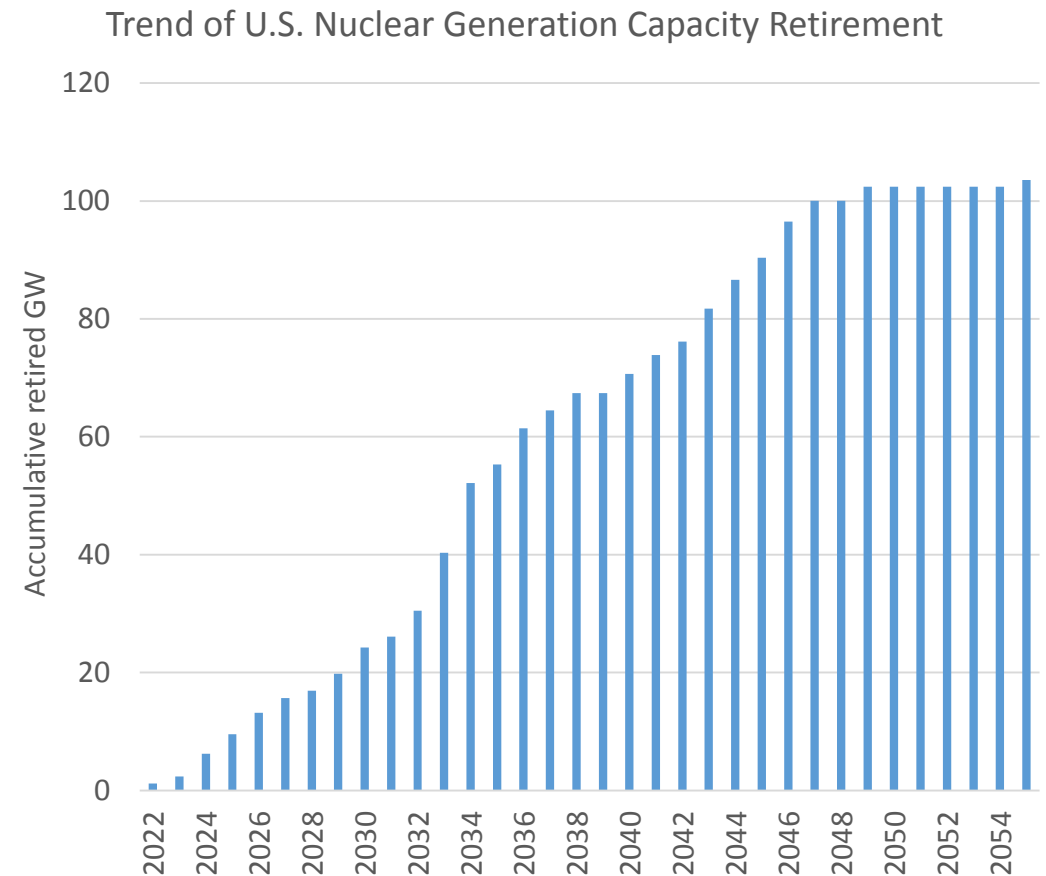


60-year licenses expire for 100 GW of nuclear generation capacity by mid-2050

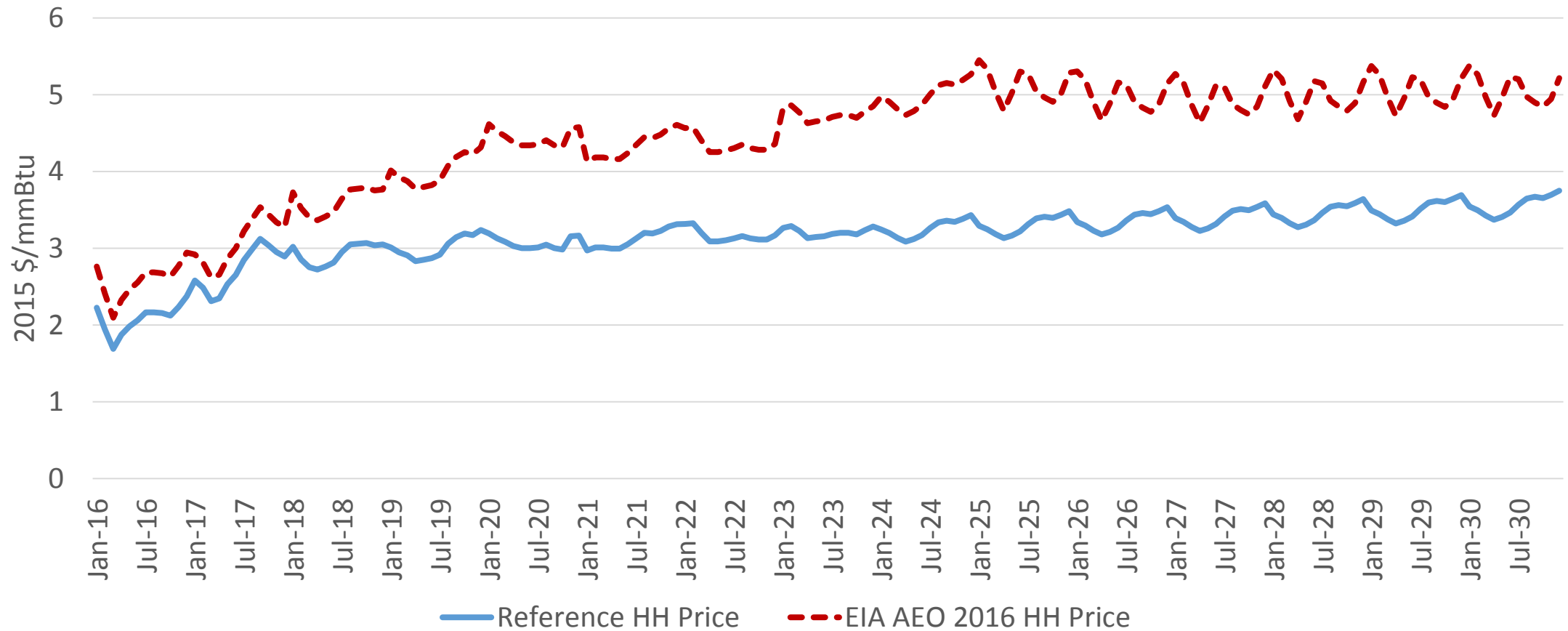
- More than 80 reactors have licenses to operate for 60 years.
- A big wave of retirements comes in around 2030, unless plant owners seek to extend operation for another 20 year (to 80 years).
 - To date only Exelon and Dominion had notified US NRC their intention to seek second license renewal for one plant each.



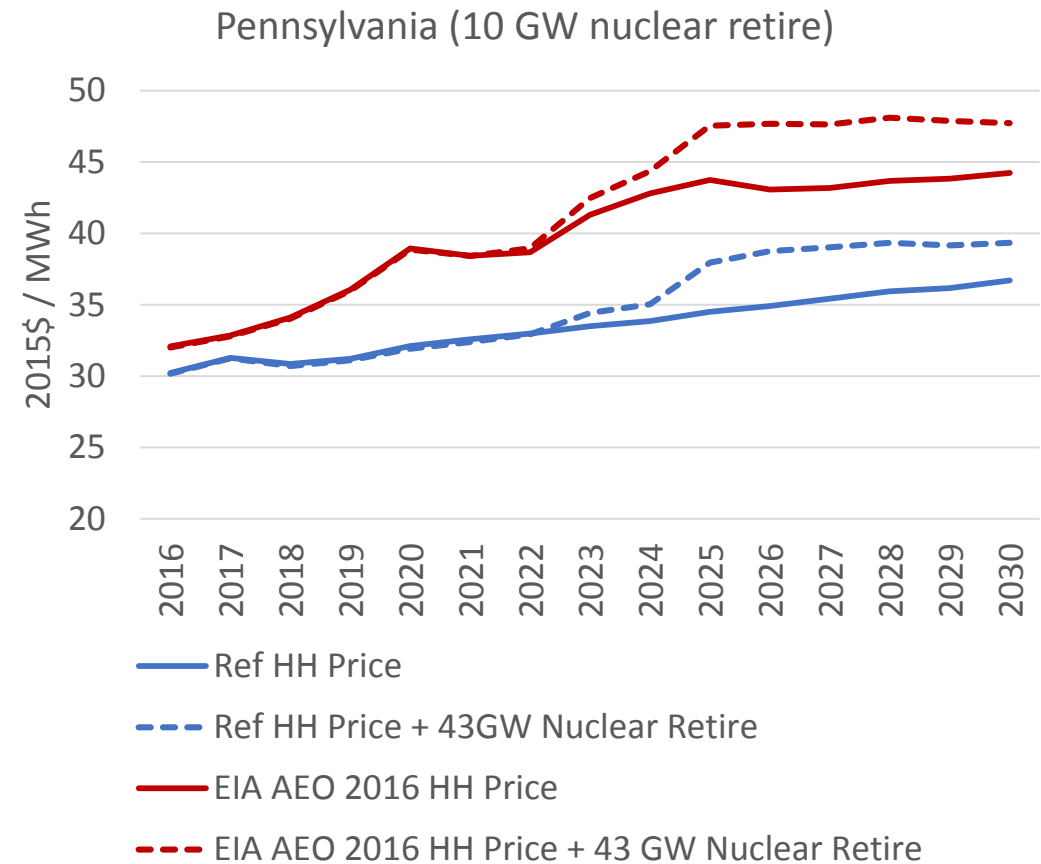
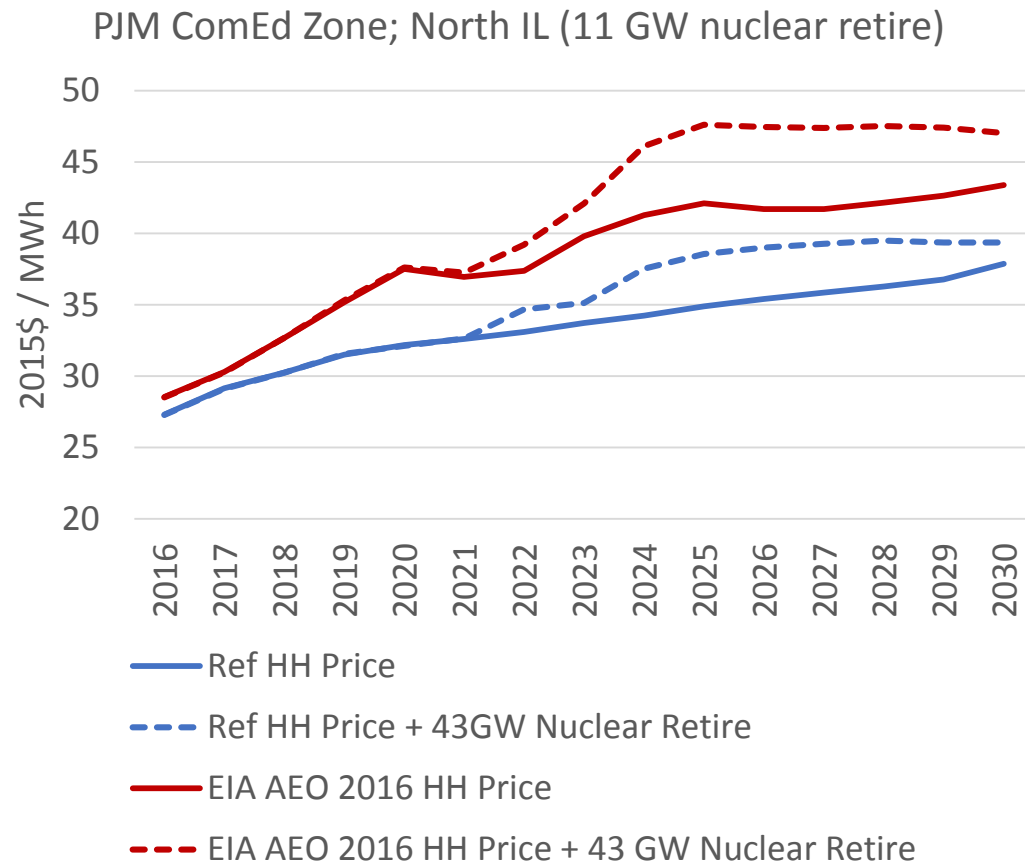
However plant owners are retiring reactors prematurely due to economics

- 6 reactors (4.8 GW) retired prematurely between 2013 and 2016; another 8 reactors (7.6 GW) are set to retire by 2025
- In addition to announced retirement, up to 43 GW in competitive wholesale markets might also be at risk of early shutdown
- Several states are trying to save their nuclear plants:
 - “Zero-Emission Credits” in New York
 - “Future Energy Jobs Bill” in Illinois
 - “Re-regulation” in Ohio
- These measures are likely to be challenged by other market participants and inconsistent with competitive markets.

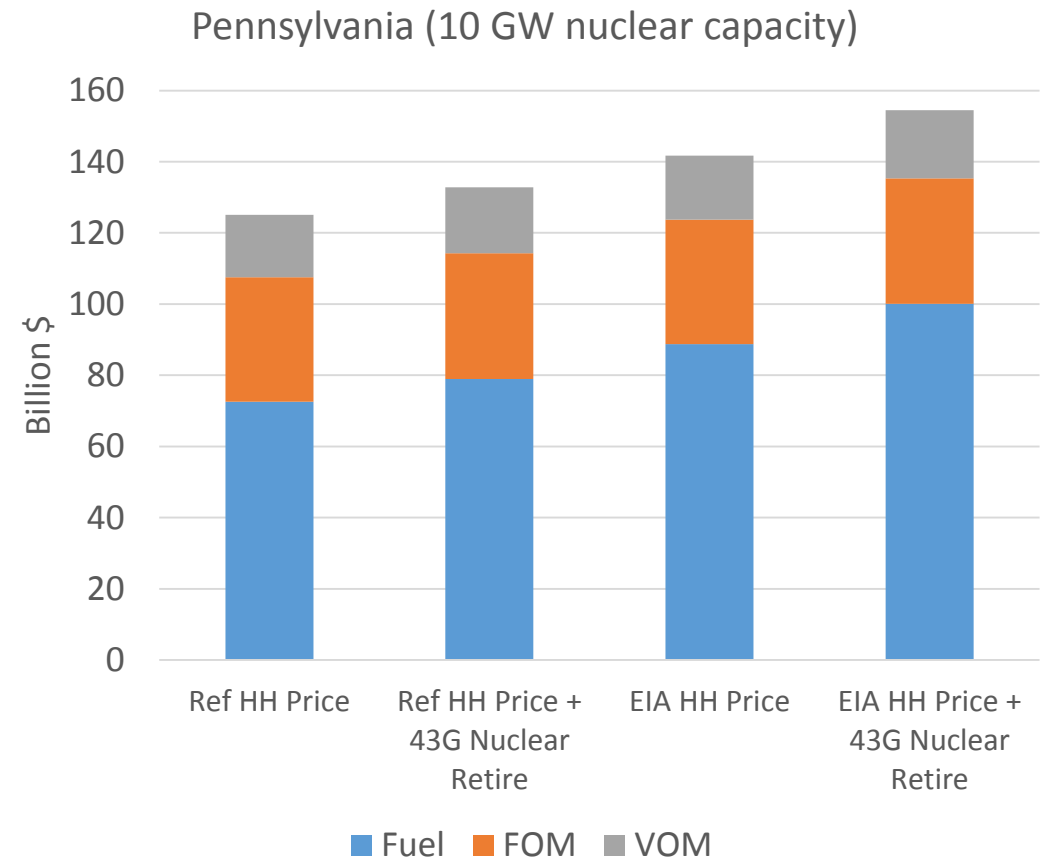
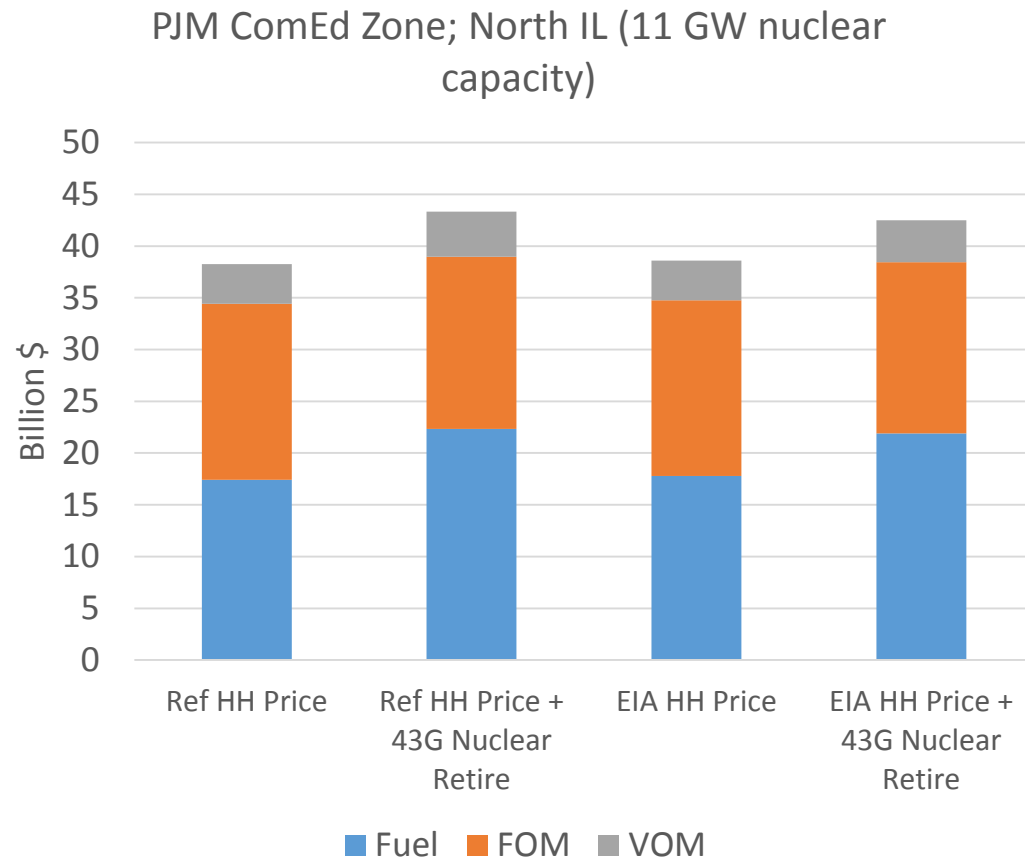
Impacts of losing additional 43 GW of nuclear capacity in competitive markets by 2025: Two Henry Hub NG price scenarios



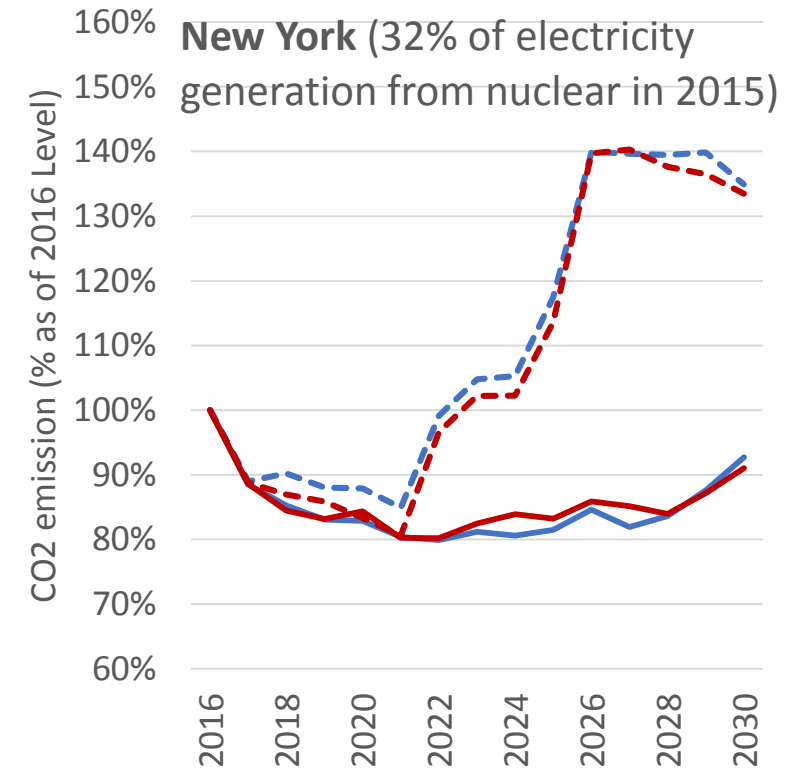
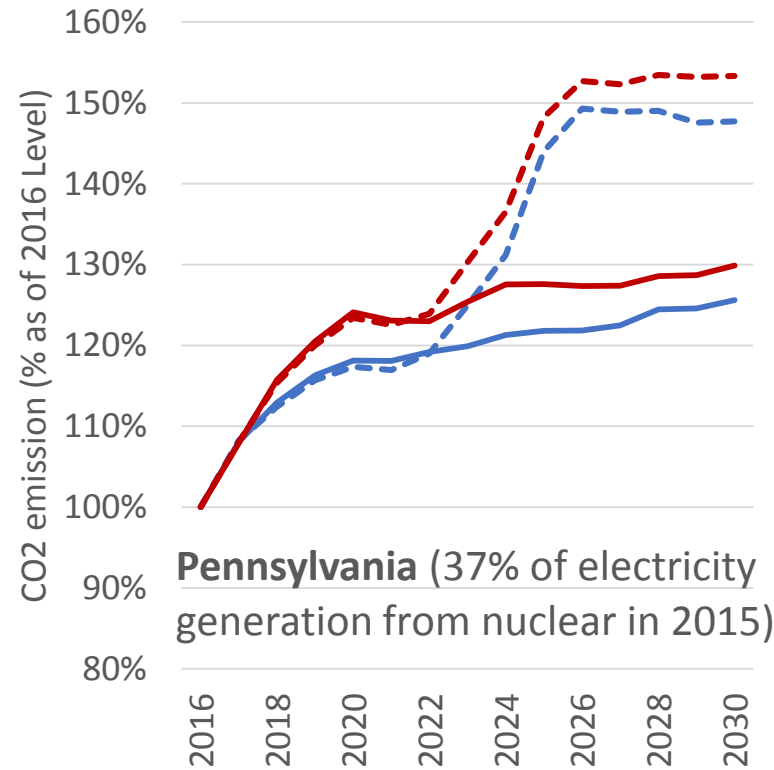
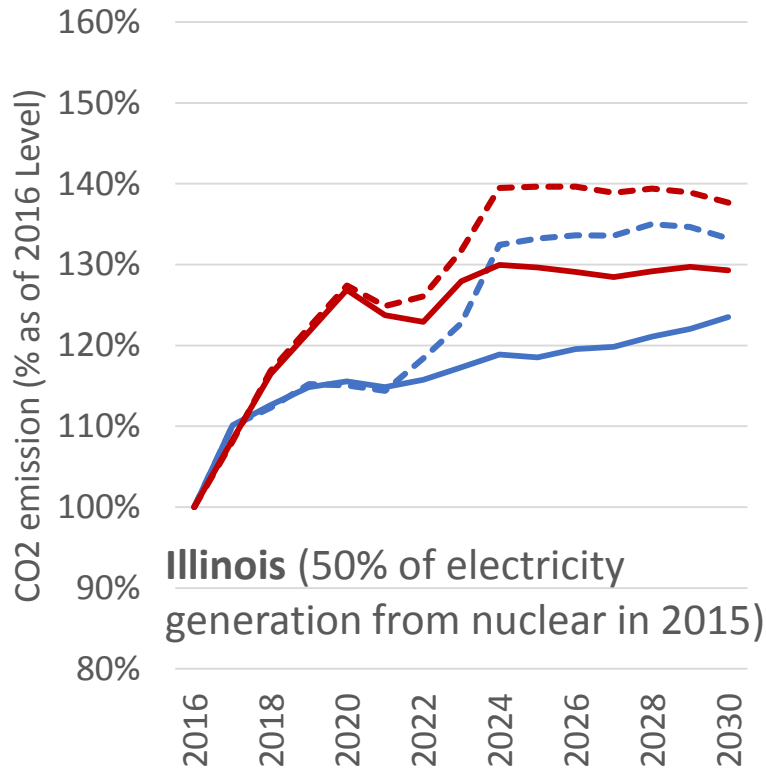
Gas-fired generation and imports fill the gap, wholesale prices rise



Total system cost increases due to higher fuel expenditures (2016-2030)



CO2 emissions increase significantly in some states



- Ref. HH Price
- - - Ref. HH Price + Nuclear Retire
- EIA HH Price
- - - EIA HH Price + Nuclear Retire

- Ref. HH Price
- - - Ref. HH Price + Nuclear Retire
- EIA HH Price
- - - EIA HH Price + Nuclear Retire

- Ref. HH Price
- - - Ref. HH Price + Nuclear Retire
- EIA HH Price
- - - EIA HH Price + Nuclear Retire

Nationwide, CO2 emission increase but much less

