An approach to model Stability Limits on units in Markets

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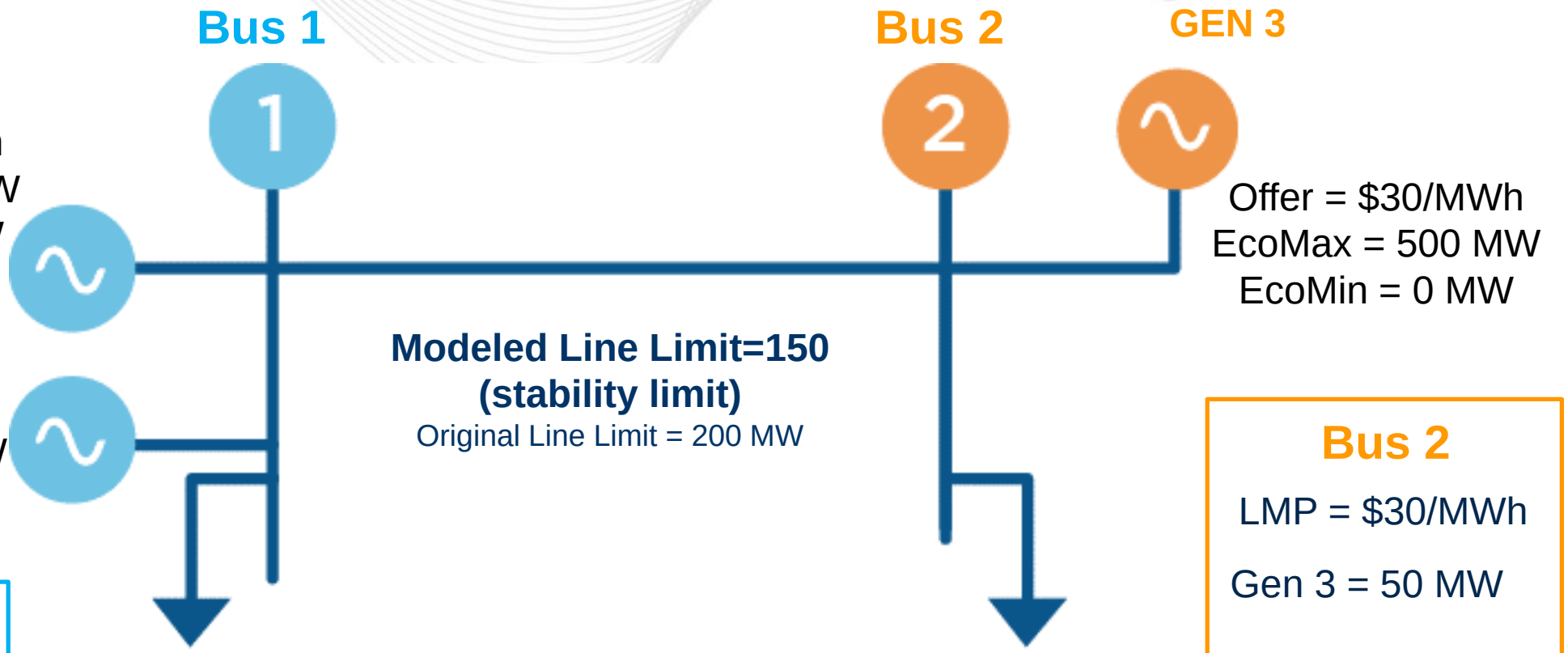
An approach to model Stability Limits

- The stability limits can be modeled as “capacity constraint” for Stability restricted units.
- The sum of MWs from stability restricted units will not be more than stability limit regardless of virtual bidding. This constraint can also be modeled such that sum of energy MWs plus reserve MWs from stability restricted units will not be more than stability limit.
- This type of constraint doesn’t directly affect the LMP.
- The output of stability restricted units will be determined based on their offer curve and LMPs.

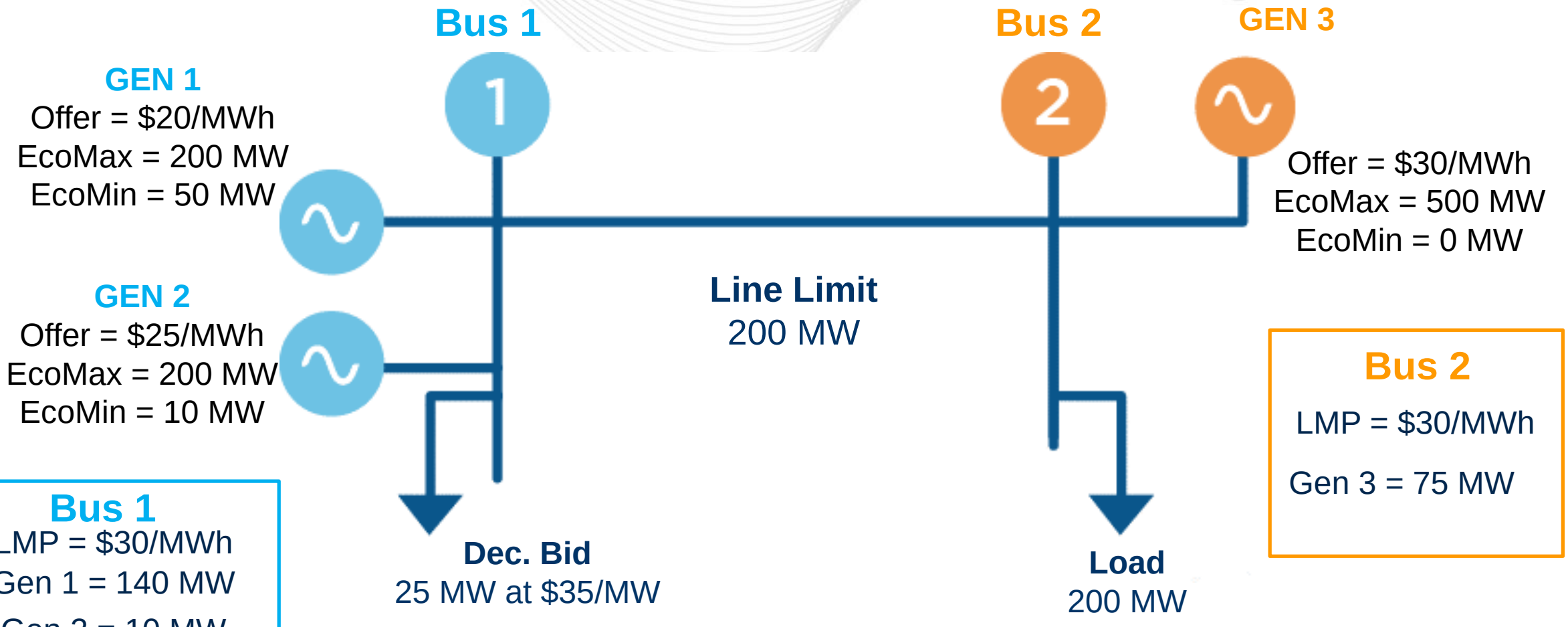
Clearing Stability Restricted units with Dec in current Thermal Surrogate approach



Bus 1
LMP = $20/MWh
Gen 1 = 165 MW
Gen 2 = 10 MW
Dec. = 25 MW

Bus 2
LMP = $30/MWh
Gen 3 = 50 MW

Clearing Stability Restricted units with Dec in new approach



Stability Limit on total output of Gen 1 and Gen 2 is 150 MW

Clearing Stability Restricted units with Inc in current Thermal Surrogate approach

GEN 1
Offer = $20/MWh
EcoMax = 200 MW
EcoMin = 50 MW

GEN 2
Offer = $25/MWh
EcoMax = 200 MW
EcoMin = 10 MW

Offer = $30/MWh
EcoMax = 500 MW
EcoMin = 0 MW

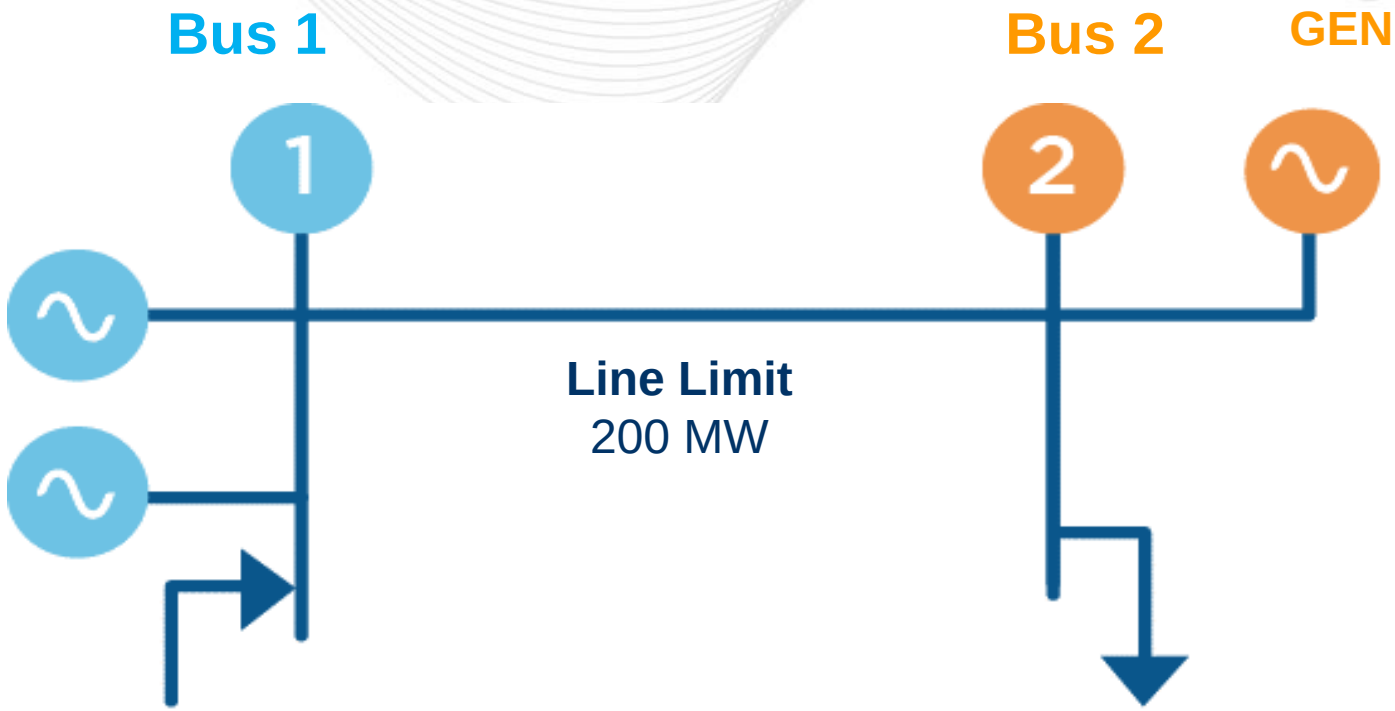
Bus 1
LMP = $20/MWh
Gen 1 = 140 MW
Gen 2 = 10 MW
Inc. = 0 MW

Bus 2
LMP = $30/MWh
Gen 3 = 50 MW

Clearing Stability Restricted units with Inc in new approach

GEN 1
Offer = $20/MWh
EcoMax = 200 MW
EcoMin = 50 MW

GEN 2
Offer = $25/MWh
EcoMax = 200 MW
EcoMin = 10 MW



GEN 3
Offer = $30/MWh
EcoMax = 500 MW
EcoMin = 0 MW

Bus 1
LMP = $30/MWh
Gen 1 = 140 MW
Gen 2 = 10 MW
Inc. = 25 MW

Bus 2
LMP = $30/MWh
Gen 3 = 25 MW

Stability Limit on total output of Gen 1 and Gen 2 is 150 MW