

Advanced Transmission Technologies (ATTs): A Cheap and Simple Grid Upgrade

OPPORTUNITY

As electricity demand surges, permitting bottlenecks and multi-year construction timelines are straining our grid.¹ Building new high voltage lines can take decades and many projects are never approved. To unlock congestion on the grid, an immediate solution is leveraging ATTs. This collection of hardware and software upgrades existing infrastructure to transmit more power in a fraction of the time.

- **Deployed in Months, Not Decades:** Traditional transmission lines can take an average of over 10 years to complete, ATTs can be implemented in a matter of months.²
- **Ready to Scale:** Some utilities are already enthusiastic about ATTs and have started deploying them voluntarily (though this has been on a small scale).³
- **Tailored for Any Environment:** ATTs are adaptable and can bolster transmission in different regions, terrains and temperatures.

TYPES OF ATTS

- **Dynamic Line Ratings (DLRs)** indicate when transmission lines can carry more electricity during favorable weather conditions.⁴
- **Advanced Power Flow Control Devices (APFCs)** determine which transmission lines are being overused and redirect flows to the ones that can carry more power at any given time.
- **Transmission Topology Optimization (TTOs)** are like APFCs, but function on a larger level and tell grid operators which transmission lines are optimal at a given time.
- **Advanced Conductor Technologies (ACTs)** replace bulky transmission lines with much lighter ones that have a larger capacity.

BENEFITS OF ATTS

- **Quick Low-Cost Capacity Growth:** They can double or triple the amount of power going through existing power lines before requiring billions of dollars of new transmission construction.
- **Bypass Slow Permitting:** Because they use pre-existing grid infrastructure, they don't require the intensive permitting timelines.
- **Saves Ratepayers Money:** By easing grid congestion, they are a cost efficient upgrade to solve for maxed out infrastructure.

1. <https://www.sightline.org/2025/11/20/the-high-cost-of-slow-permitting/#:~:text=These%20holdups%20don't%20come%20cheap.%20Permitting%20delays,least%20in%20part%20because%20of%20permitting%20delays.>

2. <https://www.wri.org/insights/advanced-transmission-technologies-us-power-grid>

3. <https://www.wri.org/insights/advanced-transmission-technologies-us-power-grid>

4. <https://www.energy.gov/oe/articles/advanced-transmission-technologies-report-508#:~:text=This%20results%20in%20added%20utility%20expenditures%20without,caused%20by%20extreme%20weather%20or%20another%20issue.>

- **Prevents Blackouts and Enhances Resilience:** They give operators flexibility to automatically route power around extreme weather hazards like wildfires.⁵

POLICY SOLUTIONS

Some states are already leading on ATT implementation:

- **Indiana SB 422:** In 2025, the state passed a law requiring the evaluation of ATTs in its long term Integrated Resource Plans. It also encourages utilities to implement ATTs by applying the same profit incentives from transmission lines.⁶
- **Utah HB 212:** Enacted in 2025, the statute requires large utilities to prove they analyzed the cost-effectiveness and speed of deploying ATTs before they are allowed to bill ratepayers for building a brand-new corridor.⁷

5. <https://www.energy.gov/oe/articles/advanced-transmission-technologies-report-508#:~:text=This%20results%20in%20added%20utility%20expenditures%20without,caused%20by%20extreme%20weather%20or%20another%20issue.>

6. <https://iga.in.gov/legislative/2025/bills/senate/422/details>

7. <https://le.utah.gov/Session/2025/bills/introduced/HB0212S01.pdf>

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