About half of the nation's 99 nuclear reactors operate in competitive wholesale electricity markets. Over the last five years, low natural gas prices, market dynamics, technical issues, and policies that favor renewables have precipitated the closure or announced retirement of 14 U.S. nuclear reactors, some well-ahead of planned lifetimes. More retirements are in the offing: Over 80 commercial reactors have garnered federal licenses to operate for 60 years—but 41 of these are more than 40 years old. The next few years will see only five new nuclear reactors begin production. See a related slideshow, "U.S. Nuclear Power Plant Closures," at powermag.com. Sources: FERC, POWER



A. December 2010—Exelon says it will close its 625-MW Oyster Creek BWR in 2019, a decade before its current operating license ends, to avoid costs associated with the installation of cooling towers.

B. February 2013—Duke Energy retires the 860-MW Crystal River PWR after being unable to repair damage to the containment structure when new steam generators were installed in 2009. The reactor's operating license was due to expire in 2016.

C. March 2013—Construction begins on Southern Co.'s Plant Vogtle Units 3 and 4, the nation's first Westinghouse AP1000 PWR units. First operation has been delayed to June 2019 and June 2020.

D. May 2013—Dominion Energy retires the 39-year-old 566-MW Kewaunee PWR after it failed to find buyers for the single-unit plant, citing low power prices caused by declining gas prices. The reactor had in 2011 gotten the NRC's approval to operate until 2033.

E. June 2013—Southern California Edison retires two PWR reactors (1,070 MW and 1,080 MW) at the San Onofre nuclear plant after leaks were discovered in the steam generators of both units, which had been replaced in 2009. Regulatory delay and uncertainty were also factors that shut down the reactors. The units' licenses would have expired in 2022.

F. August 2013—Entergy Nuclear announces that it will permanently close the 620-MW Vermont Yankee BWR by December 2014, owing to increased costs and market conditions. The unit had received a license renewal to operate until 2032.

The units are estimated to be completed in August 2019 and August 2020.

H. October 2015—Entergy announces it will retire its 680-MW Pilgrim BWR by June 2019, citing poor market conditions exacerbated by low wholesale power prices and the increased production of shale gas. Its current license ends in 2032.

I. November 2015—Entergy announces it will retire its 838-MW FitzPatrick BWR in January 2017, citing "continued deteriorating economics." The plant's current license ends in 2034.

J. June 2016—After the state of Illinois stalls on a provision to help make Exelon's Illinois units profitable, the company officially announces it will close its 1,069-MW Clinton BWR by June 2017, nearly a decade before its license expires.

K. June 2016—Exelon also says it will close its dual-unit 1,871-MW Quad **Cities** BWR plant by June 2018, though that plant's license expires in 2032.

L. June 2016—Omaha Public Power announces it will close the 476-MW Fort **Calhoun** PWR, the smallest operating unit in the U.S., for economic reasons, by December 2016. Its current license ends in 2034.

M. June 2016—The Tennessee Valley Authority's 1,123-MW Watts Bar 2 PWR generates power for the first time. The company embarked on continuing the long-stalled construction of the reactor in April 2012.

N. June 2016—Pacific Gas and Electric says it will not seek license extensions for two units at the 2,240-MW Diablo Canyon PWR plant to focus on a plan that promotes renewables and phases out nuclear power. Unit 1 will retire when its current license expires in November 2024, with Unit 2 following in August 2025.