

Tools for Building a Better Grid

February 24, 2022

Stay tuned...we will begin at 11:00 AM ET



Tools for Building a Better Grid

February 24, 2022

11:00 AM - 1:00 PM ET

Building a Better Grid Initiative

Building a Better Grid will support the development of nationally significant transmission projects and grid upgrades by:

- **Engaging and collaborating early** with states, tribal nations, and stakeholders to accelerate transmission deployment.
- **Enhancing transmission planning to identify areas of greatest need** such as high-priority national transmission needs and conducting longer-term national-scale transmission planning analysis.
- **Deploying more than \$20 billion in federal financing tools**, including through the Bipartisan Infrastructure Law's new \$2.5 billion Transmission Facilitation Program, \$3 billion expansion of the Smart Grid Investment Grant Program, and more than \$10 billion in grants for states, Tribes, and utilities to enhance grid resilience and prevent power outages, and through existing tools, including the more than \$3 billion Western Area Power Administration Transmission Infrastructure Program, and a number of loan guarantee programs through the Loan Programs Office.
- **Facilitating an efficient transmission permitting process** by coordinating with federal agencies to streamline permitting, using public private partnerships, and designating corridors.
- **Performing transmission-related research and development** to continue developing and reducing the costs of technologies that enable the transmission system to be used more efficiently.

Jennifer M. Granholm

Secretary of Energy



Welcome and Housekeeping

Questions?

If you have technical questions – please put them in the chat box for the host.

Please submit your questions in the Q&A box.
Reference the speaker or topic.

Alejandro Moreno

Deputy Assistant Secretary,
Office of Energy Efficiency and
Renewable Energy



Clean Energy Generation and our Grid

Alejandro Moreno, Deputy Assistant Secretary for Renewable Power



Goals and mission

▶ EERE MISSION

Our mission is to drive the research, development, demonstration and deployment of innovative technologies, systems, and practices that will put America on an irreversible path to:

- **Achieve a carbon-free electricity sector by 2035; and**
- **Equitably transition America to net-zero greenhouse gas emissions economy-wide by no later than 2050**

▶ KEYS TO ENSURE THE GREATEST IMPACT



Environmental and Energy Justice



Workforce Development



Diversity in STEM



State and Local Partnerships

PRIORITIES

100% decarbonized electric grid by 2035

Decarbonize energy intensive industries

Decarbonize transportation across all modes

Reduce the carbon footprint of buildings

Enable a net-zero agricultural sector

Renewable Power

Office of Renewable Power
EE-4
Alejandro Moreno
Deputy Assistant Secretary

**Solar Energy Technologies Office
(SETO)**
EE-4S
Garrett Nilsen, *Acting Director*

**Geothermal Technologies Office
(GTO)**
EE-4G
Dr. Susan G. Hamm, *Director*

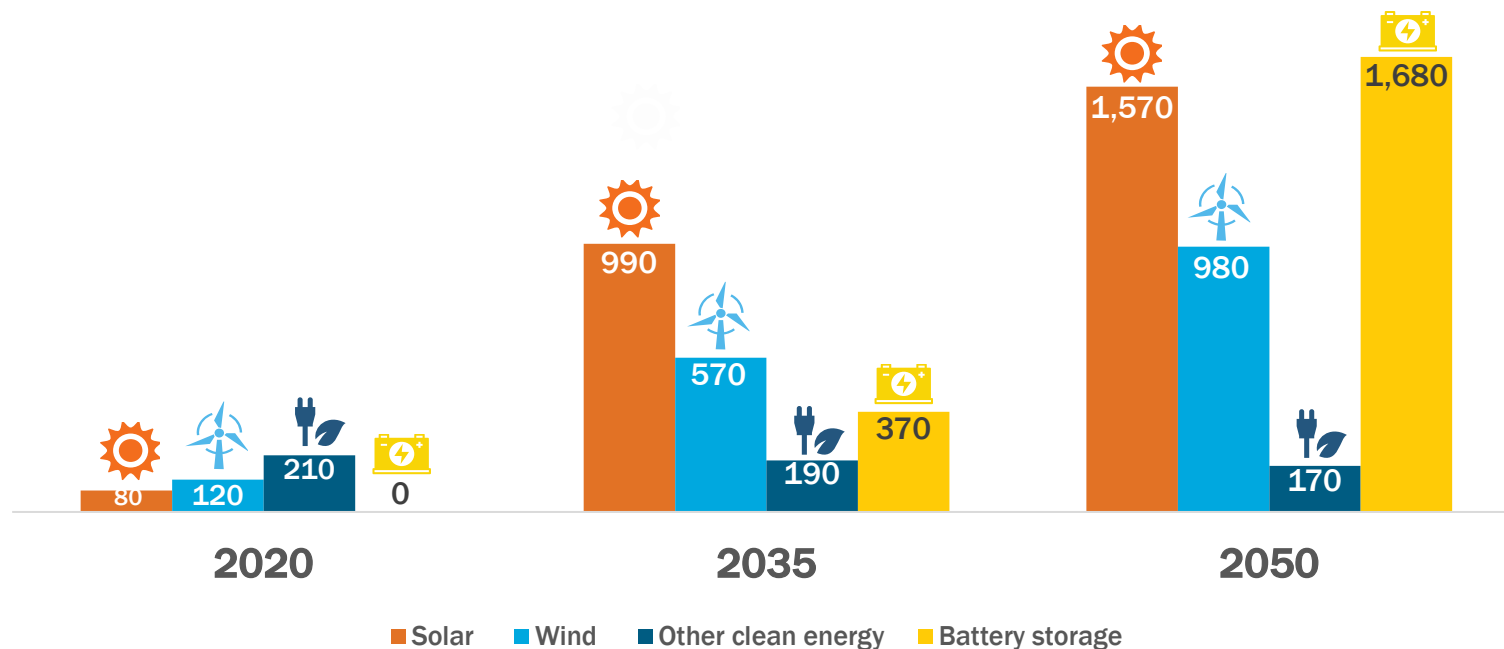
**Wind Energy
Technologies Office (WETO)**
EE-4WE
Dr. Bob Marlay, *Director*

**Water Power
Technologies Office (WPTO)**
EE-4WP
Jenn Garson, *Acting Director*

Grid Modernization Initiative (GMI)
Kevin Lynn, *Lead*

We need a lot of clean energy to meet our goals

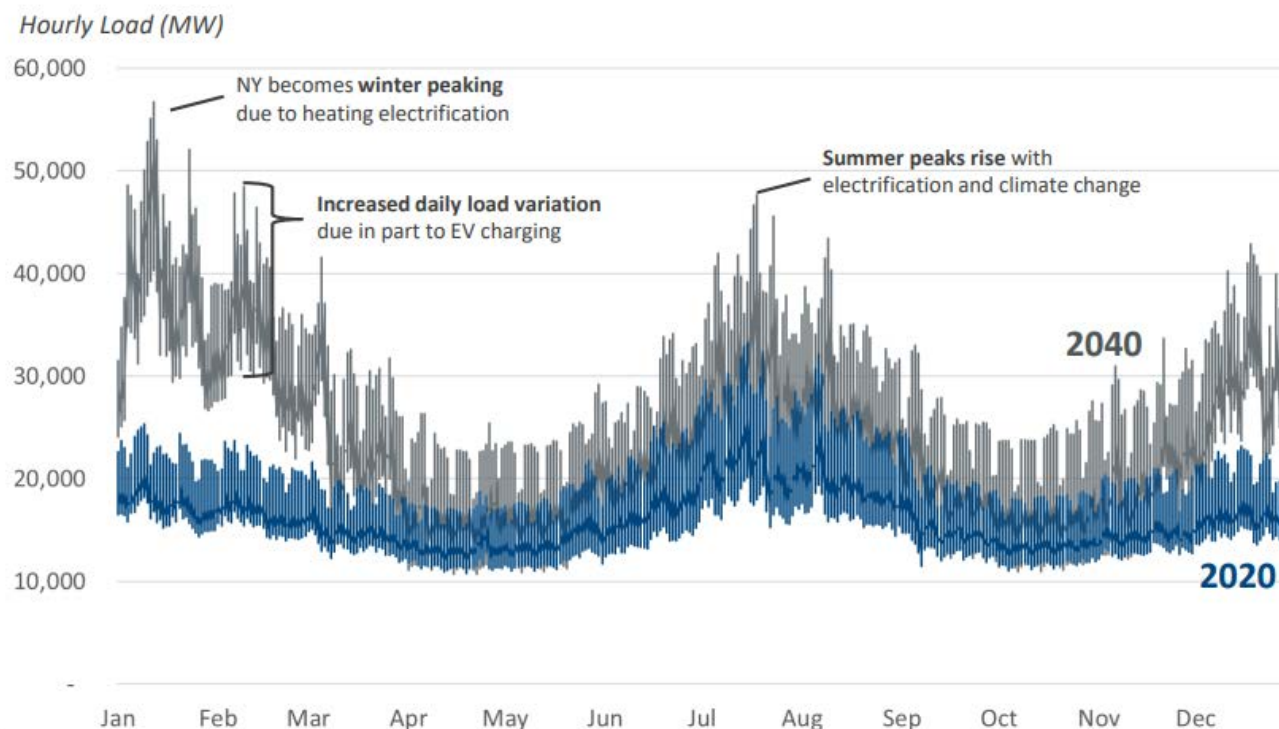
One example scenario from the NREL Solar Futures Study:
RE capacity to achieve ~95% decarbonization by 2050



Other clean energy is biomass, geothermal, hydropower including pumped storage, and nuclear

Electrification will increase and shift peak demand

**Now the highest grid demand peaks are on summer afternoons.
With building electrification, the demand peaks on winter mornings will be even higher**



Source: NYISO modeling

EERE work to scale up power generation

RDD&D efforts in solar, wind, water, and geothermal power to help **reduce the costs** and accelerate the use and **integration of renewables** in a **reliable, secure, and resilient grid**.



**Accelerate
Deployment**

Enable widespread adoption of existing technologies



**Sustain Cost
Reductions**

Ensure RE is a least-cost option across the country



**Increase Resource
Flexibility &
Diversity**

Maximize flexibility and reliability of generation & load

(Joint with OE)



**Support a
Modernized
Grid**

Optimize grid infrastructure & mgmt. to an RE-led system, through:



**Support U.S.
manufacturing
and secure supply
chains**

Ensure renewable energy technologies benefit workers and communities

Grid Modernization Initiative

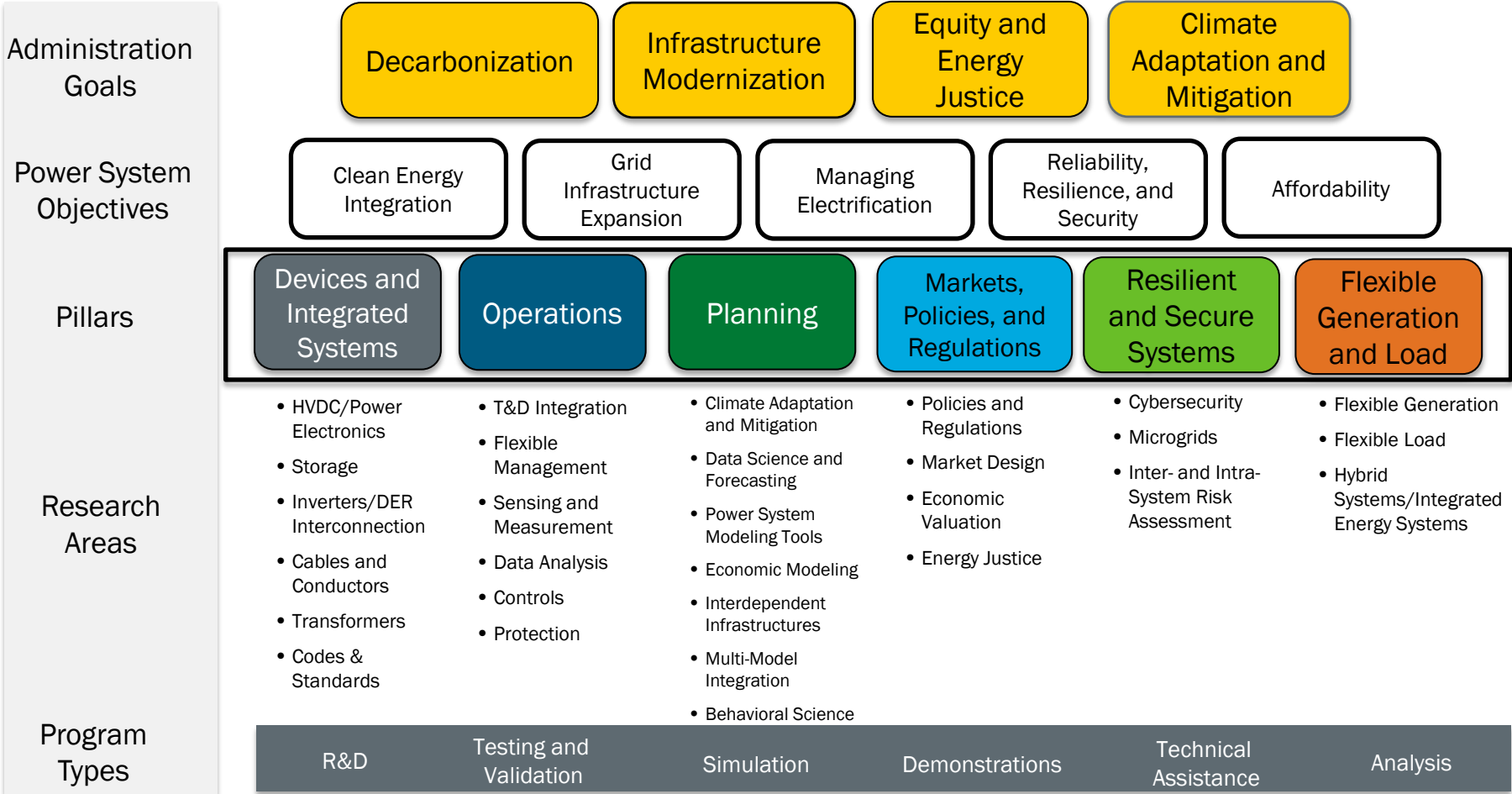
In order to support economy-wide needs, the electricity system must be designed and operated to ensure:


- Renewable Energy Integration:** reliable operation with high-levels of variable, power electronics-based generation
- Grid Infrastructure Expansion:** new infrastructure to deliver electricity across distance and enable system-wide flexibility
- Widespread Electrification:** the rapid accommodation of major new sources of demand from transportation and industry
- Resilience and Security:** continued operation in the face of emerging threats, and fast recovery and limited losses from outages



- Full Economy Decarbonization
- Modern, Affordable Infrastructure
- Climate Adaptation and Mitigation
- Equity and Energy Justice

The Grid Modernization Initiative (GMI) Strategy





DOE works together to ensure the integration of renewable resources as part of a reliable, secure, and resilient grid.

EERE Points of Contact

Principal Deputy Assistant Secretary

Kelly Speakes-Backman: kelly.speakes-backman@ee.doe.gov

Deputy Assistant Secretary for Energy Efficiency

Carolyn Snyder: Carolyn.snyder@ee.doe.gov

Deputy Assistant Secretary for Renewable Power

Alejandro Moreno: alejandro.moreno@ee.doe.gov

Deputy Assistant Secretary for Sustainable Transportation

Michael Berube: michael.berube@ee.doe.gov



Questions?

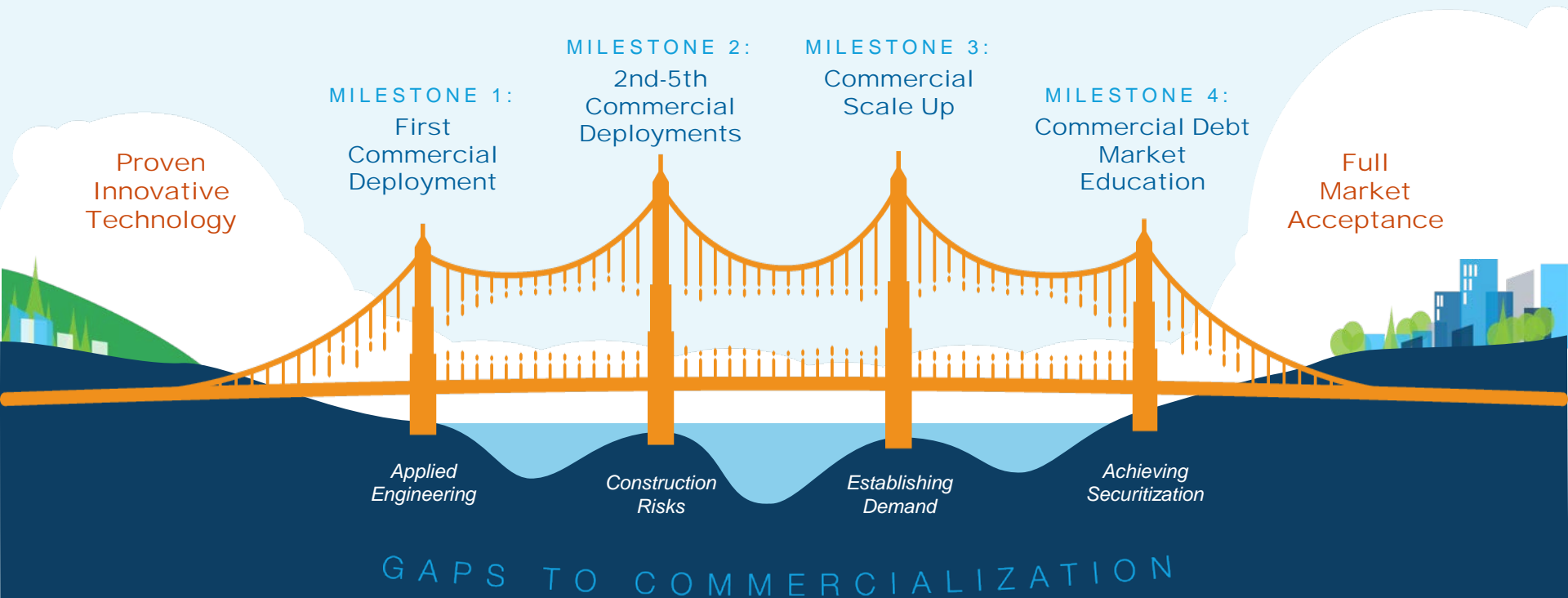
Jigar Shah

Loan Program Office



Bridge to Bankability

DEPLOYMENT MILESTONES



LPO can provide access to capital for innovative technologies along all milestones to reaching full market acceptance, overcoming key barriers to bankability.



Questions?

Erin Green

Attorney-Advisor,
Western Area Power
Administration





Investing in the Stronger Grid of the Future

Western Area Power Administration Transmission Infrastructure Program

Feb. 24, 2022

Erin Green, Attorney-Advisor

\$3.25 Billion Loan Authority

The Transmission Infrastructure Program (TIP) manages WAPA's \$3.25 Billion revolving loan program[†]. A unique federal financing program, TIP has as its core a congressional mandate supporting the development of projects that facilitate and optimize the delivery of reliable, affordable power generated by clean energy resources.

Statutory Eligibility Criteria

- Has one terminus within WAPA's 15-state service territory
- Facilitates the delivery of renewables
- Demonstrates reasonable expectation of repayment
- Will not adversely impact transmission system reliability or operations
- Is found to be in the public interest

[†] Section 301 of the Hoover Plant Act of 1984, Pub. L. No. 98-381, as amended by Section 402 of the American Recovery and Reinvestment Act of 2009 (Pub. L. No. 111-5). 42 U.S.C. § 16421a.

Program Assistance Available



Financing

Eligible construction-ready projects may apply to TIP to borrow capital to construct new or upgrade existing grid infrastructure



Project Development

Prior to a loan application, eligible projects can request technical assistance on typical development activities. Applicants provide advance funding to cover costs.



Benefits to Infrastructure Investor Developers

- WAPA can assist to navigate complex world of NEPA and other siting, permitting requirements, often acting as lead or cooperating agency
- WAPA a valued partner by offering knowledgeable financial and utility sector risk mitigation during development and construction and favorable costs of debt
- Investors leverage WAPA's project development knowledge, *e.g.*, engineering and path rating work, interconnection expertise, financial and risk analysis specific to infrastructure, stakeholder engagement and navigating commercial market challenges





Contact Information

Paul Schwabe

Senior VP & Transmission
Infrastructure Program
Manager
720-962-7710
schwabe@wapa.gov

Roman Fontes

Senior Investment Officer
720-962-7715
fontes@wapa.gov

Stacey Harris

Project Manager
720-962-7714
sharris@wapa.gov

E-mail: TIP@wapa.gov

Phone: 720.962.7710

Webpage:

www.wapa.gov/transmission/TIP



Questions?



Patricia Hoffman

Acting Assistant Secretary,
Office of Electricity



Michael Pesin

Deputy Assistant Secretary, Advanced
Grid Research and Development,
Office of Electricity



Michelle Manary

Acting Deputy Assistant Secretary,
Energy Resilience Division,
Office of Electricity

Patricia Hoffman

Acting Assistant Secretary,
Office of Electricity



Infrastructure Investment and Jobs Act (IIJA): Grid Provisions

Section	Program	Funding
40101	Preventing Outages and Enhancing the Resilience of the Electric Grid / Hazard Hardening	\$5.0B
40103(b)	Program Upgrading Our Electric Grid and Ensuring Reliability and Resiliency	\$5.0B
40107	Deployment of Technologies to Enhance Grid Flexibility	\$3.0B

Preventing Outages and Enhancing the Resilience of the Electric Grid (Grid Hardening Grants)

\$5 Billion (\$1 Billion per year) for FY 2022–2026

- Half to states via a formula grant
 - 15% cost share; can be passed thru to industry (must match grant)
- Half to industry via a competitive solicitation
 - Small utility set aside of 30%
 - Industry must match grants; Capped at the amount the eligible entity has spent in the previous 3 years on hardening efforts
- Guidance/Allowance regarding technical assistance

Grants for supplemental hardening activities to reduce risks of power lines causing wildfires and the likelihood and consequence of impacts to the electric grid due to extreme weather, wildfires, and natural disasters.

No new generation or cybersecurity activities authorized.

Program Upgrading Our Electric Grid and Ensuring Reliability and Resiliency (Grid Resilience Demos)

\$5 Billion (\$1 Billion per year) for FY 2022–2026

- Demonstrate innovative approaches to transmission, storage, and distribution infrastructure to harden and enhance resilience and reliability; and
- Demonstrate new approaches to enhance regional grid resilience, implemented through States by public and rural electric cooperative entities on a cost-shared basis.

Eligible entities:

- a State;
- a combination of 2 or more States;
- an Indian Tribe;
- a unit of local government;
- a public utility commission

Deployment of Technologies to Enhance Grid Flexibility (Smart Grid Grants)

Provides \$3.0B (\$600M per year) for FY 2022–2026 for Smart Grid Investment Matching Grants (SGIG)

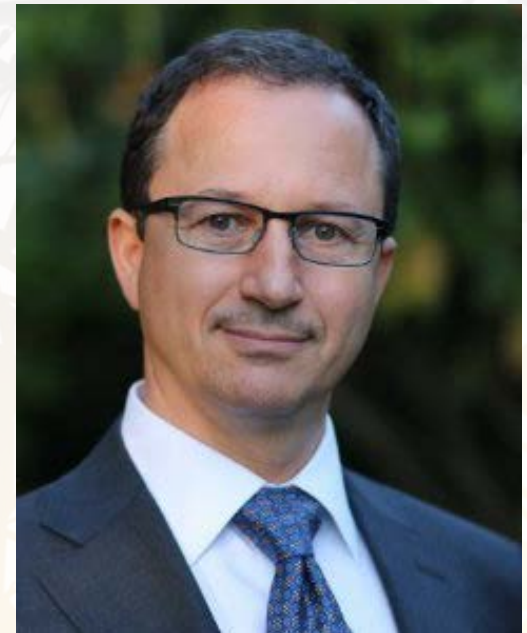
- Competitive Solicitation
- Industry must match investments

Section 40107 amends the SGIG program to additionally support:

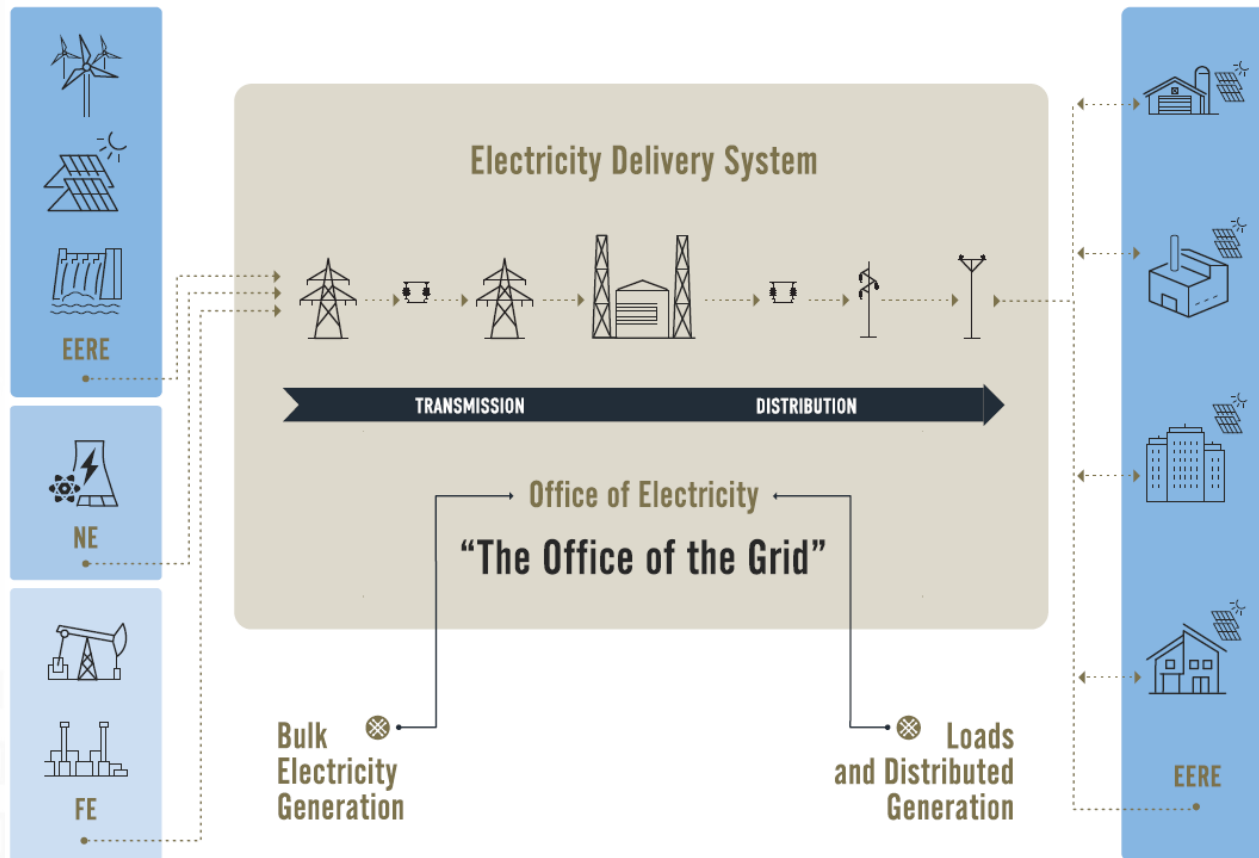
- Data analytics enabling software smart grid functions
- Building devices and software supporting demand flexibility and smart grid functions
- Operational fiber and wireless broadband communications networks enabling data flow between distribution system components
- Advanced transmission technologies, including dynamic line rating, flow control devices, advanced conductors, and network topology optimization, to increase the operational transfer capacity transmission networks

Michael Pesin

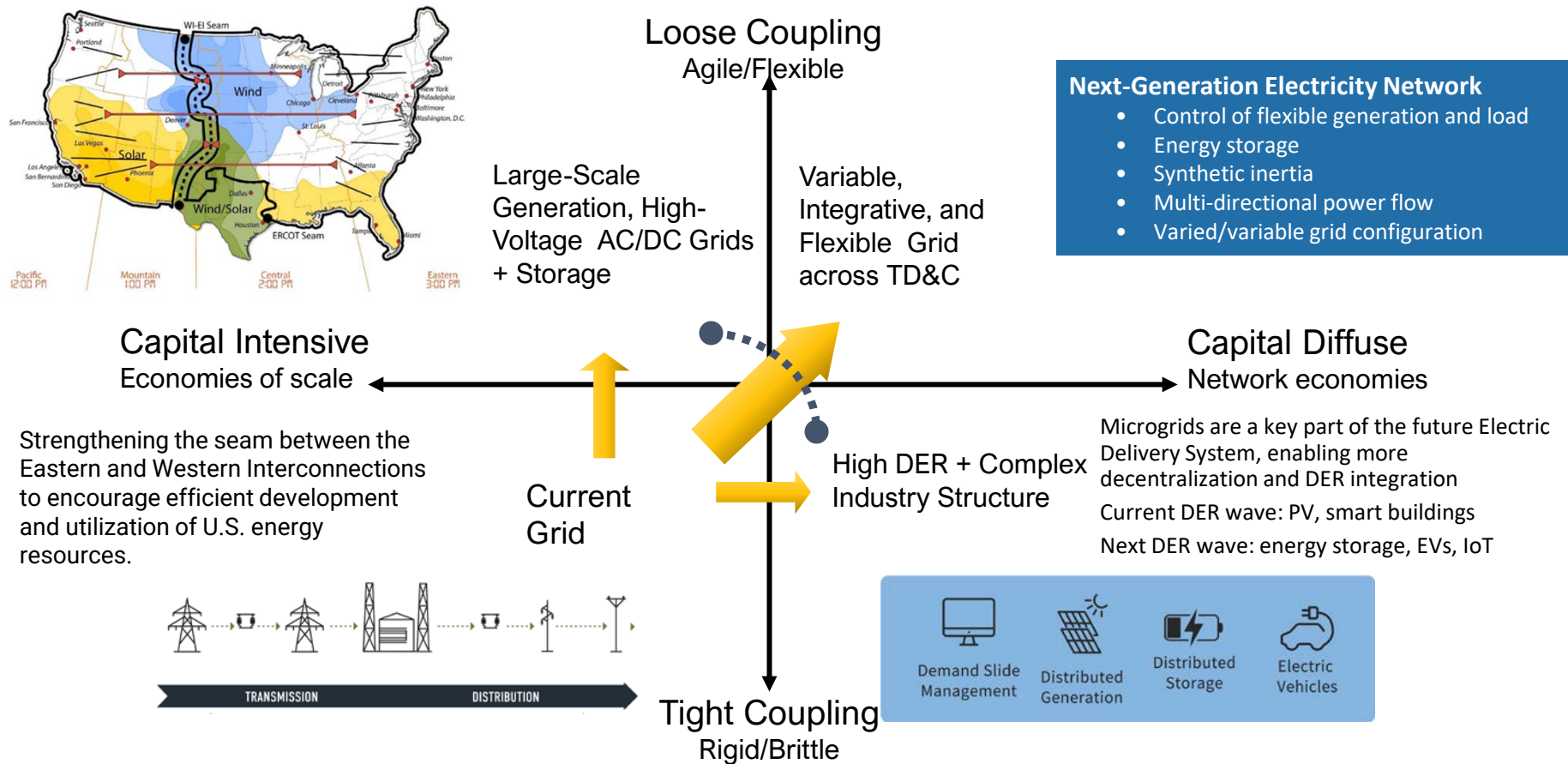
Deputy Assistant Secretary,
Advanced Grid R&D Division,
Office of Electricity

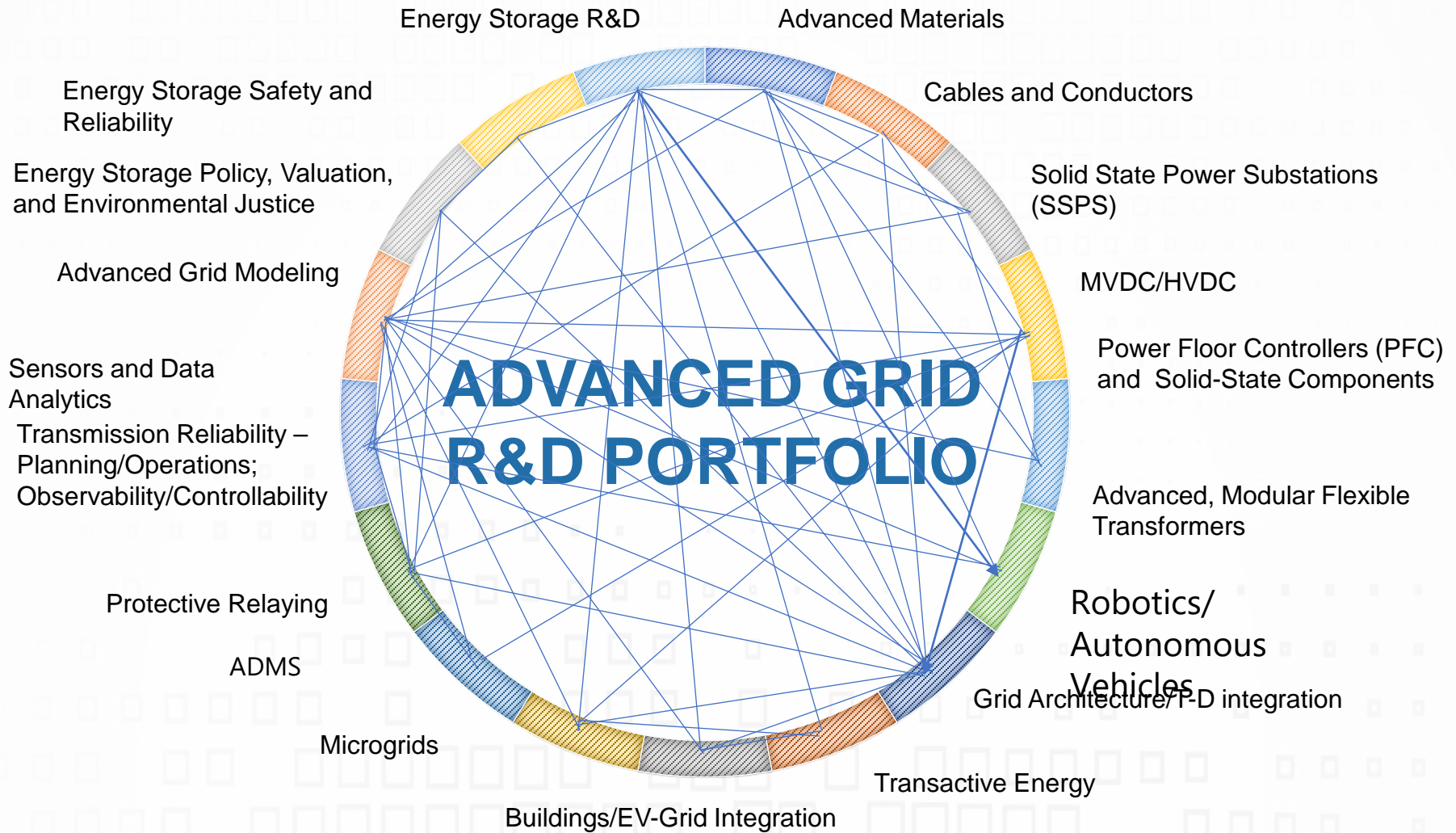


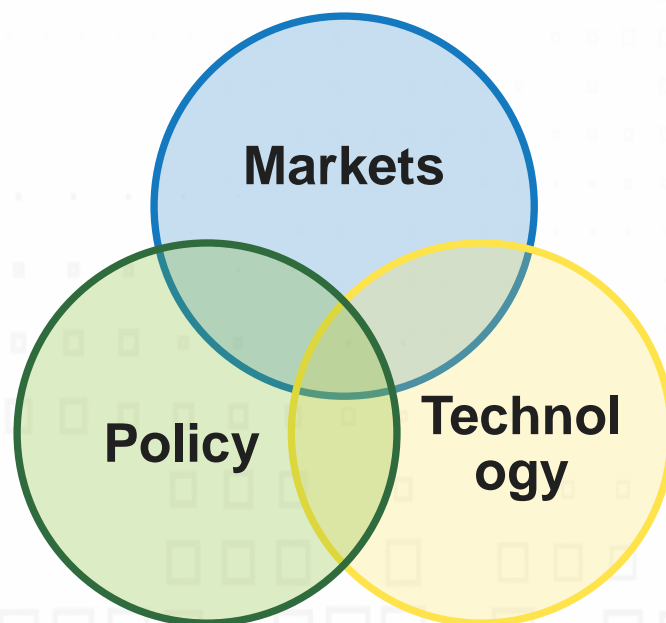
The Office of the Grid



Grid Trajectory Considerations







Michelle Manary

Acting Deputy Assistant Secretary,
Electricity Delivery Division,
Office of Electricity



Transmission Facilitation Program (IIJA section 40106)

\$2.5B revolving fund to facilitate development of eligible projects:

- New or replacement high-capacity transmission lines
- Increasing capacity of existing lines
- Connecting isolated microgrids in AK, HI, and U.S. territories

Three tools:

Anchor customer: DOE can purchase capacity, to be resold once a project's financial viability has been demonstrated

- Up to 50% of a project's planned capacity
- Terms of up to 40 years

Loans: DOE can make loans to carry out eligible projects

Public Private Partnership: DOE can participate in designing, developing, constructing, operating, maintaining, or owning an eligible project:

- In a Transmission Corridor or necessary to accommodate electricity capacity demand increase across multiple States or transmission planning regions, among other criteria
- Can overcome state siting/permitting obstacles
- Can use contributed funds from project developers

Transmission Needs Study and Designation of NIETCs

IIJA directed DOE to conduct assessments of:
historic and anticipated transmission capacity constraints and congestion
at least every three years
in consultation with States and Indian Tribes

- National Electric **Transmission Needs Study** consultation draft aiming to be published summer 2022
- Replaces the former National Electric Transmission Congestion Study
- Based on findings, the Secretary may designate specific geographic areas as National Interest Electric Transmission Corridors (“NIETCs” or “National Corridors”)

National Transmission Planning Study

Objectives

- Interregional transmission to accelerate decarbonization
- Complement existing processes
- Help prioritize DOE funding for infrastructure support

Stakeholder Engagement

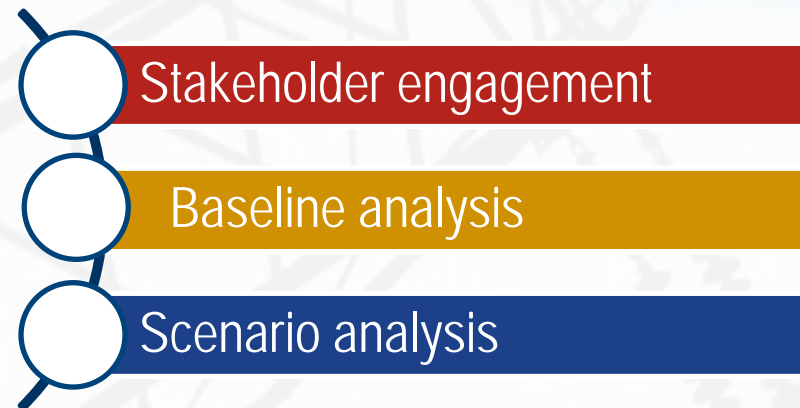
- National webinars
- Technical Review Committee
- Existing Convener Groups

Baseline Analysis

- How much decarbonization does currently-planned 2030 system achieve?
- What about 2030 TX system with high renewable integration?

Scenario Analysis

- Different ways system might evolve over next 30 years?
- Which investment options are least-regrets?



Offshore Wind Transmission

DOE is partnering with the Bureau of Ocean Energy Management to identify challenges and recommend solutions to ensure sufficient transmission capacity to achieve the Administration's goal of deploying 30 GW of offshore wind by 2030.

DOE and BOEM propose leading a series of convening workshops to solicit feedback and inform an action plan likely focused on:

1. Recommendations for OSW transmission development, transmission planning and permitting policies
2. Efforts to maximize benefits to the onshore transmission system by considering solutions that will reduce congestion and support system interconnection inclusive of potential onshore transmission upgrades

Other Transmission Authorities

- Facilitate Interagency coordination and oversight procedures for infrastructure project reviews to improve early interagency consultation and collaboration throughout the environmental review and permitting process for **FAST-41** Compliance/Federal Permitting Improvement Steering Council (FPISC)
- Lead the Integrated Interagency Pre-Application (IIP) process for qualifying interstate transmission projects per section **216(h) of the Federal Power Act (FPA)**
- Authority to accept third-party financing to upgrade or build new transmission facilities in the Western Area Power Administration and Southwestern Power Administration footprint pursuant to section **1222 of the Energy Policy Act of 2005**



Questions?

Upcoming Events and Announcements

Resilient Power Grids: Strategically Undergrounding Powerlines

March 22, 2022 | 1:00 – 4:30 PM ET | Learn more and register at

energy.gov/oe/resilient-power-grids-strategically-undergrounding-powerlines

LPO Tech Talk

www.energy.gov/lpo/articles/lpo-tech-talk-transmission

EERE Funding Opportunities

<https://www.energy.gov/eere/funding/eere-funding-opportunities>

Contact Us

Energy Efficiency & Renewable Energy

Kelly Speakes-Backman, Principal Deputy
Assistant Secretary: kelly.speakes-backman@ee.doe.gov

Carolyn Snyder, Deputy Assistant Secretary for
Energy Efficiency: Carolyn.snyder@ee.doe.gov

Alejandro Moreno, Deputy Assistant Secretary
for Renewable Power:
alejandro.moreno@ee.doe.gov

Michael Berube, Deputy Assistant Secretary for
Sustainable Transportation:
michael.berube@ee.doe.gov

Loans Program Office

LPO@hq.doe.gov

Western Area Power Administration

TIP@wapa.gov

Office of Electricity

ElectricityDelivery@hq.doe.gov



Thank You!