Resource Balance for Net CONE Calculation

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Robert Stoddard, Managing Director
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1 | *Recap*

Net CONE should reflect "as expected" conditions

NEPGA July 20 presentation made the case for calculating E&AS Offsets by modeling the system as it is reasonably expected to be in FCA 16 through 18:

− Specified by Tariff:

  › "Net CONE is an estimate of the Cost of New Entry, net of the first-year non-capacity market revenues, for a reference technology resource type and is intended to equal the amount of capacity revenue the reference technology resource would require, in its first year of operation, to be economically viable given *reasonable expectations* of the first year energy and ancillary services revenues, and *projected revenue* for subsequent years."

  › No resource developer expects system balance to be "at criterion"

− Consistent with cost-minimization principle of MRI-linked demand curves

− Ensures no excessive scarcity premiums

2 | *Issues Raised at Previous MC Meeting*

Three open questions from last MC meeting

1. Does the market equilibrate at Net ICR using "as expected"?

2. Is CONE the right measure of cost if consumers may not bear all that cost?

3. Does using "as expected" disrupt optimality of constrained zone pricing?

1 *Does using "as expected" cause the market not to equilibrate at Net ICR?*

A bit of notation

- Q → Generic quantity of capacity cleared in FCA

- Q* → Net ICR

- Q^ → Quantity of capacity that is *reasonably expected* to clear in a particular FCA

- E&AS_Offset(Q) → The E&AS Offset expected as a function of Q. E&AS_Offset(Q) is declining & continuous

- Net_CONE(Q) ≡ CONE − E&AS_Offset(Q)

- MRI → Marginal Reliability Impact

- For simplicity I embed expected net PFP costs in E&AS Offset

Replotting the Demand Curve (1)
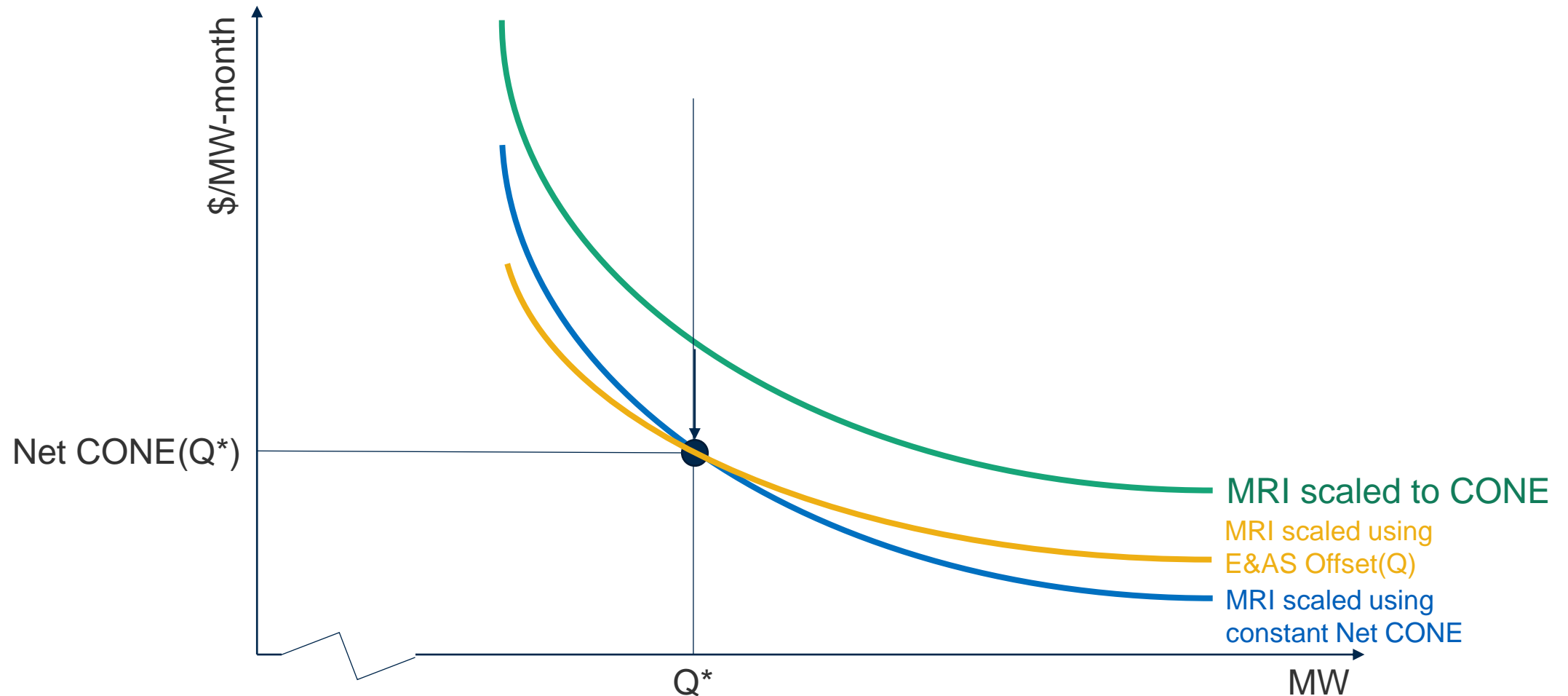
Replotting the Demand Curve (2)
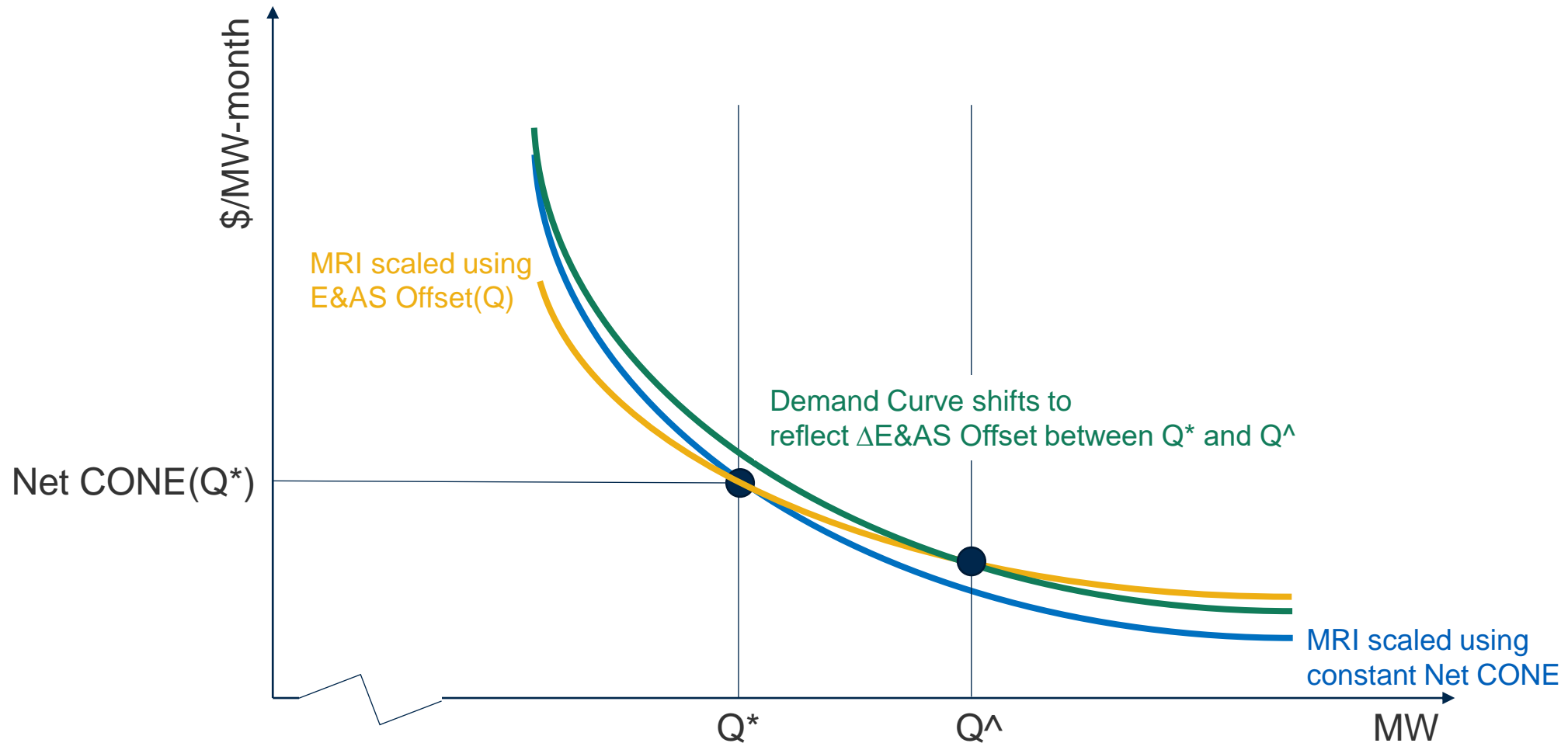
Market equilibrates using "as expected"

– Any sloped demand curve does not *intrinsically* favor any one point as the equilibrium

1. Equilibration is created by setting price at NICR = Net CONE(Q*)

2. "As expected" curve does this if the system is *reasonably expected* to be at equilibrium, i.e. Q* = Q^

– Equilibration requires three additional conditions:

1. Price when Q<NICR is *above* Net CONE *at that level of Q*

2. Price when Q>NICR is *below* Net CONE *at that level of Q*

3. Demand curve is continuous and monotonically decreasing

☑ Using "as expected" has all required properties to equilibrate the market at Net ICR

Source of possible misunderstanding?

2
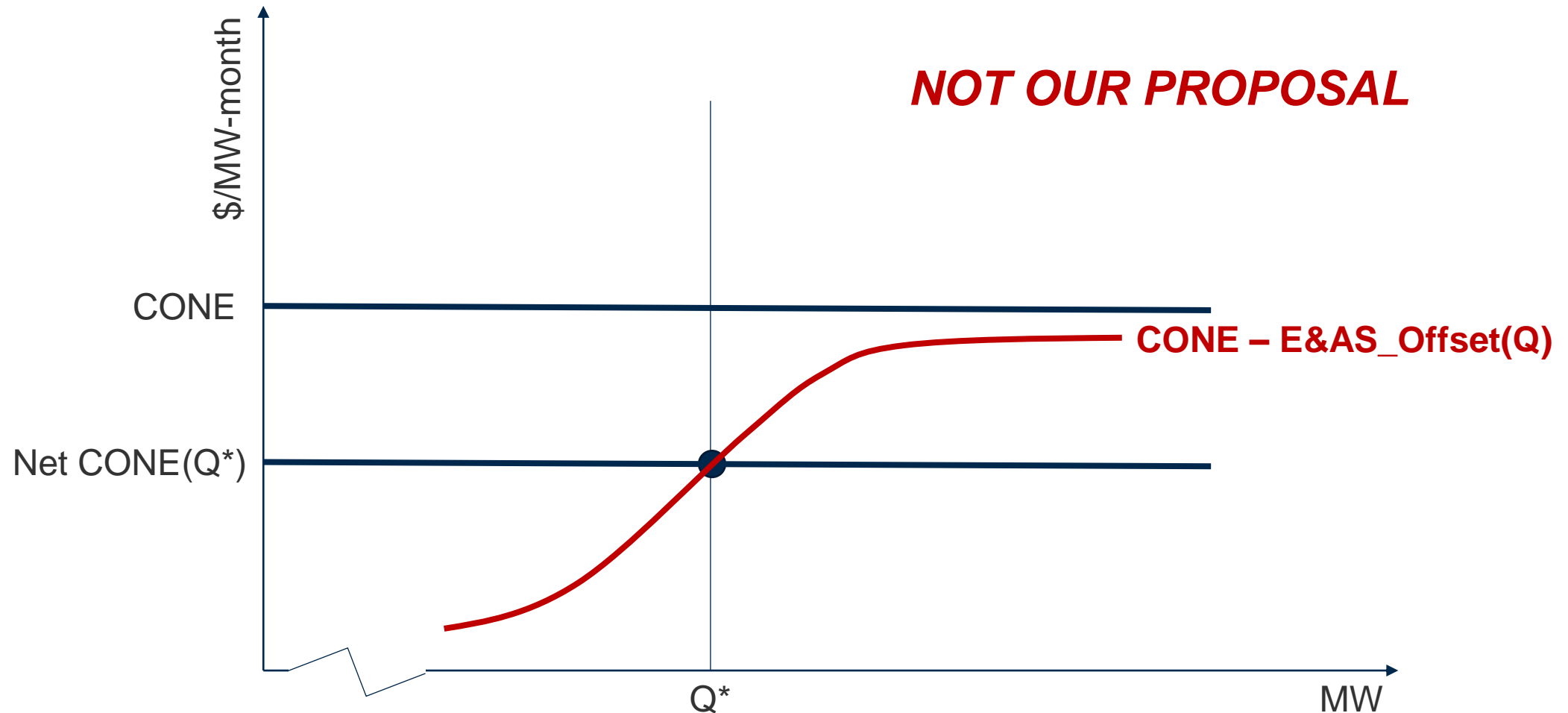
Is CONE the right measure of cost if consumers may not bear all that cost?

Remark about cost incidence obscured central point

– A central difference between "at criterion" and "as expected" is the objective function

  › At criterion balances MRI against *Net CONE*(Q*)

  › As expected balances MRI again *CONE*

   • Then applies E&AS_Offset(Q) to the translated MRI curves

– ISO's mandate is to minimize *total* costs consistent with system security & reliability

  › CONE is the correct estimate of the total cost of an extra unit of capacity on the system

  › Irrelevant what fraction of this cost is borne by various sectors

3

Does using "as expected" disrupt optimality of constrained zone pricing?

Theoretical optimality is unchanged

– Zonal balance reliability value of internal resources vs. external resources

  › For import-constrained zones, interface limits make external resources a relatively poor substitute

  › For export-constrained zones, constrained-low resources are relatively good substitutes near the export limit

– Optimality requires that the same scaling factor is applied to system MRI and zonal MRI curves

  › ISO uses Net_CONE(Q*)

  › We propose using Net_CONE(Q^)

  › Ergo no loss of optimality

Technical issues with MRI as applied to zones

– ISO approach errs by assuming:

› Same CONE in all zones

• Unlikely to be true, e.g. cost to build in Boston >> cost to build in Maine

• PJM develops zonal-specific CONE

› Same E&AS Offset in all zones

• Ignores likely transmission constraints and different PFP risks

– Our proposed approach improves on these issues by using different E&AS Offsets by zone to reflect "as expected" zonal shortages and surpluses

– MRIs are engineering estimates, currently developed at criterion

› Marginal value of resources assumes a specific capacity balance

› Changing to "as expected" requires a fresh look at MRIs

> MRI-based zonal constraints have only bound in 2 FCAs and
> are not expected to bind during the current Net CONE reset period

Questions?