

**mrc**  
Microgrid Resources Coalition

July 7, 2023

# Demand Flex Tariff Proposal

Rulemaking 22-07-005 | Track B Working Group 1

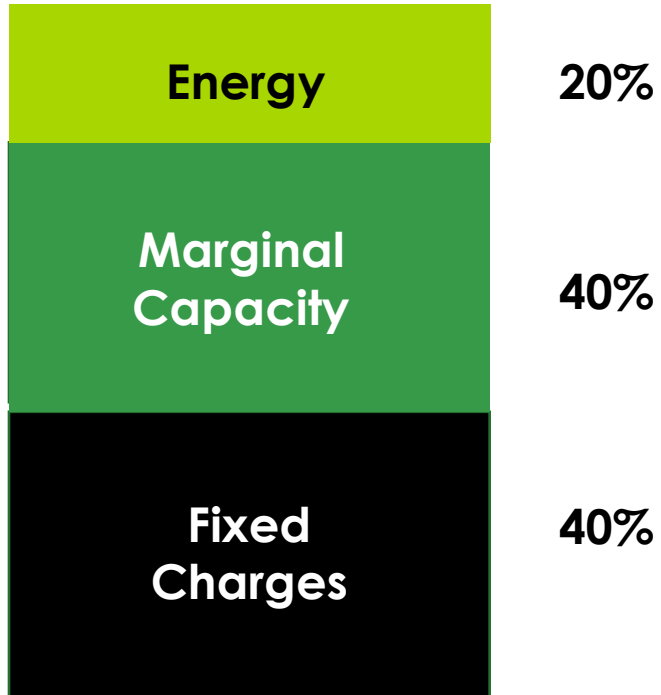
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# Goals for a Transactive Energy Tariff

- Shape load around availability of intermittent resources to allow flexible resources to operate at a more nearly steady rate near resource peak efficiency.
- Reduce stress on generation, transmission, and distribution equipment to reduce operation and maintenance cost.
- Use low-cost Customer Resources, avoid line losses, and avoid use of high-priced peaking resources to reduce systemwide energy price.
- Encourages market participation by customers as equals with other resources whenever their participation is beneficial for the grid.

# Legacy Tariff Structure



- **CalFUSE** – Create an incentive rate by redistributing the top two categories to different hours
- **MRC** – Keep bottom two categories unchanged (the Base Costs) but use actual wholesale prices for the energy component

# Option

- Customer has an option to purchase – not a subscription
- Option shape looks like subscription shape, but customer has no obligation to pay for what it doesn't use
- If customer purchases more than option amount it pays Base Costs plus a variable energy price.
- If customer purchases less than its option or exports, it pays no Base Costs for unpurchased energy and is paid the variable energy price for reductions below the option level.
- The option is a pure energy price hedge.

# Variable Energy Price

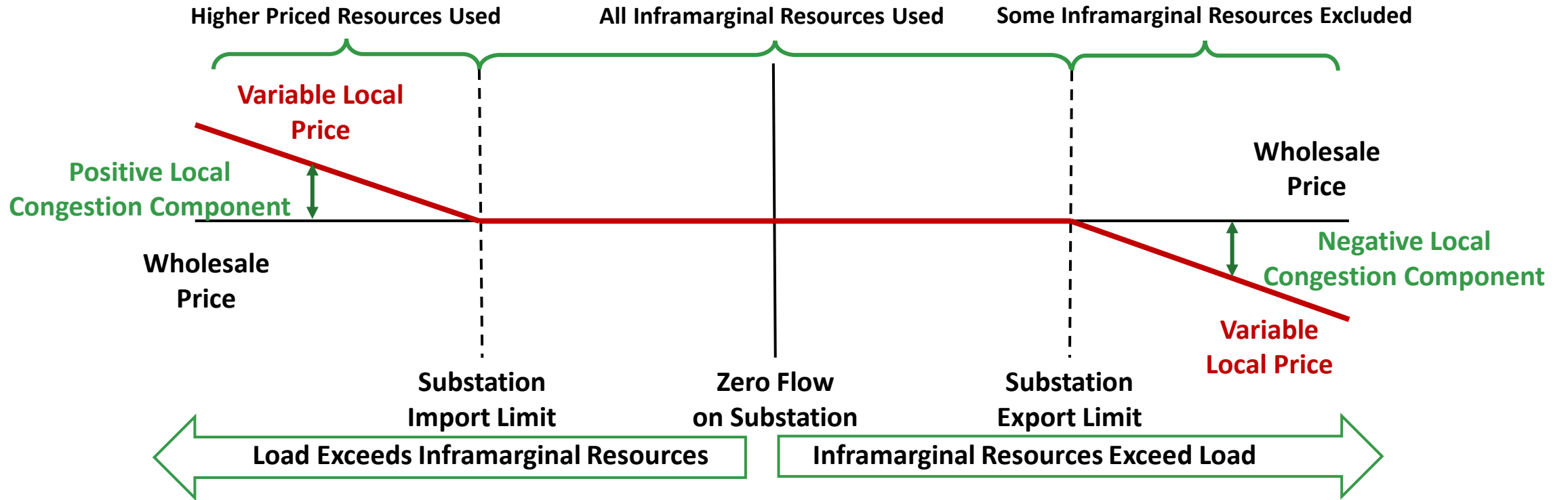
- The Variable Energy Price is the CAISO wholesale energy price at the Pnode that serves the customer's location plus a Distribution Congestion Adjustment
- Variable Energy Price is the same for purchase, DR, and export – there is a uniform incentive
  - If e.g. a battery discharge rises beyond offsetting customer load to export it experiences no difference in incentive
- The CAISO wholesale price is a congestion adjusted price that reflects the marginal generation cost of serving a congested node.

# Distribution Congestion Adjustment

- The Distribution Congestion Adjustment is based on the cost of delivering energy from the Pnode to the customer arising from congestion on the distribution system
- The Local Congestion Adjustment is the sum of local congestion adjustments (positive or negative) assessed at each substation level between the Pnode and the customer
- The Local Adjustment will be zero until the the limits of the substation (either export or import are approached)
- It will turn negative as the export limit is approached and positive as the import limit is approached

# Local Congestion Adjustment

## Effect of Local Resource / Load Imbalance on Local Variable Price



# The Market

- Calculate the Local Congestion Adjustment at each substation using intelligent pricing software (Local Pricing Server)
- The Local Pricing Server trains on the behavior of the system below the substation to predict with increasing accuracy the local price adjustments needed to limit substation flows within the substation capacity.
- Customers don't bid, they (or their home or facility controller) respond to prices by adjusting their load/exports up or down based on prior customer settings.



# Consistency for LSEs and Aggregators

- Need a level playing field for all customer resources.
- A customer in a CCA or selling direct to CAISO through an aggregator should face the same Distribution Congestion Charge whatever its path to market (and those charges should go to the distribution utility)
- An aggregator with resources at different grid locations must be prepared to pay differing Distribution Congestion Charges on different resources while receiving only the Pnode price from CAISO.
- This charge will be passed down to customer resources. A resource may simply be unable or unwilling to perform if Distribution Congestion Adjustment exceeds the wholesale price.

# Some Consequences

- MRC Proposal has a consistent energy incentive, but the price paid for purchases is different than the price for DR and export
- NEM pricing was the same for import and exports and the system overpaid for energy – let's not recreate that
- CalFUSE pricing interacts with the subscription purchase in counterproductive ways.
- The following examples use a 30-cent Legacy Tariff
  - Fixed Cost and Capacity Cost are each 12 cents
  - Base Cost is 24 cents, Legacy averaged energy cost is 6 cents

# High Stress Scenario

- \$500/MWh (50 cents/kWh) wholesale price
- NEM pricing was the same for import and exports and the system overpaid for energy – let's not recreate that
- CalFUSE variable price:
  - Wholesale price + allocated capacity + fixed cost [– legacy tariff]
  - $\$.50 + \$1.20 + \$.12 - \$.30 = \$1.32$  (DR and purchase)  $\$1.62$  (export)
- MRC variable price:
  - Wholesale price [+ Base Costs]
  - $\$.50 [+ \$.24] = \$.50$  (DR and export) =  $\$.74$  (purchase)

# Zero Energy Price Scenario

- \$0/MWh (0 cents/kWh) wholesale price
- CalFUSE variable price:
  - Wholesale price + allocated capacity + fixed cost [– legacy tariff]
  - $\$0 + \$0 + \$0.12 [- \$0.30] = -\$0.18$  (DR and purchase)     $\$0.12$  (export)
- MRC variable price:
  - Wholesale price [+ Base Costs]
  - $\$0 [+ \$0.24] = \$0$  (DR and export)                       $= \$0.24$  (purchase)

# Average Energy Price Scenario

- \$.06/MWh (6 cents/kWh) wholesale price
- CalFUSE variable price:
  - Wholesale price + allocated capacity + fixed cost – legacy tariff
  - $$.06 + \$0 + $.12 - $.30 = -$.12$ . (DR and purchase) = \$.18 (export)
- MRC variable price:
  - Wholesale price [+ Base Costs]
  - $$.06 [+ $.24] = $.30$  (DR and export) = \$.30 (purchase)

# Some Observations

- CalFUSE net credit for DR is consistently below price paid for export. No economic justification.
- On a high stress day, the variable price can be many times the wholesale price.
  - When Governor asked for voluntary reduction last September about 7 percent of load responded.
  - If variable price were 4 times wholesale, it adds 21 percent to cost.
- On average days there is likely a disincentive for DR.
- On low priced days there is a huge penalty for underuse.
- The subscription acts like a full requirements fixed charge.

# Questions?

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**“The economy is a subset of the ecology.”**