

Scenario Task Force Progress Report

Sept. 9, 2011

Starting Point, from SSC July Meeting

- Bookends Defined:
 - BAU or EE/DR/DG/SG
 - National Clean/Green/Low-carbon
 - Regional Clean/Green/Low-carbon
- Important Variables to Consider:
 - Transmission build out (most important)
 - Generation mix
 - Emissions
 - Energy flows
 - Costs

Costs External to NEEM

- MWG has calculated costs of EE, DR, DG, wind and thermal integration cost, nuclear uprate costs
- STF has not reached agreement on how these costs should be treated
- EIPC provided high-level transmission costs for all Futures as of 9-7-11

Clustering Analysis

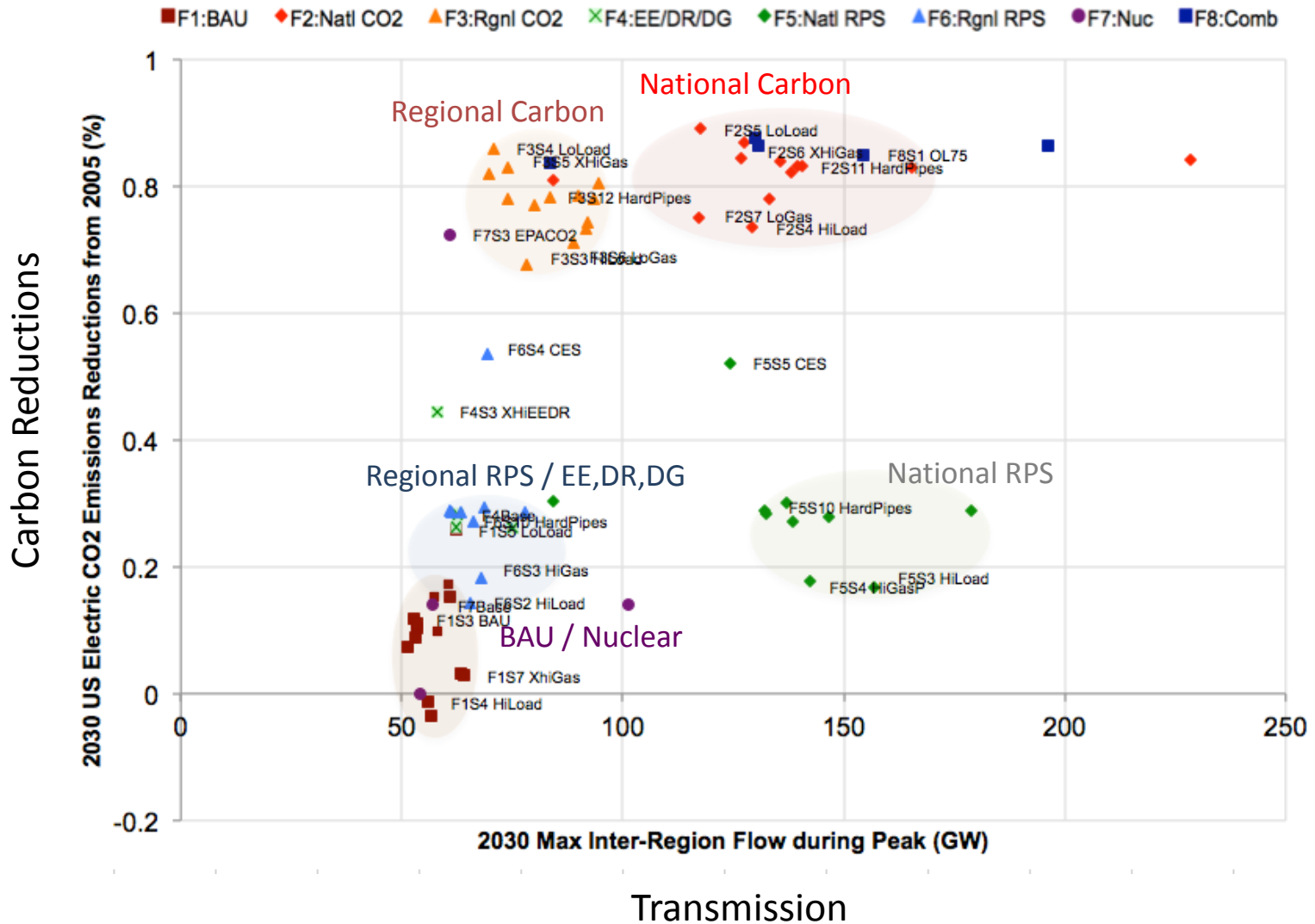
- STF agreed to focus on the following variables:
 - **Transmission** is total energy transfers among NEEM regions (TOs/TDs used amount of increase in capacity or “hardened pipes” instead)
 - **Generation mix** – focus has been on amount of renewables generation (NOTE: we did not focus on coal v. renewables as a % of total)
 - **Emissions** is percent emissions reductions from 2005
 - **Load growth**, while important, was not analyzed for comparison of sensitivities

Clustering Analysis

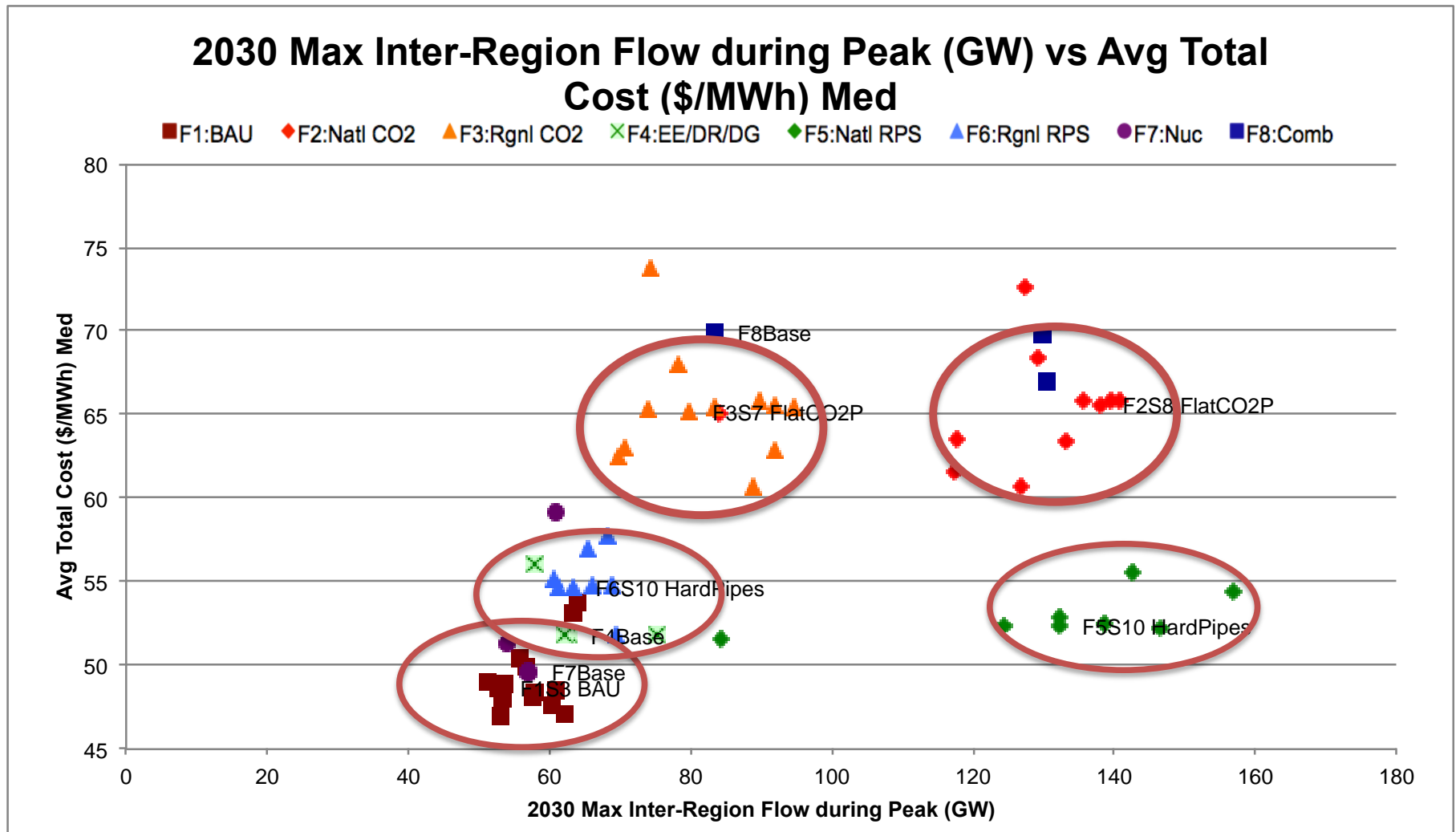
- Two most important drivers of runs seem to be:
 - Level of transmission planning coordination (national, coordination among neighboring regions, regional)
 - Environmental policy approach (carbon policy, National RPS, CES, State RPS)
- Important tradeoff:
 - Comparability (i.e. keeping most factors uniform to allow comparability among the scenarios)
 - More variety of ~~useful~~ information (i.e. changing factors to consider various potential future outcomes)

Carbon vs Transmission

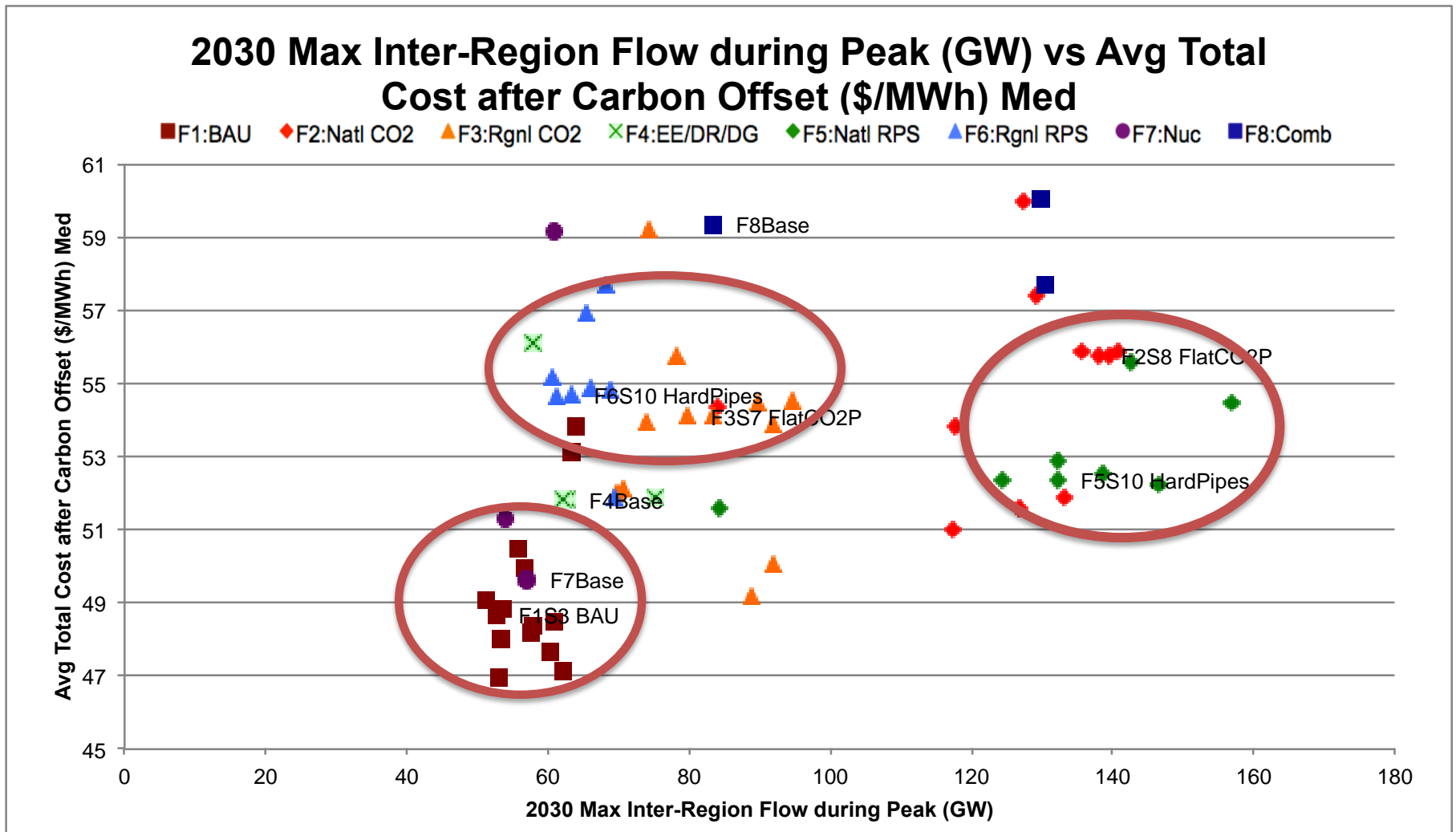
2030 Max Inter-Region Flow during Peak (GW) vs 2030 US Electric CO2 Emissions Reductions from 2005 (%)



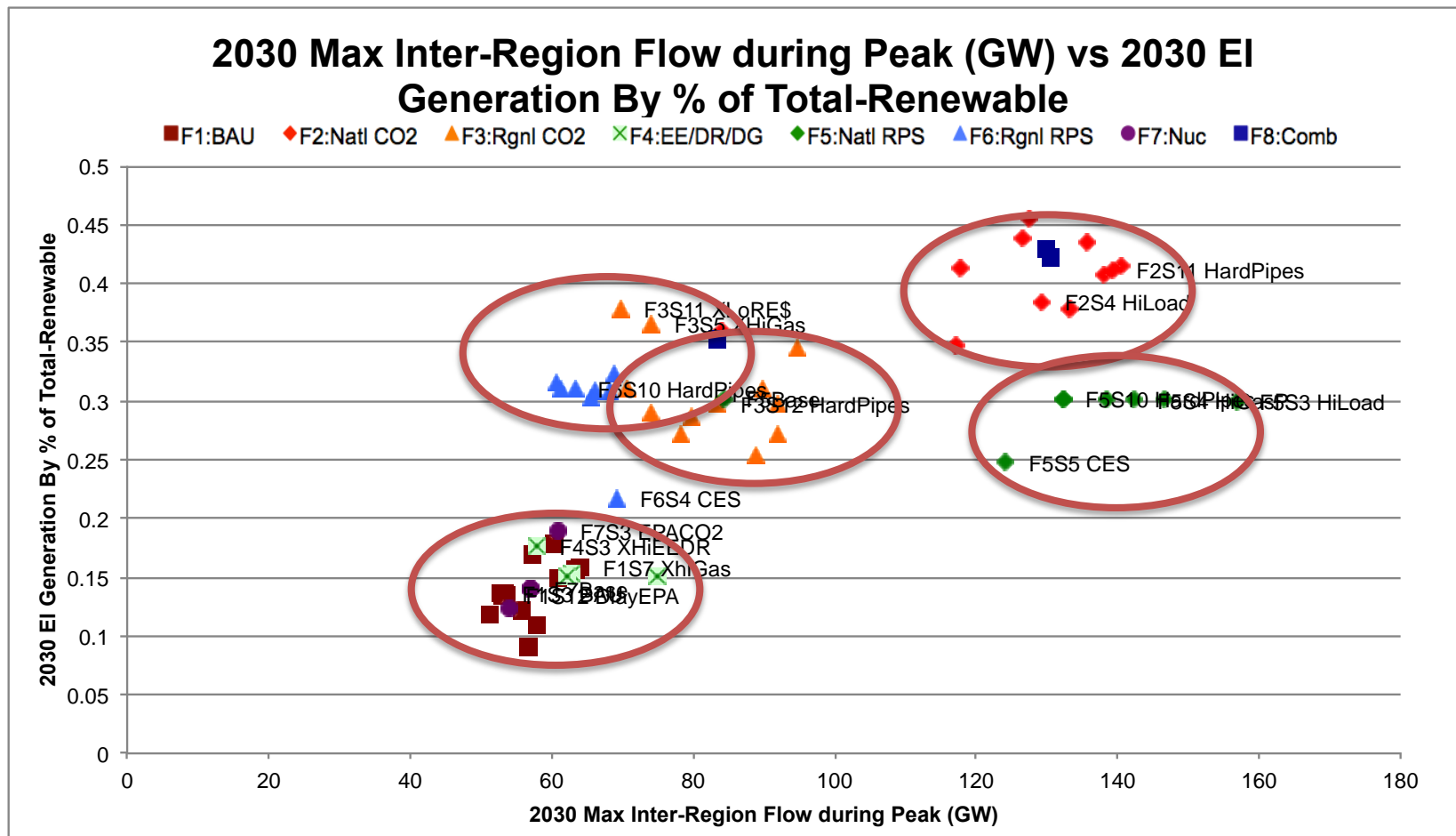
Transmission and Avg Total Cost – With CO2 costs included F2, F3, and F8 higher than others



Transmission and Avg Total Cost – With CO2 costs removed, CO2 and RPS cases have similar costs



Energy Flow vs Generation By % of Total-Renewable



TO Recommendations & Rationale

1. National CO2 price future - F2s8 (sensitivity flattens CO2 price after 2030); large build out (40,000 MW transfer capability increase between NEEM regions); meets the National RPS goal of 30% renewables.
2. Regional RPS - F6s10 (base case with “hardened pipes” based on OL25 sensitivity); smaller transmission build (3,000 MW); regions are more likely to have an RPS than a CO2 price.
3. BAU – F1s3 (which includes the updated EPA regs); has transmission expansion within - but not between - NEEM regions; the TOs believe the EE/DR assumptions of F4 may not be feasible.

Current Status

- The STF narrowed the number of sensitivity runs for further analysis, but reserved the right to bring up other sensitivity runs after consulting with Sectors.
- STF Preliminarily Narrowed “Most Likely” Bookend/Cluster choices to:
 - **National:** F2S8, F8B/F8S1 (F8 may require NEEM run with hardened limits)
 - **Regional:** F3S7, F6S10
 - **Other:** F1S3, F4B, F7all (EISPC representatives declined to narrow down the F7 runs)

(See details on following slide)

Scenario Task Force Call on Aug. 31

Most likely (?) choices for final 3 build outs noted during the call:

- F1s3 (BAU w/revised EPA regs) - 0 MW transfer increase.
- F2s8 (National CO2 price with flat CO2 price after 2030) - 40,000 MW transfer increase.
- F3s7 (Regional CO2 price with flat CO2 price after 2030) - 4,000 MW transfer increase.
- F4base (high EE/DR/DG) - 0 MW transfer increase.
- F5 – *no one pushed for this future - National RPS* - 64,000 transfer increase with very limited CO2 reductions.
- F6s10 (Regional RPS with “hardened pipes”) – 3,000 MW transfer increase.
- F7 (all) – *EISPC wanted to retain this future* - 0 MW expansion.
- F8s1 (National CO2 price, high EE/DR/DG) - 37,000 MW transfer increase.

Next Steps

- Other sectors may prepare proposals in same format as TOs.
- More cost information to be discussed, possibly incorporated
- In-person meeting (9/12) to develop recommendation of 3 Scenarios
- Define additional NEEM runs as necessary
- Finalize recommendation to SSC in advance of Sept. 26-27 meeting