables development,[2] ESIG concluded that aggressive, long-term decarbonization goals require an aggressive, long-term approach to transmission planning and development. The United States needs an organization with the authority and responsibility to conduct national-level planning that transcends regional and parochial interests. Such an organization will not obviate the need for regional planning but should work with the regional planners and others to coordinate top-down and bottom-up needs and optimize solutions according to the national public interest. We recommend that the Biden Administration and Congress create a National Electric Transmission Authority (NETA) for this purpose, and adopt new methods, authorities, and rules to cover extra-high voltage transmission planning, permitting, paying, participation, and processes.

Key Aspects of the NETA

The national highway system was created in the 1950s for the purpose of identifying and building the roads needed for the nation's mobility, defense, economy, and strategic emergency management. To ensure consistency of the component highways' value, utility, design, quality, and cost, the federal government created a federal planning and funding effort that coordinated with state and local entities to design and build the highway system connecting all of the continental U.S. states through a multi-decade

[2] Energy Systems Integration Group, "Transmission Planning for 100% Clean Energy" (February 2021).

cooperative effort. A similar approach is needed to achieve the ambitious transmission platform for high-penetration renewables. Without a NETA, there will be no planning, regulatory, operational entity with the expertise, scope, and purview to adequately assess national grid needs and manage and coordinate expansion and improvements.

Reducing Cost While Maximizing Resilience

The "macrogrid" is a close electricity analog to the interstate highway system. An example, developed from a recent ESIG-led series of workshops, is illustrated in Figure 2. The macrogrid is conceived as an expansive, nation-wide high voltage interregional infrastructure overlaid on the existing extra-high voltage (EHV) transmission infrastructure. The macrogrid would bring a range of benefits, from supporting the clean energy future to enhancing electricity system reliability and resilience. The purpose of a macrogrid is to connect regions with diverse load and generation in a way that reduces the cost and footprints of both generation and transmission resources while maximizing power system reliability and resilience. The interregional and intraregional macrogrid should be tightly integrated geographically and electrically with existing transmission and with the high voltage transmission network that connects to generation and load resources. It should be designed to leverage the benefits of geographic and resource diversity, offer enough redundancy to reduce the risk of local system failures, and be able to separate safely when necessary to prevent cascading outages under worst-case scenarios.

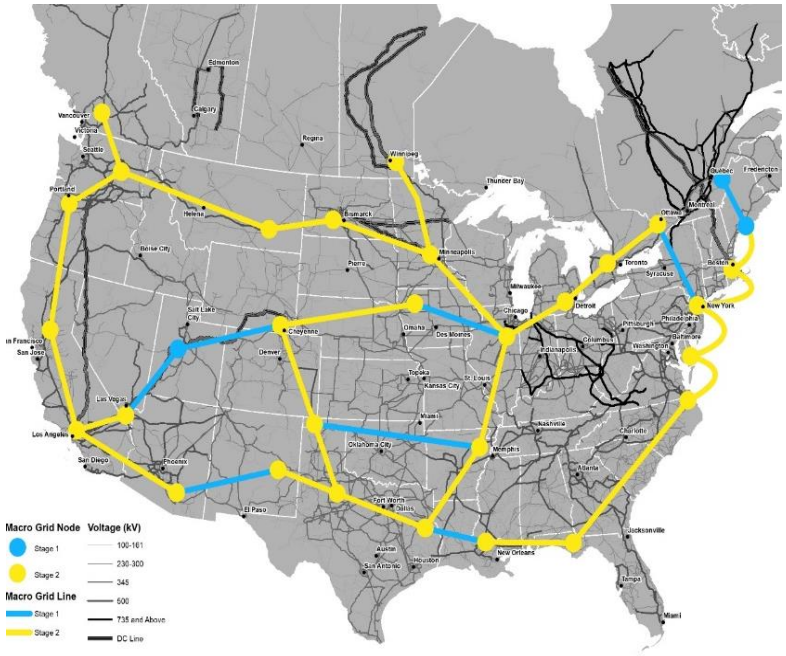


Figure 2: ESIG's macrogrid concept (Source: ESIG, "Transmission Planning for 100% Clean Energy" (February 2021)).

A macrogrid will enable the nation to lower the costs of decarbonization by leveraging cost-effective development in the best clean energy resources areas with complementary development across the nation. A recent study [3] estimates that if a macrogrid is not built, it will cost the nation an additional $1 trillion to reach 100 percent clean energy goals by 2050. A similar MIT study [2] on the value of

transmission for decarbonization found that by building and leveraging a macrogrid to coordinate and deliver energy within and between regions, the cost of decarbonization were lowered by 46 percent relative to the costs of decarbonization without significant transmission expansion.

The macrogrid in combination with an underlying high voltage transmission network will enhance resource adequacy, improve grid reliability with better steady-state and dynamic reliability, enhance system balancing, and improve resilience in the face of extreme weather events and other threats because the grid is so much larger than any weather event.

Articulating a Common Vision and Rationale

A national transmission planning authority must be designated and endowed with the responsibility to articulate the common vision and rationale for a national transmission and power system and conduct national-level planning in coordination with regional planning authorities. This authority should establish an inclusive, ongoing planning process that takes a systems perspective of the entire country to develop detailed transmission and resource plans and periodically update them.

Like the national highway system, an effective nation-wide extra-high voltage EHV transmission system will need to use a set of common planning tools and design criteria to ensure that the entire national scale, multi-decade EHV transmission portfolio works together and integrates seamlessly with existing transmission, new transmission, and utility-scale and distributed resources over the long run. This planning and design effort will require both a clear, consistent vision for the ultimate goal—an affordable, reliable, decarbonized energy system—and better electricity planning tools to achieve that vision.

Planning tools and the planning process will be complex, because the goal itself must achieve multiple dimensions: decarbonization at speed, reliability, affordability, and enough flexibility to adapt over time to evolving energy and societal policies, technologies, economics, and barriers. Consistency will be particularly important because, at present, every region has its own planning authority with localized processes, goals, and metrics, and every state has its own regulations and preferences for energy and infrastructure development. These inconsistencies have been a major impediment to the development of interregional transmission to date.

The NETA should be a stand-alone federal agency, presumably housed within the U.S. Department of Energy (DOE). It should leverage the analytical talents of DOE's national laboratories and many of the procedural and permitting insights of the federal power marketing agencies. The NETA will need to collaborate with the Federal Energy Regulatory Commission (FERC), the RTOs and other regional planning entities, the North American Electric Reliability Corporation (NERC), and industry stakeholders on policy development and project and portfolio planning. It should also coordinate with Canada and Mexico, the U.S. states, and other stakeholders. The NETA's budget should support extended planning efforts and extensive participation and outreach efforts, as well as include a very large capital budget to use as seed or matching funds to support major EHV project development.

NETA Roles and Responsibilities[3]

The NETA will need to perform a number of roles and responsibilities, all associated with actions and processes that remove or overcome the current barriers to effective design and successful construction of new interregional and intraregional backbone transmission. Those barriers include:

- A lack of common requirements from "the market" or "reliability" about which transmission is needed
- The discontinuities among current regional planning processes, where responsibility stops at regional boundaries
- Challenges in financing and cost allocation and recovery for new backbone transmission
- Inconsistent evaluation and cost-effectiveness measures for evaluating projects within individual states and planning entities
- Inconsistent state policies with respect to goals such as decarbonization priorities
- The ability of individual states and localities and regulators to veto critical portions of a transmission line.

This section reviews the NETA's roles and responsibilities, organizing them by the "five Ps" associated with transmission challenges: planning, permitting and siting, paying, participation, and process. As the discussion below indicates, the NETA staff will need to have a combination of superb human and organizational facilitation skills as well as excellent power system technical and analytical skills.

Planning

First and foremost, national transmission planning requires a clear vision and goals for what type of network is needed, and for what purpose. Given the critical timing of the climate change threat, today's transmission vision must be driven by the need for rapid decarbonization and electrification of the nation's energy uses, as recently articulated in the Biden administration's American Jobs Plan. All transmission plans should focus on how to achieve this vision at maximum speed and scale. And the entire system must be designed for reliable, resilient, and cost-efficient operation.

Renewable Energy Zones

Wind and solar energy are currently the lowest-cost sources of zero-carbon energy. Many analyses have shown that exploiting these areas of high-quality wind and solar resources will be the most cost-effective way to develop new zero-carbon energy sources—if we can build enough transmission to open up those zones for development and deliver their clean energy to customer load centers. The United States should designate renewable energy zones for large-scale wind and solar resource development (Figure 3) and, working through the NETA, build large-scale transmission to those regions to expedite coordinated generation and transmission expansion. Additional EHV and underlying transmission will be needed to deliver new generation into load centers.

[3] This section builds upon ideas developed by Liza Reed (Niskanen Institute) and Armond Cohen (Clean Air Task Force), who are exploring potential solutions to transmission development issues.

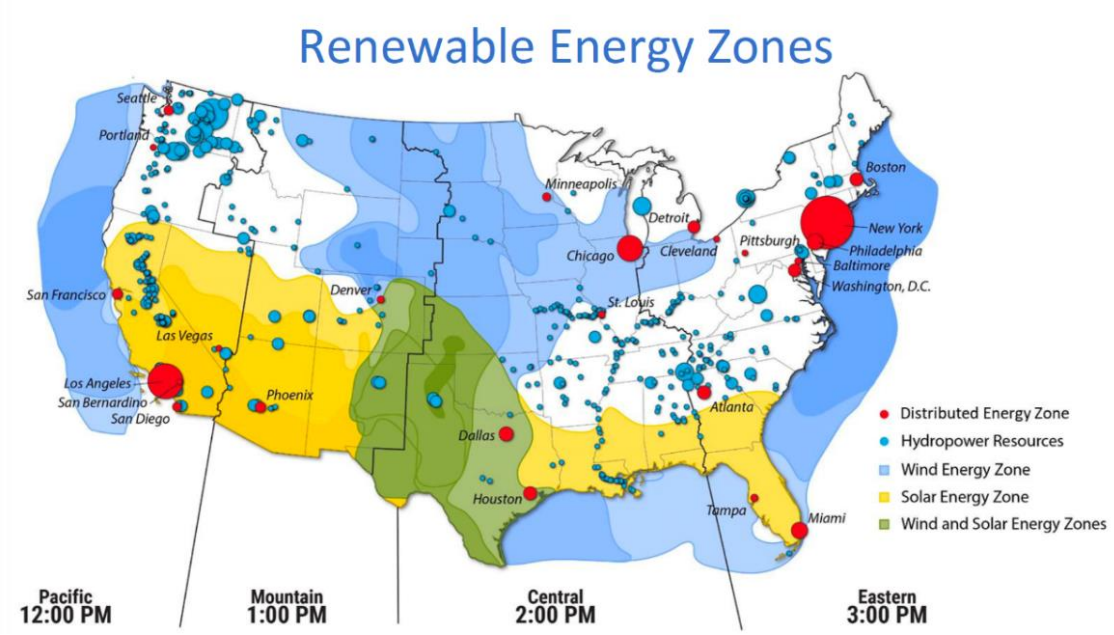


Figure 3: Overview of renewable energy resource regions and demand centers in the United States.

Source: ESIG, "NREL Interconnection Seams Study" (October 2020) [4].

Much work is needed to refine the locations and potential of renewable energy zones, determine the location of macrogrid nodes and the size of transmission lines, and identify the network of supporting transmission lines before final engineering plans and construction of the macrogrid can begin. This approach must include reliability analyses over multiple time scales regarding resource adequacy, capacity expansion, system balancing, steady-state stability, and dynamic stability. This national planning effort will essentially look like an integrated resource and transmission planning effort—even though the resource deployment is often left to developers, regulators, and utilities to plan and build—because transmission availability dominates where and how much generation is built.

A Comprehensive Approach

The macrogrid will need to be planned at the national, regional, and local levels. National macrogrid planning processes stitch together regional models, seed the models with the locations of transmission hubs, and use extensive data and modeling scenarios to assess the value of the resulting grid options. Given current computational constraints, a national transmission planning model should be initialized with a macrogrid concept and tested with multiple scenarios and configurations. The performance of this high-level plan will need to be tested, at both the national and regional/local levels, for resource adequacy and for system balancing that capture operational processes and uncertainties in detail.

The comprehensive national plan will need to be adjusted so that the planned grid will operate effectively and reliably and meets appropriate performance metrics. Planners and industry members will need to determine how to provide sufficient system services to support frequency, voltage, and other system needs during normal operation as well as during grid disturbances. Additional engineering analysis must assess AC power flows (real and reactive power) and system security under contingency conditions. This includes engineering to determine transmission technology (AC vs. DC; line-commutated converters vs. voltage source converters), line configuration (single vs. double circuit,

bipole vs. monopole), voltage level and mega-volt ampere rating of facilities (e.g., lines, converters, transformers, breakers, reactive power support), grid-enhancing technologies (e.g., dynamic line rating, topology optimization), and other considerations (e.g., relaying, protection). Adjustment of the transmission plan through considerations of steady-state thermal and voltage stability (normal operation and during events) should yield a refined plan that can be retested in production simulations.

Since decarbonizing the U.S. power system is a multi-decade challenge, the above analytical process must be conceived and worked through over multiple time horizons, to identify which interdependencies are most impactful, determine which design or line options are most robust over time, and establish how to sequence transmission components for long-term feasibility and effectiveness. These analyses and plans will need to be reassessed and updated as the actual transmission system and utility-scale and distributed generation evolve over time.

Transmission planning and interconnection methods must be improved. All of the analyses described above will require more sophisticated analytical tools that can handle probabilistic, time-sequenced, large-scale technical analyses and identify least-regrets options and build-out paths across multiple scenarios. And given the importance and broad impact of power system infrastructure, the planners will have to develop a set of presentation and communications methods to make their process, findings, and rationales clear and accessible to stakeholders and the public.

Permitting and Siting

Every state has transmission siting and permitting rules that constrain where and how utilities can route new transmission; often local jurisdictions can force a line to go around rather than routing through an area. State regulations for least-cost transmission projects can constrain the use of longer routes, require more aesthetically pleasing structures, prevent over-sizing proposed facilities for later upgrades, or prevent generous community investments to incent local siting approval. For these reasons, it will be important for the NETA to be able to access federally controlled routes such as highway and railroad rights-of-way and federally owned lands for transmission routing (subject to environmental suitability). It will also be appropriate for the NETA to have the statutory ability to override some state and local permitting and siting blocks (within defined circumstances and limits). Last, given the national importance of building out EHV transmission to achieve reliable, affordable decarbonization, the NETA should have the authority and budget to use federal funds to create locally sensitive routing with incentives and benefits that encourage community support and benefit rather than opposition to needed new transmission.

Paying

Transmission is expensive to plan and build—although it will be far less costly than the costs of adapting to rapid climate change. Classic regulatory principles direct that electric transmission should be funded by its beneficiaries; however, that gets complicated because beneficiary identification depends upon such factors as:

- Time horizon, e.g., how many generations of customers should be charged for a transmission project with a 50-year service life? A longer time horizon is more appropriate with multi-generational investments such as those made in major infrastructure intended to slow climate change.
- How many and which generators interconnecting to a new line are direct beneficiaries, and

how much they should be expected to fund the line relative to customers? EHV transmission to support long-term decarbonization and grid reliability should be recognized and funded as benefiting all members of society, not just new generators.

- Which benefits of regional and interregional transmission accrue directly to electricity customers directly using the line, and which accrue to the entire region or nation (as from emissions reductions, rural economic development, or achievement of societal goals)?

Determining Beneficiaries and Allocation of Costs

Accurate and thorough identification of project and portfolio benefits should inform cost allocation, which is a huge challenge for interregional transmission projects and portfolios. Key issues are, which project costs and capital recovery rights should be allocated directly to the utilities building the projects, and which should be charged to the entire region (as through uplift or postage stamp rates) or funded through taxes (as by federal funding contributions)? Most of the RTOs have developed cost allocation conventions to share the costs of large intraregional projects, but these become contentious if some utilities or customers are consistently expected to pay for others' projects while waiting too long to receive their share of projects and benefits.

Transmission benefits assessment is hard because few entities recognize and count all the benefits of transmission for reliability, resilience, economic growth, job creation, affordability, equity, and decarbonization—particularly since many of those benefits accrue outside the planning entity's resource base footprint, customer base, or airshed. Partly for this reason, allocating the costs of new transmission among beneficiaries is also hard, and this is what holds up most new interregional transmission lines or creation of an entire macrogrid. New interregional transmission projects should be evaluated not as stand-alone projects with narrow impact, but as parts of a well-designed portfolio with synergistic impact and benefits.

The NETA should produce transmission plans that identify the costs and benefits that a portfolio of transmission projects (or each tranche or phase of that portfolio) will produce and how those benefits and costs will accrue in each region, state, and utility footprint. These plans and benefit-cost analyses should identify both monetary impacts (delivered energy cost impacts, tax base changes, royalty income, electric bill impacts, economic gross domestic product (GDP) and multiplier impacts) and non-monetary impacts (jobs created, emissions reductions, equity, shifts in location of generation) of the transmission portfolios and scenarios analyzed. The plans should also itemize the same impacts for the alternative scenario under which the transmission-dependent portfolio is not built, to determine what costs and benefits are forgone without affirmative transmission investment.

The Cost of Inaction

Although large transmission expansion will be expensive, it is less expensive than the alternative—inaction which contributes to worsening climate change, exacerbates the effects of extreme weather events, and fails to enhance grid reliability and resilience. Since the impacts of climate change will be felt by hundreds of millions of people in the United States (and billions worldwide) through this century and beyond, the United States should commit to a federal funding program that pays for a portion of the country's electricity system expansion and improvements, accelerating this expansion and its benefits to all Americans over many decades. Coordinated federal action is desirable because it would better balance costs and benefits, speed infrastructure investment and implementation, and reduce the likelihood of incompatible investments or gaps that obstruct attainment of the full goal. Experience to

date shows that decentralized, uncoordinated transmission planning and execution approaches have not effectively built much interregional transmission and cannot address challenges of this scale and importance to the reliability, resilience, decarbonization, economic, jobs, equity, and security functions on which our nation relies.

Seed Funding to Begin

The NETA should provide seed funding for new transmission planning and financing. In the 1950s, federal funding supported the planning and construction of the national highway system that transformed our nation's transportation system. From 2009 to 2012, federal stimulus funds supported the development of new electricity planning methods, analyses, and transmission technologies and co-financed new electricity generation and system investments. Those stimulus funds prompted extensive and on-going private investment in grid modernization and transmission upgrades that have already paid off in grid reliability and efficiency improvements.

Participation

Participation has two aspects. The first participation issue is, who participates in the information collection, analytical process, and decision-making regarding transmission and power system options? The NETA should set up a broad, widely inclusive and transparent effort to invite and consult with all stakeholders, with particular attention to bringing in traditionally underfunded and underrepresented stakeholders and organizations. The NETA could leverage the experiences and insights from DOE, FERC, the National Association of Regulatory Utility Commissioners, National Association of State Utility Consumer Advocates, and other partners to determine the most effective ways to bring in a broad set of voices and stakeholders and ensure that their views are respected.

The second dimension to participation is with respect to equity, and how to ensure that the benefits as well as costs of new transmission and power system development are shared fairly; this has not always been the case. The NETA's planning processes should make a deliberate effort to design projects that deliver benefits as well as costs to all affected communities.

Process

NETA process and strategy considerations should include:

- Information collection
- Developing and operating superb analytical processes and tools that can cope with multiple time, technology, economics, and scenario interdependencies and uncertainties
- Effective stakeholder inclusion and consultation, and moving them toward agreement and acceptance
- Strategies for identifying and structuring appropriate options
- Identifying appropriate decision-making criteria (e.g., how do you identify the least-regrets network that can serve effectively over a 30-50-year time horizon?)
- Ensuring consistency of principles and projects over time and across multiple organizations
- Determining how to coordinate and integrate with regional planning organizations to ensure that the underlying transmission network is consistent with the macrogrid and EHV system plans

- Managing all of the above with clarity and transparency.

In particular, the NETA will need to ensure that states' needs are recognized and respected, but that no individual state is able to blackball an entire project (hence the need for NETA authority to override state or local permit denials under limited circumstances).

NETA Activities

The NETA should be managed like a federal power agency or FERC, with a technical administrator and expert staff, and an advisory board or commission to structure and rule upon challenging issues. That board should include some state authorities along with representatives of the regional planning authorities.

The NETA should have extensive public consultation and decision documentation responsibilities. However, given the need for fast action, the NETA's administrative process requirements should be thorough yet be able to be met relatively quickly, with a direct appeal process for contested decisions inside the agency and then through a designated legal entity that would provide for streamlined consideration and ruling.

The NETA should leverage national capabilities and industry expertise. The federal government possesses vast capabilities for studying and improving the power system through the DOE, national laboratories, power administrations, FERC, and the Department of the Interior. These capabilities should be organized and coordinated to facilitate the industry's design and construction of a national macrogrid. New capabilities should be developed and made accessible to the national transmission planning authority and industry at large.

NETA activities will extend across a wide spectrum of both technical and non-technical topics, including:

- Conducting and supporting design and engineering studies of the macrogrid
- Coordinating with regional planning entities, providing a "top-down" complement to their existing "bottom-up" perspectives
- Working with partners (e.g., NERC) to develop and maintain data and models for national-scale grid studies
- Developing enhanced methodologies for evaluating benefits and costs of large-scale transmission as well as other technologies (e.g., grid-enhancing technologies and non-wires alternatives)
- Supporting research into engineering tools of the future based on the technical and engineering challenges posed by large-scale transmission and the need for national modelling and analysis
- Working with federal, state, and local authorities to address challenges related to new transmission siting
- Convening periodic workshops to present and discuss NETA progress
- Sponsoring and supporting industry events to discuss and address national scale transmission challenges

A long-term, ongoing transmission planning process is needed because the results of a "one-off" planning exercise would quickly become outdated. The speed with which the United States needs to build clean energy resources and the speed with which technology innovations occur necessitate ongoing, frequent planning cycles. The national transmission plan will need to have some basic long-term, least-regrets elements that receive long-term commitment, yet be nimble enough to evolve as ground conditions change (e.g., off-shore wind development in the northeast and west coast, continued wind and solar development nationwide, resolution of questions around whether a new nuclear technology can use brownfield generation sites, or radical improvements in the deployment of distributed generation, storage, or hydrogen).

Once the NETA, with industry and other stakeholder participation, has developed the initial set of plans and procedures, it will need to begin planning for the next cycle even as its industry partners are working to build the first phase of the long-term national transmission plan. This planning cycle should align with the RTOs' planning cycles.

Recommended Near-term Actions

Immediate action is imperative to change the trajectory of U.S. carbon emissions and electrify our economy. Only the federal government has the capacity to support and coordinate the planning and development of a cross-country network of high voltage and extra-high voltage transmission that unites the country to achieve common clean energy policy goals. A national transmission plan should be led by an organization with a national view and goals, that respects regional and state goals and concerns.[4]

The Biden administration has already articulated the broad decarbonization vision and is building a case and budget for this vision. Next comes the commitment to more than double existing transmission capacity and expand clean energy production by an order of magnitude. The administration should charge DOE to work with stakeholders to build on the studies available to fill out the decarbonization vision and justification for the power system, and identify the key principles, goals, and tools appropriate to guide the NETA and industry process going forward. The administration should quickly convene governors, state public utility commissions, FERC, NERC, DOE, independent system operators and RTOs, municipal utilities, cooperatives, investor-owned utilities, and many sectors of customers and stakeholders to rise to this challenge.

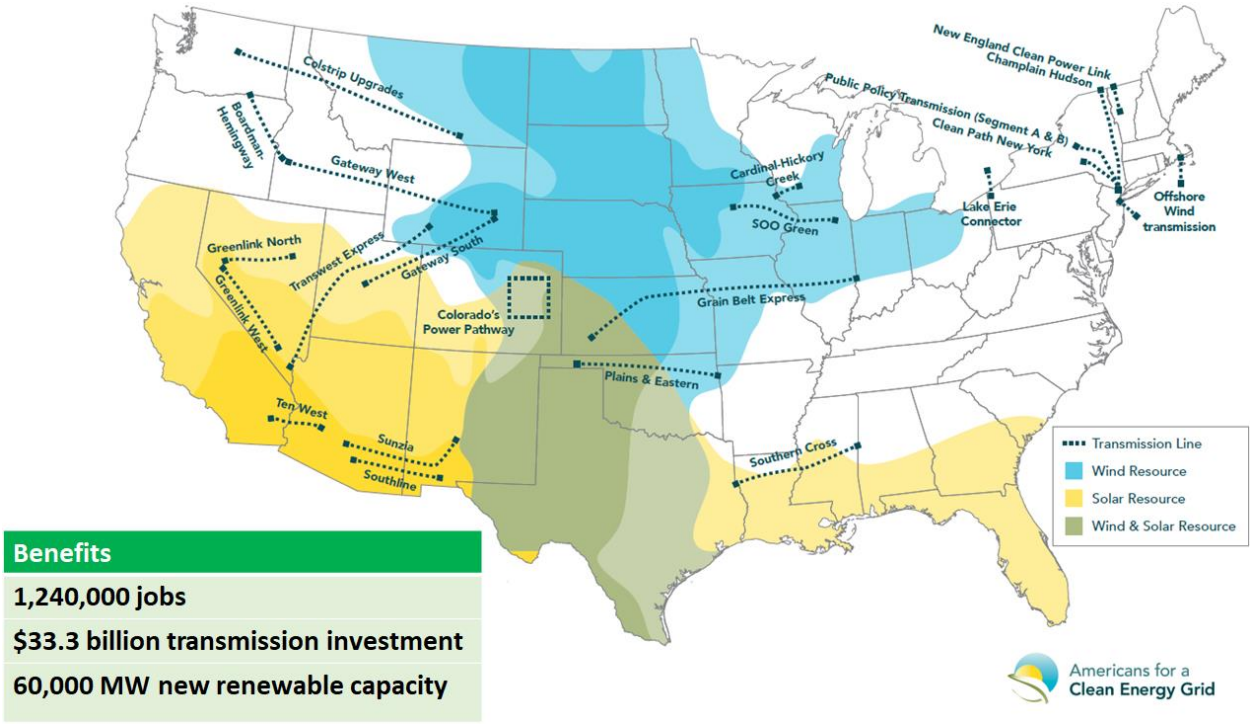
As discussed above and elsewhere, the insufficiencies of and inconsistencies between different regions' benefits recognition and cost allocation measures have hampered major regional and interregional transmission development. FERC should begin a proceeding to develop new transmission benefits recognition principles, detailed guidelines, and cost allocation rules to replace existing regional methods for all transmission at 345 kV and above.

The NETA should start work immediately. Development of the first multiregional transmission plan will be analytically challenging, as will the process of pulling together stakeholders to build the vision and

[4] The Biden administration has proposed development of a Grid Deployment Authority at DOE to consolidate current loan and permitting authorities and take on any new authorities created by new legislation. FERC is presently developing a new transmission policy. The authors welcome both efforts, but do not believe that they can overcome all of the obstacles discussed in this paper or perform all of the functions proposed for the NETA to open up new transmission planning and construction.

consensus around the need for such a plan. DOE could create the NETA organization and begin its planning functions even without congressional statutory authorization and appropriations for the more complex operational and funding capabilities proposed here.

It will take several years to plan the planning process itself as the lead-in to the actual transmission planning effort; for this reason, the NETA should look at how to leverage most or all of the existing proposals for large interregional transmission projects (Figure 4) that have not yet received full approval or financing, to get those moving toward construction.



Benefits
1,240,000 jobs
$33.3 billion transmission investment
60,000 MW new renewable capacity

Figure 4: Americans for a Clean Energy Grid's view of "shovel ready" U.S. transmission projects.

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