

EPRI's Comments on the Federal Plan

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Resources for the Future Forum on
Comments on the EPA's CPP Federal Plan
and Trading Rules

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EPRI Comment Topics

1. Inclusion of Energy Efficiency
2. Evaluation, Measurement, and Verification (EM&V) for Energy Efficiency
3. Credit for Nuclear Life-extension
4. Reliability
5. Choice of Rate vs. Mass Final Plans
6. Allowance Allocation
7. Allowance Banking
8. Output-based Set-asides (OBS) for NGCCs in the Mass Model Rule

EPRI Comment Topics

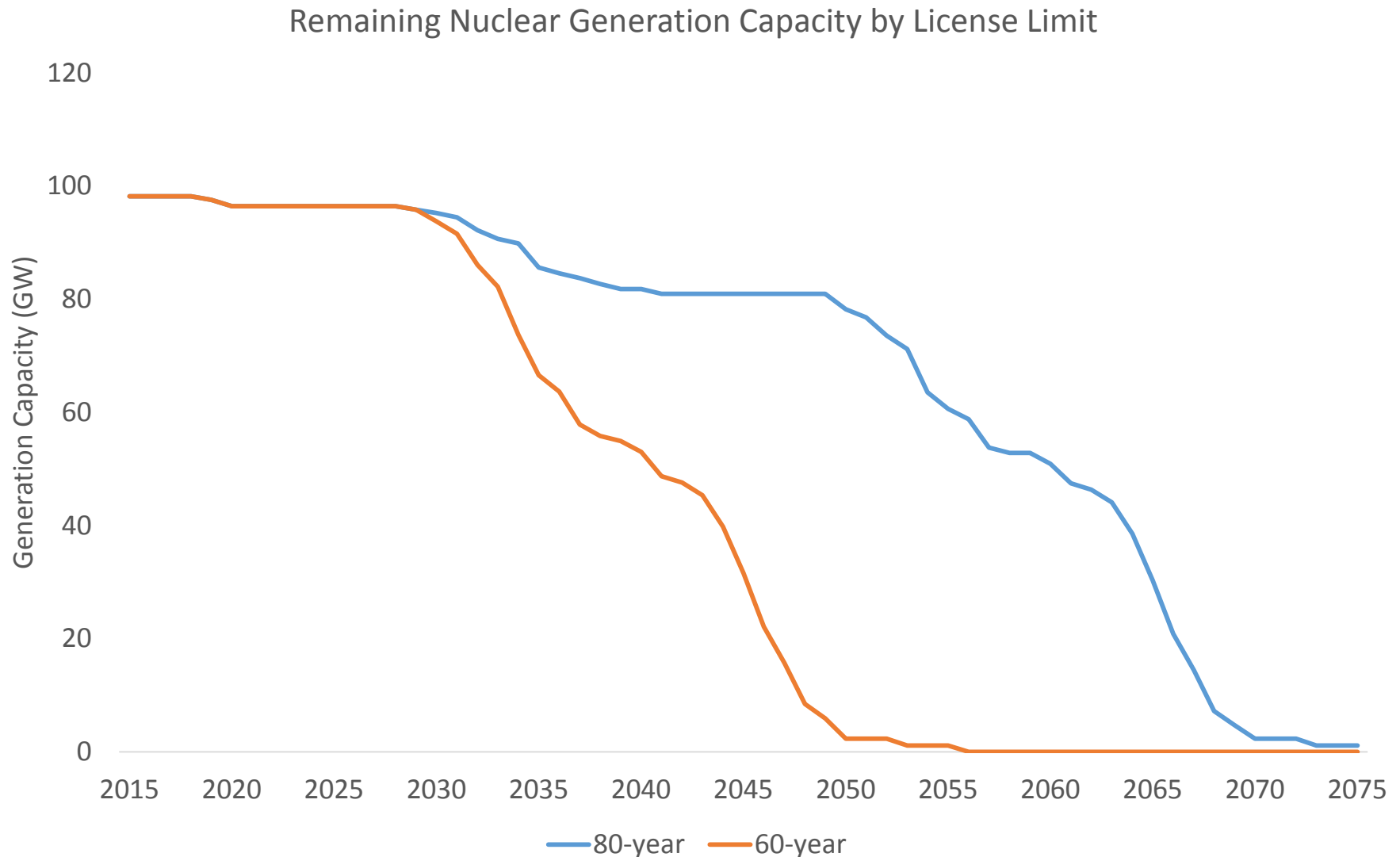
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3. Credit for Nuclear Life-extension

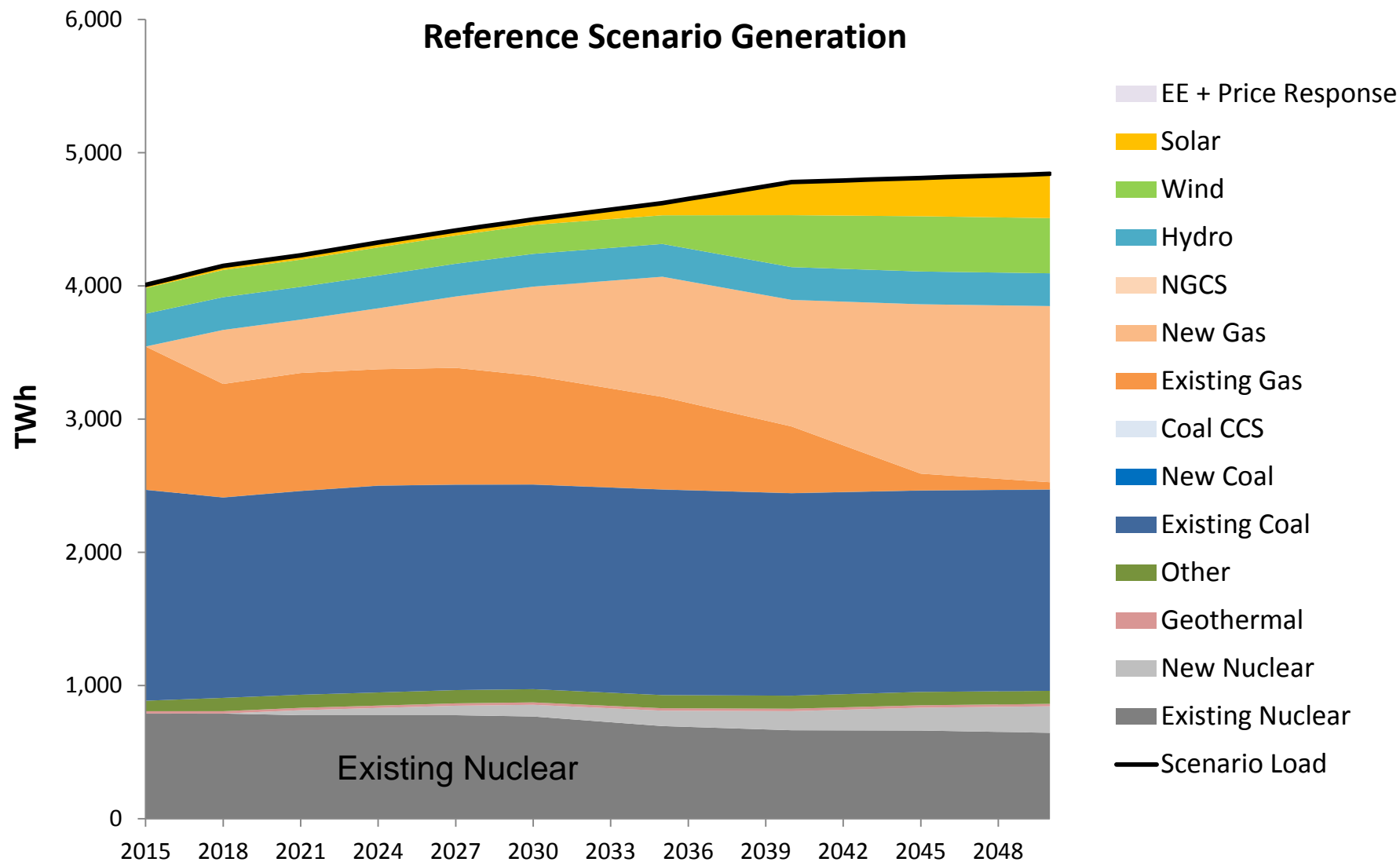
- EPRI suggests that EPA consider explicitly allowing generation from existing nuclear units that have undergone a life extension on or after 2013 to count as a source of ERCs
- This is consistent with EPA's treatment of nuclear unit uprates, and new nuclear units, as a life extension essentially is a new source of zero-CO₂ generation
- At this time, a real possibility exists to extend the license for nuclear plants out to 80 years
- The decision to seek license extension and to operate a nuclear plant for a longer period of time is a deliberate one and is weighed against other generation options

Evolution of U.S. Nuclear Fleet:

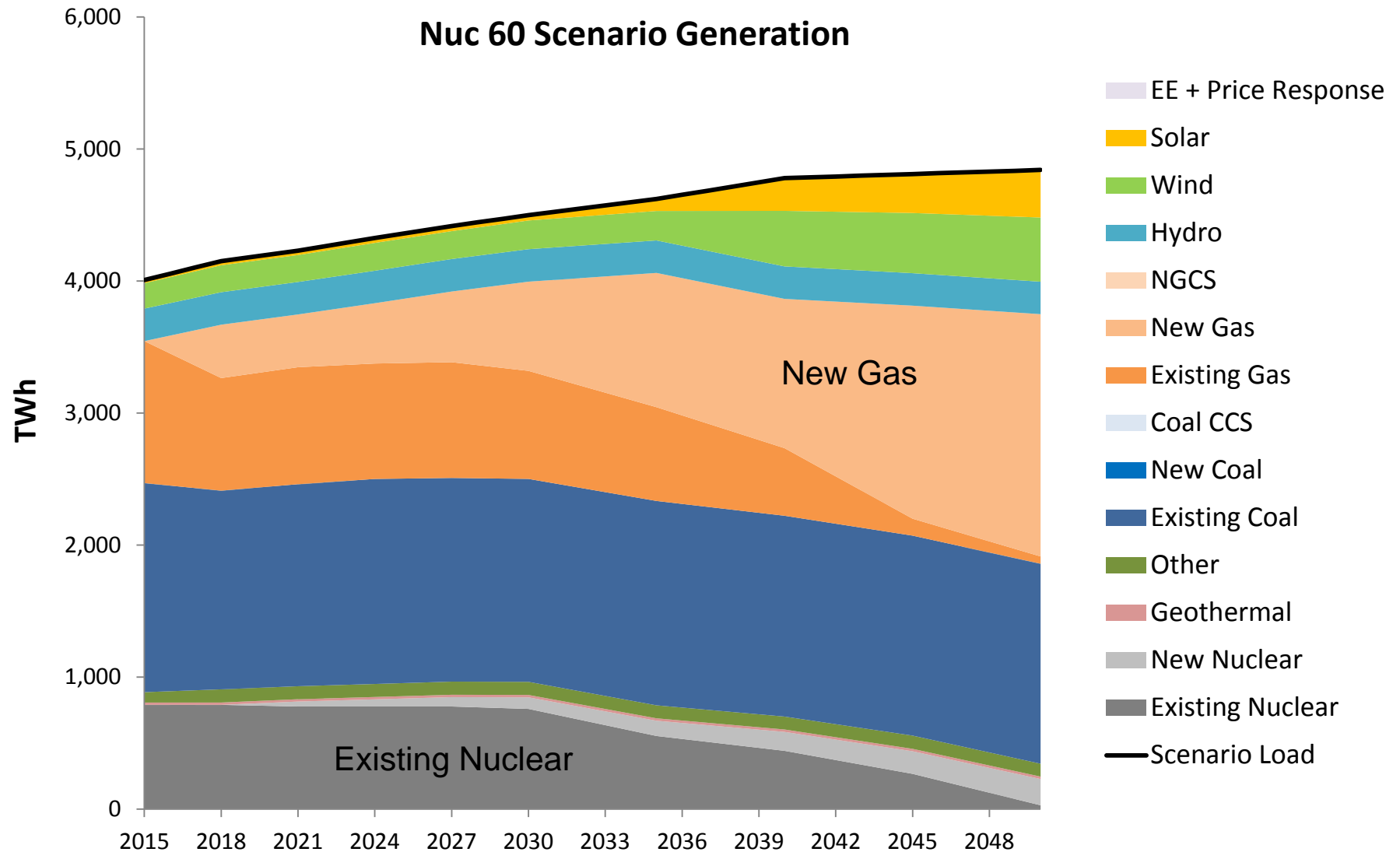
Extending 75% of Units to 80 Years Maintains 80GW through 2050



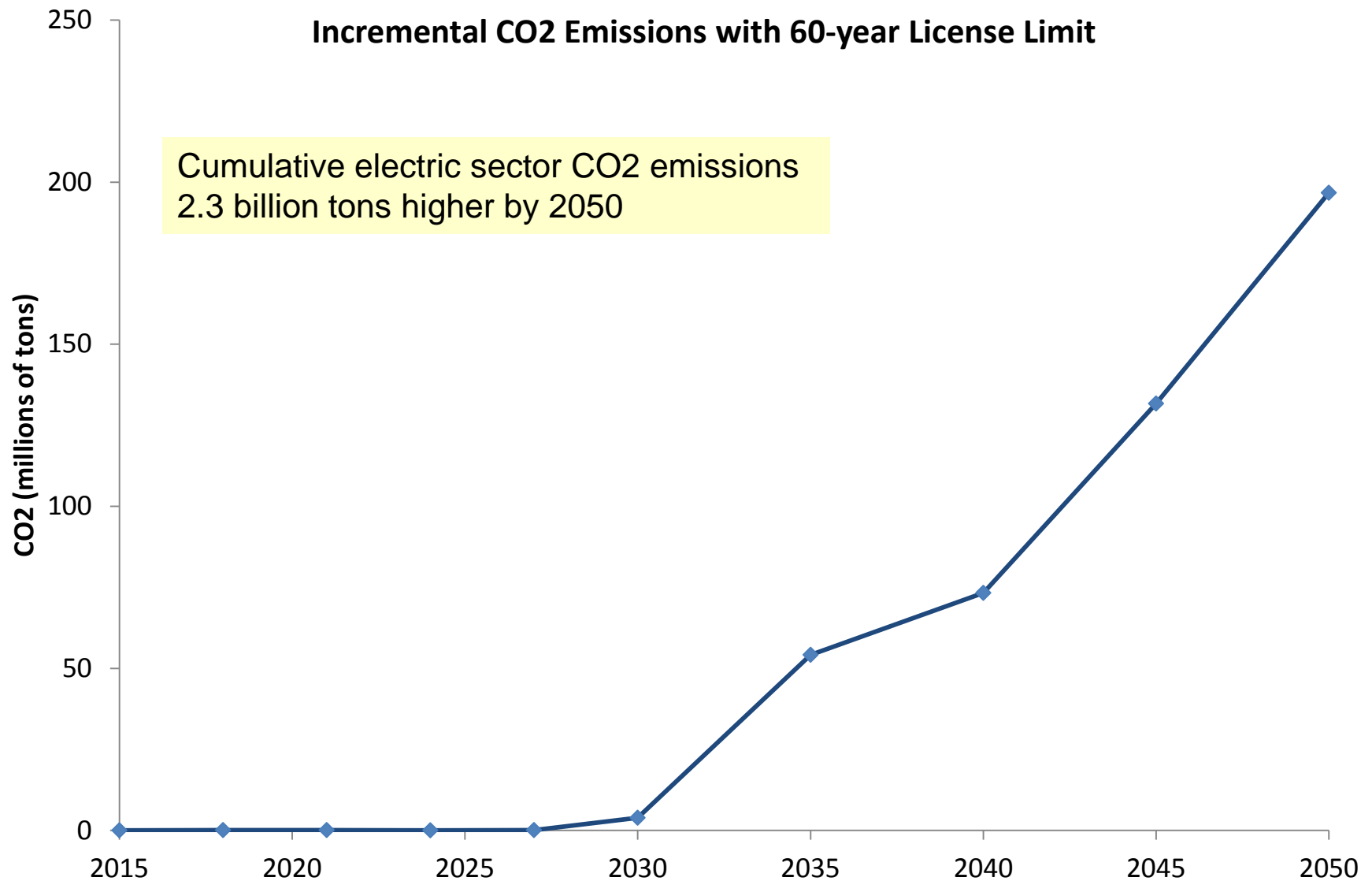
Energy & Environmental Analysis REGEN Reference Scenario Assumes 80-year Nuclear License Limit



With 60-year Nuclear License Limit New Natural Gas Generation Makes up Over 80% of Loss (+ wind/solar)



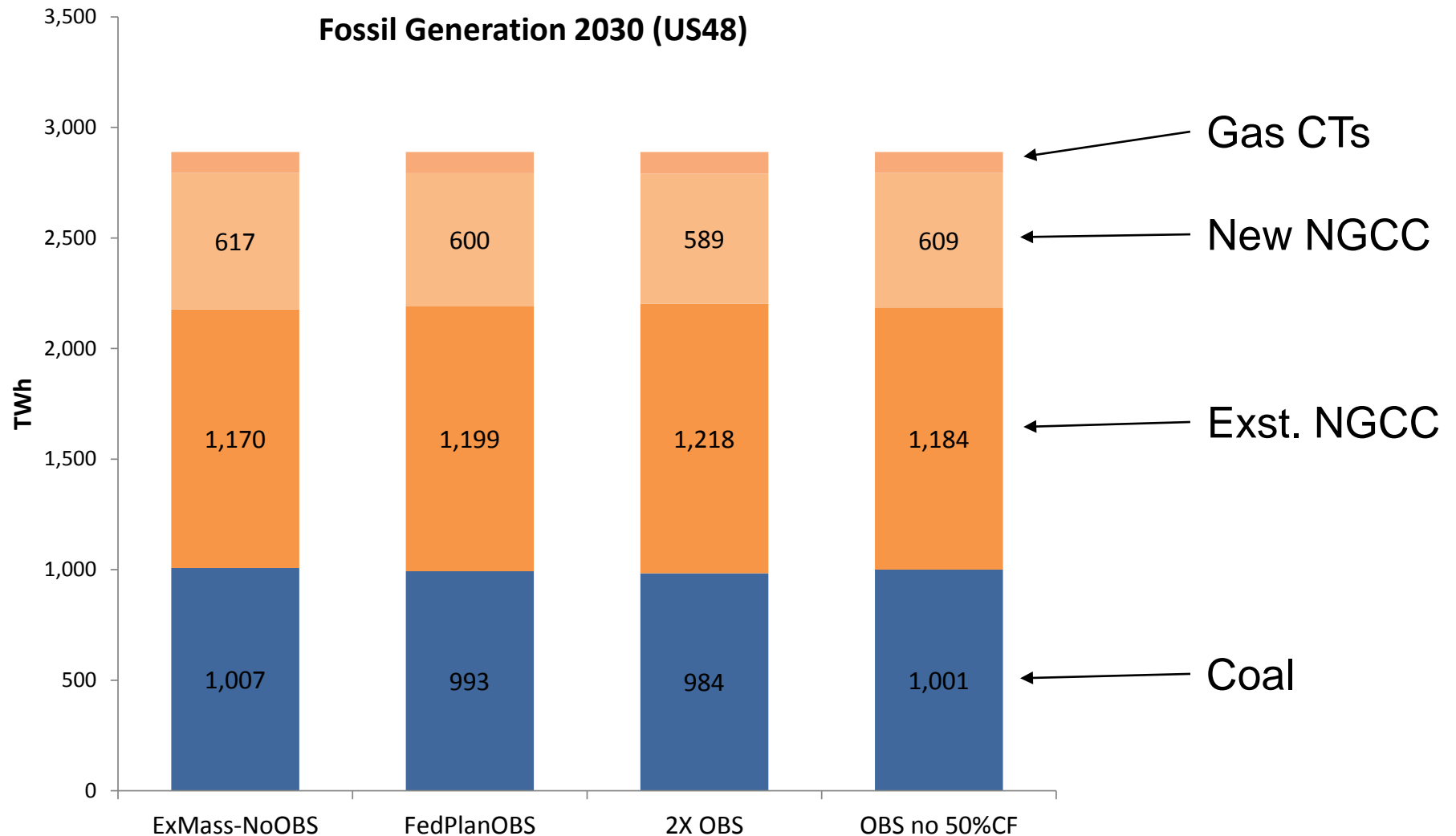
REGEN Simulation of Additional Emissions Under 60-year License



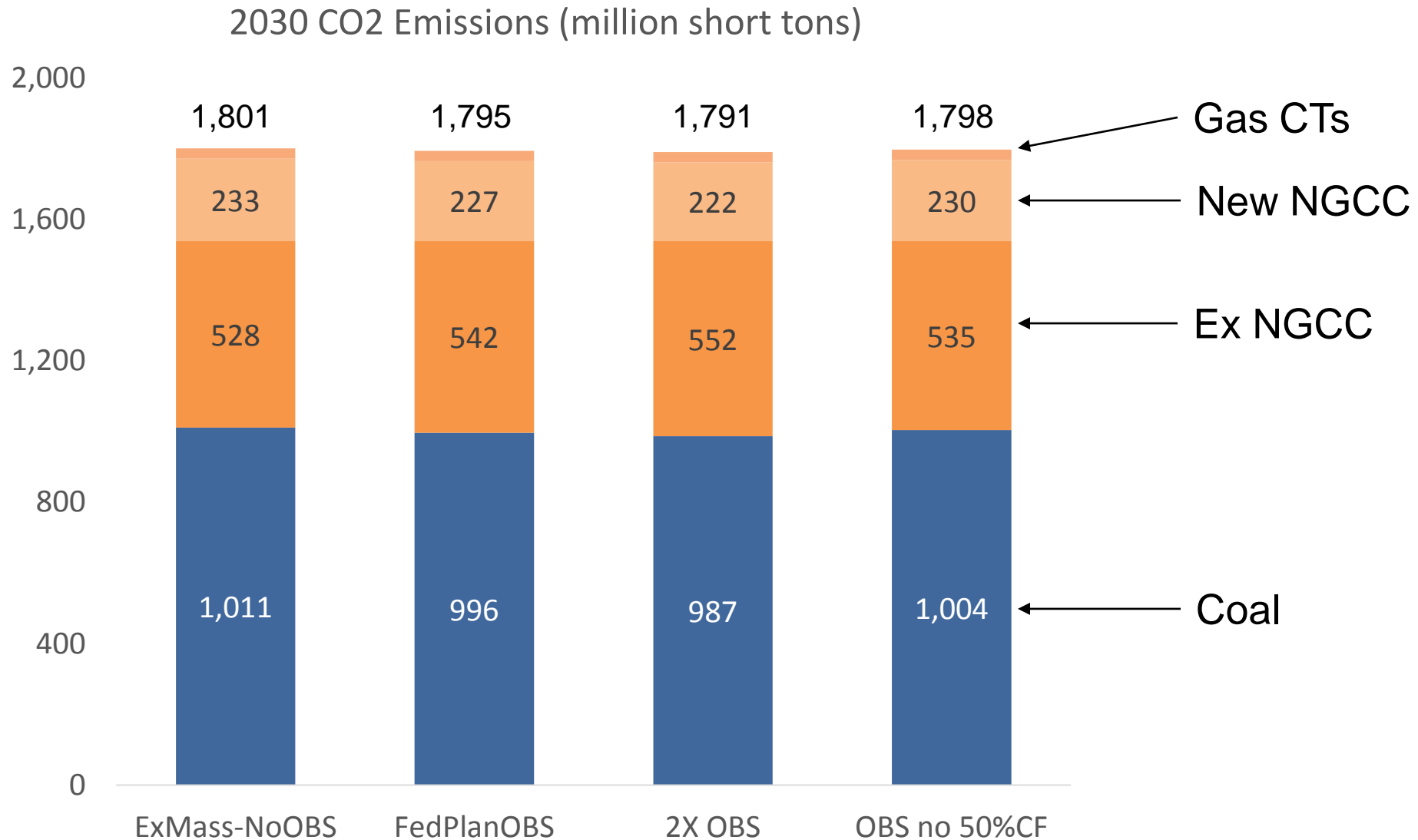
8. Output-based Set-asides for NGCCs in the Mass Model Rule

- EPA can greatly simplify the mass-based Federal Plan by dropping the requirement to have an OBS program for existing NGCCs, at no significant increase in total CO₂ emissions
- The OBS program for existing NGCC units offers no benefit unless it facilitates participating units to operate at a loss
- In practice, challenges such as risk, uncertainty, and time delays for receiving the required subsidies will likely limit participation
- Simulations suggest limited opportunities to increase NGCC output in an environment already strongly incentivizing NGCC use

The Effect of Output-based Set-asides for NGCCs (~zero)



The Effect of Output-based Set-asides for NGCCs (~zero)





Together...Shaping the Future of Electricity

OBS for NGCCs

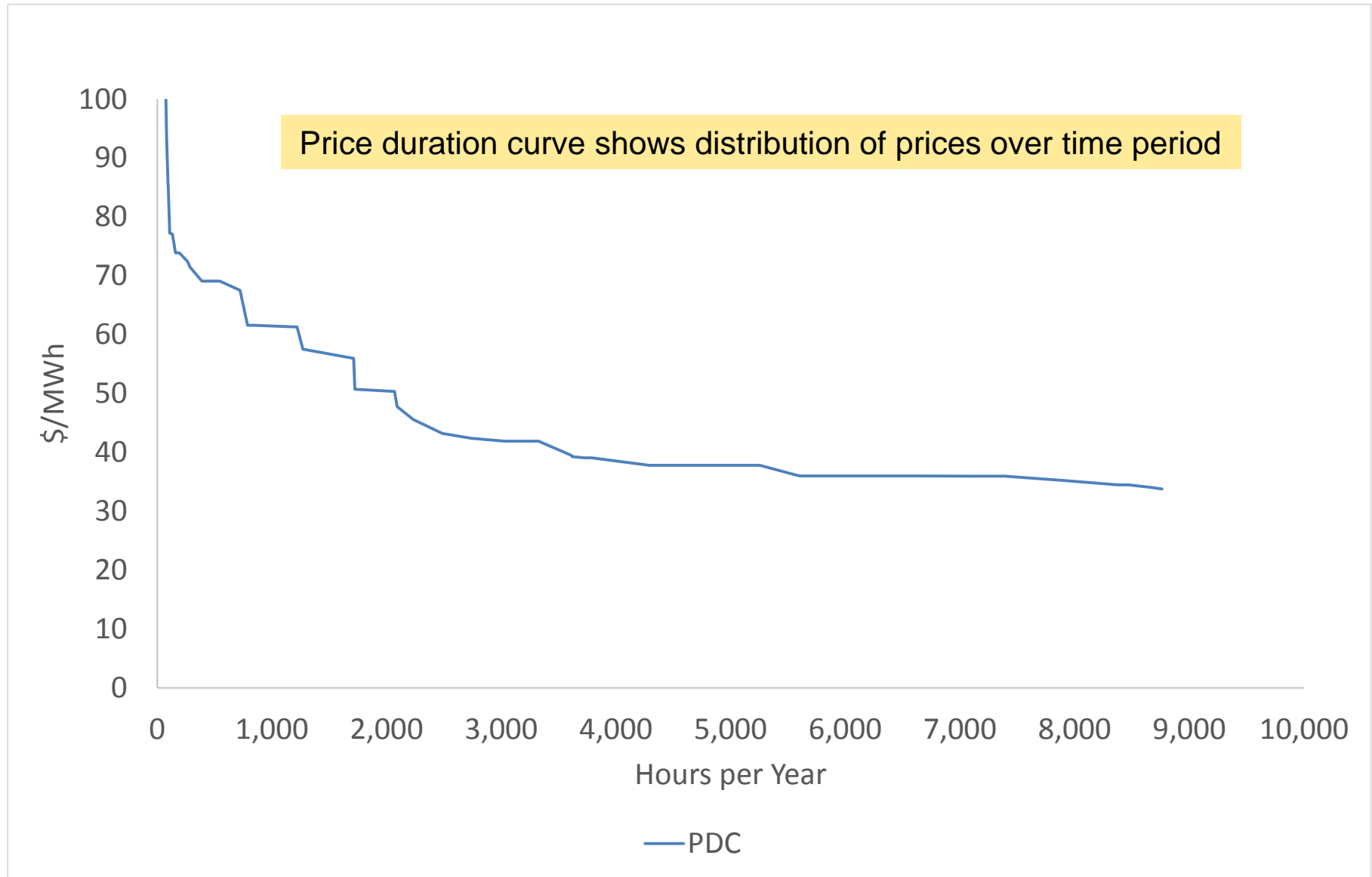
Allocation Method to Incentivize Existing NGCCs

- Pool of allowances set-aside to give to existing NGCCs (0-20%, depending on the state)
- Existing NGCC can claim 1030 pounds of allowances per MWh, for any MWh generated over 50% of the unit's capacity factor
 - Allowances are not awarded until the following compliance period
 - Rate is fixed, and not subject to pro-rata reductions
- These allowances are in addition to the unit's share of allowances due to historic generation
- Existing NGCCs sell allowances at the market price to obtain their subsidy

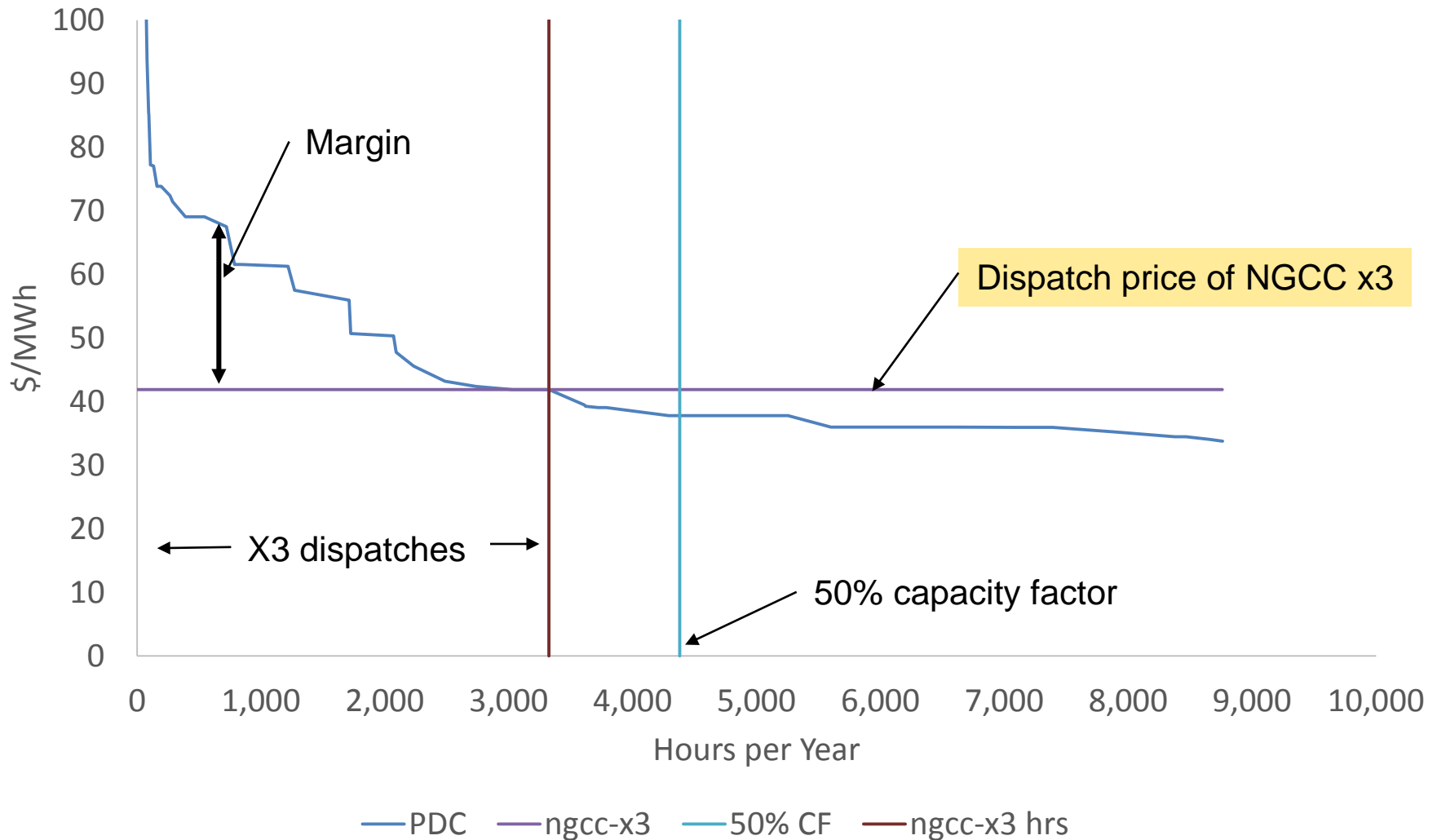
How would a “smart” owner of an existing NGCC think about the OBS incentives

- Lots of uncertainty, but maybe some of money
- Thinking easier if there are really good forward markets for power (by time segment) and for CO2 allowances (in current and future time periods)
- Key decision is when to operate
- Normally only operate when power price > dispatch price
- But now get a future (uncertain) pay-off if operate > 50% CF so maybe should operate in additional hours when current power price is below units dispatch price
- Needs to think about these decisions on a compliance period basis, not just yearly

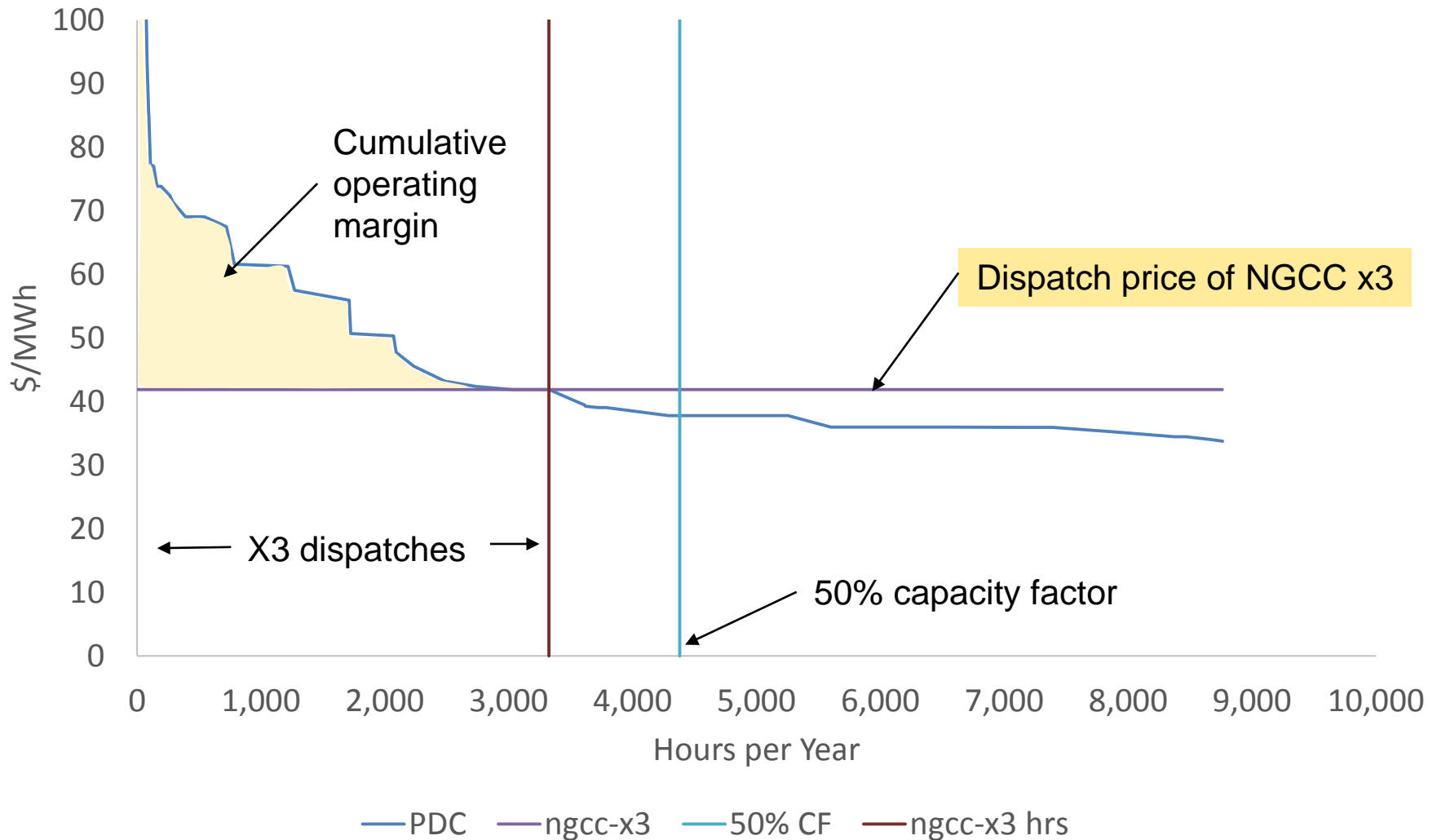
Price Duration Curve Provides a Framework for Understanding Dispatch Decision



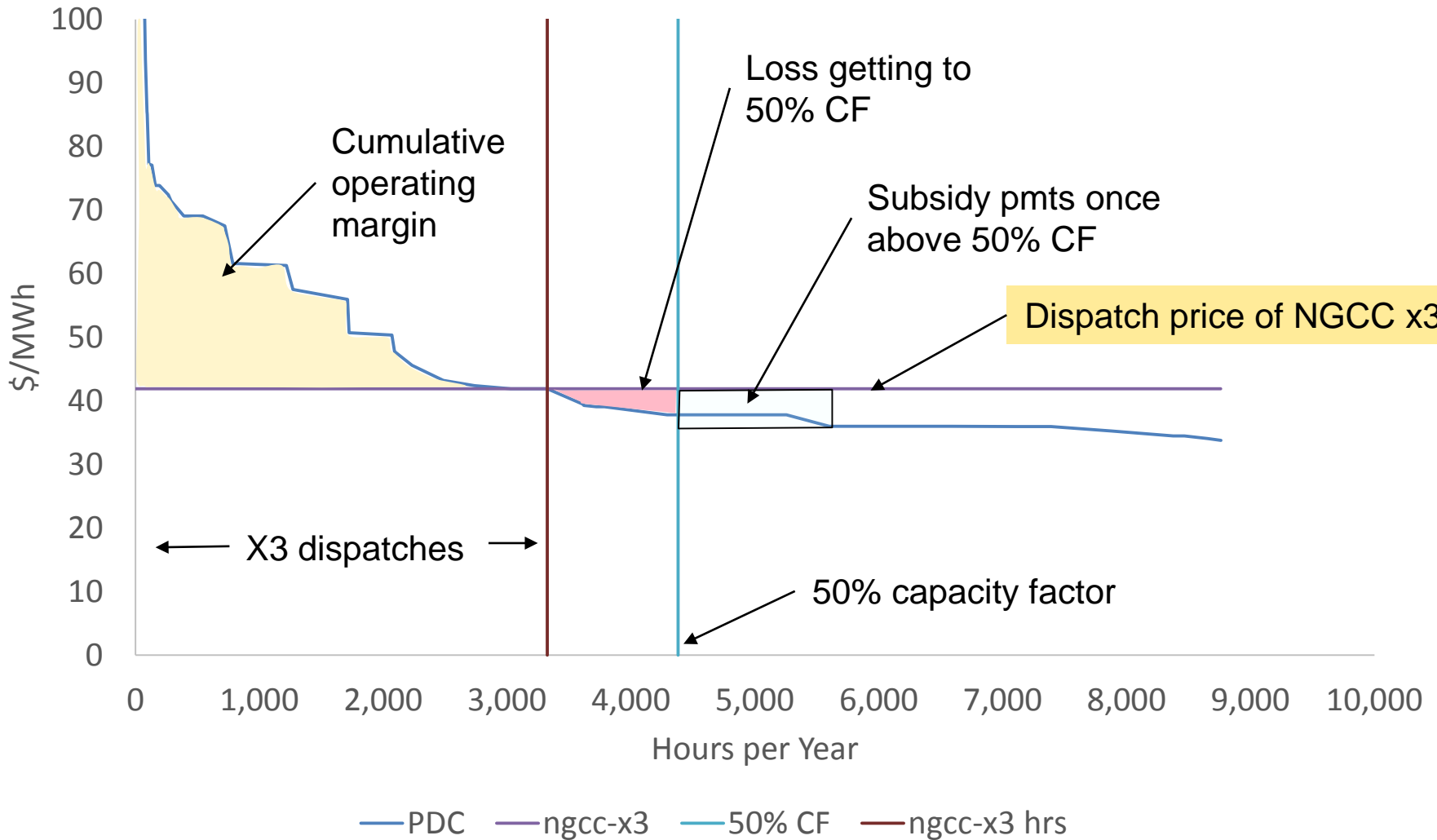
Sample Dispatch Strategy for NGCC Named x3



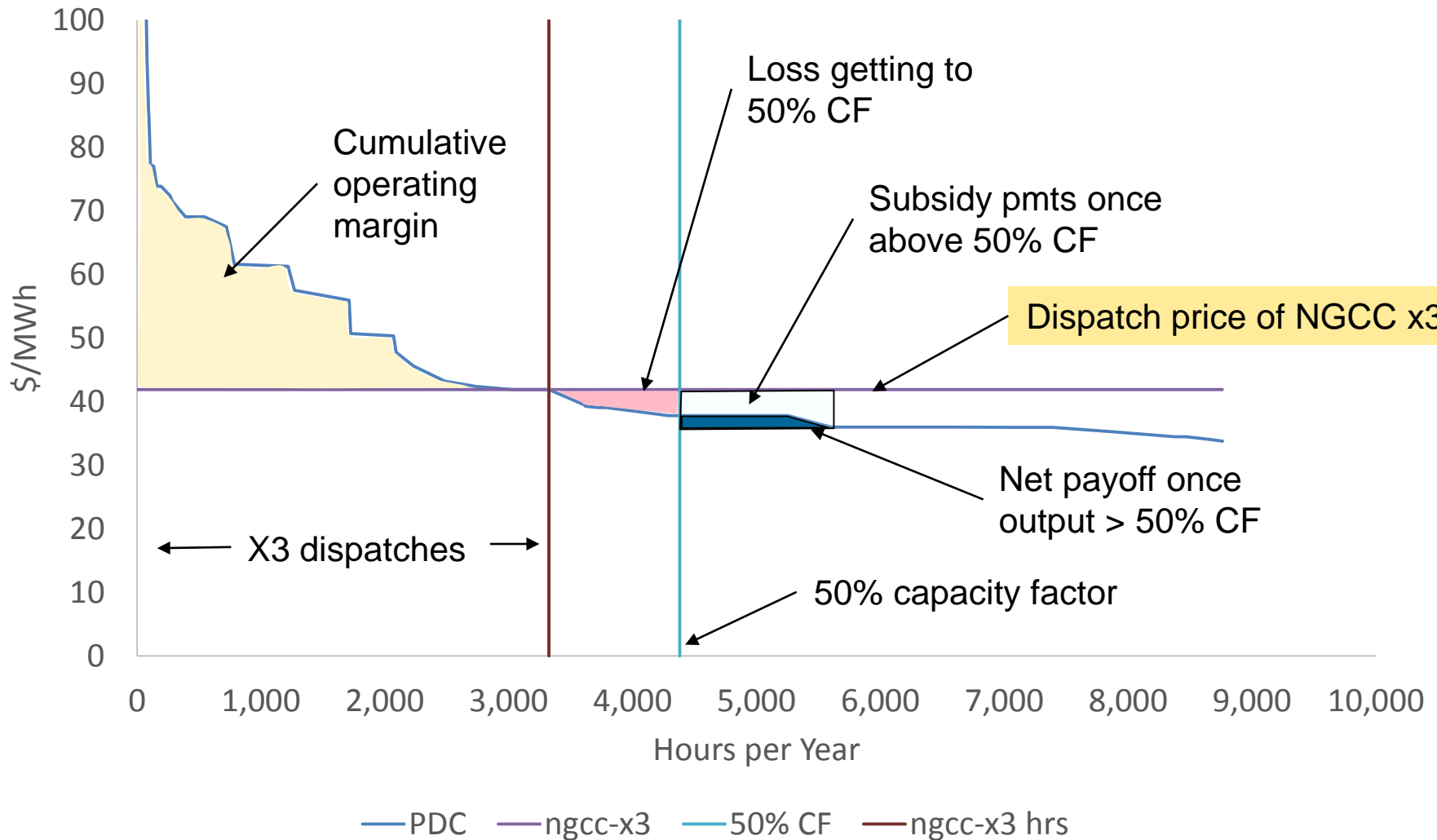
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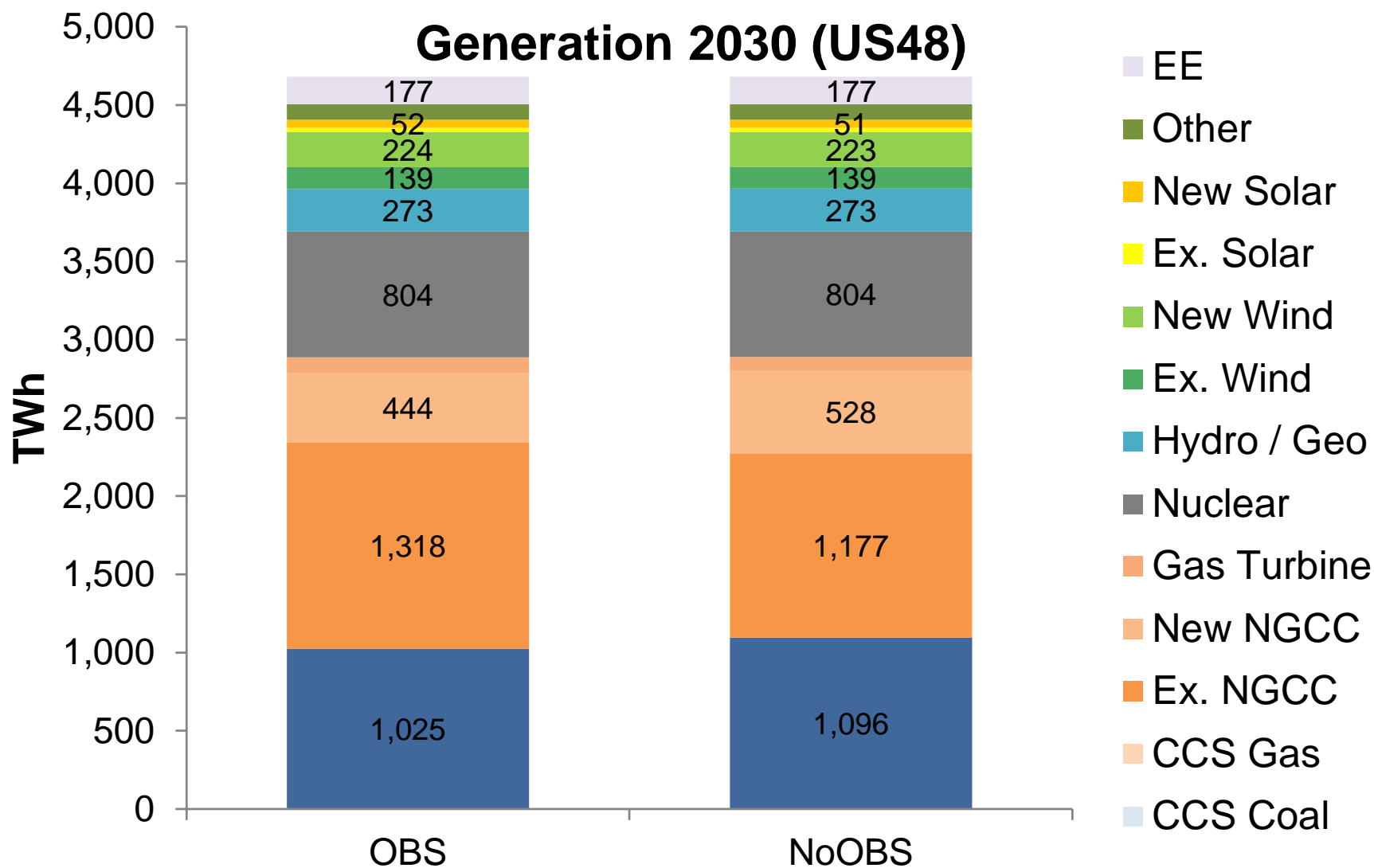


Sample Dispatch Strategy for NGCC Named x3

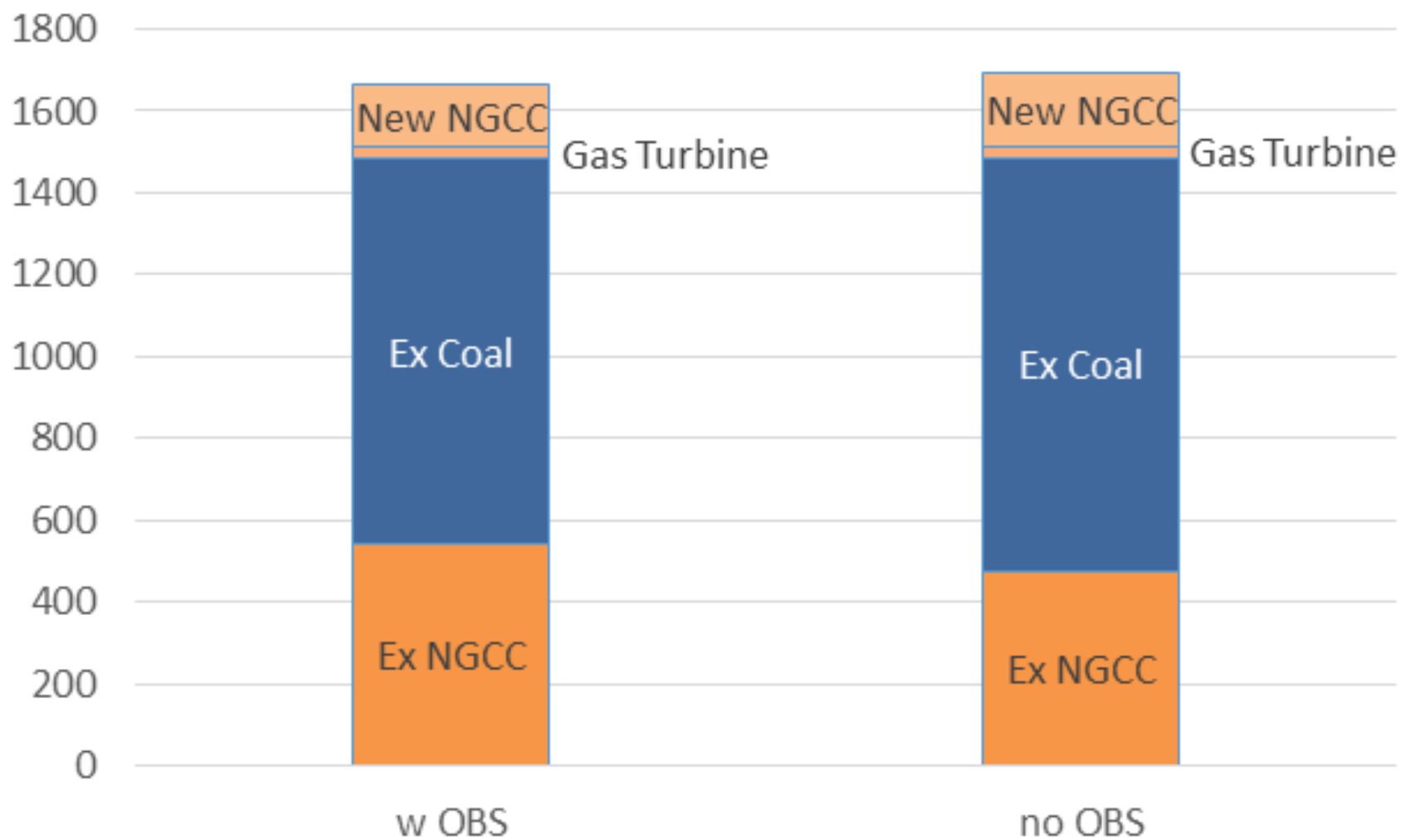


Sample Dispatch Strategy for NGCC Named x3

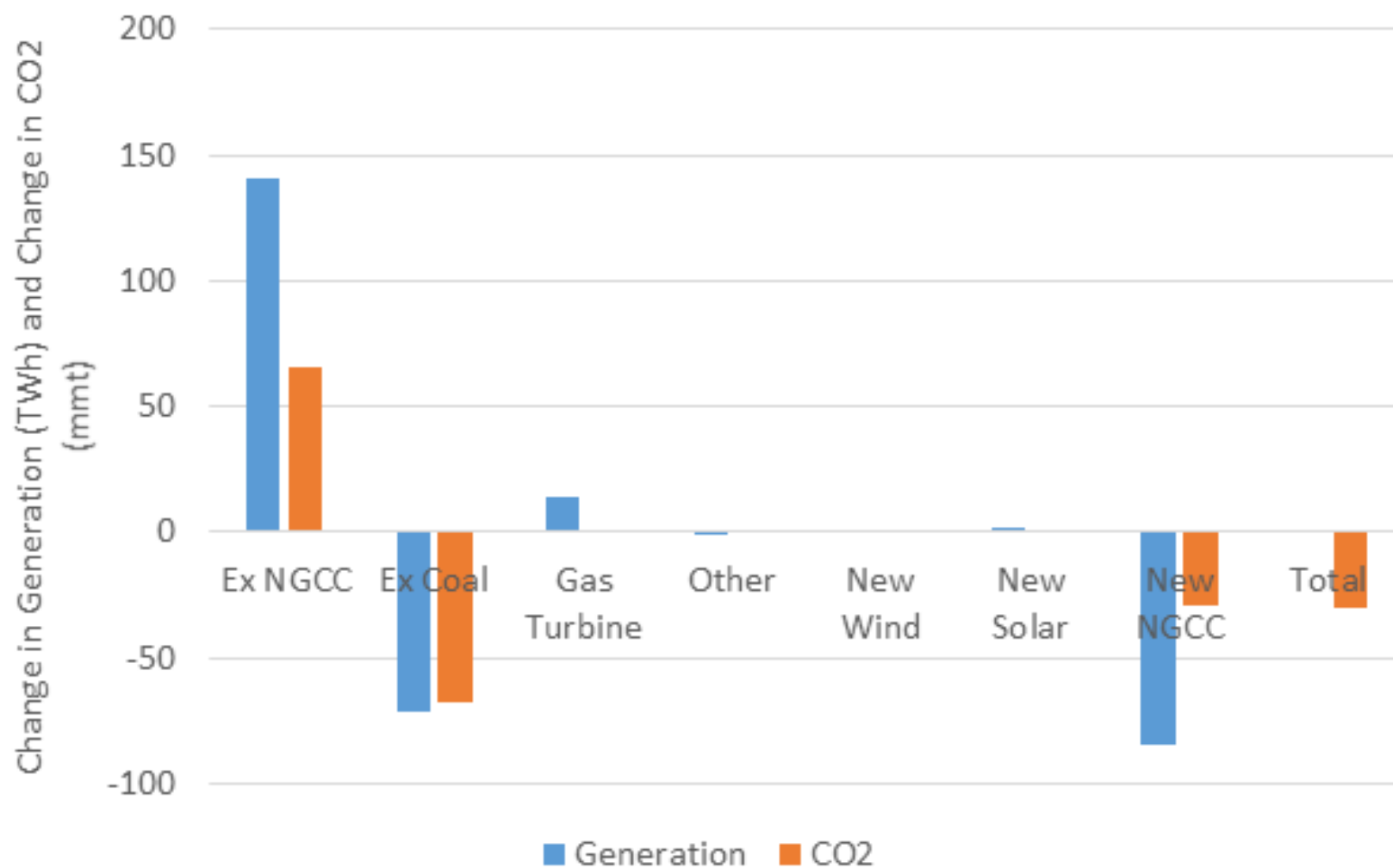




US CO2 in 2030 (mmt)



Effect of OBS in 2030 (US total) - Ref Gas Prices



Observations on OBS for NGCC

- Wow, this is a tough business
- But incentives are clear
- Also, incentives work better for NGCCs already $> 50\%$ CF
- Larger modeling problem not shown here is setting the incentives to exhaust the EPA-mandated supply for the state's mix of generators
 - We can do this
 - Probably reasonable to believe our calculations will be an upper bound on the real OBS-induced NGCC output