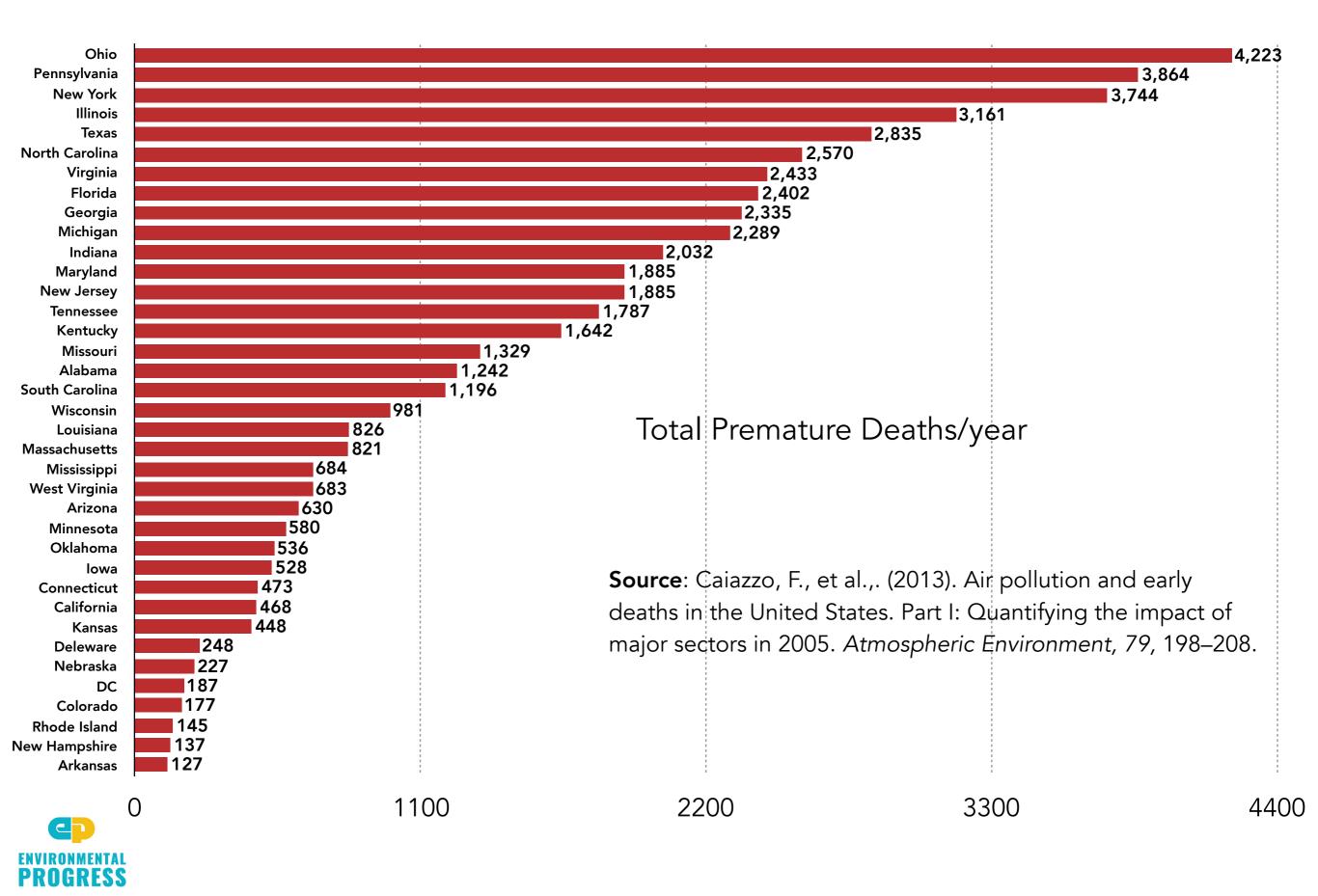


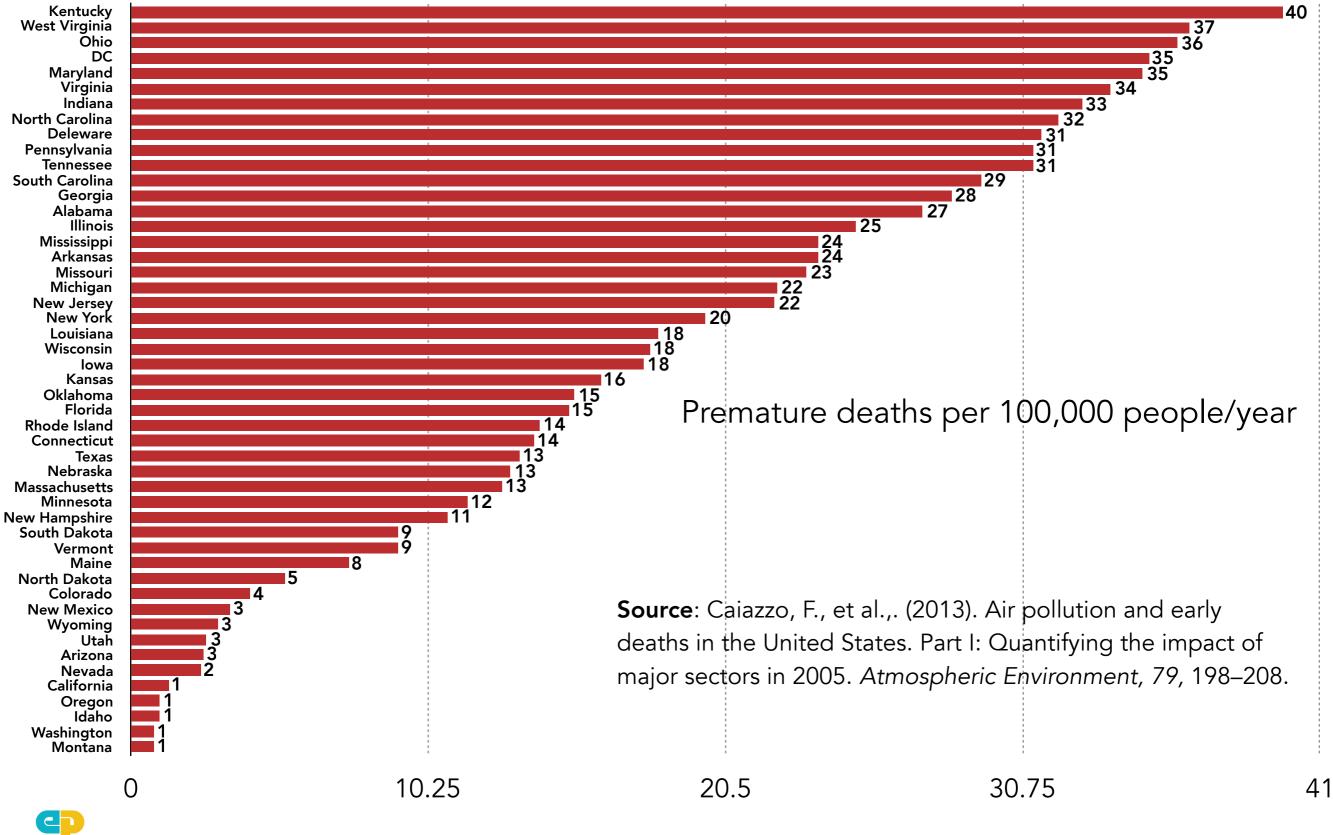
Ohio Energy

Last updated June 26, 2017

Ohio #1 in premature deaths from particulate matter from electricity generation



Ohio #3 in premature death rate from particulate matter from electricity generation



Coal is cause of high particulate matter

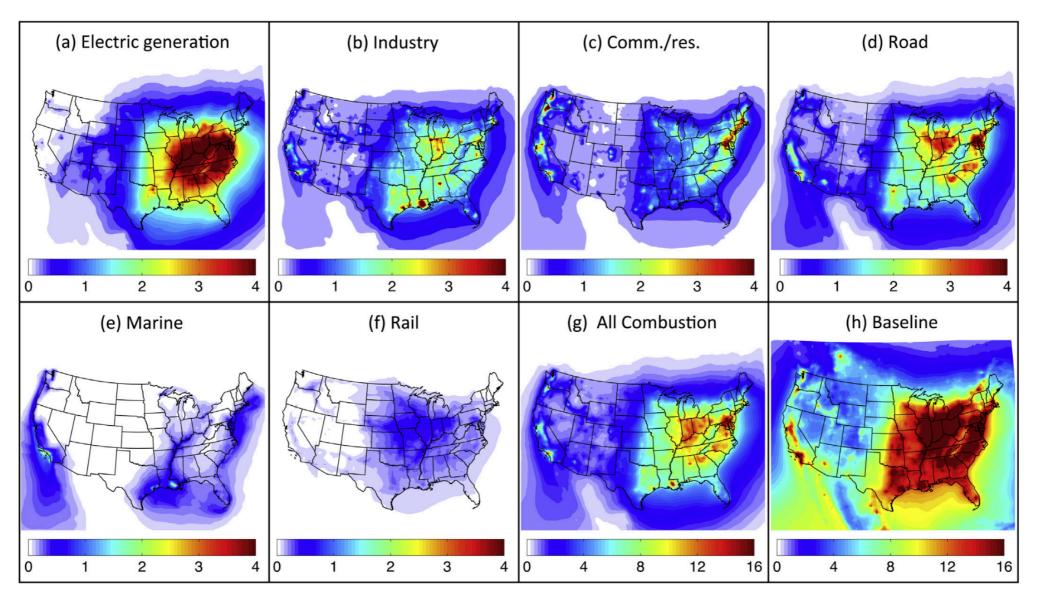
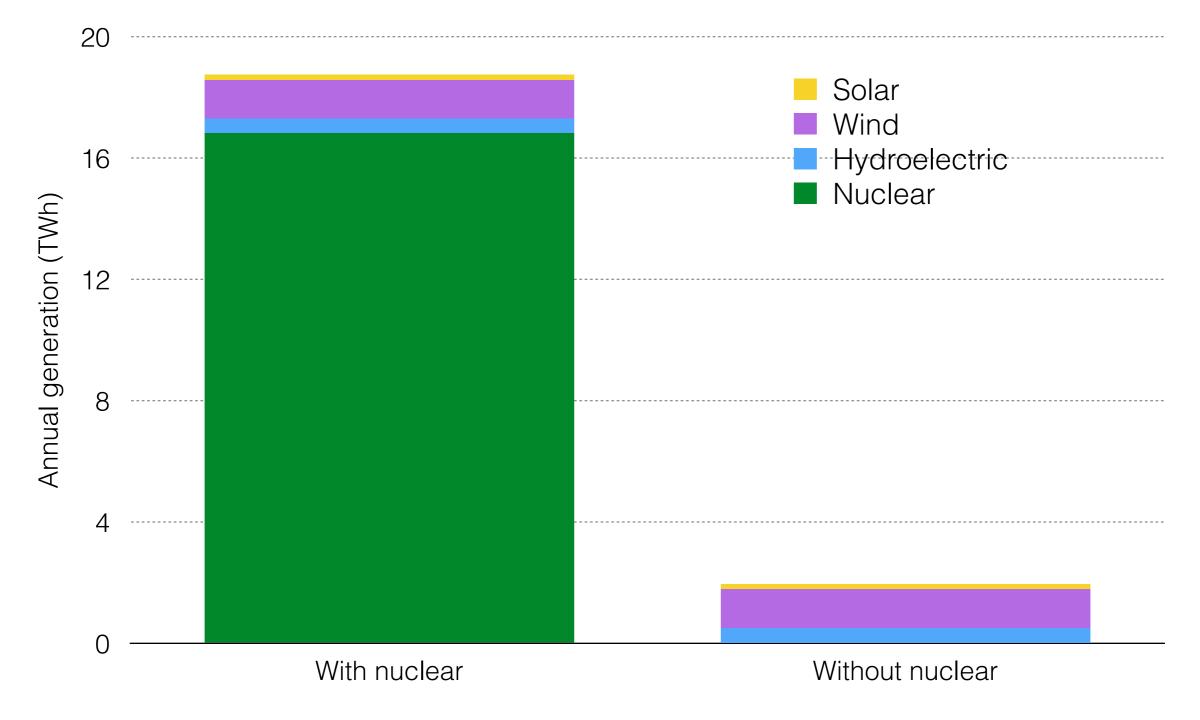


Fig. 1. Annual average ground-level $PM_{2.5}$ concentration ($\mu g m^{-3}$) from U.S. sources attributable to combustion emissions from (a) electric power generation; (b) industry; (c) commercial and residential sources; (d) road transportation; (e) marine transportation; (f) rail transportation; (g) sum of all combustion sources; (h) all sources (baseline case for this study). A different scale is adopted for (a–f) and (g–h).



Fabio Caiazzo, et al., "Air pollution and early deaths in the United States. Part I: Quantifying the impact of major sectors in 2005," *Atmospheric Environment*, 2013

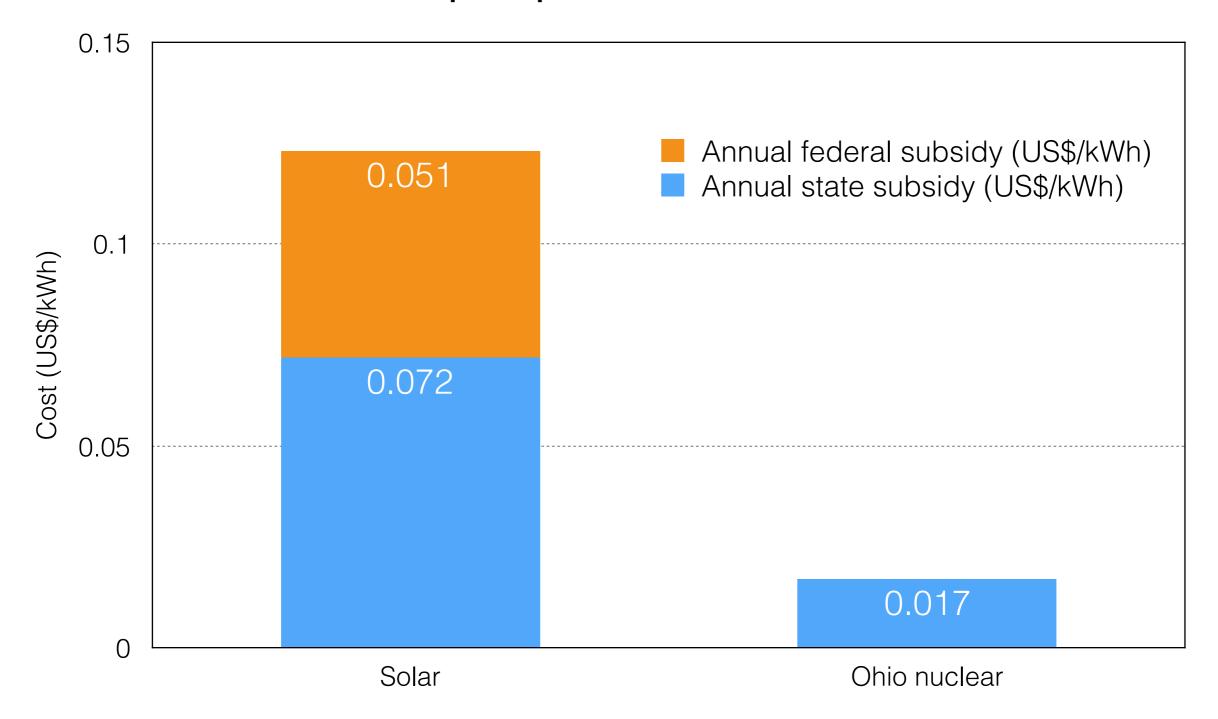
Without nuclear, the amount of clean electricity in Ohio will decline 90 percent.





Source: https://www.eia.gov/electricity/data/browser/. Based on 2016 generation totals.

Solar subsidies vs. proposed Ohio nuclear subsidy



Sources: http://www.srectrade.com/srec_markets/ohio

https://solarpowerrocks.com/ohio/

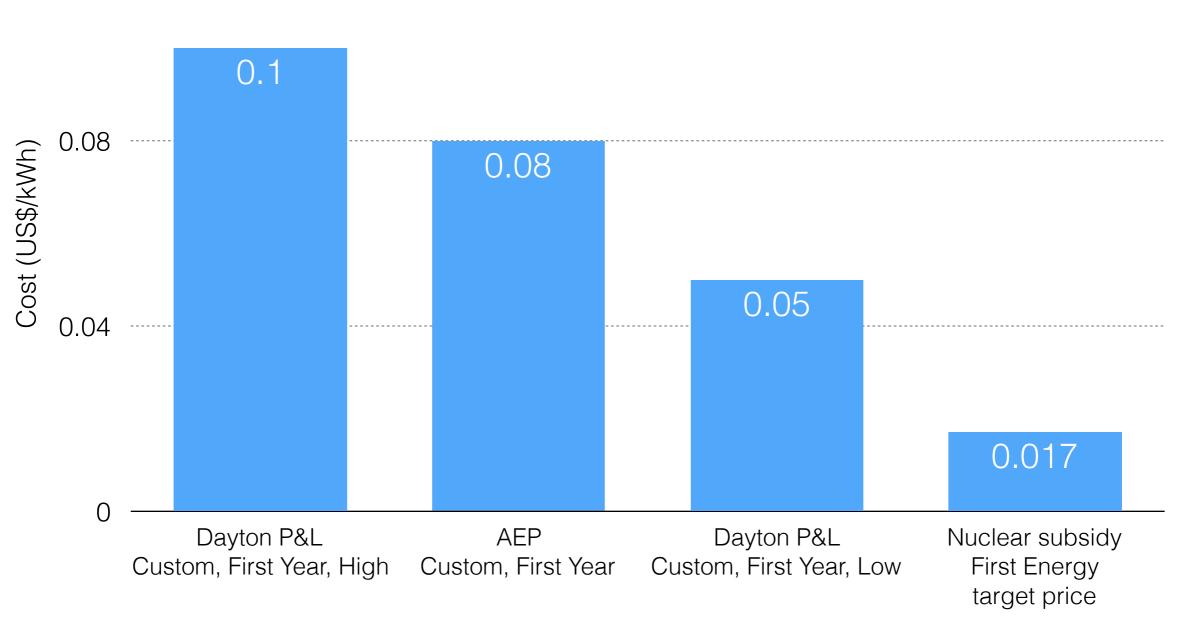
http://www.utilitydive.com/news/aep-ohio-wholesale-auction-prices-continue-to-decline-stressing-utilities/408870/

https://www.eia.gov/electricity/data/browser/#/topic/7?agg=0,1&geo=g0002&endsec=vg&linechart=ELEC.PRICE.US-

ALL.A&columnchart=ELEC.PRICE.US-ALL.A&map=ELEC.PRICE.US-

ALL.A&freq=A&ctype=linechart<ype=pin&rtype=s&pin=&rse=0&maptype=0

Ohio energy efficiency subsidies cost up to 6x more per kilowatt hour than the proposed nuclear subsidy.



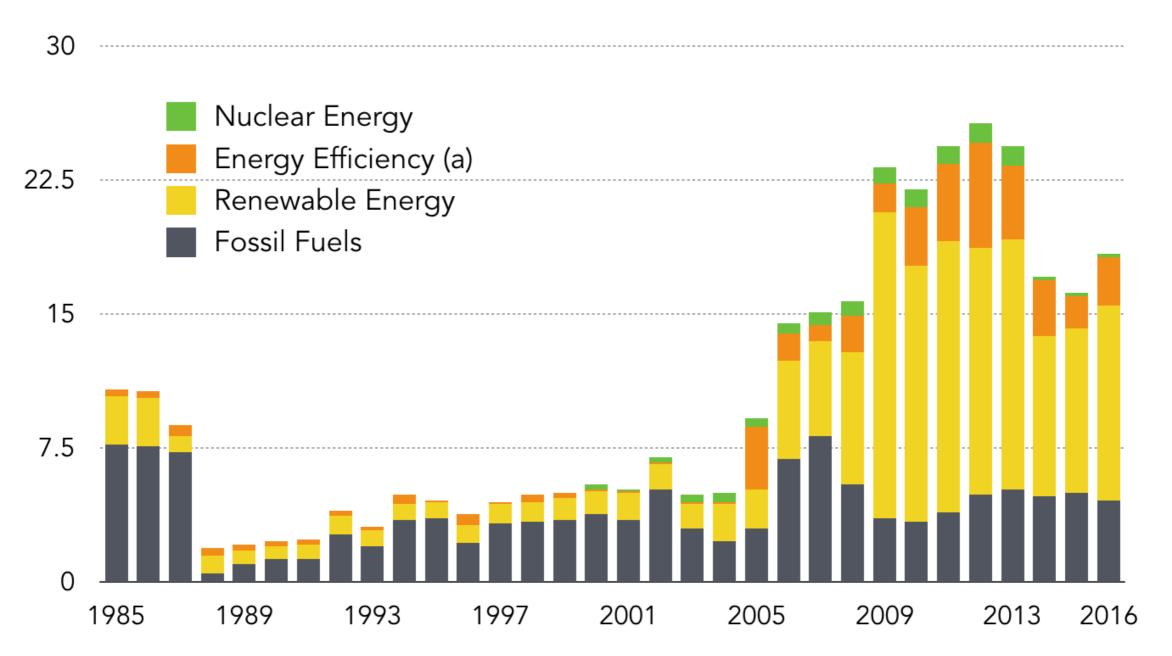
Subsidy program



0.12

Sources: <u>https://energy.gov/eere/femp/energy-incentive-programs-ohio</u> <u>http://media.cleveland.com/business_impact/other/Benefits%20of%20Ohio's%20Nuclear%20Assets.pdf</u>

Costs of Energy-Related Tax Preferences, by Type of Fuel or Technology, 1985 to 2016

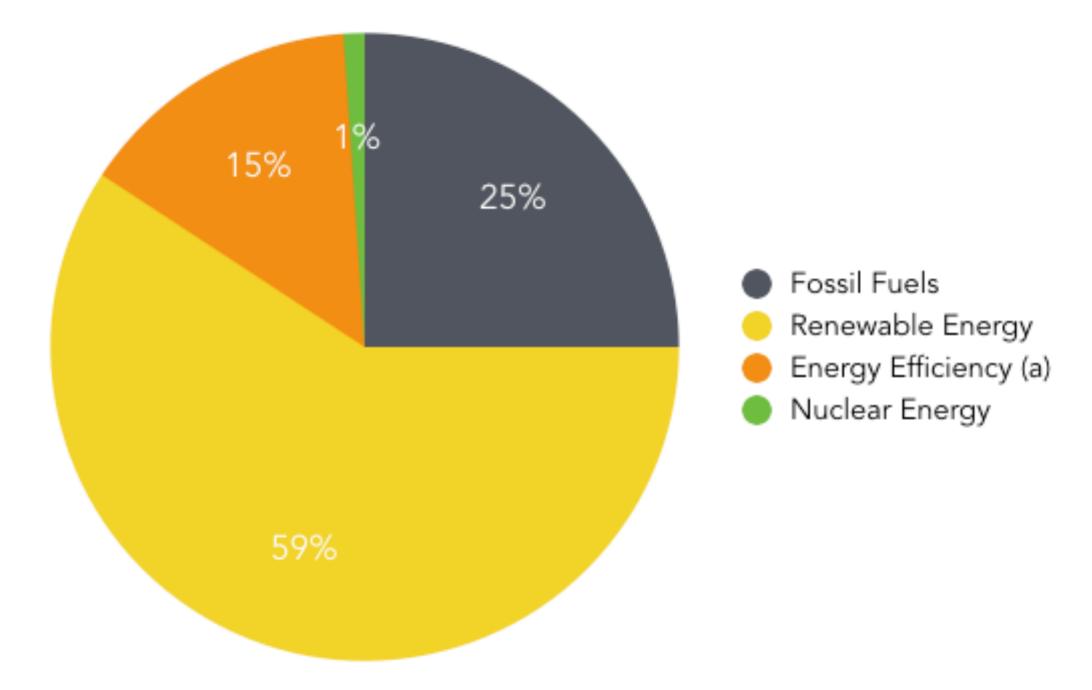


(a) Includes the costs of tax preferences related to the transmission of electricity, which are typically small.



Source: Testimony on federal support for developing, producing, and using fuels and energy technologies: Hearing before the Subcommittee on Energy Committee on Energy and Commerce, U.S. House of Representatives, 115th Cong. (2017) (Terry Dinan, Congressional Budget Office). <u>https://www.cbo.gov/system/files/115th-congress-2017-2018/reports/52521-energytestimony.pdf</u>

Costs of energy-related tax preferences, by type of fuel or technology, 2016

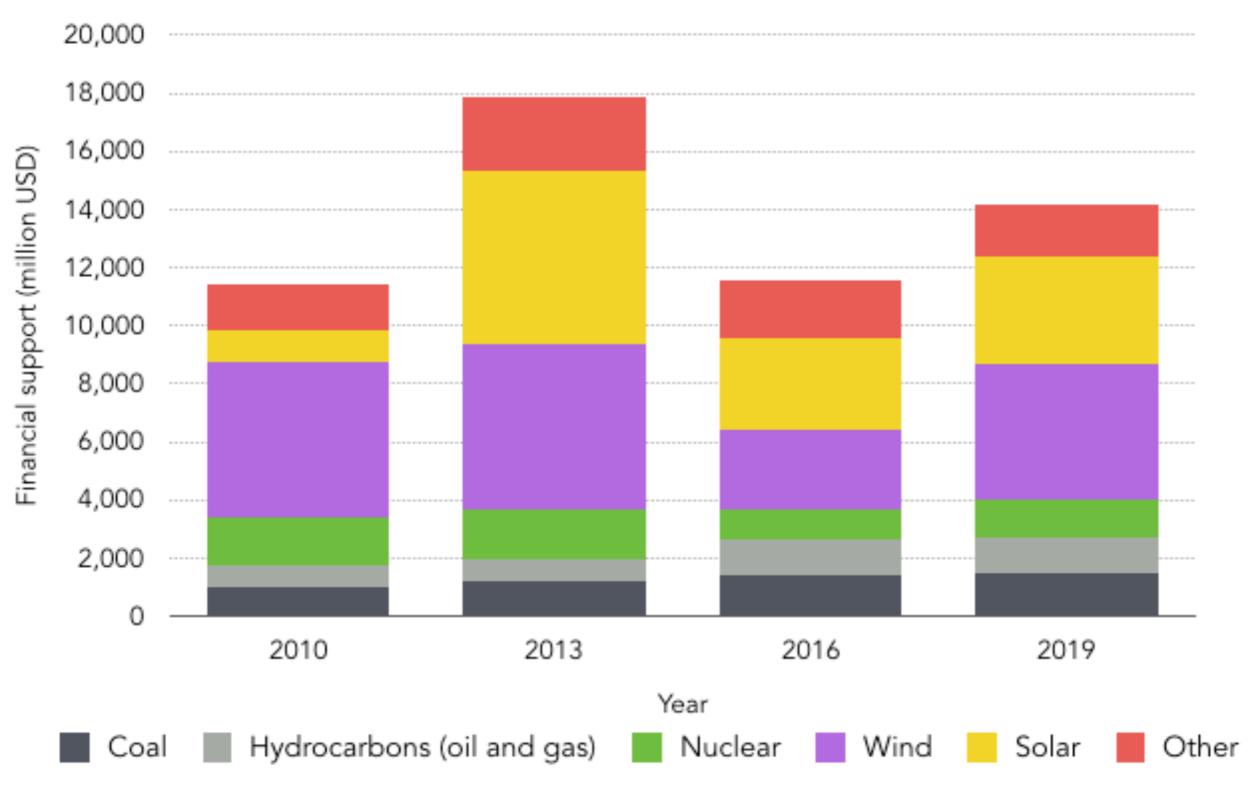


(a) Includes the costs of tax preferences related to the transmission of electricity, which are typically small.



Source: Testimony on federal support for developing, producing, and using fuels and energy technologies: Hearing before the Subcommittee on Energy Committee on Energy and Commerce, U.S. House of Representatives, 115th Cong. (2017) (Terry Dinan, Congressional Budget Office). <u>https://www.cbo.gov/system/files/115th-congress-2017-2018/reports/52521-energytestimony.pdf</u>

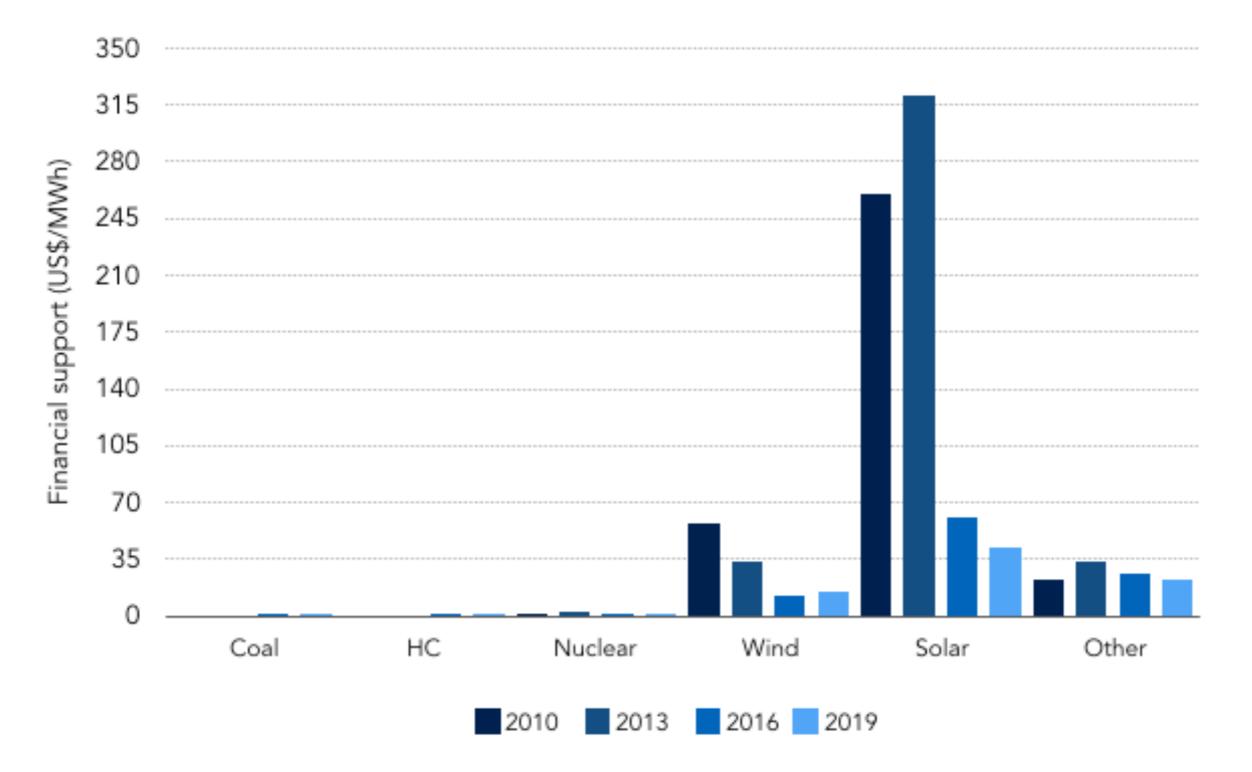
Total federal spending on electricity by fuel type and year





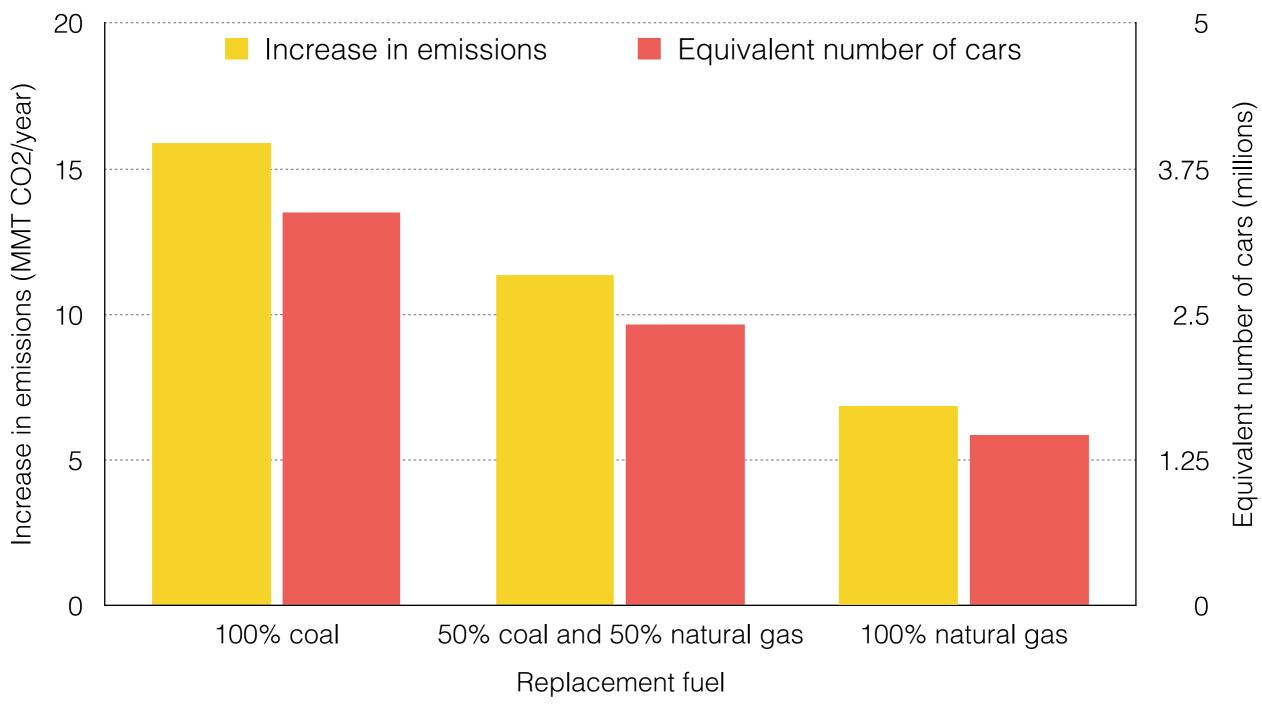
Source: Griffiths, Benjamin W., <u>Gülen</u>, <u>Gürcan</u>, Dyer, James S., Spence, David, and King, Carey W. "Federal Financial Support for Electricity Generation Technologies" White Paper UTEI/2016-11-1, 2016, available at: <u>http://energy.utexas.edu/the-full-cost-of-electricity-fce/</u>

Subsidy by type and fuel per megawatt-hour





Source: Griffiths, Benjamin W., <u>Gülen</u>, <u>Gürcan</u>, Dyer, James S., Spence, David, and King, Carey W. "Federal Financial Support for Electricity Generation Technologies" White Paper UTEI/2016-11-1, 2016, available at: <u>http://energy.utexas.edu/the-full-cost-of-electricity-fce/</u> Ohio emissions will increase the equivalent of adding up to 3.4 million cars to the road if Perry and Davis-Besse close.





Sources: <u>https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle-0</u> <u>https://www.eia.gov/electricity/annual/html/epa_08_02.html</u>

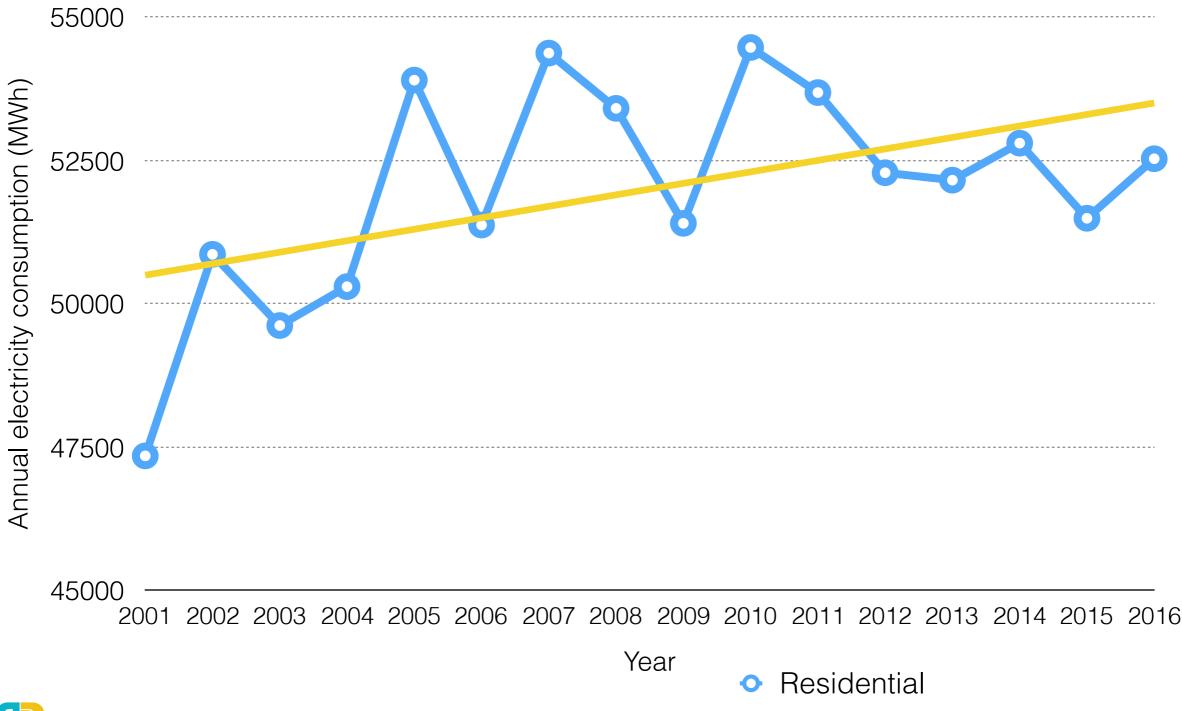
In 2016, Ohio imported more than 19% of its power.





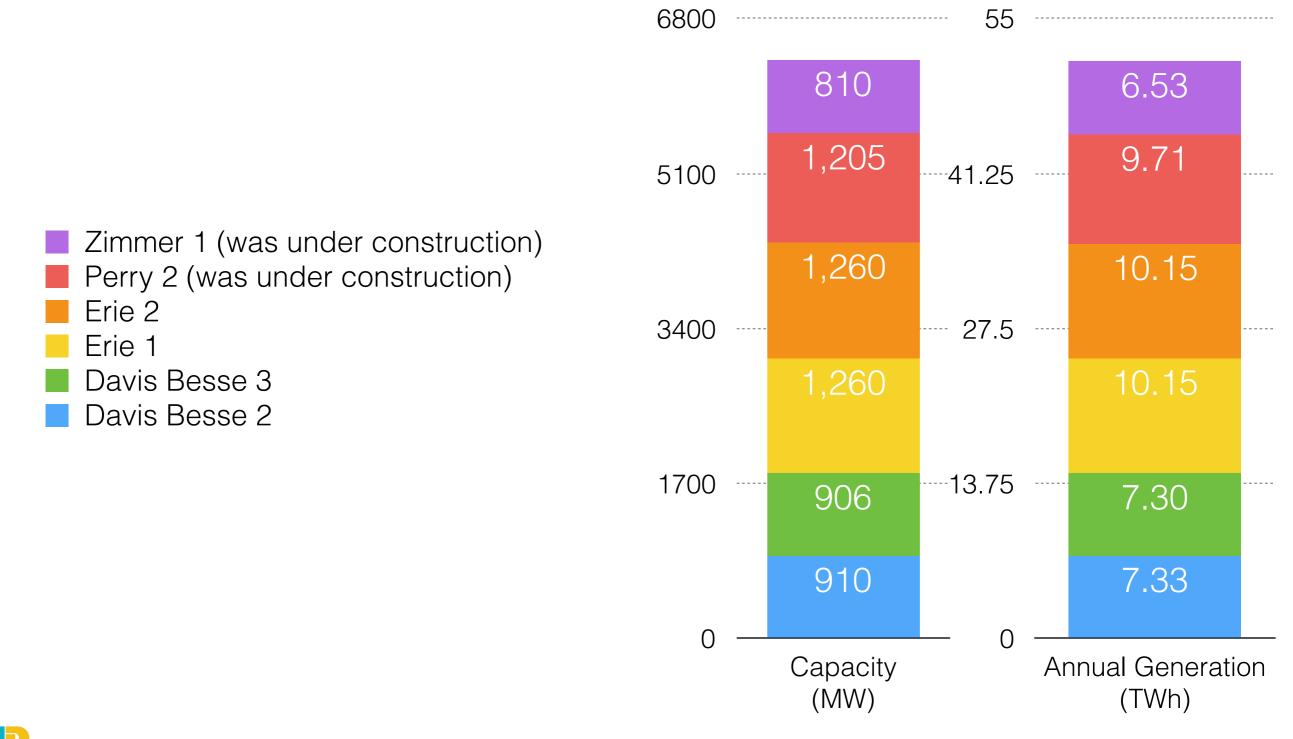
Source: EIA Electricity Data Browser. https://www.eia.gov/electricity/data/browser

Ohio residential electricity increased despite energy efficiency spending



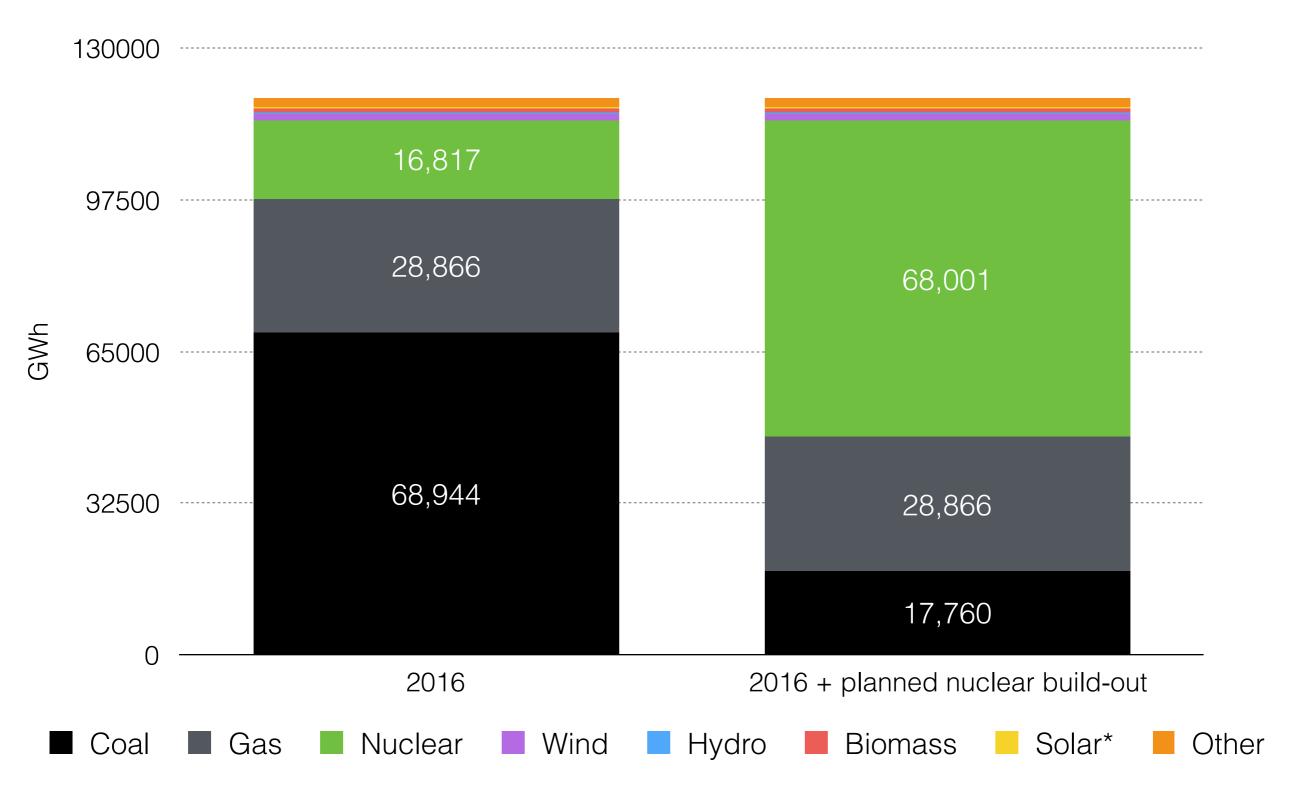


Ohio Nuclear Abandonments





Nuclear Abandonments Locked in Fossil Fuels

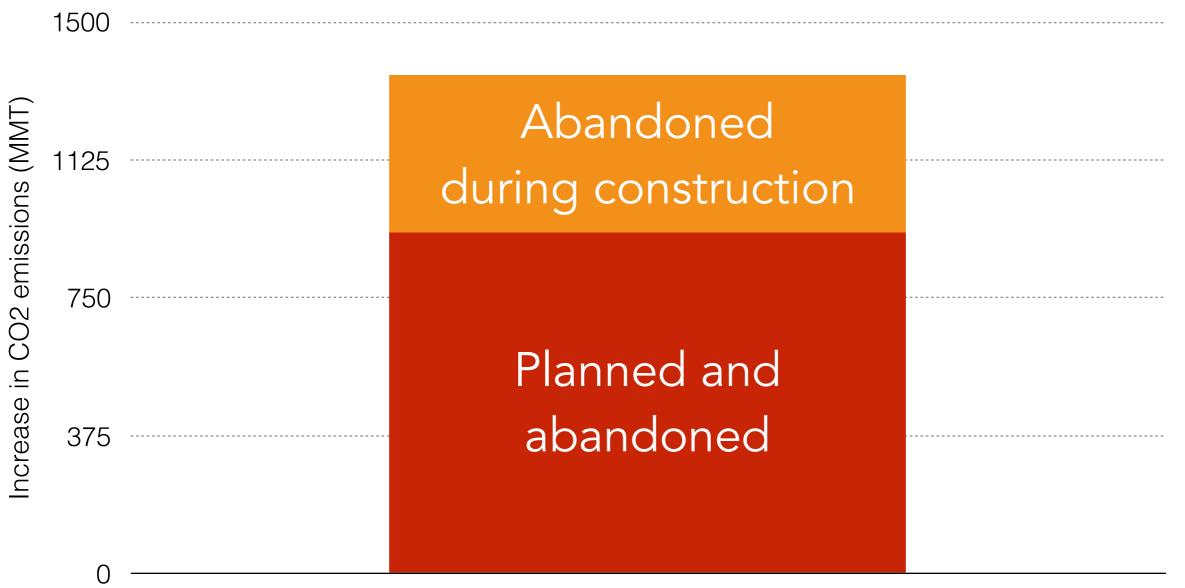




*Includes distributed solar

Source: US Energy Information Administration

Since 1985, Ohio's nuclear abandonments increased emissions equivalent of adding 14 million cars to road.

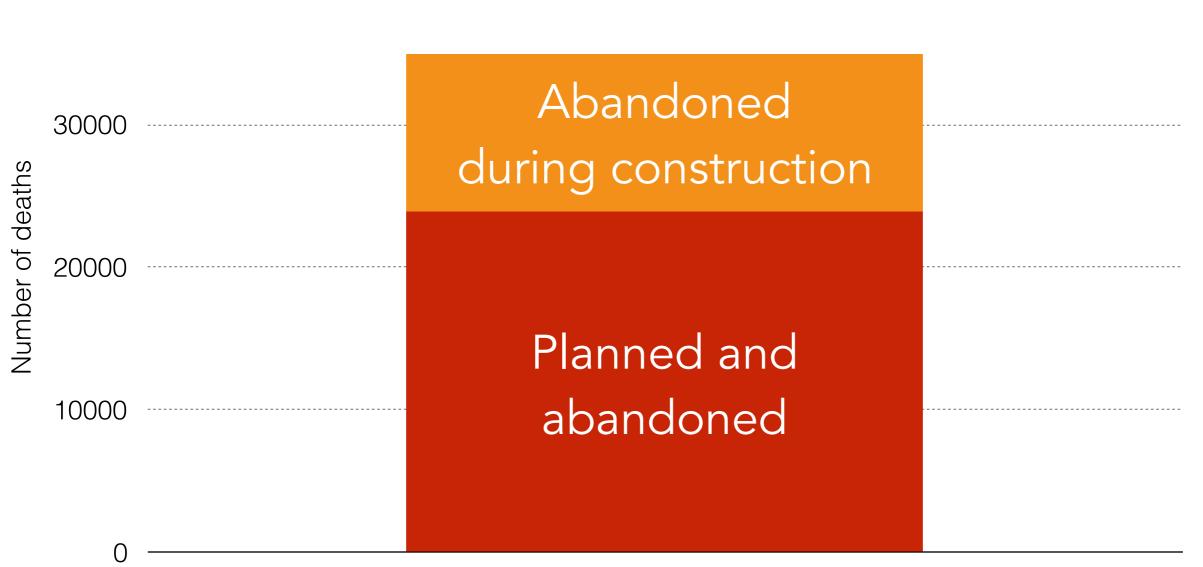


Nuclear projects



Source and notes: EP Energy Progress Tracker. Emissions calculated using a coal emission factor of 950 g CO2/kwh. All replacement generation came from coal.

Nearly 35,000 premature deaths resulted from Ohio's nuclear abandonments and the pollution from the coal that burned instead.



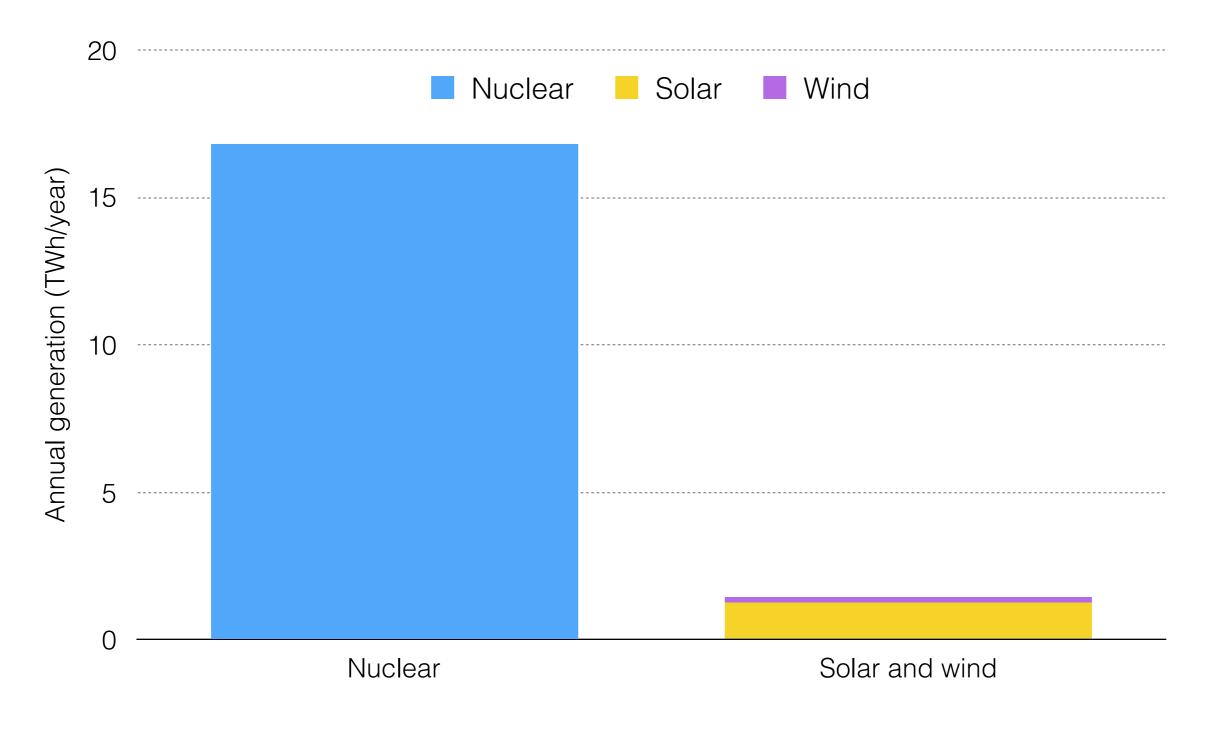
Premature deaths



40000

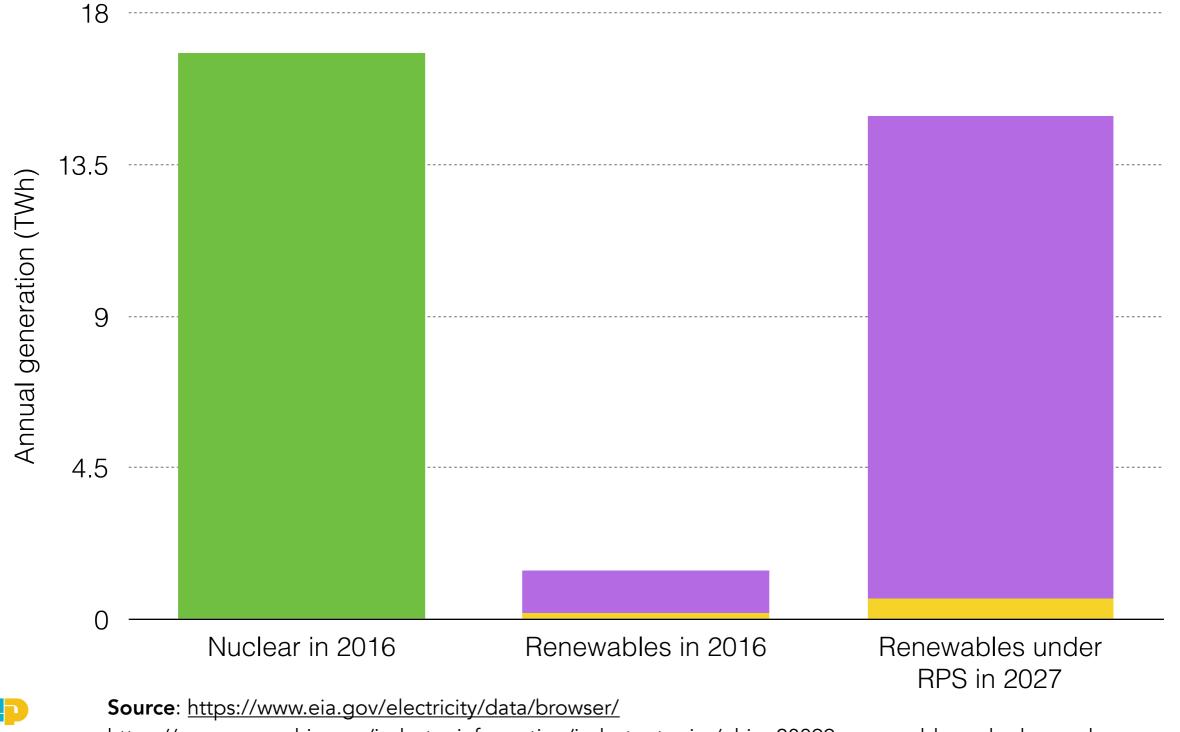
Source and notes: EP Energy Progress Tracker. Emissions calculated using a coal emission factor of 950 g CO2/kwh. All replacement generation came from coal. Number of deaths per TWh of coal burned taken from Markandya, Anil, and Paul Wilkinson. "Electricity generation and health." The Lancet 370.9591 (2007): 979-990.

Ohio nuclear provided almost 12x more electricity than Ohio solar and wind combined in 2016.



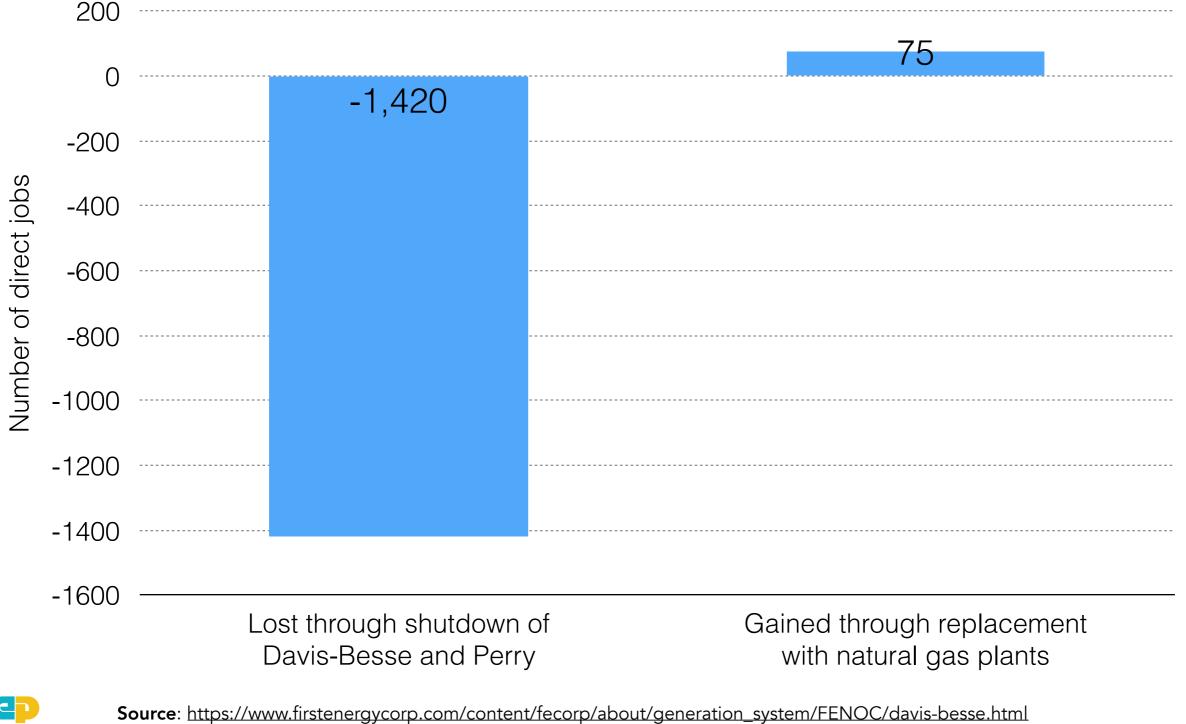


Nuclear produced more electricity in 2016 than renewables under RPS in 2027 assuming flat demand.



<u>https://www.puco.ohio.gov/industry-information/industry-topics/ohioe28099s-renewable-and-advanced-energy-portfolio-</u> standard/

Ohio will face a net loss of at least 1,345 direct jobs if nuclear plants are replaced with new natural gas.



https://www.firstenergycorp.com/about/generation_system/FENOC/perry.html http://www.power-eng.com/articles/2001/12/intergen-completes-financing-on-900-mw-project-in-mississippi.html