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ILLINOIS AND NEW YORK RESCUE NUCLEAR PLANTS; OTHER STATES MAY FOLLOW

伊利諾伊州和紐約州拯救核電廠;其他州可能跟進

IER INSTITUTE FOR ENERGY RESEARCH

Illinois and New York approved as much as $10 billion in subsidies to keep their nuclear reactors open for the next decade, limiting emissions that would have come from new fossil fuel consumption since natural gas plants would likely replace them.[i] Nuclear units are finding it hard to compete against low-cost natural gas. Five nuclear plants have retired over the past 5 years[ii] and several more have been announced. Even Diablo Canyon in California—a nuclear plant that the Nuclear Regulatory Commission ranks as one of the best in performance—is being shuttered after this decade supposedly to be replaced by renewable

本期摘要(KEY INFORMATION)

◎根據美國智庫能源研究所(IER)於日前公開的分析文章，伊利諾伊州和紐約州對於核電批准了高達 100 億美元的補貼，以確保未來十年內核反應器繼續運作，因為天然氣廠可能會取代它們，並藉以限制新化石燃料消耗致生的排放量。其他如俄亥俄州、康涅狄格州和新澤西州等等，由於核電供應了這些州大部分的無碳電力，這些州亦可能追隨伊利諾伊州和紐約州的腳步。除了天然氣價格低廉難以競爭之外，美國核管會(NRC)漫長和不確定的延役審查，也是導致許多核電廠提前退役的因素，雖然補貼核電不是通常的解決之道，紐約和伊利諾伊州卻發現需要補貼核電廠以持續獲得無碳電力，其他州亦可能會遵循這個做法，以達到減少溫室氣體的目標。

◎美國智庫能源研究所(IER)於 2017 年 5 月發表「風能補貼應結束」一文，指出現在是聯邦政府停止浪費納稅人錢補貼風力的時候了。根據能源資訊管理局(EIA)於「Annual Energy Outlook 2017」所述，即使少了風力發電最重要的補貼—生產稅抵減（PTC），風機仍足以和新型天然氣複循環機競爭。此外，風機還造成其他問題，例如風力資源的不確定性和間歇性，必須有可靠的電力來源讓電網運營商可以快速充電或斷電，這造成系統的額外成本，並導致更大的排放量，而且最好的風力資源通常位於偏遠地區，導致需有額外的傳輸基礎設施和低耗能的電力。此外，英國的一項研究發現，風力發電機組的壽命約為 12 至 15 年，而不是假定的 20 至 25 年。為了獲得與傳統能源相當的風能需求，風機的設置亦需要大量的土地。基於上述原因，美國政府不應繼續使用稅收來補貼風能。

energy and efficiency programs. However, in reality, it is likely that they will be replaced, at least in part, by natural gas units as has been the case for other nuclear unit retirements.

Other states that may follow in Illinois and New York's footsteps are Ohio, Connecticut, and New Jersey where nuclear units are providing most of the state's carbon dioxide-free electricity. In Connecticut, the Millstone nuclear plant produces 98 percent of the state's low-carbon power, and in New Jersey, nuclear reactors produce 97 percent.

Past and Projected Nuclear Retirements

The Fort Calhoun nuclear plant near Omaha, Nebraska was retired last year, following the retirements of Crystal River, Kewaunee, and San Onofre in 2013 and Vermont Yankee in 2014. Other nuclear plants whose owners have announced retirements include Exelon's Clinton plant in central Illinois (by June 2017), its Quad Cities plant in northwestern Illinois (by June 2018), its Oyster Creek plant in eastern New Jersey in 2019, and Entergy Corporation's Pilgrim plant in Massachusetts by June 2019.

In New York, the Fitzpatrick and Ginna nuclear plants could face retirement in 2018, Nine Mile Point in 2020, and Indian Point in 2020-2021.[iii] In addition, Pacific Gas and Electric announced that it will not seek license extensions for its Diablo Canyon nuclear power plant north of Los Angeles, California, retiring its two units in 2024 and 2025.

Illinois and New York Subsidize Nuclear Plants

The "Future Energy Jobs Bill", as it is called by supporters, is providing Exelon and Commonwealth Edison with a $235 million annual credit to keep the Clinton and Quad Cities nuclear plants in Illinois operating and saving the state about 4,200 jobs. Utility officials indicated that the credit would cost residential customers with average bills no more than 25 cents per month. Nuclear power provides over 90 percent of Illinois' zero-carbon energy.[iv]

In New York, residential customers will be paying an extra $1.50 to $3 a month, based on their electricity consumption, beginning in April as utility companies collect a state-mandated surcharge to keep three upstate nuclear power plants operating. The surcharge will cover $462 million in annual subsidies the state will pay to keep the Nine Mile Point, Fitzpatrick and Ginna nuclear plants operating. In Oswego County alone, where three of the four affected reactors are located, the subsidy will save over 1,500 jobs. The nuclear subsidies could total as much as $7.6 billion over 12 years. New York sees the subsidy as part of its plan to generate half its power without producing new carbon dioxide emissions over the next decade.[v] New York's nuclear plants generate about 30 percent of the state's electricity.[vi]

The Indian Point nuclear plant in Westchester County, New York, will not be receiving a subsidy because electricity prices are much higher downstate. Governor Cuomo, however, wants federal regulators to shut down Indian Point because he claims that it is unsafe to operate nuclear reactors in a densely populated area so close to New York City.[vii] But, without

Indian Point, it is unclear how New York City's demand for electricity would be met.

Reasons for Shuttering Nuclear Power Plants

A few years ago, it was assumed that most existing U.S. nuclear plants would easily obtain 20- or 30-year license extensions from the Nuclear Regulatory Commission (NRC), which would carry the bulk of the U.S. nuclear fleet into the 2040s and beyond. However, extremely long and uncertain reviews by the NRC have resulted in early retirements rather than life extensions. Two units at the San Onofre Nuclear plant in California were shuttered because the NRC did not grant life extensions after extensive work had been done on the units. Further, the NRC reviews took so long that the plant operators had to close the plant due to the expense of keeping the nuclear units in operating condition and purchasing power to replace their output.

Electricity deregulation also caused problems for nuclear plants. Merchant power plants, whose rates cannot be recovered through regulated cost-of-service rates, have found it difficult to compete with low natural gas prices and increasing regulations. The Kewaunee Power Station and the Vermont Yankee plant are both merchant plants that were forced to retire because of a number of financial factors, including low wholesale electricity prices driven in part by low natural gas prices, increasing capital costs for maintaining the unit, low prices in the regional market for electric generating capacity, and increased costs to comply with new federal and regional regulations.

Artificially low prices caused by the production tax credit for wind also played a role in the economics. Prior to this year when the subsidy has been lowered by 20 percent, wind producers were paid the equivalent of $35 per megawatt-hour (pre-tax income) in production tax credit subsidies. As a result, a wind producer could profit while paying the grid to take its electricity, producing negative prices. In times of low demand, nuclear plants can be forced to take the negative prices rather than go through the long and expensive process of ramping their output up or down.

Diablo Canyon's two nuclear units are being shuttered due to environmental pressure. According to the NRC, these units are well run and are among the best in the country. They are able to withstand earthquakes, tsunamis and flooding. But, the utility company is being pressured to shutter them by environmental groups, who believe they are situated in a potential earthquake area and want them replaced with renewable energy and energy efficiency programs. Originally, Pacific Gas and Electric announced that rates would not increase with the nuclear plant closures. It now admits, however, that the closure would cost $1.77 billion, which will be collected over an 8-year period. Further, Diablo Canyon's power will be replaced almost entirely by natural gas—not renewable energy.

Conclusion

Nuclear energy in the United States are closing mainly due to low natural gas prices and onerous regulations from the NRC. While subsidies should not normally be the answer,

New York and Illinois have found the need to subsidize their nuclear plants to continue to receive carbon free electricity. Other states may follow in order to meet their greenhouse gas reduction goals.

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WIND SUBSIDIES SHOULD END

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It is time for the federal government to stop wasting taxpayer dollars on subsidies for wind power. In its Annual Energy Outlook 2017, the Energy Information Administration (EIA) compares the levelized costs for units coming online in 2022 and found that the levelized cost of wind turbines is competitive with the levelized cost of new natural gas combined cycle units even without wind power's most significant subsidy—the Production Tax Credit (PTC).[i] And, with the production tax credit, wind turbines are 18 percent less than a new natural gas combined cycle unit, according to EIA. With levelized costs competitive with its closest competitor, natural gas, there is no reason to continue to subsidize wind power.

Further, wind turbines pose others problems. Due to the uncertainty and intermittency of wind resources, reliable electricity sources must be available so grid operators can quickly power the grid up or down. This creates additional costs to the system and results in greater emissions than if more reliable electricity sources were to run at their normal rate. And, the best wind resources are usually located in remote locations, causing the need for extra transmission infrastructure and power loss inefficiencies. Further, a British study has found that the life of wind units is on the order of 12 to 15 years, rather than the assumed life of 20 to 25 years.[ii]

To get the equivalent amount of wind energy compared to traditional energy sources would require massive amounts of land. For example, for the equivalent amount of energy, wind would require about 700 times more land than a hydraulic fracturing site.[iii] For these additional reasons, the U.S. government should not continue to use the U.S. Treasury to subsidize wind.

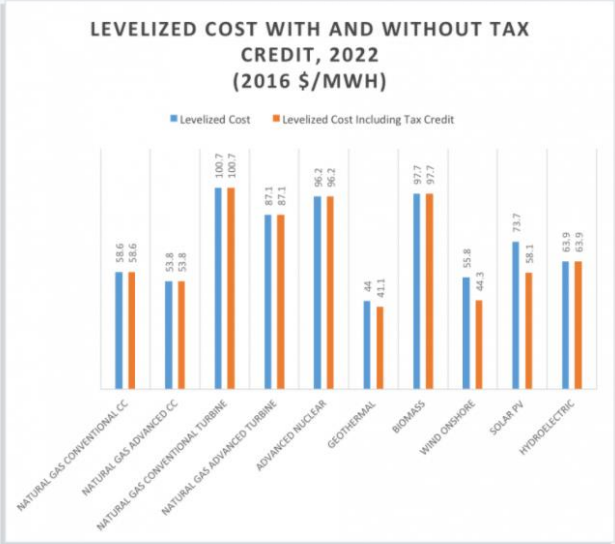
Production Tax Credit

The production tax credit (PTC) for wind has expired and been extended 10 times. It is now set to expire at the end of 2019. This year, the subsidy is 20 percent less than its level last year of 2.3 cents per kilowatt-hour. In 2018, it will be 40 percent less, and in 2019, 60 percent less.[iv] Wind turbines get the PTC for the first ten years

of their operation. It is so lucrative that wind operators can, and sometimes do, accept a negative price during periods of low demand in order to wipe out the competition. According to a Congressional Research Service study, the PTC is the largest 2016 to 2020 energy-related tax expenditure cost to the Treasury at $25.7 billion.[v]

EIA's Levelized Costs of Electricity

In EIA's reference case for its Annual Energy Outlook 2017, which includes the Clean Power Plan, the agency projects that the levelized cost of new wind turbines in 2022 will be $55.8 per megawatt-hour (in 2016 dollars) without the PTC, which compares favorably with new natural gas combined cycle units, which have levelized costs at $58.6 megawatt-hour for conventional units and $53.8 per megawatt-hour for advanced units. However, with the PTC, EIA projects the levelized cost of new onshore wind units at $44.3 per megawatt-hour. Clearly, from EIA projections, the PTC is no longer needed. See graph below.



Source: EIA, AEO 2017,
https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf

According to an Institute for Energy (IER) research study entitled the Levelized Cost of Electricity from Existing Generation Resources, the levelized cost of wind, even including the PTC, in AEO 2017 is higher than the levelized cost of existing dispatchable generating technologies.[vi] In that same IER study, in an attempt to deal with intermittent issues with wind power, the authors found that based on the Annual Energy Outlook 2015 cost assumptions for generating technologies and 2015 values for capacity factor and fuel cost, the levelized cost of natural gas combined cycle unit, the least cost dispatchable technology, backing-up wind power would be $27 per megawatt hour (in 2016 dollars).

Do Americans Want Wind Farms?

It depends on who you ask. Many of those living near a proposed wind site in rural America are not enamored with them. The push for large-scale renewables is creating land-use conflicts in rural regions from Maryland to California. Rural residents are objecting to wind projects to protect their property values and their views. Since 2015, over 120 government entities in about two dozen states have moved to reject or restrict the subsidized sprawl of wind power.

In Maryland, an eight-year battle may have ended when a judge ruled in favor of local homeowners and Allegany County against the developer of a 60-megawatt wind project. In California, which has a mandate that 50 percent of the electricity sold in the state be produced from renewable energy by 2030, the Los Angeles County Board of Supervisors voted unanimously to ban wind turbines in L.A.'s

unincorporated areas. In New York, which also has a 50 percent renewable mandate by 2030, commercial fishermen are suing to stop an offshore wind project on the Eastern Seaboard and three upstate counties—Erie, Orleans and Niagara—and the towns of Yates and Somerset, are fighting a proposed 200-megawatt wind project on the shores of Lake Ontario.

Even environmentalists are against some wind projects. Despite federal officials approving a 200-megawatt wind farm in Nevada, environmentalists killed the project because it could harm golden eagles and desert tortoises. The Searchlight wind farm would have included 87 wind turbines, stretching across 9,300 acres on public land sixty miles south of Las Vegas, near the California border. Conservationists sued the federal Bureau of Land Management and the U.S. Fish and Wildlife Service, arguing the agencies had not adequately analyzed the impacts to federally protected species. In 2015, a federal judge invalidated Searchlight's environmental review and threw out its government permit–a first for a renewable energy facility. An appeals court upheld that ruling in October.[vii]

To increase wind-energy production to the levels needed to displace significant quantities of coal, oil and natural gas will require erecting more and taller turbines, reaching 700 feet. But the more wind turbines that get installed, and the taller they are, the more nearby residents are likely to object.

Renewable energy development has also divided environmentalists in the Southwest, with critics saying they hurt desert ecosystems. Conservationists are putting a greater emphasis on rooftop solar, encouraging government officials to allow large-scale solar and wind farms only on lands that have already been disturbed by development.

Conclusion

In reviewing the tax code, the President and Congress should take a look at federal tax credits that are no longer needed for renewable development, which would save U.S. Treasury funds for President Trump's priorities. Clearly, EIA's forecasts show that wind energy is cost-competitive with natural gas generating technologies without the PTC and ignoring the cost of its reliability issues, which is the comparison made by wind advocates. Further, rural Americans do not want wind turbines in their back yards and conservationists see wind farms as unnecessarily hurting ecosystems.

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