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Death of nuclear power – a foolish prediction



On 21 April 2015, Motley Fool published an article about the death of nuclear power. This article should have been released 2 weeks earlier - on April Fools' Day.

Motley Fool published an article, [Did Exelon Corporation Just Quietly Admit That Nuclear Power Is Dead?](#)¹ on 21 April 2015.

The clickbait headline was followed by a shallow and flawed analysis of an Exelon gas turbine purchase and by a foolish recommendation that Exelon replace its nuclear power fleet with gas turbines.

This Commentary takes a closer look at this article.

This purchase was not recent or quiet

The article headline implies that the Exelon gas turbine purchase had just happened and was somehow hidden. Instead, this purchase was covered in the Wall Street Journal, "[Exelon to Expand Two Texas Power Plants](#),"² more than 6 months earlier. Exelon bought four advanced GE gas turbines for use in two 1,000 MW combined cycle gas turbine (CCGT) power plants in Texas.

Gas turbines are not power plants

The article wrongly assumed that four GE 7HA gas turbines are the same as a 2,000 MW power plant.

The [GE web page for 7HA gas turbines](#) has the output of a simple cycle combustion turbine at about 300 MW, so the output for four gas turbines would be about 1,200 MW. The same turbines in CCGT mode could generate about 500 MW each as a part of a larger power plant.

CCGT power plants cost more than gas turbines

The article wrongly assumes that the \$500 million cost for four gas turbines is the total cost of a 2,000 MW power plant. This is an installed capital cost of \$250/kW.

The [2015 Annual Energy Outlook](#) (2015 AEO) was released by the U.S. Department of Energy's Energy Information Administration about a week before the Motley Fool article was published.

The 2015 AEO [assumptions](#) show a CCGT capital cost of about \$1,000/kW. Using the 2015 AEO assumptions, the two Exelon CCGT power plants would cost \$2 billion, not \$500 million.

Capital cost is only a part of the cost of electricity

The article wrongly compares different generating technologies using only capital costs. Even if the article had gotten the capital costs right, this approach is wrong.

A gas-fired power plant burns vast amounts of natural gas to generate the same amount of electricity as a nuclear power plant. Levelized cost of electricity (LCOE) is the correct way to

¹ You need to be a member of Motley Fool (free) to access the complete article.

² Unless you subscribe to the WSJ, this is behind a paywall.



compare generation technologies. The 2015 AEO [Levelized Cost Report](#) has LCOE estimates in Table 1:

- CCGT (87% capacity factor) \$66.3/MWh
- Advanced Nuclear (90% capacity factor) \$96.1/MWh

The LCOE difference between CCGTs and nuclear power plants is much smaller than the difference in capital costs.

Sunk capital costs of existing nuclear power plants cannot be ignored

The Motley Fool article ends with a suggestion that Exelon replace its entire nuclear power fleet with gas turbines, based on a comparison of the capital cost of gas turbines to the capital cost of the new Vogtle 3 & 4 nuclear project.

Even if Motley Fool had the correct power plant type and capital cost, it is foolish to suggest that Exelon might replace all of its nuclear power plants with gas-fired generation.

Existing nuclear power plants have already been built and the capital investment for these nuclear plants has already been made. This means that replacing an existing nuclear power plant with a new CCGT power plant would mean replacing operating and fuel costs (i.e., \$24/MWh in the 2015 AEO) for the nuclear power plant with the full cost (i.e., an LCOE of \$66.3/MWh) of a CCGT power plant.

Replacing existing nuclear power plants with new simple-cycle gas turbines would be worse than foolish.

Real news – that any new power plant is being built

The 2014 WSJ article covers the real news - that the Exelon investment was made to meet “the need for new generating capacity” in the Texas market where “power demand is rising” and “at a time when power demand in the rest of the country remains stagnant.”

Exelon’s selection of CCGT generating technology for this market-based power plant investment in the growing Texas power market is entirely consistent with the 2015 AEO assumptions.

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