

Deploy Advanced Conductors to Achieve U.S. Decarbonization Goals

Policy Actions Must Eliminate 1.72 billion tons of CO₂ Emissions per year by 2035 by Adding 61 GW of Carbon-Free Generation Annually

Accomplishing This Requires Rapid Transmission Capacity Additions and Grid Modernization Using Advanced Technologies

Summary: Advanced conductors are high voltage powerline conductors with modern designs, aerospace-grade materials, and significant performance advantages over legacy conductors. Advanced conductor technologies manufactured in America by multiple companies are being used by utilities all over the world to:

- ***double the capacity of existing transmission corridors*** quickly and cheaply,
- ***eliminate significant CO₂ emissions by reducing line losses*** on heavily loaded power lines, and
- ***de-bottleneck their grids for greater reliability, resiliency, and flexibility for a fraction of the cost*** of traditional solutions.

Simply put, deploying advanced conductors on existing transmission towers (or “reconducting”) is the fastest, lowest cost method to add substantial capacity to the grid needed to interconnect enough clean generation to meet the Administration’s decarbonization goals.

Biden Administration’s Goal: President Biden’s goal for the electricity sector to be 100 percent carbon-free by 2035 will require generation, transmission, and distribution of an additional 2.6 billion MWh of carbon-free electricity. This is the amount of electricity generated from fossil fuels in 2019, which released 1.72 billion metric tons of CO₂.¹ Replacing this generation would require about 850,000 MW of carbon-free renewable capacity (at 35% capacity factor).



The Problem – Transmission Capacity

Constraints: Due to a lack of available transmission capacity, 680,000 MW of carbon-free electricity generation is awaiting interconnection to the U.S. grid². While the Administration is working to reduce this backlog, an action that could quickly and cost-effectively add substantial transmission capacity to the grid is being overlooked: replacing legacy conductors with advanced conductors on existing system structures at constrained points on the grid. This action would immediately double the capacity of these congested chokepoints and allows more carbon-free resources to interconnect.

¹ EIA 2019 electricity data; see <https://www.eia.gov/electricity/state/unitedstates/index.php> and select Full Data Tables 1-16. Table 7 line 21 for CO₂ emission rate. Table 5 Lines 59, 62, 71, and 72 for fossil fuel generation.

² Berkley Lab, Energy Markets & Policy, <https://emp.lbl.gov/publications/queued-characteristics-power-plants>

Reconductor Now to Meet Clean Energy Goals: Adding advanced conductors on existing structures is the fastest, lowest-cost way to add substantial carbon-free electricity to the grid. Utilities can cut years of planning and permitting time as well as millions of dollars of construction costs by reconductoring on their existing towers rather than the conventional solution of rebuilding the power line or building a new one. This reconductoring process typically doubles the capacity of existing transmission lines and can be completed with no new rights-of-way and virtually no environmental disturbance.

Why Action is Needed: Despite the obvious benefits of reconductoring, there is little financial incentive for utilities to reconductor. Under our existing regulatory structure, it is more financially attractive to construct a new, less efficient line over 5-10 years than it is to reconductor an existing line in a matter of months. This slows down progress towards our clean energy goals and adds costs to consumers' bills.

Additional Benefits: In 2019, transmission and distribution line losses (power lost as it travels from generator to load) in the U.S. totaled almost 207 million MWh³, which is equal to the production from



35 large coal-fired power plants. The associated CO₂ emissions for these line losses totaled 86 million tons. Advanced conductors can reduce line losses by 30 percent as compared to legacy conductors, saving millions of MWh of wasted electricity and millions of tons CO₂ emissions while lowering utility bills for consumers.

Advanced conductors also provide resiliency benefits. They are less vulnerable to natural disasters and sag significantly less reducing wildfire risks.

Executive Action Requested: The Administration can advance its carbon-free electricity goals with the following actions:

1. Require that transmission projects receiving federal funds use high-efficiency advanced conductors made in America;
2. Direct Federal Power Marketing Agencies and other U.S. government agencies to use high-efficiency advanced conductors made in America;
3. Direct DOE to develop a Conductor Performance Standard establishing minimum efficiency / maximum resistance requirements for transmission and distribution conductors; and
4. Direct utilities, ISOs, and RTOs to accelerate adding transmission capacity on their existing systems to advance moving more clean energy to market. A utility reconductoring their own structures should be allowed to proceed as though it were a powerline maintenance project.

³ EIA IBID., Table 10 line 26 for estimated T&D losses. Table 7 line 21 for CO₂ emission rate.