

A Dormant Plant Reawakens

If the lights come back on at the shuttered Three Mile Island Nuclear Generating Station (TMI) in Pennsylvania, it will represent a significant shift in how we value electricity generation infrastructure in an industry being shaped heavily by increasing demand against shortening supply, and by changing federal policies.

Following the partial meltdown and permanent closure of TMI's Unit 2 in 1979, and the shutdown of Unit 1 in 2019 due to financial infeasibility, the facility seemed likely to remain closed forever. That changed when it was reported that Constellation Energy and Microsoft have agreed to a 20-year power purchase agreement, a bi-lateral contract in which Microsoft agrees to purchase all of the power produced by the plant. The agreement will ensure predictable and presumably adequate revenue for the plant owner, assuring supply to the quickly increasing demand from data centers like Microsoft's. (Public Power Association, 2025). Furthering the plant's financial viability, this week it is reported that the U.S. Department of Energy (DOE) is offering a new type of government support in the form of a \$1 billion loan to TMI. (AP News, 2025)

Artificial Intelligence and Data Centers Demanding Vastly Greater Supply of Electricity

Computers for artificial intelligence and data centers need substantially more electric power than our current national electricity suppliers can offer. Demand for electricity is expected to substantially outpace supplies for at least the next decade. Electricity prices are already rising faster than inflation in the general economy. Data centers are built relatively quickly, over 12 to 18 months, and a great number are currently proposed. Given that new nuclear plants are expected to take ten years to build out, and natural gas-fired electricity plants take five years to plan and build, there are no easy or quick ways to increase supply to meet the expected demand. Wind and solar plants are relatively quick to build, only 6 to 18 months, but it can take years to get wind and solar plants approved and permitted before construction. Lastly, there is a multi-year backlog in major components for gas-fired and wind plants.

Due to these factors, existing power plants have greater value now than several years ago. TMI was financially not worth operating in 2019 and therefore had no value at that time. Today that has changed, and TMI may have a value in the \$2 billion range or more. Our appraisals reflect these value-enhancing market conditions. However, market managers will need to recognize that value increases to existing plants do not necessarily imply a healthy, balanced market for consumers. In this case, they indicate an unhealthy condition

of supply shortages with no clear paths to equilibrium.

Restarting physically capable but previously financially infeasible nuclear power plants may be a short-term fix to shortages in supplies, if it doesn't take years to restart them.

Realistically, restarting any major power plant that has been closed for more than five years will likely take years. It is reported that TMI will need some \$1.6 billion in repairs and rehabilitation. At this scale of rehabilitation, it will take years to bring TMI back online.

Recently coal-fired power plants were typically retired for three reasons. One is just the age of the plants. The vintage of these types of plants makes these plants nearer to the end of their physical lives. Nuclear plants have longer functional lives than coal plants. Two, coal-fired plants produce substantially more CO₂ emissions than gas-fired plants, while nuclear power produces no CO₂. Lastly, and most importantly, coal plants have become less economically competitive relative to gas-fired plants. Even if environmental regulations on coal plants are substantially rolled back, power companies will not be electing to maintain or build coal plants, because natural gas plants are simply more profitable. It just costs less to build and operate a modern gas plant, and consumers pay less for the electricity from gas plants than from coal plants. Given that new coal plants would take more than five years to plan and build, and they would not be economical anyway, they are not a solution to our supply and demand issue today.

Modern gas plants are so cost effective that some nuclear plants, such as TMI in 2019, are not competitive economically. The competitive advantage of gas plants is due to the revolutionary improvements in gas extraction via hydraulic fracturing well driving (fracking). Natural gas prices are substantially lower today than in decades past.

Thus, only solar is almost positioned to meet demand for new power in the short term, but only if we accept component supplies from China, and we can get around the permitting roadblocks, both of which are problematic.

Federal Financing Shifts Focus from New Wind and Solar Power to Old Nuclear Plants

The DOE's Energy Dominance Financing Program (EDF) replaced the earlier Section 1706 Energy Infrastructure Reinvestment initiative and reportedly widens the scope of projects eligible for federal credit support. Under the EDF program, energy projects may qualify for loan guarantees or direct loans if they repower or replace inactive infrastructure or expand capacity in existing facilities. (DOE Loan Programs Office, 2025). This program can help stopgap supply issues by repowering and re-activating and expanding existing facilities, but

it will not solve the supply issues fully or in the long term.

This contrasts with the loss of federal programs that supported new wind and solar developments, through tax credits and incentives. These programs have been effectively terminated by the current administration. These programs were succeeding in supporting the construction of new wind and solar and in building new power supply. Wind and solar supplied less than 1% of our national electricity in 2000. Today they supply 17.2%. Today the wind and solar manufacturing industries can install wind and solar nearly as cost effectively and competitively as the very effective and competitive natural gas-fired plants. From the appraisal perspective, existing wind and solar plants will be more valuable, but planned ones will be less financially feasible. With the removal of federal industry support, the wind and solar industries and development will take a hit, supply will fall, and consumer prices for electricity will rise.

How The Federal Government Support Shapes Value

Federal government credit enhancements and/or tax credits and incentives directly affect several core valuation inputs. Federal lending reduces financing risk. In appraisal terms, this reduces debt rates, which in turn reduce equity rates and capitalization and discount rates, elevating indicated values under an income approach analysis. This is good for the values of plants to be re-activated or re-powered, and it is helpful to consumers to the extent that it alleviates supply shortages. Federal incentives, such as those for wind and solar, also reduce financial risk by eliminating potential income shortfalls and thus eliminating economic obsolescence. The loss of these incentives will cause proposed wind and solar to fall into financial infeasibility and will cause a drop in supply and a corresponding increase in consumer prices, but an increase in values for existing plants.

Analysis of Three Mile Island

Constellation has estimated a cost of \$1.6 billion to renovate and restart Unit 1 (DOE Grid Talk, 2025), an 835-megawatt plant. This indicates a cost of \$1,916 per kilowatt (kW). The DOE loan is for \$1 billion, a loan of \$1,198/kW. The typical loan-to-value ratio in this industry is approximately 40%, so the amount of the loan indicates a total plant value of \$2.5 billion, or \$2,994/kW. These numbers indicate that the existing plant assets have a value of \$900 million (the total \$2.5 billion minus the \$1.6 billion cost to renovate and restart), which is \$900 million more than the plant owners believed in 2019 when they closed the plant down. This is great news for the plant owners, who once had no value and may soon have \$900 million.

If TMI does not open, there would be even greater unsatisfied demand for electricity. TMI Unit 1 is a very large, single unit, base load power plant, a great asset to help supply the market. If this plant can be brought back, physically and economically, it should be. However, valuation requires the analysis of economic opportunity costs. If the federal government picks old nuclear plants as their winners, they may not be picking natural gas, wind, and solar, which may lose out in a way that is not beneficial to electricity consumers. According to the Energy Information Administration in 2024, natural gas-fired power plants cost approximately \$868/kW to build and have a levelized cost of electricity of \$65/MWhour. Wind power plants cost approximately \$1,489/kW to build and have a levelized cost of electricity of \$30/MWhour. Solar power plants cost approximately \$1,502/kW to build and have a levelized cost of electricity of \$32/MWhour. At these competing costs, the DOE planned loan at \$1,916/kW, with a presumed substantially higher market price of baseload cost of electricity of \$45/MWhour, appears to be financially inadvisable. The DOE could do better investing in gas, wind, and solar.

Furthermore, because the TMI loan does not underwrite and reconcile against market values from gas, wind, and solar, the DOE may be investing in a loan which could be at risk of default, where the DOE could lose its principal. The only way this loan can be justified is if Microsoft is contracting in the power purchase agreement to pay substantially above market electricity prices, Microsoft has no termination clauses, and Microsoft does not default.

How Federal Appraisal LLC Supports Stakeholders in This Evolving Market

Federal Appraisal LLC specializes in the appraisal of power plants across the country, including nuclear power plants. At Federal Appraisal LLC, we specialize in interpreting the complex intersection of federal policy, private capital, and energy-market fundamentals. The revival of Three Mile Island exemplifies how government-incentives can materially shape the economic profile, and therefore the market value, of aging or underutilized energy assets, or of newly built ones. Whether involving nuclear restarts, renewable-energy installations, or grid-scale infrastructure, our valuations incorporate the full spectrum of modern risk factors, policy considerations, and capital-stack dynamics. As federal programs like the EDF continue to influence energy investment, staying ahead of these shifts becomes essential for stakeholders. Our team is ready to provide the insight and analysis necessary to navigate this evolving landscape.

Sources

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