Order No. 1920 Compliance

Grid Enhancing Technologies

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Topics

Agenda

1. About the WATT Coalition
2. Order 1920 on Transmission Technologies
3. Dynamic Line Ratings in long-term planning
4. Advanced Power Flow Control in long-term planning
5. Topology Optimization in long-term planning

Working for Advanced Transmission Technologies

WATT

www.watt-transmission.org

Mission: The Working for Advanced Transmission Technologies (WATT) Coalition advocates for policy that supports wide deployment of Grid Enhancing Technologies (GETs) to accelerate the clean energy transition and lower energy costs.

Ampacimon
HASI
LINDSEY SYSTEMS
SMART WIRES
REIMAGINE THE GRID
ATECNUM
PowerDonut PD4
Heimdall Power
newgrid
LAKI
POWER
EDF renewables
Invenergy
SOLSYSTEMS
vermont electric power company
VELCO
ENGIE
LINEVISION
prisma photonics
aes

Order No. 1920 on Transmission Technologies (see pages 845-848)

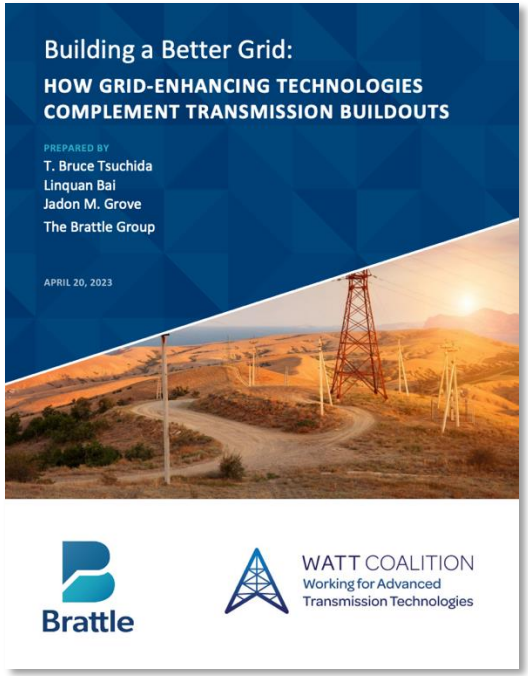
- Require transmission providers in each transmission planning region to consider
  - dynamic line ratings
  - advanced power flow control devices
  - advanced conductors
  - and transmission switching

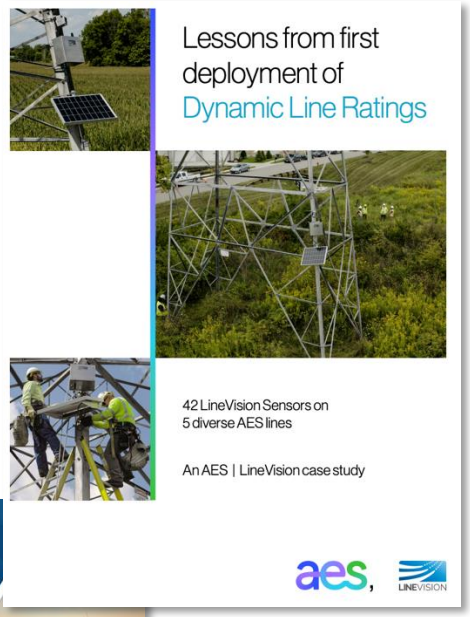
  for each identified transmission need, in long-term regional planning and Order 1000 processes.

More from Order No. 1920

- For new facilities and upgrades
- Evaluate whether ATTs alone or with other upgrades "would be more efficient or cost-effective than selecting new regional transmission facilities or upgrades to existing transmission facilities that do not incorporate these technologies."
- Evaluate against all required benefits and standard selection criteria, and follow Good Utility Practice

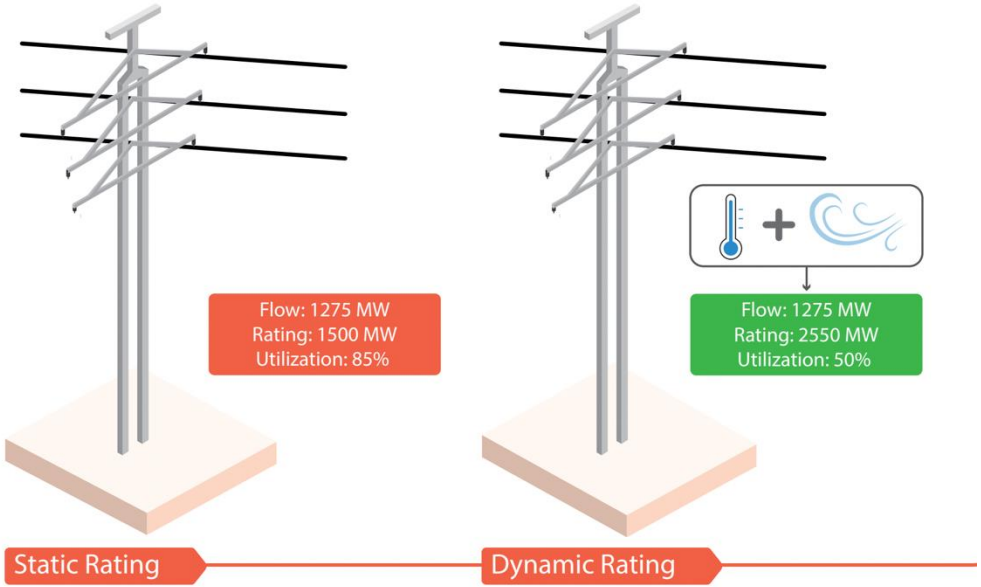
Examples of Grid Enhancing Technologies in Planning





https://watt-transmission.org/wp-content/uploads/2023/04/Building-a-Better-Grid-How-Grid-Enhancing-Technologies-Complement-Transmission-Buildouts.pdf

Dynamic Line Ratings



Since 2012, Belgium sees >20% capacity increases >90% of the time (increase capped at 30%)

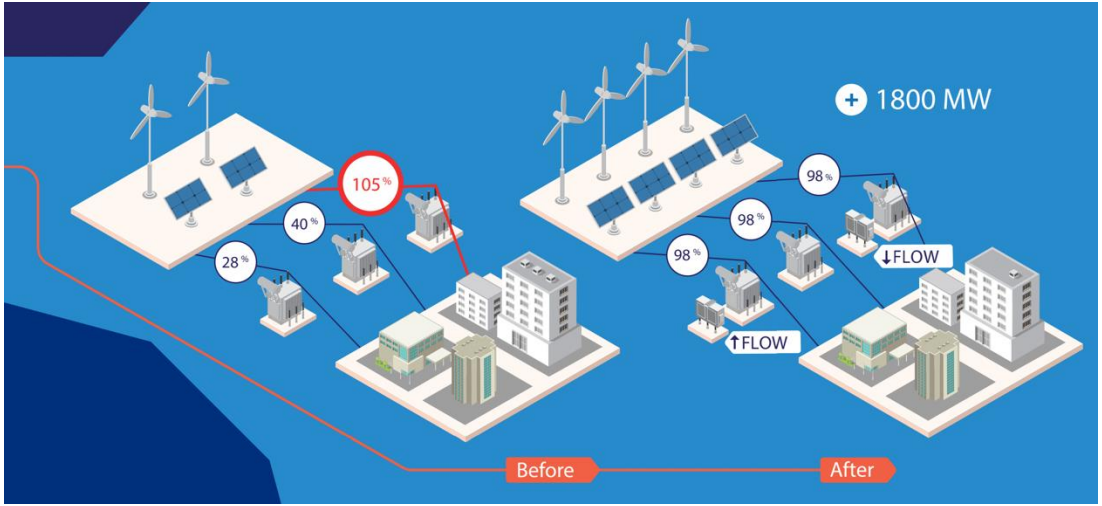
PPL Electric Utilities avoids $60 million in redispatch costs in first year of 2-line DLR deployment

AES found 61% average capacity increase over static line ratings on a 345kV line

Dynamic Line Ratings

- Scenarios should be self-consistent – if a line has 20%+ more capacity all winter, that should be recognized.
- DLR can be deployed to mitigate constraints if they emerge before new infrastructure comes into service.
- Many other study inputs are uncertain – planners can choose confidence levels when applying DLR uprates in planning scenarios.

Advanced Power Flow Control



[VELCO DOE GRIP Grant with EPRI to increase VT-NY transfer capacity]

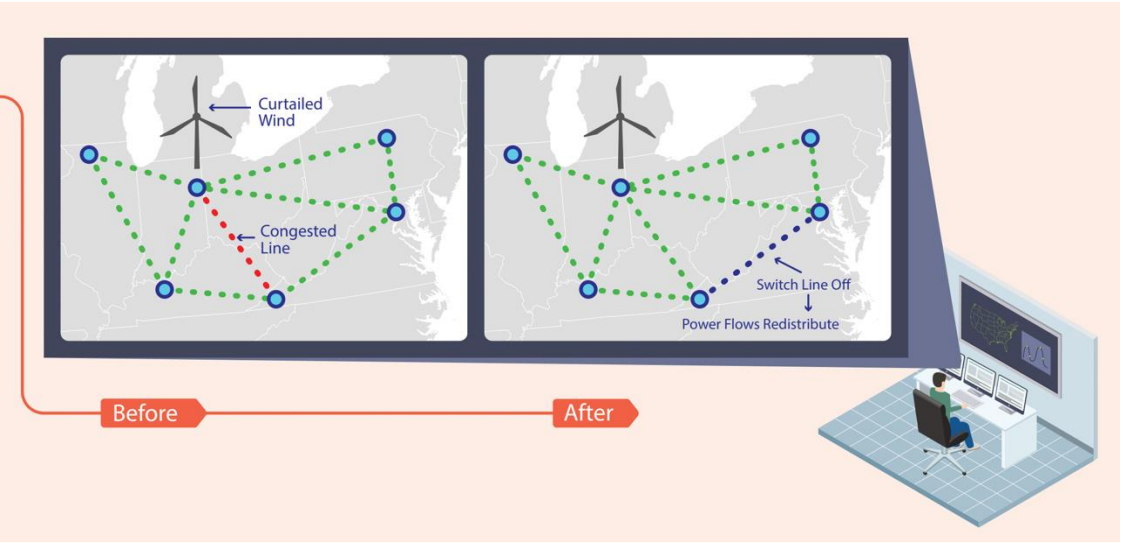
[Central Hudson unlocks 185 MW of transmission capacity]

[California utilities identify reliability applications]

Advanced Power Flow Control

- APFC can be modeled as adjustable reactance in steady-state transmission planning models, by adding a "Modular Static Synchronous Series Compensator."
  - In production cost modeling, a utility can model variable reactance.
  - Modeling packages exist to automatically insert MSSSCs, or utilities can work with vendors for assessment.
  - Modeling packages are available for dynamic studies.

Topology Optimization



ISO New England and SPP using Topology Optimization for outage planning

ERCOT and MISO allow reconfigurations for congestion mitigation

Study: Topology Optimization could reduce PJM congestion costs by 50% on average

Topology Optimization

- Generation retirements and additions and new transmission infrastructure change grid topology.
  - Reconfigurations could resolve constraints that emerge with these chagnes at negligible cost.
- Planners may find value in increasing optionality for future reconfigurations through substation design.

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Working for Advanced Transmission Technologies

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