Pacific Northwest
NATIONAL LABORATORY

GCAM-USA: State-Level Policies

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U.S. DEPARTMENT OF ENERGY BATTELLE

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Policies in GCAM-USA

We Can Model

- Carbon prices
  - Including policy costs using GCAM's endogenous deadweight loss cost calculator
- Carbon constraints
  - Including regional / sectoral markets (ex. RGGI)
- Energy production policies
  - Constraint on production (ex. bio-energy constraint)
  - Minimum production requirement (ex. Renewable Fuel Standard)
- Renewable Portfolio Standards (RPS)

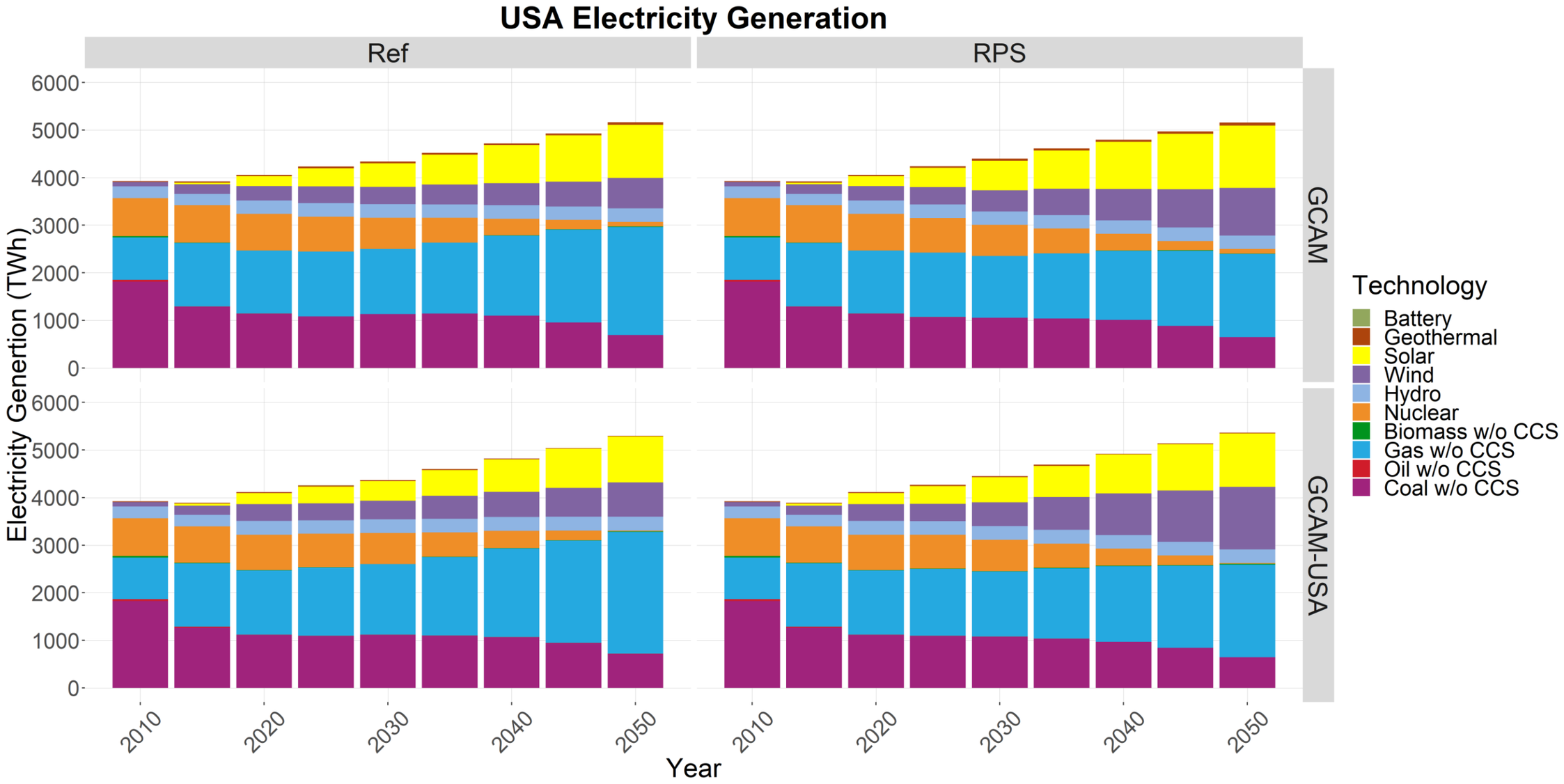
We Currently Cannot Model

- Climate constraints (e.g. radiative forcing and temperature targets, etc.)
  - These depend on non-CO_2 GHG emissions, which are currently not included in GCAM-USA

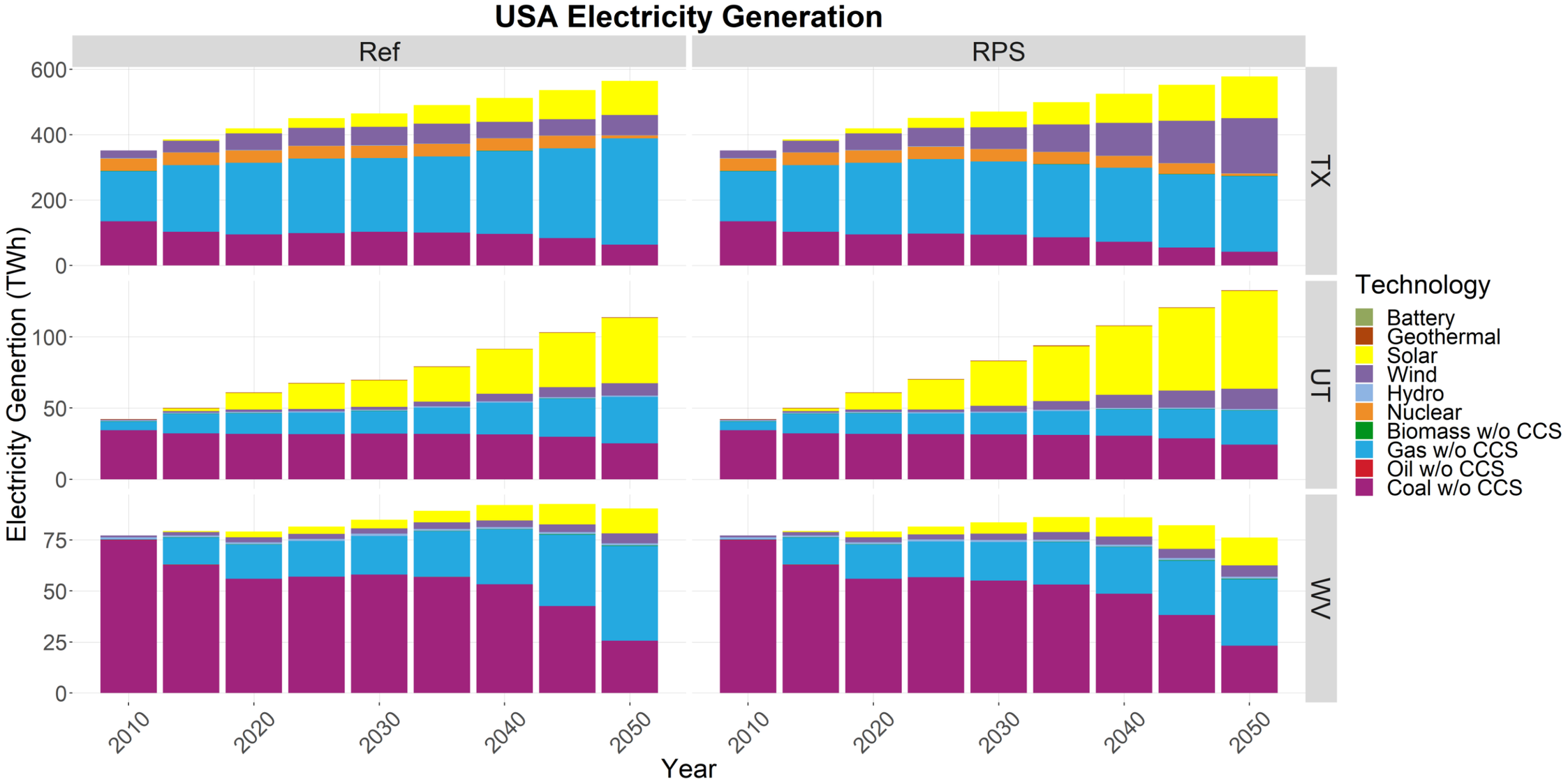
Policies in GCAM vs. GCAM-USA

- Structurally, GCAM and GCAM-USA are very similar.
- GCAM-USA's finer spatial resolution allows us to better represent state-level policies (e.g. RPS) and regional policies / markets (e.g. RGGI), which would be more challenging to model at an aggregate level in core GCAM.
- As a simple experiment, we harmonized the U.S. power sector reference scenario coming out of GCAM and GCAM-USA.
  - We then tested how GCAM and GCAM-USA might respond to policies differently.
  - For the purposes of the experiment, we focus on an RPS policy.
  - The RPS target is the same across models, and implemented as a national target in both GCAM and GCAM-USA.

GCAM and GCAM-USA produce relatively similar results *in aggregate*



GCAM-USA can help explore regional differences in response to policy



Conclusions

- GCAM-USA allows us to model state-level policies (e.g. RPS) and regional policies / markets (e.g. RGGI), which would be more challenging to represent at an aggregate level in core GCAM.
- If we model national-level policies in GCAM-USA, we get relatively similar results *in aggregate* as we would using the USA region in core GCAM (assuming we're using the same input drivers, sectoral structure, etc.)
- But, we may still observe interesting regional differences in GCAM-USA outcomes, even when aggregate results are largely consistent with core GCAM.

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Thank you