Grid Modernization & Decarbonization

Get MORE from the Existing Grid with Advanced Conductors

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Grid Enhancing Technologies (GETs)

- GETs rapidly get more capacity from the existing electric system and makes the network more efficient, more resilient, and more reliable.

- GETs include software and sensor-based technologies as well as hardware technologies.

- The GETs technologies are not mutually exclusive; they can be used together!
What is an Advanced Conductor?

Advanced conductor is a modern design electric conductor that enables more current flow through a given diameter conductor with less sag than traditional conductor. Two types:

- Metal Core (introduced ~1970; aka HTLS)
- Composite Core (introduced ~2000)
- Superconductors (arriving soon commercially)

In this discussion, “Advanced Conductor” used for Reconductoring will mean only the composite core conductors.
Advanced Conductors – Designed for Performance

Advanced vs. Conventional

- Replace steel and hard aluminum with carbon and annealed aluminum
- More aluminum that is more efficient =
  - 2x capacity
  - More efficient (30% lower losses)
- Lower thermal expansion means 50% less thermal sag

- Less sag means smaller towers or fewer towers
- Less sag means wildfire risk mitigation
Even after more aluminum is added, the composite core Advanced Conductor weighs about the same as the conventional ACSR of the same diameter.

**Composite Core: Enables a Unique Capability**

Enables a unique capability:

**Reconductor with Advanced Conductors on EXISTINGSTRUCTURES**

(designed for the conventional ACSR) to provide much greater capacity and energy efficiency (and lower sag).

**GETs**
Grid Enhancing Application: GET MORE NOW

Reconductoring old legacy ACSR conductor with high-efficiency, high-capacity Advanced Conductor using existing structures generates consumer savings:

- 50%-100% more capacity in same ROW
- 25%-40% lower line losses
- HALF the cost of conventional structural rebuild to uprate line
- Fast Process: ~12 - 24 months from decision to an energized line
  - Construction permit (& process) is eliminated
  - Maintenance practices for installation
- LOW SAG => Wildfire Risk Mitigation

Reconductoring at congestion points To interconnect more offshore wind (Netherlands & Germany)
IIJA and IRA Applications

3 - IIJA Transmission Programs explicitly call out Advanced Conductors:

- Grid Resilience (40101): reconductoring fire-prone areas with low-sag advanced conductors
- Transmission Facilitation Program (40106): Advanced Conductor use is prioritized for funding
- Smart Grid (40107): Grid Enhancing applications, including with advanced conductors, with more capacity, efficiency, resiliency, and reliability.

IRA 22004: $9.7B for Coop projects including to increase the efficiency of the transmission and distribution system

IIJA Innovation Program (40103): demonstrate innovative approaches to T&D infrastructure to harden and enhance resilience and reliability; upgrade T&D lines in rural areas;
Conductor Energy Efficiency

• DOE will do a national study looking at the effects of a Conductor Efficiency Standard
  • Directed by 2023 Appropriations Bill Report Language
  • 180 days to report to Congress
  • A “report regarding the environmental, economic, and clean energy deployment benefits of establishing an energy conservation standard for overhead electricity conductors”:
    • 5 specified areas of investigation
    • DOE -OE, -GDO, -EERE, and FERC shall cooperate on the report

• For YOUR projects NOW...........
  • Make sure that the project is investing appropriately in high efficiency conductors (and transformers)
  • Energy Efficiency (line losses) should be a DESIGN CRITERION at the project design stage
    • Reduces energy costs (and losses)
    • Reduces emissions
    • Reduces the required generating capacity to serve loads
Reconductoring on existing T&D structures with high-efficiency advanced conductor is the fastest, lowest-cost way to add substantial capacity to the existing grid and it adds efficiency, resiliency, and reliability.

Come by the table to get information and see how we can help you.