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NATURAL RESOURCES DEFENSE COUNCIL (NRDC)
BEFORE THE
US HOUSE OF REPRESENTATIVES
COMMITTEE ON NATURAL RESOURCES
SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES
HEARING TITLED:
"PLUGGING into PUBLIC LANDS: TRANSMISSION INFRASTRUCTURE for RENEWABLE ENERGY"
NOVEMBER 16, 2021

Good morning, Chairman Lowenthal, Ranking Member Stauber, and distinguished members of the Subcommittee. My name is Yvonne McIntyre, and I am the Director of Federal Electricity and Utility Policy at the Natural Resources Defense Council (NRDC). NRDC is an international nonprofit organization of scientists, lawyers, and environmental specialists dedicated to protecting public health and the environment. Founded in 1970, NRDC has more than 3 million members and online activists supporting work to protect natural resources, public health and the environment. Prior to coming to NRDC, I spent over 30 years in the power sector, first as an electrical engineer working in power plants and the distribution system, then moving over to federal government affairs. I want to thank you for holding this hearing on examining the challenges and opportunities of expanding renewable energy generation and transmission on public lands and waters in a way that cleans up our electric grid while minimizing environmental impacts and engaging with local communities.

The need for careful, environmentally responsible, equitable, and rapid expansion of our electricity transmission system has never been greater. The imperatives of climate change and decarbonizing our economy are growing more pressing every day, and the speed with which we must cut emissions of carbon dioxide and other greenhouse gases is only accelerating. As the sector with the second largest share of greenhouse gas emissions in the United States, our electric generation system is ripe for rapid decarbonization via the build out of clean energy sources located both on- and offshore, including sources located on our public lands and waters. However, this buildout must be accompanied by a complimentary, coordinated strategy for ensuring that new clean energy resources provide dependable, responsive, and resilient sources of energy into our grid via a modernized and efficient transmission system.

A wide range of tools are available to achieve these goals, including planning for and siting electricity transmission across and between regions; incentivizing and expanding energy efficiency, distributed solar, energy storage, efficient buildings and electrification; unlocking the benefits of demand flexibility and distributed energy; and providing assistance and support to low-income communities and communities of color to reduce the burdens and negative impacts from disasters and harmful pollution that our fossil-based electric generation system has left in its wake.

For public lands and waters, where decisions must be made that balance a wide range of interests and appropriate uses of public resources, the siting and construction of new clean energy generation and the transmission capacity to connect it to the grid must be a national priority. Indeed, Congress has recently taken action on this priority, directing the Department of the Interior (DOI) to site 25 gigawatts (GW) of wind, solar, and geothermal capacity on public lands by 2025. And the Biden Administration has set a target of deploying 30 GW of offshore wind capacity by 2030.

For many years, NRDC has been a strong advocate for the concept of "Smart from the Start" project siting for both new renewable energy generation and transmission. With the accelerating growth of renewable energy deployment, driven in part by aggressive goals for expanding renewable energy production on our public lands and waters, employing Smart from the Start principles is more critical than ever.

In a nutshell, siting new energy projects using Smart from the Start principles accomplishes two essential goals: (1) ensuring that proposed projects are sited in areas with lower levels of conflicts (environmental, cultural, social, etc.) and the highest potential for delivery benefits (generation and/or transmission capacity); and (2) ensuring that we can accomplish as much as possible as fast as possible. In other words, by avoiding many of the conflicts that extend the permitting and construction timeline for these critical resources at the preplanning and planning stages, more projects are built and developers, policymakers, and land managers have a higher probability of reaching, and ideally exceeding, renewable energy deployment targets.

In my following testimony, I will go into greater detail regarding the application of Smart from the Start principles to the on- and offshore transmission siting context. However, because it is essential to understand the current energy transmission landscape before delving into what must happen next, I will begin with an overview of experts' views of our current and future transmission needs. I will then explain how the Smart from the Start framework can help to overcome some of the traditional barriers that have slowed progress toward meeting these needs.

A Modernized Transmission System Delivers Many Benefits

The current process for expanding and improving our electricity transmission system is largely broken, especially for regional, inter-regional, and cross-interconnection elements of the system. Put simply, the grid is not evolving to keep pace with the changing energy mix,

changing weather patterns, and changing demand. Extreme weather events, including the August 2020 heat storm event in California that resulted in load interruptions to more than four million people and, more recently, the February 2021 polar vortex that caused extreme cold throughout much of the country and triggered multi-day power outages for millions of customers in Texas, highlight the current system's vulnerabilities.

A rapid course correction is necessary to significantly bolster the resilience and reliability of the electric grid to meet the challenges of extreme weather events, the needs of a rapidly transitioning and lower-carbon electric system, and the increased demand from anticipated electrification of the transportation and building sectors. Upgrading and expanding the nation's transmission infrastructure can help on all three fronts. Currently, insufficient transmission capacity is preventing many emissions-free power projects from connecting to the grid, and weak interconnections between regional power grids (Eastern, Western, and Texas) are limiting access to thousands of megawatts of existing low-cost, renewable power resources. Expanded interregional transmission will dramatically lower the cost of achieving a 100 percent clean electricity grid by reducing the amount of wind, solar, storage, and other generation capacity that must be built. A modern long-distance, high-voltage transmission system can move low-cost renewable energy from where it's generated to where it's needed and enables balancing of the variability of wind and solar power on a national scale, which leads to a more reliable grid and lower costs for consumers. Additionally, increased demand from electrification will be more efficiently met by enabling additional generating resources to access load.[1]

We are quickly transitioning to higher amounts of clean energy resources on the grid. Rapidly falling clean energy prices are making these resources cost competitive and often cheaper than fossil energy. In addition, state clean energy standards, federal tax incentives and other laws, and utility and corporate commitments are increasing the demand for these resources. In 2020, wind and solar generation provided 10 percent of the nation's capacity for the first time,[2] while their costs fell 65 percent in the past decade.[3] At the same time, generation from all renewable sources has increased by 90 percent since 2000,[4] and in 2019, renewable energy's contribution to the grid exceeded that of coal for the first time.[5]

Interconnection queues in different regions provide a clear example of what this growth looks like on the ground. For example, in the Midcontinent Independent System Operator (MISO) region which includes all or a portion of 15 states in the Midwest, solar and wind projects total

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[1] *See* Chris Clack & Michael Goggin, *Consumer, Employment, and Environmental Benefits of Electricity Transmission Expansion in the Eastern U.S*. at 19 (Oct. 2020), https://cleanenergygrid.org/wp-content/uploads/2020/10/Consumer-Employment-and-Environmental-Benefits-of-Transmission-Expansion-in-the-Eastern-U.S.pdf.

[2] https://www.nrdc.org/resources/nrdcs-8th-annual-energy-report-slow-and-steady-will-not-win-race?nrdcpreviewlink=rmmB6NM6zpiOTruhuObZJdH92bCOvmZTY1hx72xCSzQ.

[3] https://www.lazard.com/perspective/levelized-cost-of-energy-and-levelized-cost-of-storage-2020/.

[4] https://www.c2es.org/content/renewable-energy/.

[5] Oliver Milman, "US generates more electricity from renewables than coal for first time ever," *Guardian*, October 2018, https://www.theguardian.com/environment/2019/jun/26/energy-renewable-electricity-coal-power, accessed October 2018.

73 GW and comprise 80 percent of all active projects in the current interconnection queue.[6] Similarly, in the PJM Interconnection region which includes all or a portion of 13 states and Washington, D.C. in the Eastern U.S., solar and wind projects total 62 GW and comprise 79 percent of all active projects in the current interconnection queue.[7]

Despite the myriad benefits provided by transmission, its buildout has been stymied across the country as the current planning processes for identifying and selecting necessary transmission projects often present hurdles to transmission's ultimate construction. The Federal Energy Regulatory Commission's Order No. 1000, issued in 2011, envisioned a process where transmission needs are identified through regional planning and inter-regional coordination, and then developed through competitive procurement. Unfortunately, incumbent transmission owners have minimized the use of regional planning processes to avoid competition. As a result, the current regulatory regime does not promote proactive planning of regional and interregional transmission infrastructure necessary to accommodate these resources and prepare for increased demand from electrification. Instead, most approved new projects serve local needs or the reconstruction of aging facilities, with like-for-like replacements. Consider the evidence from MISO. In the last five years, out of 2,174 projects approved by MISO, only 9 were planned to meet regional system needs.[8]

As briefly mentioned above, this failure to plan regionally and between regions can have profound impacts. When extreme weather knocks out power plants in one area, the cause is often because there are insufficient transmission lines to move power from other areas where it is plentiful. The February 2021 cold snap sent millions of Texas into days of cold and darkness because of the failures of the state's electricity system which is isolated from other regional grids. During that same cold snap, neighboring regions showed encouraging signs of resiliency. The grid operators for the Southwest and Midwest saw a spike in demand for electricity just as Texas did but they were able to pull electricity from neighboring parts of the country that were not hit by the polar vortex, as well as from different parts of their own geographically diverse regions. It was not perfect - the Southwest Power Pool, which includes parts of 14 states from Wyoming to Louisiana, had the first rolling blackouts in its history. But those blackouts were limited, lasting hours rather than days as they did in Texas.

This demonstrates the critical need for expanding and upgrading regional, interregional and cross-connection transmission systems and a top priority for federal regulators should be to improve the process for getting electricity transmission lines sited, permitted and built. There is a need for greater interagency coordination and increased focus on system-wide planning that will enhance grid flexibility and resilience in the face of extreme events which are growing in frequency. We need a grid capable of keeping the power on - it can literally be a matter of life and death.

[6] https://api.misoenergy.org/PublicGiQueueMap/index.html.
[7] https://www.pjm.com/planning/services-requests/interconnection-queues.aspx.
[8] https://www.nrdc.org/experts/john-moore/plan-grid-we-need-not-grid-we-have.

Future Renewable Generation Requires New Transmission

Congress has set a 25GW goal for renewable energy deployment on public lands by 2025.[9] By bringing renewables online and integrating them into the grid, a new and modernized transmission system also drives us toward meeting greenhouse gas reduction targets. A new analysis from the research firm Grid Strategies shows that transmission lines provide enormous carbon-saving benefits.[10] Building just 22 new transmission lines—identified as "shovel ready"[11]—and operating them for the next 50 years could lead to total emissions reductions of about 6.4 billion tons of carbon dioxide, which is roughly equal to the total yearly amount of greenhouse gas emissions for the entire U.S.[12]

The 25GW siting goal for onshore renewables on public lands represents an extraordinary expansion of renewable energy projects sited throughout the West that can increase the resilience of the grid while also delivering major decarbonization benefits. A recent example of a successful renewable project developed on public lands is the MEGA Solar Array project located in Nevada within the Dry Lake Solar Energy Zone on Bureau of Land Management (BLM) managed public land.[13] The project is located 15 miles outside of Las Vegas and supplies clean power to MGM resorts. In the press release announcing the commencement of power delivery from the project, DOI Principal Deputy Assistant Secretary Laura Daniel-Davis noted the many benefits of developing renewable energy resources on public lands, saying "Today's progress is a great example of how renewable resources on public lands can provide clean energy solutions to urban centers as we move into the future. The demand for renewable energy has never been greater. The technological advances, increased interest, cost effectiveness, and tremendous economic potential make these projects a promising path for diversifying our national energy portfolio while at the same time combatting climate change and investing in communities." However, in order to realize the benefits of these projects nationwide, planning bodies and regulators must ensure efficient interconnection of these new resources into the grid.

At the same time, this explosive growth in development of both generating capacity and needed transmission upgrades must be carefully balanced with the existing uses of the lands impacted. This is especially true where lands have high conservation values, contain critical habitat for wildlife, are home to irreplaceable cultural resources, are areas treasured by local communities, or could any other situation where a careful consideration of impacts is crucial to avoiding as many conflicts as possible. For several years, members of this Subcommittee and others in Congress have introduced the *Public Land Renewable Energy Development Act*, which would alleviate some of the concerns created by rapid expansion of renewable energy on public

[9] https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/stimulus-renewables-directive-an-early-test-for-us-interior-under-biden-62059663.
[10] https://gridprogress.files.wordpress.com/2021/10/electricity-transmission-is-a-low-cost-tool-for-carbon-abatement.pdf.
[11] https://cleanenergygrid.org/wp-content/uploads/2019/04/Transmission-Projects-Ready-to-Go-Final.pdf
[12] https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019.
[13] https://www.blm.gov/press-release/renewable-energy-generated-blm-managed-public-land-comes-online-power-resorts-las.

lands, by designating low-conflict, high energy potential siting zones for solar, wind, and geothermal energy located on federally managed public lands. It may be worthwhile for this Subcommittee to consider a complimentary effort to ensure the siting of transmission on these lands is considered with similar levels of care.

Accelerating this clean energy push, the Biden Administration has also set a 30GW goal for offshore wind by 2030 as a pathway for meeting 110GW of offshore wind by 2050.[14] Additionally, states along the Atlantic Coast have a collective anticipated offshore wind planning figure of 37.5GW. Development on this scale will require a significant investment in agency staff with relevant expertise and experience in permitting large scale wind, solar, geothermal and transmission projects. To aid in this expansion and appropriately resource and staff this effort, Congress has also directed the DOI to establish the Renewable Energy Coordination Office, which is expected to facilitate the permitting of new generation and transmission projects located on or crossing federal lands and waters.[15]

The offshore wind generation targets also present a tremendous opportunity to build an offshore network that connects states and regions to each other, lowering costs for consumers and providing important reliability and resiliency benefits to millions of Americans on the East Coast and beyond. Offshore wind is a key tool in warding off the most devastating impacts of climate change. With 53 percent of the country's population on both coasts, offshore wind is near areas that consume large amounts of electricity. Offshore wind can also meet growing clean energy needs during rainy and cloudy winter months when less solar energy is available. Even more appealing from an energy planner's perspective is that offshore winds often ramp up in the afternoon and evening when the sun goes down—and home electricity use jumps. Having clean electricity near where people live means that we can retire fossil fuel plants, which are often located in disadvantaged communities. Offshore wind will also allow us to revitalize our port communities. The clean energy sector has been hard hit by the pandemic-created recession, but offshore wind can put people back to work in good paying jobs, many of them unionized.

States such as New York, New Jersey and others have begun to consider transmission options to bring this power onshore. However, current offshore wind projects under development are considering using generator lead lines that connect each project individually to the onshore grid. However, a lead line approach to offshore wind transmission buildout may miss efficiencies that come from a more comprehensive and planned approach. We believe that an interregional offshore high-voltage network that connects the entire East Coast could address fuel security issues, reduce generation needs, boost resilience, and lead to significant savings compared to more local or regional options. The first step in this process is to conduct a study on the costs and benefits of such an interregional offshore wind transmission system. A study

[14] https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/29/fact-sheet-biden-administration-jumpstarts-offshore-wind-energy-projects-to-create-jobs/.
[15] *See* 43 U.S.C. § 3002.

could examine how to best implement such a network, including how to do so in a cost-effective manner.

Several weeks ago, the Department of Energy released a report that found a lack of comprehensive evaluation of transmission analysis to support offshore wind energy development at scale and called for comprehensive interregional studies of possible offshore wind transmission options.[16] As a follow up to this report, last week the Department announced that it was launching a study of transmission options to support offshore wind development on the East Coast through 2050.[17] The study will evaluate multiple pathways to offshore wind goals through coordinated transmission solutions along the East Coast under various combinations of electricity supply and demand, while supporting grid reliability and resilience and ocean co-use. The study will also compare the current lead line approach versus a coordinated shared transmission infrastructure. We agree with the Department's approach and believe that there are important roles for states, regional transmission organizations and other stakeholders to play in ensuring that this buildout is done in a responsible, equitable, and cost-effective manner.

A Redoubled Focus on Transmission Requires Smart Planning

Despite undeniable benefits in terms of flexibility, efficiency, resilience, and greenhouse gas reductions, planning for the siting and construction of any significant amount of new high voltage transmission comes with serious hurdles. For this reason, we strongly urge the Subcommittee, Congress, relevant agencies, developers, and all other relevant stakeholders to consider and implement a framework for transmission infrastructure buildout that incorporates Smart from the Start siting principles.

Why Smart from the Start?

A Smart from the Start approach identifies and prioritizes areas where renewable energy generation, storage, and transmission can be deployed with as little impact as possible to natural lands, cultural resources, recreation, and other conservation values while also ensuring that effected communities and other stakeholders have the ability to engage and help shape the decision-making process that will lead to the construction of these projects. There are many benefits to pursuing this approach to energy generation and transmission planning including:

- Ensuring adequate transmission is sited and built in the right places to achieve our climate goals, and can ultimately create a more efficient, equitable, and comprehensive process. It brings forth disparate knowledge from stakeholders early on, thus improving planning, permitting, coordination, and implementation decisions. This improvement

[16] https://www.energy.gov/sites/default/files/2021-10/atlantic-offshore-wind-transmission-literature-review-gaps-analysis.pdf.
[17] https://www.energy.gov/eere/wind/articles/atlantic-offshore-wind-transmission-study-will-inform-options-support-national.

increases the odds that renewable projects will minimize costs, maximize economic benefits, and avoid regulatory or legal hurdles.

- Reducing impacts to conservation, cultural, recreation, and other resources decreases conflict, which in turn decreases time and cost for project development. A Smart from the Start approach begins by identifying and incentivizing lower-impact renewable energy generation and transmission sites upfront so development and conservation can proceed in tandem.
- Identifying previously disturbed lands that may have high renewable energy generation potential. Development on these lands may inherently lower conflict and can help accelerate renewable development while helping conserve undisturbed lands for other beneficial uses.
- Enhancing carbon benefits of undisturbed lands by avoiding land use changes that result in landscape disturbances and conversion due to greenfield generation or transmission projects.
- Increasing economic benefits flowing from new projects by avoiding the costs of project delays and reducing the burden on ratepayers.
- Providing economic revitalization and new economic activity to areas where new generation and transmission projects are sited and built.

In the final section of this testimony, I provide further detail on strategies for how to operationalize Smart from the Start planning and siting.

Expanding Transmission Capacity: Grid Connection, Modernization, and Non-Wire Solutions

A core tenet of Smart from the Start is to avoid starting something new when the existing system can be further optimized. We certainly need to build more transmission, but we also need to make the best use of the transmission we have. This means improving the efficiency of how we use electricity, generating clean electricity where customers use it through distributed energy resources such as rooftop solar, and increasing the flexibility of the demand side of the grid through smart appliances and distributed storage. It also means being smarter about how we use the transmission we have. Through greater real-time monitoring, we can implement dynamic line ratings, increasing the grid's capacity and its reliability. None of these require the siting or construction of new high voltage transmission lines and pursuing each of these strategies will bring us far closer to a decarbonized electricity grid.

We also must maximize the use of existing Rights of Way (ROW). ROWs are difficult to create, controversial to site, and time consuming to approve and finalize so existing ROWs are precious. Much can be done to increase ROW transfer capacity by refurbishing electricity substations, improving grid controls, coordinating transmission across the interconnections, physically increasing their capacity with new wires (conductors), reconstructing towers where necessary, and in some cases converting AC lines to DC lines.

When new transmission is indicated, there are existing tools – most developed with considerable federal support – that can aid the effective routing of new transmission. Processes

for planning renewable energy resource areas and the transmission to support them have been effectively developed in several states and regions. Following are several examples:

- Texas created Competitive Renewable Energy Zones (CREZ, 2008-2013) to facilitate a massive wind energy resource build-out. Substantial new transmission assets were built to serve them, opening the nation's largest wind resource.[18]
- California's Renewable Energy Transmission Initiative (RETI 2009-2017) that created similar resource zones and transmission alternatives to serve them.[19] RETI resulted in massive increases of renewable generation and transmission to serve it. Through the California Energy Commission, RETI created a geospatial planning tool to describe the areas and transmission options and engage with stakeholders from federal and state land management and energy agencies, the DOD, environmental and conservation organizations, renewable energy and transmission developers, utilities, agricultural interests and local governments. The process was later expanded to review suitable lands in the Central Valley with mapping done through the online service Data Basin.
- The Western Electricity Coordinating Council (WECC), with DOE sponsorship, created a similarly diverse stakeholder group to develop a GIS based "Environmental Data Viewer" planning tool (2010-present) that also incorporates cultural resource data to into ROW planning and evaluation. The tool is web-based and available to all users.
- The Eastern Interconnection States Planning Collaborative (EISPC) also developed a GIS based planning tool, built and maintained by Argonne National Laboratory.[20]

Remembering Lessons Learned: Progress Has Already Been Made

The Obama Administration recognized the need for proactive transmission planning involving a spectrum of concerned stakeholders. One of the most important innovations it instituted was coordinating environmental review between and among federal agencies, avoiding sequential reviews which can delay decisions significantly. Under an administration-wide MOU of affected agencies, a lead agency was selected to coordinate and collate input from its sister agencies. For example, the DOI might be named lead agency for a review, and would coordinate input from the USFS, USFWS, DOE, and BLM contemporaneously. This process should be reinstated.

Another effective method that the Obama Administration employed was conducting, where possible, joint environmental review with states. In 2009-2010, a DOI/California joint environmental review process led to the approval of thousands of megawatts of new solar projects and related transmission in less than a year. This collaboration has worked effectively, and should be reprised wherever possible.

Resources, Partnerships, and Cooperation Can Get Transmission Built

[18] https://poweringtexas.com/wp-content/uploads/2018/12/Transmission-and-CREZ-Fact-Sheet.pdf.
[19] https://reti.databasin.org.
[20] https://ceeesa.es.anl.gov/projects/eispc/EZ_Mapping_Tool_Handout_Nov2013.pdf.

Financial and human resources are needed at the Federal, state and local levels to get transmission, especially interstate transmission, built. Evidence suggests that when adequately resourced, planning, siting and permitting can happen on a reasonable timescale. Resources and staffing can also be used to ensure that all stakeholders - federal agencies, states, tribes, developers, local communities, and others - are engaging in appropriate forums which helps to develop trust and find areas of agreement.

Just as government resources are essential to getting transmission built, so is the partnership with developers/utilities and their state regulators. All parties must be willing to come to the table and demonstrate that they are evolving as the grid and generation changes and modernizes. States should consider taking actions to facilitate the permitting process for project applicants. An idea for one such action presented in the paper, "America's Power Plan"[21] authored by Carl Zichella and Johnathan Hladik is for states to establish "a one-stop siting agency for large energy and transmission projects." This would lessen the complications for applicants of dealing with multiple agencies, ensure that permit requirements are not duplicated, and shorten the permitting timetable.

Further, states need to be engaged with each other in planning, regulatory review and approval for transmission infrastructure. Without joint planning and approvals states can become inadvertent roadblocks to needed transmission, or present difficult delays that jeopardize both energy and transmission investments. They need to be partners in transmission planning and development. States are often more poorly resourced than their federal partners so federal financial assistance for joint planning and environmental review could both bring them to the table and reduce approval times.

Consideration of Equity and Environmental Justice

My colleague Julia Prochnik testified before this Subcommittee in July 2020 on the need to incorporate equity and environmental justice concerns in the planning, siting and permitting process for clean energy and transmission projects. In this section, I will draw on many of the points she made in her testimony.[22] As mentioned earlier, communities of color, tribal and low-income communities have often faced the most harmful impacts of climate change and pollution and land impacts from fossil fuel plants and energy infrastructure. These communities have lacked the resources and information needed to meaningfully take part in the decision-making process for the development of energy projects. Oftentimes, government agencies and developers fail to include these communities out of fear that this will slow down the development process. But, as Ms. Prochnik's testimony notes, incorporating environmental justice and cultural awareness information upfront in the transmission planning process can reduce potential conflicts during siting, permitting, and construction.

[21] https://s30428.pcdn.co/wp-content/uploads/sites/2/2020/08/APP-SITING-PAPER.pdf.
[22] https://naturalresources.house.gov/imo/media/doc/Testimony%20-%20Ms.%20Julia%20Prochnik%20-%20JASenergies%20-%20EMR%20Ov%20Hrg%2007.14.20.pdf.

Transmission planning must be better coordinated to ensure these diverse communities are included in the process. It is essential that government agencies help communities overcome the complex hurdles involved with transmission planning by providing better access to data and information as well as financial assistance. Ms. Prochnik included the following recommendations for inclusive planning:

- In any re-evaluation effort, agencies need to build an inclusive process at every level of decision-making including assessment, planning, implementation, enforcement, and evaluation that is ongoing, inclusive and respectful.
- Inclusion means impacted communities (EJ, tribal, and frontline) are treated as equal partners and their interests are protected equally (if not more than) other industry interests.
- All project decisions and evaluations need to fully reflect on-the-ground realities and cumulative impacts including but not limited to health and environmental outcomes, pollution levels, and impacts to sacred/ cultural resources.

Federal, state and local governments, developers, regulators, and other stakeholders must rethink traditional approaches to the development of transmission projects to incorporate equity and environmental justice concerns.

Recommendations

Integrate Smart from the Start Principles into Renewable Energy Siting and Transmission Planning. These principles include:

- Consult stakeholders early and involve them in planning, zoning and siting.
- Collect and use up to date geospatial information at regional scales to identify and categorize early the risk of resource conflicts.
- Avoid land and wildlife conservation conflicts and prioritize development in previously disturbed areas.
- Avoid cultural resource conflicts (historic sites, tribal resources, etc.).
- Identify renewable resource values with the highest energy potential.
- Establish, when possible, pre-screened resource zones for development.
- Where zoning is not feasible (as in much of the Eastern Interconnection), use siting criteria based on Smart from the Start principles.
- Incentivize resource zone development with expedited priority approvals and access to transmission.
- Consider renewable energy zones or development sites that optimize the use of the existing grid.
- Maximize the use of existing infrastructure, including transmission rights of way and roads.
- Follow the mitigation hierarchy of avoid, minimize and mitigate when planning project designs

- "Mitigation that matters" (durable and planned conservation improvements at larger scales).

Improve Transmission Planning and Coordination

- FERC actions:
    - Require that grid planners take a forward-looking approach to planning rather than simply replacing existing lines. In other words, plan for the future rather than the past.
    - Require minimum planning standards; many grid upgrades don't happen even though the benefits of the upgrades far outweigh the costs.
    - Identify additional transmission benefit metrics for cost allocation purposes.
    - Consider transmission return on equity incentives for truly advanced transmission technologies: energy storage, phase angle regulators, advanced cabling, etc., and grid enhancing technologies like dynamic line ratings that increases the capacity of the existing network.
    - RTOs and non-RTO grid planning regions should plan transmission between regions in a single process rather than the three different approvals that are currently required.
    - Independent transmission monitors should be created to oversee the process of constructing transmission lines on a regional and interregional basis.
    - Planning regions should be required to plan for a wider range of grid needs in the future, and use more realistic forecasts of future energy demand and renewable energy development.
    - Transmission planners should engage with states, many of which are pushing for climate action and cleaner energy, to ensure that these lines are sited properly and equitably.
- Other government actions:
    - The federal government should fully fund research, development, and deployment initiatives to promote advanced transmission technologies that improve the flexibility, reliability, and sustainability of the electric grid.
    - Allow for concurrent agency NEPA review for transmission projects. Coordinating NEPA review between and among Federal agencies, and joint reviews with state regulators, planning authorities and other applicable jurisdictions can shave years off of approval times for needed transmission. By establishing a lead federal agency to direct NEPA reviews, coordinating the input from other agencies sequential reviews by separate agencies can be avoided.[23]

[23] A good example of this is the joint Federal State environmental review of large-scale renewable energy projects in California in 2009. Approximately nine gigawatts of California renewable energy projects were approved in nine months using a joint review process coordinated by the Interior Department and the California Governor's office. This same approach can be applied to approving transmission projects. *See* https://www.doi.gov/news/pressreleases/secretary-salazar-approves-three-renewable-energy-projects-in-california-and-nevada.

- Enable federal power marketing administrations and similar transmission-owning/operating federal agencies to be leaders in clean energy transmission development by requiring PMAs to invest and partner in right-sized clean energy transmission lines within their footprints using modern technologies. Additionally, Federal power marketing agencies could prepay to fulfill their power procurement needs up front in order to boost major energy projects, similar to hydroelectric dams that they manage when not producing energy.
- Coordinating with tribal governments on routing decisions that may implicate tribal lands can also create benefits both in terms of time saved in finding alternative routes for transmission rights of way, and in creating economic opportunities for tribal governments to improve people's lives. FERC approvals of cost recovery from equity partnership arrangements and compensation for transmission lines for tribes can greatly incentivize tribal participation in more than 50 million acres of trust lands.

Conclusion

As the country faces increasing severe climate change impacts, it is imperative that the nation focuses on decarbonizing our grid with greater deployment of clean energy resources. In parallel, we need to improve our transmission system to both accommodate the changing electricity mix and to improve the reliability and resiliency of the system. Development of renewable resources and transmission on public lands and across the country will provide substantial benefits in the transition to a cleaner grid. But, as we move forward with this process, it is critical that we do it smartly and take into consideration the impacts of these projects on the environment and on communities of color, and tribal and low-income communities. Key tools to help us address these issues are policies to: facilitate better transmission planning by using Smart from the Start principles; assistance and support to impacted communities to ensure their inclusion; and actions to improve transmission planning and coordination.