

NON-TRANSMISSION ALTERNATIVES

by

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Non-Transmission Alternatives (NTA) are not yet in the everyday vernacular, but they are becoming more of a game changer for the future of the electric transmission industry. NTAs, as defined by Navigant Research, is “An electricity grid investment or project that uses non-traditional T&D solutions, such as distributed generation, energy storage, energy efficiency demand response, and grid software and controls, to defer or replace the need for specific equipment upgrades, such as T&D lines or transformers, by reducing load at a substation or circuit level.”¹ NTAs are looking to alleviate the higher costs of upgrading or replacing existing infrastructure by, instead of installing new poles, transmission lines, or local wires, exploring how increased efficiency due to technological innovations can benefit a defined area.

Microgrids are one example of NTAs. Microgrids are modern, small-scale versions of an electric distribution system which serve a community rather than a large region and can function autonomously from the larger grid system, lessening the stress of that area on the greater electric distribution system. Many microgrids have a component dealing with energy storage, so electricity that was generated during another time can be used at a later point. An example of this would be producing solar power during the day, and transmitting the energy stored during the night. NTAs can balance microgrids to achieve a good match between generation and load. Storage devices can provide frequency regulation to maintain the balance between the network's load and power generated, and they can achieve a reliable power supply.

NTAs are good countermeasures against demand spikes. A demand spike is when demand for electric power increases past the load forecast, straining the grid. Demand spikes usually happen in extreme temperature, either hot or cold, which was not anticipated. For the MISO region (of which Louisiana is a part), demand increases throughout the day, rising from a low in the morning, increasing as the day goes on, due to HVAC usage and also the time when most businesses operate, and decreasing in the evening hours, which one would expect based on the basic life-schedule of the average person. However, the demand schedule does vary depending on the region. California, for example, has a longer peak demand, which tails off in the early morning hours. Microgrids have the ability to lessen the dependence on the grid as a whole, or the macrogrid, taking stress off during peak demand hours. Microgrids, if used properly, can provide a flexible supply for areas that demand a greater load during peak hours, lowering the costs for consumers during those times, and allowing for a more stable electric grid going forward. Solar, wind, hydroelectric, nuclear, geothermal, as well as fossil generation, all have the potential to power microgrids, focusing on powering smaller areas.

Energy efficiency also plays a large part in NTAs. ISO 50001 is a framework companies use to help manage and improve their energy use and to reduce costs. The efficiency aspect of ISO 50001 shows the financial practicality by reducing long term costs through better technology and reducing carbon use. In fact, a study in ISOfocus magazine, respondents reported the standard has helped them identify the activities that consume the most energy.² With the understanding of where efficiency can help cut

¹ <https://www.utilitydive.com/news/non-wires-alternatives-whats-up-next-in-utility-business-model-evolution/446933/>

costs, companies now can target activities that are inefficient, changing the processes, and ameliorating the overall outcome, saving money in the long-term.

Energy storage prices are falling, mainly due to increasing effectivity of technology. “As distributed energy storage performance has improved, and costs have come down, it is becoming a viable solution to a wide variety of efficiency and reliability concerns on the electric grid.”³ In Q3 2017, more than 41.8 megawatts of storage capacity was installed in the United States.⁴ In 2019, it is expected that the United States will have more than 1 gigawatt of energy storage installed.⁵ And from 2010 to 2017, the cost of Photo Voltaic (PV) Solar fell 81%.⁶ As the price decreases for energy storage, with the bulk of that storage being lithium-ion batteries, more states and companies are exploring the possible expansion for the use of the storage to help defer the costs of buying electricity in the spot market, which is the most expensive alternative for increasing demand load.

Enhanced energy storage can provide multiple benefits to both the power industry and its customers. Among these benefits are:

- Improved power quality and the reliable delivery of electricity to customers;
- Improved stability and reliability of transmission and distribution systems;
- Increased use of existing equipment, thereby deferring or eliminating costly upgrades;
- Improved availability and increased market value of distributed generation sources;
- Improved value of renewable energy generation; and
- Cost reductions through capacity and transmission payment deferral.⁷

The future of NTAs is still uncertain. As the prices continue to fall due to achievements in technology, the viability of installing new NTAs in areas where demand peaks create instability increases. Personal NTAs are gaining more popularity, especially residential solar power in areas where electric rates tend to be high, the prices are decreasing, allowing more people access to reliable, affordable energy. More companies are exploring the utilization of NTAs in order to defray some of the costs of electricity. This can be seen in Combined Heat and Power (CHP) within industries that generate heat and electricity at the same time, such as refineries, chemical plants, and other industrial processes. Microgrids have the potential to supply communities and shelter those communities from the fluctuating prices of peak demand. Efficiency helps to cut down on wasted resources, allowing less energy, thus less money spent. NTAs have the ability to transform the future of electric power; from an individual level; to a community level, and on to an industrial level. It benefits the consumer by lowering costs, the generation companies by decreasing wasted resources, and the ability to change the way the world currently thinks about electric power.

² https://www.iso.org/isofocus_119.html

³ <https://microgridknowledge.com/boosting-local-energy-with-non-transmission-alternatives-in-maine/>

⁴ <https://www.utilitydive.com/news/energy-storage-sees-significant-growth-as-more-utilities-include-it-in-long/512684/>

⁵ <https://www.utilitydive.com/news/energy-storage-sees-significant-growth-as-more-utilities-include-it-in-long/512684/>

⁶ https://www.eia.gov/outlooks/archive/aeo15/electricity_generation.cfm

⁷ <https://www.energy.gov/oe/activities/technology-development/energy-storage>