Flexible ramping product discussion

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Improve deliverability by not awarding FRP to resources that have a zero opportunity cost because of congestion

- Flexible ramping up awarded to resource behind constraint
  - Next market run unable to dispatch higher than current output

- Flexible ramping down awarded to resource providing counterflow
  - Next market run unable to dispatch lower than current output
Introduce deployment scenarios to ensure deliverability

1. EN is deliverable to load forecast
2. EN + FRU is deliverable to meet load and VER upward uncertainty
3. EN – FRD is deliverable to meet load and VER downward uncertainty
Distributing the demand curve surplus as decision variable at load aggregation points

- Moving to load aggregation points allows for more granular relaxation of the requirement.

- Allows a share of the system requirement to be relaxed in a LAP while not limiting procurement of the full share of the system requirement in another LAP.
Deployment scenarios transmission constraints

\[
\begin{align*}
\text{LFL}^{(u)}_{m,t} & \leq \bar{F}^{(u)}_{m,t} + \sum_i (\Delta EN_{i,t} + \Delta FRU_{i,t}) SF_{i,m,t} + \sum_{j \in EIM} \sum_r \Delta FRUS_{r,j,t} SF_{r,j,m,t} \leq UFL^{(u)}_{m,t} \\
\text{LFL}^{(d)}_{m,t} & \leq \bar{F}^{(d)}_{m,t} + \sum_i (\Delta EN_{i,t} - \Delta FRD_{i,t}) SF_{i,m,t} - \sum_{j \in EIM} \sum_r \Delta FRDS_{r,j,t} SF_{r,j,m,t} \leq UFL^{(d)}_{m,t}
\end{align*}
\]

\forall m \land t = 1, 2, ..., N
Propose virtual supply and demand not be settled for congestion from the deployment scenarios in real-time

• Since deployment scenarios are not included in the day-ahead market,
  – Systematic difference in MCC between day-ahead and real-time
  – For example, FRU deployment scenario (P97.5) could have congestion while base deployment (P50) would not.
  – Virtual supply would be profitable even though unable to converge with P97.5 scenario, only P50.
  – Will continue to evaluate in the development of the DAME if this settlement treatment remains
FRP demand curve was intended to gradually raise energy prices as requirement relaxed

• Currently, the FRU requirement is not always relaxed prior to the power balance constraint due to congestion

• Nodal procurement will ensure the FRP requirement is fully relaxed prior to the power balance constraint being relaxed
  – Market will no longer make FRP awards to transmission infeasible capacity and relax power balance constraint