Stiff Competition: Natural Gas and Renewables

- Natural gas supplies are abundant as tight oil and gas fracturing continues to grow unabated.
- Despite modest incentives to boost wind and solar, these resources are putting up stiff competition against natural gas.
- The Department of Energy projects higher penetration rates of renewables as an important supply stream in the years ahead.

The U.S. Energy Information Administration (EIA), the statistical and analytics unit of DOE, is tracking closely the competition among fuels used for electricity generation (see top chart). Two major “crossovers” are evident in these time series.

- Since 2006, the year just before the onset of the financial crisis, coal represented the most prevalent source for generation — about a 50% share and 2 trillion kWh of power.
- In the decade since, coal faltered and natural gas became the primary source just three years ago, during 2015. EIA projects natural gas to garner a 34% market share next year.
- Another important crossover took place since the financial crisis. Nonhydro renewables — primarily wind and solar — edged above hydropower in 2014. Nonhydro renewables are slated to reach nearly 500 billion kWh by 2019, representing a 10% share of total generation.

These changing patterns of fuel sourcing are largely driven by market economics and an understanding of the social costs of CO₂, prodded by incremental policy levers such as production and investment tax credits and, in some communities, outright targeting of higher renewables shares. Cost and pricing curves matter greatly.

- Natural gas prices have fallen 58% since the most recent peak in February, 2014.
- Total dry shale gas production reached 50 billion cubic feet per day at yearend 2017 (see 2nd chart). This is up 65% during the last 5 years.

Even with this gas resource abundance, renewables sourcing is competing. Its share is rising and costs are dropping.

- For example, the EIA’s projections of the all-in cost (i.e., levelized cost of electricity) for plants coming into service in 2022 shows competitive wind and solar resources (see table). Based on 2016 $ per MWh, onshore wind costs of $44.3 per MWh is 24% below conventional gas-fired plant costs.
- Solar PV and gas-fired plants are at competitive cost calculations, but only because the fixed costs associated with solar — the capital costs, operation and maintenance — are higher than the current projections for conventional natural gas-fired plants. The competitive race is on!