GRID DEPLOYMENT OFFICE

Building a Better Grid: The Department of Energy's Grid Deployment Strategy

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DOE’s Grid Deployment Office

Mission Statement: The Grid Deployment Office (GDO) works to provide electricity to everyone, everywhere by maintaining and investing in critical generation facilities to ensure resource adequacy and improving and expanding transmission and distribution systems to ensure all communities have access to reliable, affordable electricity.

Generation Credits Division	The Generation Credits Division works with existing generation facilities to ensure resilience and reliability.
Transmission Division	The Transmission Division supports innovative efforts in transmission reliability and clean energy analysis and programs, and energy infrastructure and risk analysis in support of the Administration’s priorities to enhance grid resilience.
Grid Modernization Division	The Grid Modernization Division oversees activities that prevent outages and enhance the resilience of the electric grid.

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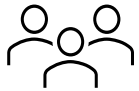
Building a Better Grid

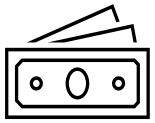


Engagement and Collaboration

- Federal agencies
- States
- Tribal Nations
- ISOs/RTOs
- Stakeholders

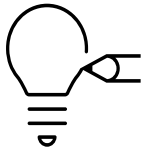
Enhanced Transmission Planning

- Transmission Needs Study
- National Transmission Planning Study
- Atlantic + Pacific Offshore Wind Transmission Studies



Federal Financing Tools (>$20B)

- Transmission Facilitation Program ($2.5B)
- Transmission Facility Financing ($2B)
- Grid resilience formula grants for states, tribes, and territories ($2.5B)
- Grid Resilience and Innovation Partnerships (GRIP) Program ($10.5B)



Transmission Permitting Process

- Improve federal permitting regimes with federal agency partners
- Public private partnerships
- Designation of national interest electric corridors
- Grants to siting authorities and affected communities ($760m)

Transmission Related R&D

- “Next generation” electricity delivery technologies
- Advanced Conductors/ Reconductoring
- Grid Enhancing Technologies

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Enhanced Transmission Planning: Transmission Needs Study

Overview of National Transmission Congestion Study

Federal Power Act §216(a) directs DOE to conduct assessments of:

historic transmission constraints and congestion

every three years

with consultation from States and regional grid entities

- Department's triennial **state of the grid report**
- Reviews historic industry data
- Previous studies published 2006, 2009, 2015, 2020 (draft)

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Overview of National Transmission ~~Congestion~~ Needs Study

as amended by Bipartisan Infrastructure Law

Federal Power Act §216(a) directs DOE to conduct assessments of:

historic and expected transmission capacity constraints and congestion

every three years

with consultation* from States, Indian tribes, and regional grid entities

- Department's triennial **state of the grid report**
- Reviews historic industry data, recent power system studies, published capacity expansion results
- Final published Summer 2023 **following public comment period**

*__consultation__ = **ability to contribute to Study draft** as referred to in Federal Power Act;
NOT government-to-government *Consultation* with Tribes as defined by DOE Order 144.1

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How will the Needs Study be Used?

Helps inform **DOE prioritization of future funding** and **focuses the attention** of federal, state, and Tribal policymakers, industry, and other stakeholders on most pressing national and regional transmission needs

Helps inform **designation of National Interest Electric Transmission Corridors** (NIETC, \nit-SEE\) under FPA §216

- **The Needs Study does not designate any NIETCs**
- While DOE must complete the Needs Study before designating a NIETC, actual designation happens through a separate process
- NIETC designation considers the Needs Study and many other statutory factors, including whether designation would promote economic vitality, diversity of supply, reduction of consumers' costs, and national energy security and independence.

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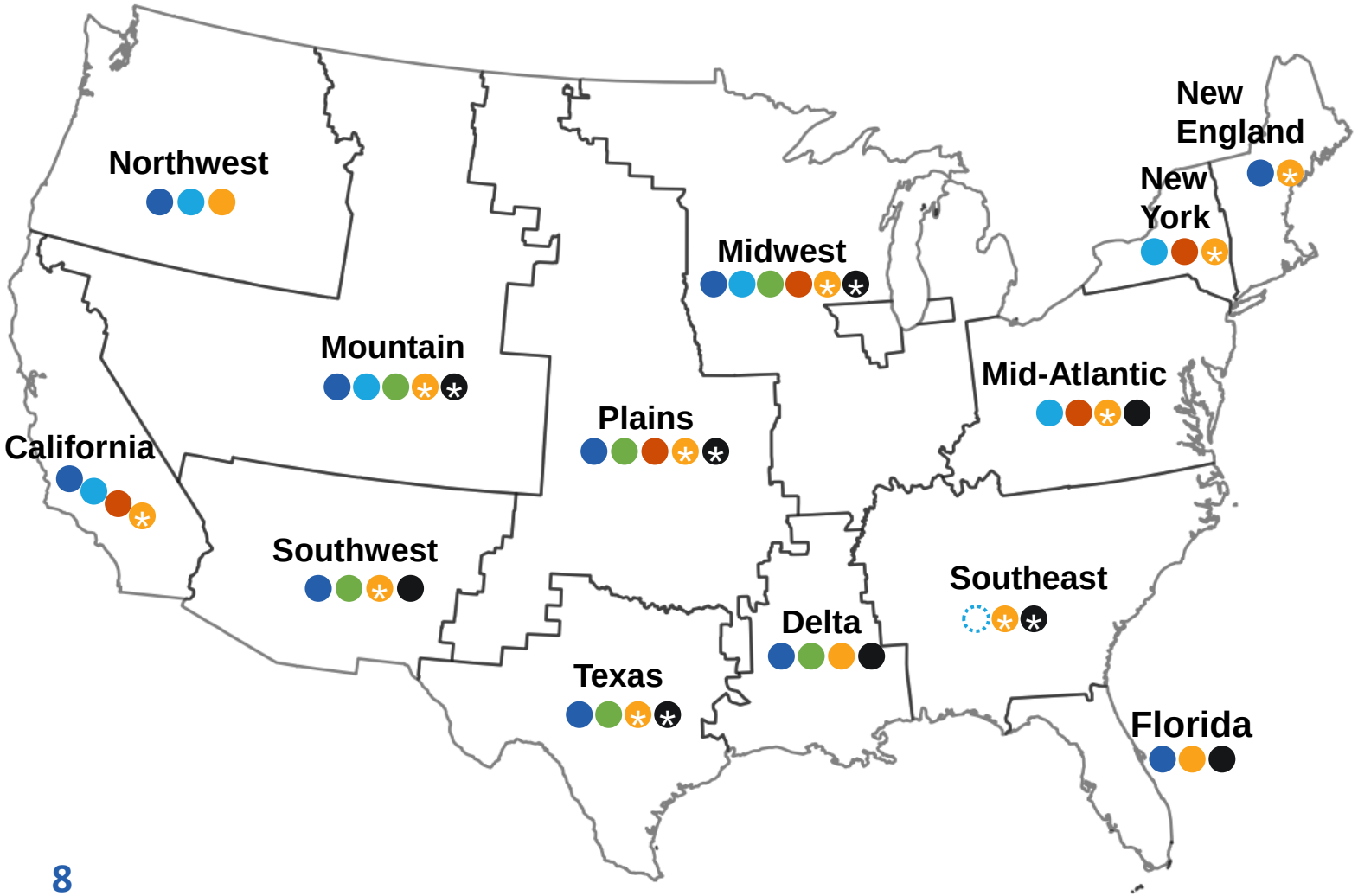
Federal Power Act 216(a) →

High-level summary of regional needs, supported by detailed findings.



Current:

Improve reliability and resilience	Alleviate congestion & unscheduled flows
Alleviate transfer capacity limits between neighbors	Deliver low-cost generation to high-priced demand

Anticipated future:

Meet future demand with interregional transfer capacity	Meet future demand with regional transmission

* Represents ≥50% growth in 2035 relative to 2020 for mod/high scenario

◌ Lack of transparency in dataset used

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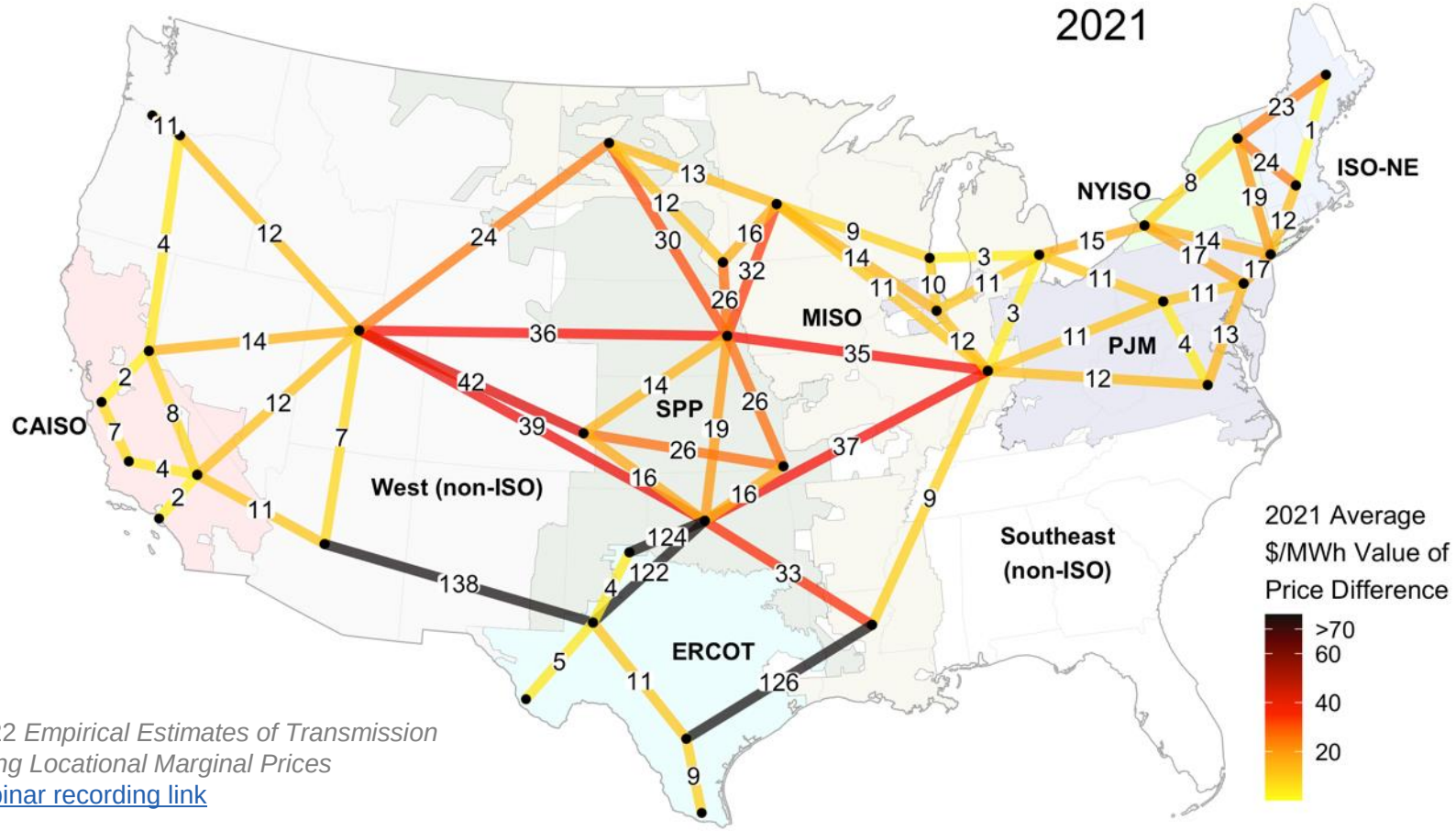
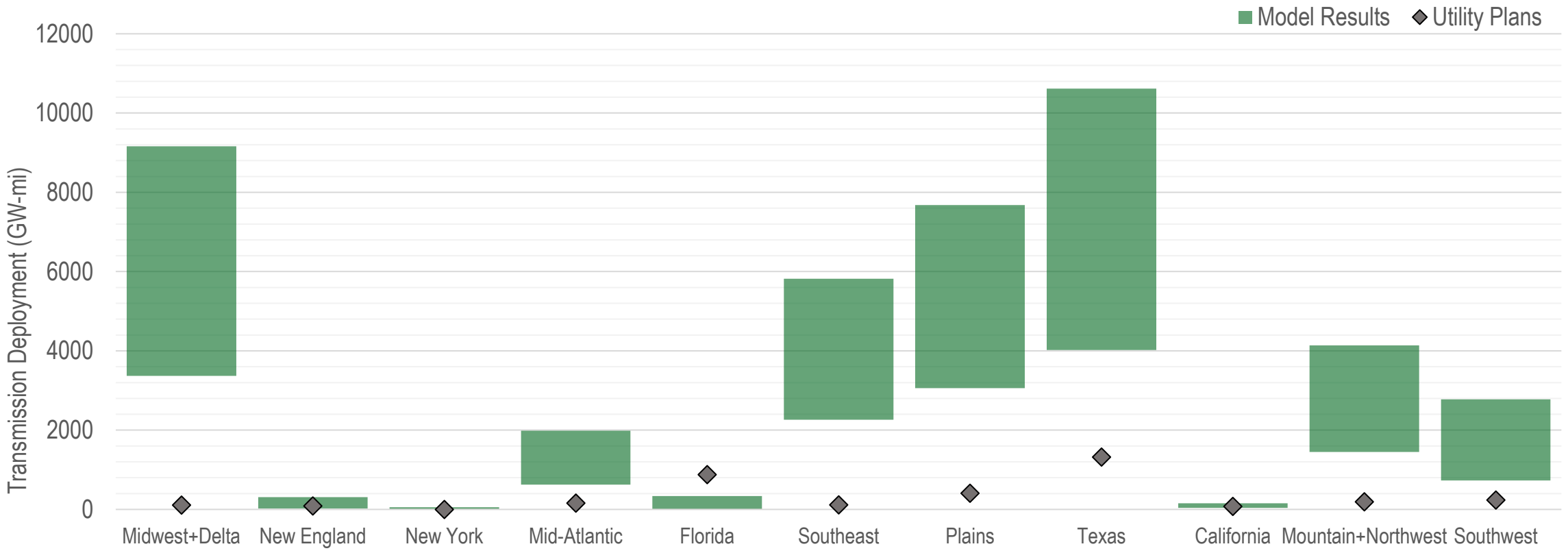
Largest congestion value of new transmission is across the interconnects and during extreme weather events.



Each link shows marginal value ($/MWh) of relieving congestion. Absolute values are high in 2021, but value trends are consistent dating back to 2012.

LBNL 2022 *Empirical Estimates of Transmission Value using Locational Marginal Prices*
ESIG webinar recording link

Comparison of transmission plans against 2030 Mod/High results



Utility Plans from NERC Energy Supply & Demand 2020 database

Results of scenarios which enable a 2040 power system:

- 80% - 100% clean energy deployment
- 25% - 75% load growth
- 95 - 100% decarbonization from 2005 levels

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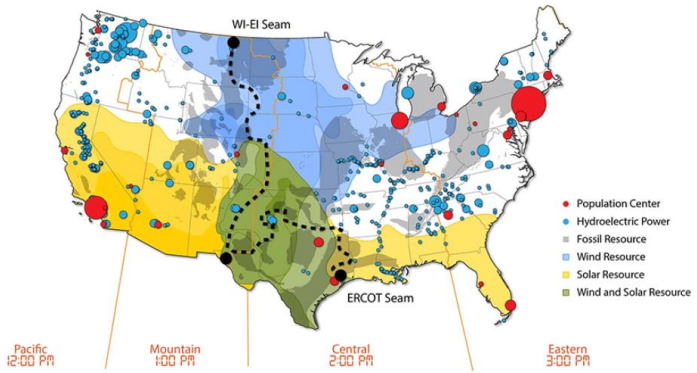
Enhanced Transmission Planning: National Transmission Planning Study

National Transmission Planning Study: Project team

- This study is being conducted by a joint National Renewable Energy Laboratory (NREL) and Pacific Northwest National Laboratory (PNNL) project team
- This study builds on past projects and expertise at NREL and PNNL with the support and direction of DOE's Office of Electricity



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Office of Electricity

North American Energy Resilience Model

NREL Transforming ENERGY

Pacific Northwest NATIONAL LABORATORY

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https://www.energy.gov/gdo/national-transmission-planning-study

National Transmission Planning Study: Objectives

1. Identify interregional and national strategies to accelerate cost-effective decarbonization while maintaining system reliability

2. Inform regional and interregional transmission planning processes, particularly by engaging stakeholders in dialogue

3. Identify viable and efficient transmission options that will provide broad-scale benefits to electric customers

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National Transmission Planning Study: Desired outcomes

- Results help prioritize future DOE funding for transmission infrastructure support

- Results help fill existing gaps within interregional transmission planning

- Study provides a framework for stakeholders to discuss desired grid outcomes and address barriers to achieving them

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Transmission Siting and Permitting

Transmission Siting and Economic Development Grants

- $760 million in grant authority provided by the Inflation Reduction Act to:
  - Facilitate the siting and permitting of interstate and offshore electricity transmission lines; and
  - Provide economic development grants to communities affected by the construction and operation of interstate and offshore transmission lines
- Siting authorities (e.g., state PUCs) can receive grants to support siting and permitting activities (e.g., analysis of alternative routes, participation in other siting or cost allocation proceedings, etc.)
- Economic development grants can support a range of community priorities
  - Available to siting authorities and local, State, or Tribal governmental entities
  - Includes considerations of environmental and energy justice, equity, and job quality, and Tribal cultural resources.
- Conditions:
  - For siting activities, siting authorities must reach a final decision with two years of the grant
  - Economic development grants conditioned on approvals or start of construction, depending on recipient

Federal Permitting Coordination

- Federal Power Act Section 216(h)
  - Authorizes DOE to act as the Lead Agency to coordinate Federal authorizations and related environmental reviews required to site an interstate electric transmission facility.
  - Includes establishment of schedules and preparation of a single environmental document.
- President Biden recently directed Federal agencies to come together under White House direction to develop and execute a new MOU to implement FPA Section 216(h)
  - Will update and supersede 2009 MOU
- GDO is building capacity to implement this directive and to develop new resources to make federal permitting more efficient

National Interest Electric Transmission Corridors (NIETCs)

- Federal Power Act Section 216(a)
  - Authorizes the Secretary to designate as an NIETC any geographic area that—(i) is experiencing electric energy transmission capacity constraints or congestion that adversely affects consumers; or (ii) is expected to experience such energy transmission capacity constraints or congestion.
  - Based on the results of the Needs Study and additional statutory criteria
- NIETC designation unlocks statutory tools to advance transmission deployment, including:
  - Public-Private Partnerships under the IIJA's Transmission Facilitation Program
  - Transmission Facility Financing loans under the IRA
  - FERC backstop permitting authority under FPA Section 216(b)
- DOE is designing an "applicant driven, route-specific" NIETC designation process:
  - Builds on lessons learned from prior implementation through broad corridors
  - Intended to focus resources on actual projects in development

Commercial Facilitation and Financing

BIL, IRA and Other Transmission Funding Programs

Program Name (DOE)	Total Funding	Program Goal
BIL: Transmission Facilitation Program	**$2.5 billion**	• Transmission deployment of new and upgrading high-capacity transmission lines. 3 tools: Capacity contracts, loans, and public-private partnerships
IRA: Transmission Facility Financing	**$2 billion**	• Loans for projects designated by the Secretary to be necessary in the national interest under section 216(a) of the Federal Power Act
Loan Programs Office: Title 17 Innovative Clean Energy Loan Guarantee Program	**$40 billion in loan guarantee authority**	• Innovative transmission expansion projects and emerging technologies (including HVDC deployment) are eligible
Loan Programs Office: Title 17 Energy Infrastructure Reinvestment (EIR) Financing (Loan Guarantees)	**$250 billion in loan authority**	• Retool, repower, repurpose or replace energy infrastructure (including transmission) that has ceased operations or enable operating energy infrastructure to avoid air pollutants
IRA: Grants to Facilitate Siting and Permitting of Transmission	**$760 million**	• Grants to siting authorities and state, local, and Tribal authorities to support activities to facilitate siting and permitting of transmission lines and provide economic development opportunities to affected communities

BIL Programs for the grid include transmission and distribution

Program Name (DOE)	Total Funding	Program Goal
Preventing Outages and Enhancing the Resilience of the Electric Grid / Hazard Hardening - (40101(d) "State, Territory and Tribal Formula Grid Resilience Grants")	**$2.5 billion**	• Formula funding for Grid Resilience and Hardening Investments tied to state & tribal led objectives, criteria and methods for resilience investments
Preventing Outages and Enhancing the Resilience of the Electric Grid / Hazard Hardening - (40101(c) "Utility/Industry Grid Resilience Grants")	**$2.5 billion**	• Competitive funding for Grid Resilience and Hardening Investments tied to state & tribal led objectives, criteria and methods for resilience investments
Program Upgrading Our Electric Grid and Ensuring Reliability and Resiliency (40103(b) "Grid Innovation Program")	**$5 billion**	• Large infrastructure projects, including transmission, distribution and storage. • Partnership between state entities and project/infrastructure developers
Deployment of Technologies to Enhance Grid Flexibility (40107 "Smart Grid Grants")	**$3 billion**	• Deployment of technology at scale, prioritization of technologies that increase transmission capacity, mitigate wildfires, manage load / electrification of “edge devices”, and incorporate secure communications / cybersecurity