Enhancing the grid:
New technology and new approaches to planning

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Transmission is essential infrastructure for every decarbonization path:

We need 2X-3X more transmission capacity to decarbonize by 2050
That’s a lot of new transmission capacity...
...that needs to go just about everywhere
High capacity lines are hard to come by

Plains & Eastern
Cancelled in 2017

Northern Pass
Denied by NH Site Evaluation Committee

Independence Energy Connect
Denied by Pennsylvania Public Utility Commission

New England Clean Energy Connect
Rejected by Maine voters mid-build
New lines aren’t the only way forward

Add power flow devices (FACTS)

Reconductor

Increase Voltage

Convert to HVDC
New HVDC technology had many benefits

- Much smaller footprint (3 acres vs 30 acres)
- Interoperability with AC grid, manages power flow
- Easily tapped off
- Multi-terminal operationally straightforward
- Can be independent of AC system (OSW, blackstart, islanding)
But is not without risk and uncertainty

- Early deployments at EHV
- Higher cost (~30%)
- Limited onshore expertise
- Saddled with old perceptions
A new grid mix requires new planning

Reliability driven → Reliability and resilience
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Short term, conservative forecasts → Clean energy targets, scenarios
A new grid mix requires new planning

Reliability driven

Short term, conservative forecasts

Interstate tensions

Reliability and resilience

Clean energy targets, scenarios

Interstate compacts
A new grid mix requires new planning

Reliability driven → Reliability and resilience
Short term, conservative forecasts → Clean energy targets, scenarios
Interstate tensions → Interstate compacts
Maximizing rights of way? → Maximizing rights of way!
Clean Air Task Force and Niskanen Center, 2020

**Planning**
Studies of current and future conditions, including demand and generation, congestion, and other factors to identify priority areas for expansion

**Permitting**
Siting and various impact assessments required for permission to build the project at a given location

**Process**
Existing process is fragmented and different for each line. Consistent and transparent process reduces uncertainty, transaction costs, and barriers to participation

**Paying**
Financing through power purchase agreements, participation in power markets, or other structures

**Participation**
Inclusive, “smart from the start,” sustained interaction should educate, build trust, and incorporate local input and community compensation
Thank you!