JASENERGIES

TESTIMONY BY

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US HOUSE OF REPRESENTATIVES
SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES

Thank you Chairman Lowenthal and members of the committee. It is an honor to be here with all of you and my fellow panelists to testify before the Subcommittee on Energy and Mineral Resources on "Energy Infrastructure and Environmental Justice: Lessons for a Sustainable Future."

I stand in solidarity with Black communities that have been deeply harmed by our society's injustices and inequalities. As a mother with young children, I am committed to a clean energy future and economy that is inclusive of all, for the benefit of all, and that contributes to a Just and Equitable society; it cannot come to pass without acknowledging and overcoming insidious discrimination.

As many lifestyles become increasingly dependent on electricity, the United States needs to make major investments in a modernized grid to expand capacity and improve reliability as we plan for the future.

For the first time in the United States in April 2019, renewable energy overtook coal, providing 23% of US power generation, compared to coal's 20 percent share.[1]

Between 2010 and the first quarter of 2019, US power companies announced the retirement of more than 546 coal-fired power units, most of which are located in frontline or disadvantaged communities or on tribal lands, and totaling about 102 gigawatts (GW) of generating capacity. Plant owners intend to retire another 17 GW of coal-fired capacity by 2025, according to the US Energy Information Administration. After a coal unit retires, the power plant site goes through a complex, multi-year process that includes decommissioning, remediation, and redevelopment including a repurposing of transmission lines. The US electric transmission network consists of over 350,000 circuit miles of lines[2] connecting communities and provides a backbone of reliability and economic support.

As coal plants are retired, capacity opens up on transmission lines. Renewable energy can step in and provide reliable, inexpensive and clean power. Solar and wind do not fit on the footprint of every coal plant site. Economics and public policies are pushing faster closure of coal plants and accompanied transitioning of local communities and infrastructure. The Centralia transition agreement is an example of a well-funded, long-term transition plan. Unlike many coal plant closures today, it was forged not because the company was going out of business but to address climate change.[3] There are only 20 coal plants in the continental West with owners who haven't committed to fully retiring them by specific dates or given the local communities a transition plan.[4]

1 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.
2 https://www.energy.gov/sites/prod/files/2018/03/f49/2018%20Transmission%20Data%20Review%20FINAL.pdf
3 https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2020/03/04/as-us-coal-plants-shutter-one-town-tests-an-off-ramp
4 https://www.latimes.com/environment/story/2020-02-04/coal-power-plants-western-us

Transmission planning activities are undertaken to enable future reliable and efficient utilization of transmission facilities by addressing many factors but historically have not often addressed social or climate justice concerns. Transmission constraints and economic congestion (e.g. when it is too costly to move resources or no resources are available) are closely related phenomena[5], but are presented separately in reporting and are not shared with other agencies as openly as possible. Given the diversity of the transmission system itself—in ownership, operation, planning, and physical characteristics—presenting the data in a unified framework is challenging, but achievable.

I will cover the need to ensure coordinated planning in three themes: inequities of the grid, climate change and the grid and inclusive planning for the grid. The electric grid is the economic backbone of our country and must now transition towards increased inclusivity and equality.

Inequity and the Grid

Clean energy will help us recover from the current Covid-19 recession, but we must act and think differently to ensure diverse stakeholders including disadvantaged and front-line communities, Black and Brown organizations are at the table and able to participate in the changes.

Over the past few years I have worked with communities, policymakers, advocates, unions and industry to help transition fossil fuel assets and infrastructure embedded in communities across the country. Just and Equitable Transition[6] must benefit the local community and must come with financing, retraining, fair wage jobs and lost income protection. These efforts must prioritize the areas that are most vulnerable to climate change, including low-income neighborhoods and communities of color. Due to historic discrimination and residential segregation, these are often located near fossil fuel plants and mines, in flood-prone areas, or are exposed to disproportionately high heat, pollution, and other environmental risks.[7]

The Environmental Justice community strives for fairness and climate justice where aspects of mitigation and adaptation are uneven. There is a climate gap, which is an issue of human rights, public health, and equality and demonstrates how climate change does not affect everyone equally, and it is people of color and the poor who will be hurt the most.[8]

Transmission and distribution planning must be better coordinated. Confusing jurisdictions, lack of transparency, misaligned agency missions, lack of funding to bring diverse meaningful stakeholders into the complex process are all hurdles. But matching supply and demand in a more unified fashion will help the communities with costs, the industry with better information and policymakers with clear drivers to set goals.

5 https://www.energy.gov/sites/prod/files/2018/03/f49/2018%20Transmission%20Data%20Review%20FINAL.pdf
6 https://westerngrid.net/wcea/jet/
7 https://www.americanprogress.org/issues/green/reports/2019/08/01/473067/a-perfect-storm-2/
8 https://dornsife.usc.edu/assets/sites/242/docs/ClimateGapExecSumm_10ah_small.pdf

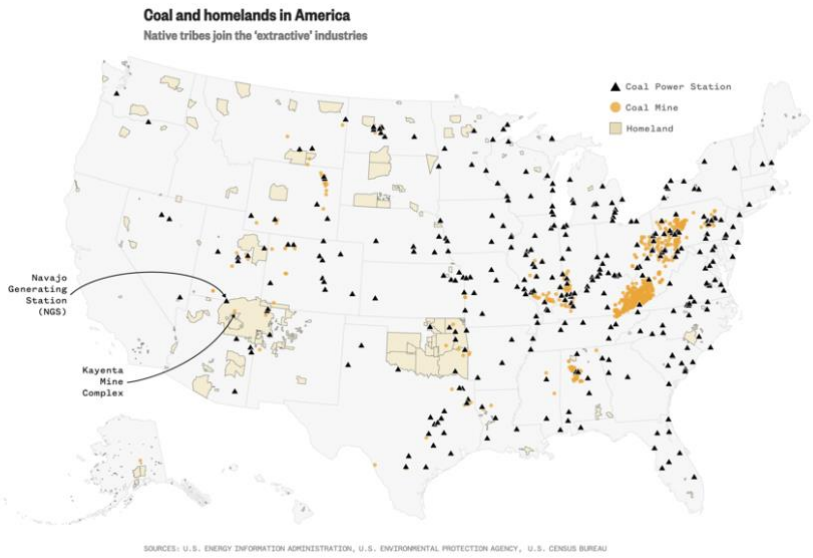
To attain these benefits, planning criteria and methodologies need to be revised to include climate justice and resilience. The design of resilient power systems starts with the overall planning of the entire system. Until recently, there had been little work on including climate considerations in planning.[9]

Tribal Energy and Infrastructure

The President of the Navajo Nation delivered a heartfelt wake-up to many white people of the many hardships the Nation has faced and the strength and resiliency in the Navajo People. President Nez said in his testimony to Congress, "I implore you to help address the systemic changes that need to occur for the improvement and advancement of Indian Country. He also said "Today, I am asking that our environment and natural resources be protected, and our needs be promoted. With the protection of our resource and our participation in the 21st century, we will be able to live in a more harmonious state in our permanent homeland for generations to come."

Renewable energy policies must recognize—and attempt to correct—the history of fossil fuel oppression and displacement of Indigenous people. The federal government has directive to advance Tribal Sovereignty and Rights, and 100% regenerative energy policies should include the leadership and consultation of Indigenous communities, particularly around energy sovereignty.

Federal agencies should collaborate on coordinated processes with Tribes to be put in place to ensure advocates and policymakers intentionally consult with Indigenous communities on land, water, and air rights related to renewable energy.



When developers are working with tribes and federal agencies there must be attention paid to the unique characteristics of rural and Indigenous communities, such as siting of renewables on sensitive lands, "off grid" solar options, and "green businesses".[10]

As outlined in the 100-network building blocks report,[11] "when planning transmission and generation together it is recommended to include renewable energy projects both "located in" and "benefiting" EJ communities (while recognizing that it is not always feasible to site all renewable energy within target communities) because it rectifies disproportionality of dirty energy impacts and structural inequities." The public health and economic goals of achieving 100% regenerative energy will only be

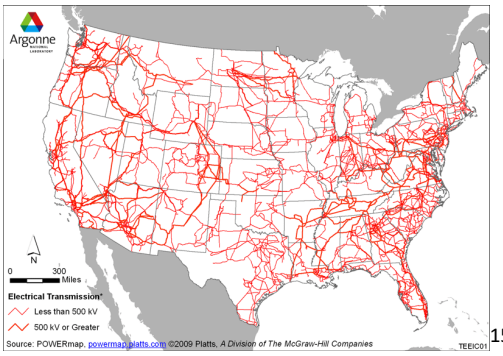
9 https://openknowledge.worldbank.org/bitstream/handle/10986/31910/Stronger-Power-Improving-Power-Sector-Resilience-to-Natural-Hazards.pdf?sequence=1&isAllowed=y
10 https://www.100percentnetwork.org/uploads/cms/documents/100-network_comprehensive-building-blocks-for-a-just-regenerative-100-policy-2020.pdf
11 ibid

achieved if renewables are located in and benefit BIPOC[12] (black, Indigenous and people of color) and frontline communities.[13]

Climate Change and the Grid

As coal plant closures create changes for the electric system, the National Oceanic and Atmospheric Administration (NOAA) notes that extreme weather caused by climate change is growing and transmission lines are at risk across the country as storms grow more severe.

Many leaders have referred to the electric grid in the US as the largest single machine in the entire world, and it is an incredibly complicated thing to manage and balance.[14] The grid on the right shows areas in the US affected by climate disasters, which always affect some part of the grid (map on the left).



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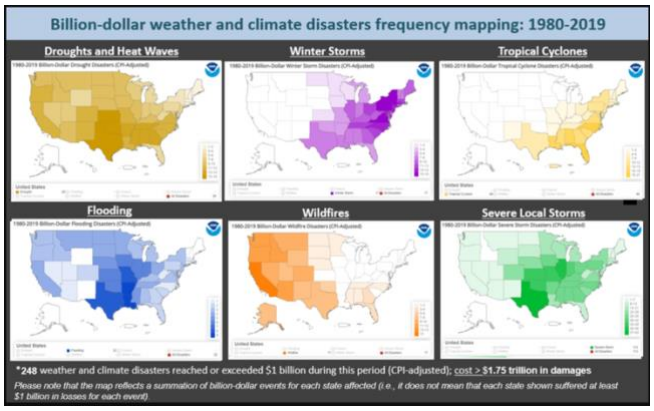


In broader context, the total cost of US billion-dollar disasters over the last 5 years (2015-2019) exceeds $525 billion, with a 5-year annual cost average of $106.3 billion, both of which are records. The US billion-dollar disaster damage costs over the last decade (2010-2019) were also historically large, exceeding $800 billion from 119 separate billion-dollar events. Moreover, the losses over the most recent 15 years (2005-2019) are *$1.16* trillion in damage from 156 separate billion-dollar disaster events.[16]

Significant portions of the nation's energy production and delivery infrastructure are in low lying coastal areas and low income disadvantaged and frontline communities; these facilities include oil and natural gas production and delivery facilities, refineries, power plants, and transmission lines. The traditional approach to infrastructure design may no longer be adequate. It is important to capture key features of a changing grid and the additional benefits to approaching adaptation in a more proactive way in order to adequately estimate future climate change impacts to all communities. Increasing transmission

12 https://www.nytimes.com/article/what-is-bipoc.html
13 https://www.100-network_comprehensive-building-blocks-for-a-just-regenerative-100-policy-2020.pdf
14 https://www.latimes.com/environment/story/2020-02-04/coal-power-plants-western-us
15 https://www.anl.gov/
16 https://www.climate.gov/news-features/blogs/beyond-data/2018s-billion-dollar-disasters-context

capacity within and between regions is critical to addressing extreme weather events, changes in peak loads, water and weather constraints on energy production, and sea level rise. [17]

Anticipated impacts of climate change can be addressed with increases in generating, transmission and distribution capacity, as well as through improvements to equipment design.[18] My colleague Rob Gramlich mentioned in a 2019 Congressional testimony that "new technologies are commercially available and are being deployed in other countries to reduce transmission congestion and improve reliability, such as Dynamic Line Ratings, power flow control, and topology optimization. Congress can direct the Federal Energy Regulatory Commission (FERC) to ensure that transmission owners have an incentive to deploy these technologies to a wide range of customers including low income and disadvantaged communities."[19]

Transmission planning at federal, state and local levels must be inclusive of resilience and climate justice concerns as well as adaptive and mitigation measures.

Renewables and Public Opinion

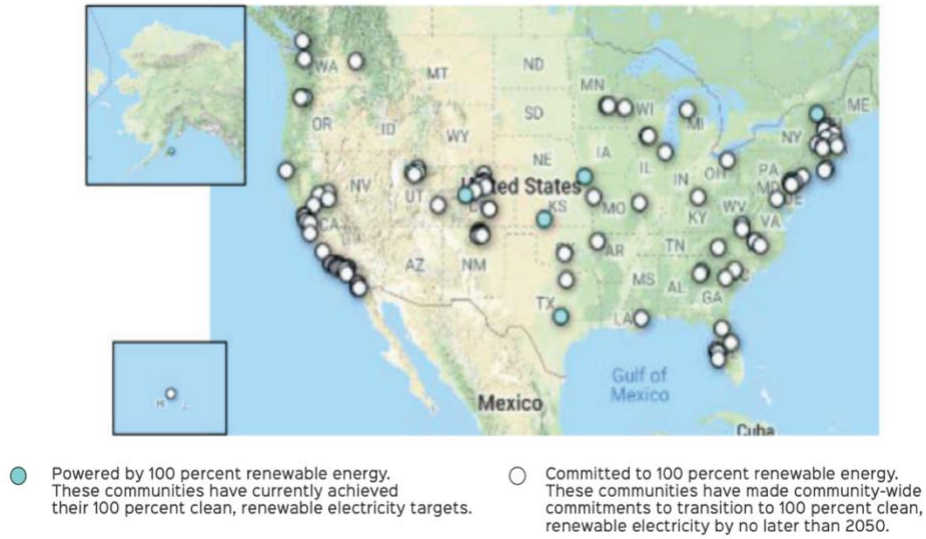
As a recent Yale study points out "Voters support establishing a national renewable portfolio standard (RPS) requiring 100% of electricity to be generated from renewable sources by 2050 (71%) and say enacting a national 100% RPS would have a positive impact on the environment in the US (77%) and the US economy (61%), bring down electricity costs (61%), and benefit rural and farming communities (56%)."[20] They also say infrastructure investments should repair old roads and bridges (92%), repair and modernize America's public school buildings (84%), expand the use of renewables (81%), build new power lines for transmission of renewable energy (81%), expand rural broadband (80%), build new roads and highways (79%), and expand public transportation (76%). And 76% say it's important to invest in building infrastructure to withstand the effects of climate change.[21]

US renewable energy development has skyrocketed in recent years. In 2020, the Energy Information Administration projected that US solar generating capacity in 2019 and 2020 would increase by 65% from 2018 capacity. And in 2020, approximately 44% of new US electric generating capacity installed will be wind generation, and 32% will be solar photovoltaic. Pluralities of voters think a 100% RPS policy would help bring down the unemployment rate (46%), improve wages for American workers (46%), and benefit communities of color (42%).[22]

Public policies pushing the need for 100% clean energy and carbon reduction promote the economic stimulus for market and regulatory certainty; however, community transition is not always at the top of the list and must be part of the plan. As the electric generation changes on the grid, the transmission changes too; especially the capacity on the lines and the upgrades needed.

17 https://openknowledge.worldbank.org/bitstream/handle/10986/31910/Stronger-Power-Improving-Power-Sector-Resilience-to-Natural-Hazards.pdf?sequence=1&isAllowed=y
Nicolas, C., J. Rentschler, A. Potter van Loon, S. Oguah, A. Schweikert, M. Deinert, E. Koks, C. Arderne, D. Cubas, J. Li, E. Ichikawa. 2019. "Stronger Power: Improving Power Sector Resilience to Natural Hazards." Sector note for LIFELINES: The Resilient Infrastructure Opportunity, World Bank, Washington, DC.
18 https://www.osti.gov/biblio/1026811
19 https://gridprogress.files.wordpress.com/2019/06/testimony-to-roundtable-on-electricity-transmission-infrastructure-.pdf
20 Climate Nexus, Yale Program on Climate Change Communication, George Mason Center for Climate Change Communication | 09/13/19
21 ibid
22 ibid

Cities with 100 Percent Clean Electricity Commitments[23]



Clean power commitments have increased at the county and city level, with a total of 11 counties and 104 cities pledging to 100 percent clean energy goals at the end of 2018. Approximately 50 million people live in places with these goals, making up about 15 percent of the nation's population.[24]

The next step is to ensure the commitments also include environmental justice policies and climate justice goals. There is no "one size fits all" solution and this should not supersede the interests and self-determination of local frontline communities. A "community benefits" framework is recommended that includes ecological, health, and economic benefits.[25] Public land issues and eminent domain need to also be considered in the policy.

RPS policies should clearly outline and make transparent purchase agreements of renewable energy and ensuring that policies related to the grid are linked to disaster preparedness and clear ways to address the climate gap.

State and local policies have pushed the desire to meet climate goals and the federal government could assist by enacting a federal renewable portfolio standard (RPS). State integrated resource plan planning process, which could facilitate investment-level analysis of these public policy-enabling projects[26] as well as a new FERC Order on mandated coordinated planning.

23 https://www.cfra.org/sites/www.cfra.org/files/publications/CapacityForChange.pdf
24 ibid
25 https://nationaleconomictransition.org/
26 https://static1.squarespace.com/static/59b97b188fd4d2645224448b/t/59f40357652dea26877e092e/1509163867513/RETI+2+Western+Outreach+Project+Report.pdf

Inclusive Planning for the Grid

Incentives to drive inclusive, data-driven planning

The North American Electric Reliability Corporation (NERC) creates standards for the electric grid as well as enforces compliance for the bulk power system. NERC Standards coordinate resiliency and reliability, but the needs must also account for and include frontline, disadvantaged and tribal communities.

Transmission standards could also be improved to standardize equipment for plug and play interoperability, as well as conventionalize geographic information systems (GIS) to provide visualization of power outages to federal and state agencies to better depict planning for climate change disasters.[27]

To better account for resilience considerations, utilities will also have to adopt a holistic approach. Currently, planning exercises are disconnected from each other and since the power system is a network, the resilience of the whole system must be considered as a unit. An integrated approach that simultaneously considers both the resilience of individual assets and that of the system as a whole would be highly desirable. Despite challenges, my recommendation is to adopt interdisciplinary models that can simulate the behavior of the power system and its reaction to a natural disaster.[28]

Transmission infrastructure rights of ways weave across the country and over 17,000 miles on BLM land[29] and over 6000 on Forest Service public land.[30] As climate change affects the landscape of federal lands, it is the responsibility of the government to ensure effective management of our limited natural resources, protect wilderness and conservation sites, establish renewable energy sources and develop environmental regulation and public participation that includes climate justice.

As mentioned before, transmission right of ways are networked on many federal public lands and vegetation management is necessary to maintain reliability. A critical reliability standard is vegetation management of rights-of-ways. Tree contacts have caused many blackouts in the US and around the world. But there can be balance with certain pathways. Additional benefits of integrated vegetation management are the reduction of invasive species and the possibility of creating new pollinator or wildlife habitat, offering a considerable number of acres in the form of right-of-way corridors in new habitat across the US These corridors can also serve an important role in providing transition landscape for several species, promoting biological diversity while reducing habitat fragmentation.[31] Conducting an inclusive costs benefit analysis of various land use factors can provide a better understanding of hardening of grid.

Costs for transmission right-of-way leases can also change. Landowners who host wind turbines receive annual land lease payments, but payments for a transmission line right of way are typically one-time

27 US National Rural Electric Cooperative Association uses the Los Alamos tool online to see what upgrades it recommends for their systems.
28 https://openknowledge.worldbank.org/bitstream/handle/10986/31910/Stronger-Power-Improving-Power-Sector-Resilience-to-Natural-Hazards.pdf?sequence=1&isAllowed=y
29 https://www.blm.gov/programs/lands-and-realty/rights-of-way/electric-power-lines
30 https://www.govinfo.gov/content/pkg/CHRG-113hhrg87850/html/CHRG-113hhrg87850.htm
31 Benefits of Integrated Vegetation Management (IVM) on Rights-of-Way." US Environmental Protection Agency, Pesticide Environmental Stewardship Program, Nov. 4, 2016. epa.gov/pesp/benefitsintegrated-vegetation-management-ivm-rights-way. Accessed June 2019.

sums that are much smaller in comparison. Utilities and developers can form new models providing benefits to communities near transmission projects.[32]

Asking the right questions is key and listening to the diverse answers is critical. Some groups would say in the California Central Valley, decarbonizing residential fuel combustion (such as wood-burning stoves and fireplaces) and diesel-powered transportation is more urgent than installing rooftop solar for improved air quality. The California Energy Commission (CEC) helped fund microgrids to strengthen the energy resilience of communities in the Central Valley and supporting energy infrastructure, especially in low-income areas affected by PG&E public safety power shutoffs.

Electrical grid reliability and outages can have a significant impact on the health and safety of customers, especially in regions affected by extreme heat and in need of cooling and in low-income and disadvantaged communities. State policy makers are asking for additional data in utility integrated resource plans, but more has to be done to address the climate gap especially since high energy bills relative to income may drive low-income households to make do with insufficient heating or cooling, which can increase the incidence of asthma, especially in children.[33]

A robust and efficient transmission system will be essential to reap the benefits of renewable energy resources. Planners should aim not just for the immediate needs of the transmission grid but take a long-term view of the changing electric power sector. Utilities and transmission developers must work to change the process for designing and constructing grid projects, employing approaches and techniques that will lead to increased satisfaction for all stakeholders and improved impact mitigation that provide Just and Equitable outcomes for each community.

Enhance Data Access and Modeling

The US Department of Energy deployed hundreds of phasor measurement units to measure the electricity flow on the wires in real time. This data is immense, and many universities and labs have started to study the plethora of information.

Transmission and distribution phasor measurement units (PMU) provide an unprecedented ability to compare time-stamped, synchronized measurements of voltage and current magnitudes and phase angles. This data, in conjunction with new and existing distribution-grid planning and operational tools, is expected to enable better model validation, event detection and location, and renewable resource and load characterization, among other applications. Adjunct Professor Alexandra von Meier is researching and using PMU data to define a nimble and resilient electricity infrastructure to support a carbon-neutral energy sector.[34]

Smart grids and advanced metering infrastructure both improve situational awareness and facilitate rapid restoration of service. PMUs have averted widespread blackouts even in normal operations. They rapidly assess and report the state of the transmission network, and, when employed in wide-area

[32] Using underground lines can improve resilience of the grid, as they are shielded from the elements of nature. However, burying overhead wires costs $300,000 to - $1,250,000 per kilometer (compared to $80,000-$240,000 for above ground wires).[32] The per-mile cost of HVDC projects ranges between $1.17 million and $8.62 million per mile, according to a review of recent proposals and relevant regulatory filings.[32] Additionally, underground wires take longer to restore in the event of a fault, and repair costs are also higher. The advantages therefore need to be balanced carefully against the disadvantages of siting transmission above or below ground and usually in rights of ways with existing corridors.

[33] Based on a 2016 study by Drehobl and Ross. https://www.aceee.org/sites/default/files/publications/researchreports/u1602.pdf

[34] https://onlinelibrary.wiley.com/doi/abs/10.1002/9781118755471.sgd087

monitoring systems, automatically react to changes in the network. The information from PMUs and other intelligent electronic devices helps improve grid performance and resilience, and is vital to system operators, who are otherwise blind to rapid changes in the power system.[35]

Another type of automation, created at Texas A&M, relies on sensors at substations — facilities where high-voltage lines that travel long distances meet low-voltage lines that weave through neighborhoods. These sensors monitor how electricity is flowing through power lines connected to the substation. These electrical signals also contain clues about where problems are — sometimes down to the exact location on an individual power line.[36]

One key challenge is data recording is rapidly outstripping the processing capabilities of standard planning and operational tools. Continuous innovation is a must as we work to improve situational awareness and gain a deeper understanding of the physics of the electric grid. The ability to launch new technologies and digitization, and capabilities in hybrid technologies and storage to counteract intermittency as well as new tower designs with AC/DC bi-poles is important in current research, development and deployment. Digital tools and skills will be key to competitiveness along the asset life cycle of clean energy tools and infrastructure, from site identification to project compilation.[37] Making the data available to more diverse students can broaden insight into better grid planning.

Bilateral Contracts Obscurity

There is an unfortunate lack of access to the actual numbers of megawatts moved around the grid through bilateral contracts. Gaining access to this data would provide numerous benefits to planning, operation and resilience measures for the grid.

As the resource portfolio in the western interconnection evolves into the 2030s, the need for transmission becomes more obvious and resources will face transmission constraints. Increased transparency with bilateral contracts is needed to better understand resource adequacy on the system and adjust for flexibility. Having more access to information will decrease the pressure to lean on frontline and disadvantaged communities who are continually exploited by fossil fuels.

The use of bilateral contracts and electric transfers via transmission lines are likely to increase in the coming years and such economic transfers are one of the most effective tools to for increasing system flexibility. Open and coordinated power markets help make these transactions more efficient in the short term.[38] Currently, lack of grid flexibility is leading to more and more curtailment, a reduction in generation output, which often impacts renewable energy first due to the variability of these resources across a region and constraints such as limited transmission capacity. Decreasing curtailment would infuse the grid and electric markets with more low-cost renewable energy while improving revenue for generators—a key concern in the initial planning of projects.[39]

35 The GridWise Alliance 2013; White House 2013.
36 https://www.sciencenews.org/article/u-s-power-grid-desperately-needs-upgrades-handle-climate-change
37 https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/rethinking-the-renewable-strategy-for-an-age-of-global-competition#
38 https://westernenergyboard.org/wp-content/uploads/2019/12/12-10-19-ES-WIEB-Western-Flexibility-Assessment-Final-Report.pdf
39 Denholm, Paul, et al. "On the Path to SunShot: Emerging Issues and Challenges in Integrating High Levels of Solar into the Electrical Generation and Transmission System." National Renewable Energy Laboratory, US Department of Energy, May 2016, nrel.gov/docs/fy16osti/65800.pdf. Accessed June 2019.

FERC, Regional Transmission Organizations and states should provide a more supportive policy environment for the types of bilateral contracts that are most beneficial to developing healthy, competitive electricity markets. [40]

Non-Wires Alternatives

When transmission cannot be upgraded or built, then non-wires solutions can assist grid reliability. Outlined in federal and state policies non-transmission alternatives (e.g., demand-side management, distributed generation, conservation, and energy efficiency) are also considered during the local and regional transmission planning process; however, despite these efforts, new transmission will enable renewable energy development. Education and outreach are part of early adaption of non-wires solutions. For example, increasing access to rooftop solar for low-income customers can reduce energy burden, if energy use coincides with periods of sunshine or rooftop solar is combined with energy storage that can be discharged after the sun sets. Sometimes a non-wire alternative like storage can assist with keeping clean power on the system longer. Especially if the storage can provide short and/or long duration storage. This energy can then be used on the distribution or transmission system.

Transmission and distribution planning should account for the growing penetration of behind-the-meter resources and energy efficient appliances and buildings,[41] and the willingness of customers to reduce electricity consumption during peak electricity demand. There are many black and brown communities who pay higher rates for energy than wealthier neighborhoods and cannot afford EV or solar.[42]

Inclusive "Smart from the Start" Siting

There is a significant value in incorporating environmental justice, cultural and environmental awareness information upfront in the transmission planning process, which provides a range of optionality to reduce the potential for conflict during siting, permitting, and construction.

My colleague Jennie Chen outlined that the National Environmental Protect Act (NEPA) and federal permitting requirements are important components of "smart from the start" planning in her 2019 Congressional testimony.[43] Smart from the Start enables utilities and developers to anticipate potential issues with prospective construction sites and consider a multitude of alternatives while engaging affected communities early in the process. She shared the following principles outlined by Carl Zichella and Johnathan Hladik[44]:

- Consult stakeholders early and involve them in planning, zoning and siting.
- Close collaboration with tribal, state, and local governments is critical, and robust public engagement is essential for the credibility of the siting, permitting, and review process.
- Use geospatial information to categorize the risk of resource conflicts.
- Avoid land and wildlife conservation and cultural resource conflicts and prioritize development in previously disturbed areas (use WECC environmental data viewer tool).[45]

40 http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.179.1344&rep=rep1&type=pdf
41 https://www.nrdc.org/experts/lara-ettenson/everyone-can-benefit-electric-homes-heres-how-0
42 https://www.americanprogress.org/issues/race/reports/2018/02/21/447051/systematic-inequality/
43 https://energycommerce.house.gov/sites/democrats.energycommerce.house.gov/files/documents/Testimony-Chen-EP-Hrg-on-State-of-the-Nation%E2%80%99s-Energy-Infrastructure-2018-02-27.pdf
44 Carl Zichella and Johnathan Hladik, Siting: Finding a Home for Renewable Energy and Transmission. http://americaspowerplan.com/siting/.
45 https://www.arcgis.com/apps/webappviewer/index.html?id=658e57d6a5d1450fac532c0110172d62

- Incentivize resource zone development with priority approvals and access to transmission. Consider renewable energy zones or development sites that optimize the use of the grid. Maximize the use of existing infrastructure.
- Where zoning is not feasible (as in much of the Eastern Interconnection), use siting criteria based on these principles.

I would add:

- Agencies and legislatures can streamline and clarify the text of laws to make requirements more understandable, reduce paperwork burdens by providing for e-filing and approval, and have multiple agencies that administer similar requirements jointly approve projects.[46]
- Address and include Climate Gap criteria.

As outlined in the Statement of Principles for Environmental Justice[47] mandates the right to ethical, balanced and responsible uses of land and renewable resources in the interest of a sustainable planet for humans and other living things, and to prevent disproportionate shares of polluting projects from being sited in vulnerable communities. The exiting NEPA process should be strengthened to expand opportunities for public involvement in the federal decision-making process.

1. 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.
2. 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.
3. 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.

Policymakers must craft effective solutions that cut across diverse policy areas and address region-specific climate change impacts.

Over the last 20 years the grid has changed dramatically as clean energy has been integrated. We have amazing grid operators who help keep the lights on and balance the system intricacies, but we must transition to a new system. As we plan for a better clean energy future, we will not make the mistakes of the past- disenfranchising brown and black people and their communities.

[46] For example, renewable energy developers building generation or transmission in wet areas typically must obtain state approval for dredging and filling in wetlands in addition to a federal dredge and fill permit issued by the Army Corps of Engineers. When the state and Corps join forces and allow for one submission of project data to the state and the Corps and jointly process permit applications, this can save time and resources (US Army Corps of Engineers n.d.). Oregon follows a similar joint permitting process for wind energy under a Memorandum of Understanding between the Oregon Energy Facility Siting Council and the Bureau of Land Management[5] (US Department of the Interior, Oregon State Office 2009). As well as *Governor Andrew Cuomo proposed all of these steps in the Accelerated Renewable Energy Growth and Community Benefit Act in February 2020, arguing that this expedited review will be necessary to meet New York's aggressive climate goals (Governor Andrew Cuomo 2020). Specifically, he proposed to "consolidate the environmental review and permitting of major renewable energy facilities to provide a single forum" for reviewing large environmental projects.*

[47] http://www.energyjustice.net/files/ej/energy-ej.pdf

Public Lands and Coordinated Policymakers

The International Panel on Climate Change report[48] emphasizes how important it is to balance multiple public goods in land use planning—food security, environmentally responsible renewable energy development to fight climate change, and conservation of large, intact landscapes for multiple benefits, including their ability to sequester carbon.

The Bureau of Land Management, steward of millions of acres of public lands in the West is charged with implementing innovative programs including the West Wide Energy Corridors, the Western Solar Plan (as well as the Wind and Solar Land Leases) and the Desert Renewable Energy Conservation Plan.

All energy sources have some impact on the environment—even renewables. Fortunately, as compared to fossil-fueled electricity, renewable energy has the potential to produce large amounts of clean electricity and reduce impacts on land, water, wildlife, human health and climate.[49] Incorporating nature at the outset of energy planning not only results in lower impacts to wildlife and habitat but improves energy planning so that new clean energy investments are directed to the places where they can be developed with more certainty. When clean energy can be sourced across a larger area, there are more cost-effective opportunities to create balanced solutions for clean energy and land conservation.[50]

Transmission is a long-lived investment, and it would be prudent to account for public policies that drive changes in the energy resources we use to power the grid. Planning should account for modern transmission technologies and other ways to increase the capacity on the system, reduce energy loss, and maximize the use of existing lines and rights of way. The federal agencies need to continue to work together to ensure this criteria is incorporated into updated land use and resources management plans to ensure the inclusive public is receiving the greatest benefit.

A coordinated and guided development approach to development on public lands should identify areas with low natural resource values, high renewables potential, and needed infrastructure like transmission are suitable for development. By guiding projects to zones, the agencies can ensure that transmission and renewable energy projects are built faster, with community involvement, less expensive and better for the environment, developers and customers.

West-wide energy corridors are considered preferred locations for energy transport projects on lands managed by the BLM, US Forest Service. When I worked on the Section 368(a) of the Energy Policy Act of 2005 (EPAct), interagency plan the National Park Service, the US Fish and Wildlife Service, the US Department of Defense, and US Department of Agriculture (US Forest Service) and the US Office of Minerals were also working together to adjust land use and resource plans. It was a first of its kind report, and it was not perfect but a good start. Federal agencies need to increase public comment periods, conduct various types of public hearings for greater accessibility, and translate information about proposed projects.

The lessons learned focused on how to deal with conflicting interests, control, access and protection as well as a lack of knowledge in certain areas. The agencies were able to get past the infighting of mission creep and cross purpose goals to meet the underlined principle – “what is best for the American

48 https://www.ipcc.ch/
49 https://www.scienceforconservation.org/assets/downloads/Technical_Report_Power_of_Place.pdf
50 https://www.nature.org/en-us/about-us/where-we-work/united-states/california/stories-in-california/clean-energy/

people." However, at the time we naively did not consider the diversity of communities and resources available. Our knowledge was limited, and we didn't seek more and that is a great fault, and now the need for the process to change for the better is beginning.

Key Changes for the Grid

All planning must be undertaken with Just and Equitable transition in mind and these key principles:

- **Create access to capacity data, planning tools, and new models**
- **Coordinate state, regional and inter-regional transmission planning**
- **Improve federal resource planning and coordination**

Many of these challenges will require the government, industry, policymakers, regulators, developers, advocates and stakeholders to rethink traditional approaches to projects, whether that be the design phase of a project, conducting community outreach, or the actual construction of a line. But, implementing changes in the development process presents opportunities for transmission lines to be routed and built in ways that better consider the needs and desires of local stakeholders.[51]

Policymakers can support economic security, protect communities from the brunt of climate change impacts, and improve the availability, quality, and accessibility of affordable clean energy in frontline communities.

Congress needs to:

1) Direct BLM/USFS/USDOE to publish final West-Wide Energy Corridor Study and begin a new wind and solar study.
2) Direct all federal agencies to implement EJ policies and include in holistic transmission and distribution planning.
3) Direct all federal land agencies to create criteria protecting tribal, low income, frontline and disadvantaged communities from green gentrification.

"Climate change does not affect everyone equally in the United States," according to Rachel Morello-Frosch, lead author of The Climate Gap, "People of color and the poor will be hurt the most – unless elected officials and other policymakers intervene." [52] Climate change mitigation efforts must consciously protect low-income communities from "green gentrification."

Thank you for the opportunity to testify, and I look forward to your questions and working together to solve the inequities of the grid.

[51] https://www.cfra.org/sites/www.cfra.org/files/publications/CapacityForChange.pdf
[52] https://dornsife.usc.edu/pere/climategap/