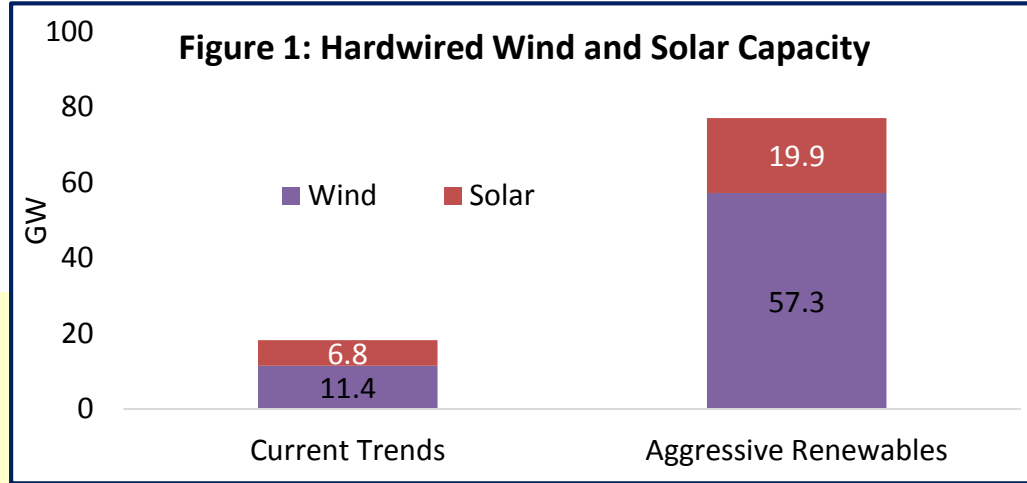
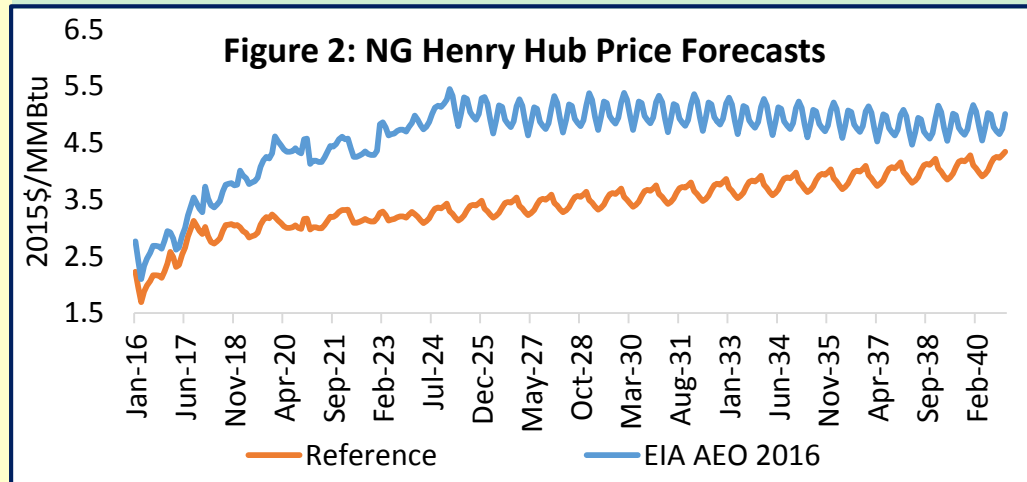


# How Big is the Pathway for NG-fired Electricity Generation to 2030?

- The U.S. electricity industry is going through significant transformation with increasing penetration of renewable energy, cheap natural gas, stagnant load growth and new environmental regulations, among other factors.
- These changes to date have led to record level of natural gas-fired electricity generation<sup>1</sup> but there are uncertainties going forward.
- We model<sup>2</sup> 10 scenarios to capture some of these uncertainties: a more aggressive expansion of renewables (Figure 1), low and high natural gas price forecasts (Figure 2), lower load growth, and premature retirement of 43 GW of nuclear capacity.



The model does not build much renewables capacity economically. We hardwire projects under construction in the CT scenario. Announced projects and those in various stages of development are also added in the AR scenario. Reported completion dates are used. **Data from ISO/RTO generation interconnection reports and SNL (last updated in June 2016).**



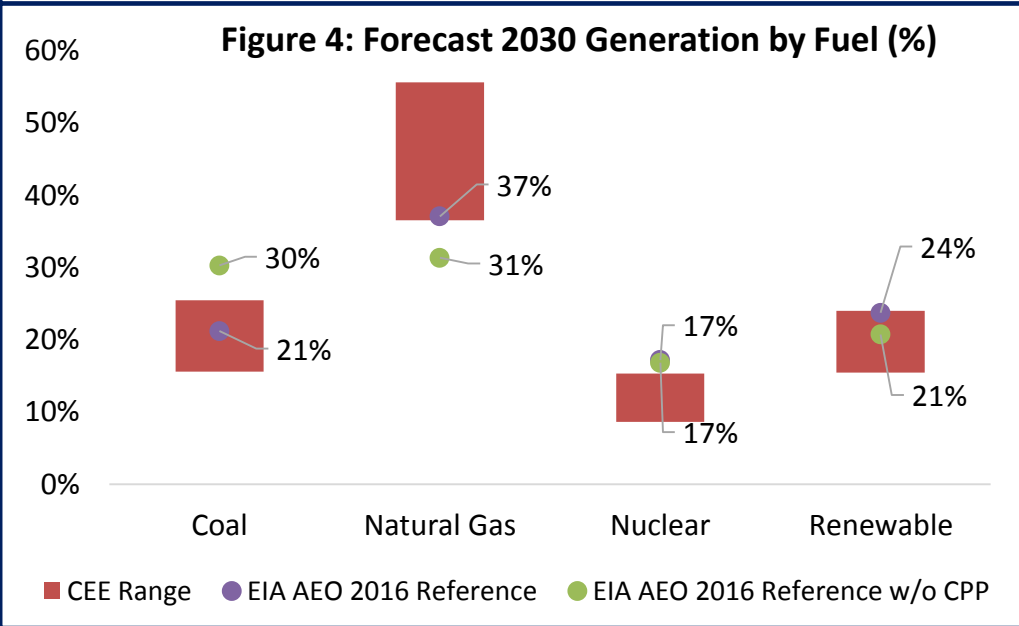
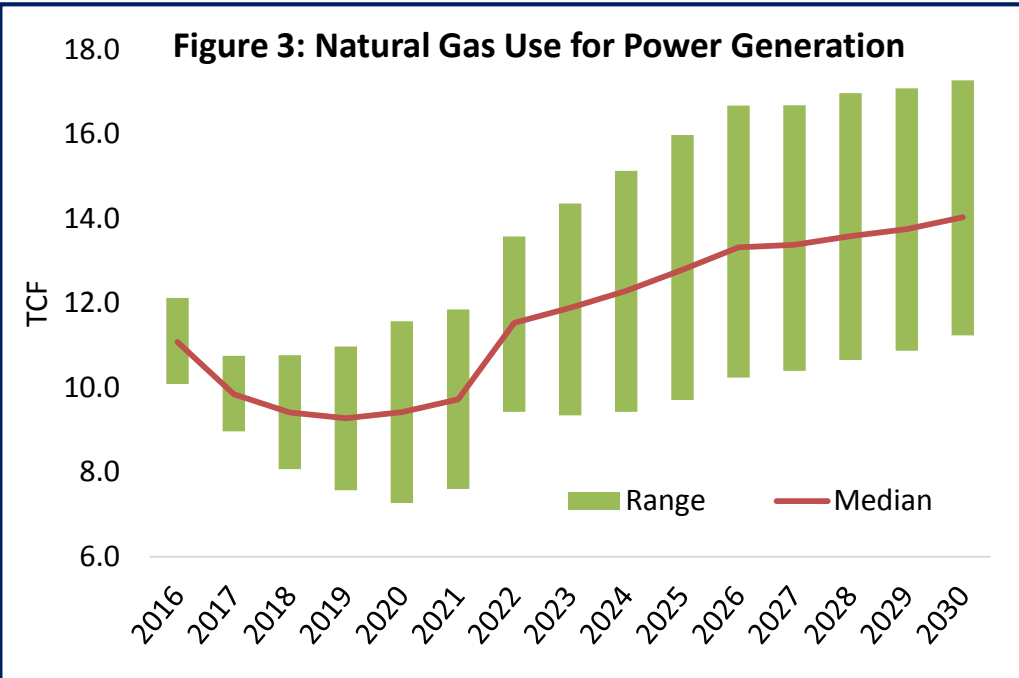
Reference price forecast is from UT Austin Energy Institute “Full Cost of Electricity” research project; EIA price forecast is from the Annual Energy Outlook 2016. Monthly variability is added to both forecasts by CEE on the basis of historical patterns.

1. See US EIA *Today In Energy* “[Natural gas-fired electricity generation expected to reach record level in 2016](#)”  
 2. We use AURORAxmp for long-term resource expansion and dispatch modeling.



# NG use is likely to grow but there is a wide range across scenarios

- In 2030, there is a 6-TCF range of natural gas use for power generation (Figure 3):
  - Low estimate (11 TCF in 2030): Aggressive Renewables, EIA AEO 2016 NG price forecast, and low load growth.
  - High estimate (17 TCF in 2030): Current Trends, Reference NG price forecast, reference load growth, and premature nuclear retirements.
- Our NG-burn forecasts are more bullish than the EIA AEO 2016 forecasts (Figure 4); but the low end of our forecasts (Scenarios 9, and 10 in the next slide) matches the EIA AEO 2016 Reference case (about 37%). Scenarios 3 and 4 are also close: 38-39%.
  - **NG price is the most dominant factor**

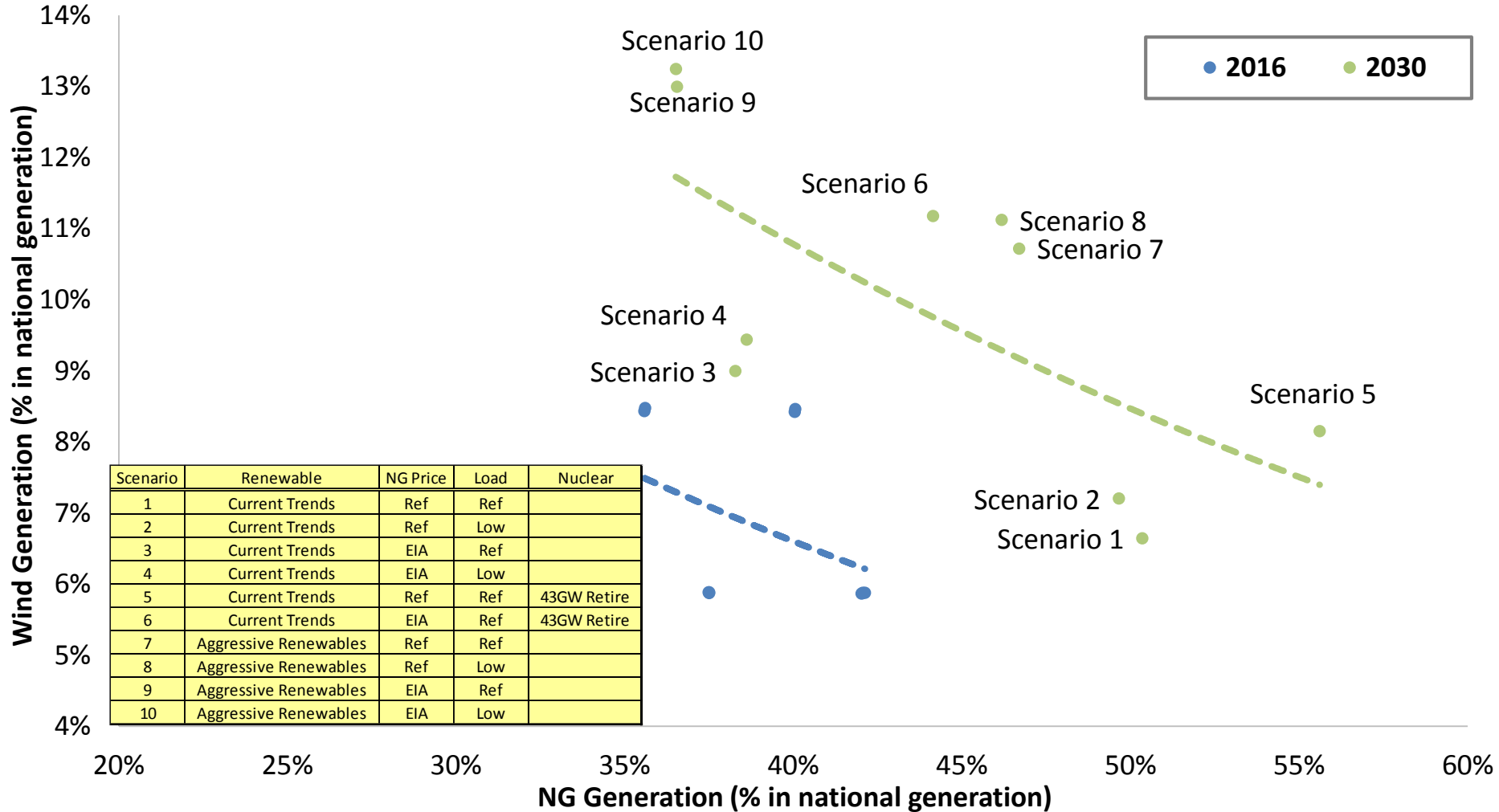


(1) Renewable includes conventional hydro, wind and solar; (2) CPP = Clean Power Plan



# Natural gas and wind generation both increase over time; however, there is a trade-off between their shares across the scenarios.

Figure 5: Natural Gas - Wind Generation Balance



# Higher wind generation reduces NG plant revenue.

Figure 6: Wind Generation Share and Natural Gas Plant Revenue in 2030

