Marginal vs. Average Capacity Accreditation

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Introduction

- Capacity accreditation is essential because it:
  - ✓ Determines the amount of different types of resources that will be procured to satisfy resource adequacy needs
  - ✓ Is key for establishing the incentives to invest in and retire different types of resources
- Capacity accreditation should be aligned with the reliability resources provide. This will:
  - ✓ Ensure that resources with more desirable attributes are efficiently compensated
  - ✓ Minimize the costs of satisfying the RTO's reliability requirements
- Resources whose availability is highly correlated with other resources can provide less incremental (marginal) reliability to the system.
  - ✓ This presentation discusses why it is essential to accredit such resources on a marginal basis.

Marginal and Average Accreditation

- **Marginal Accreditation approach**
  - ✓ Compensate each resource based on the incremental reliability benefit the next unit of that resource type would provide.
  - ✓ Calculated from the impact of an *incremental quantity* of a given resource type on a reliability metric (LOLE or EUE), relative to that of 'perfect capacity'.
  - ✓ Includes the Marginal Reliability Improvement (MRI) and the Marginal ELCC methods
- **Average Accreditation approach**
  - ✓ Compensate each resource based on the aggregate reliability benefit of every unit of that resource type.
  - ✓ Calculated as 'perfect capacity' needed to replace *all* capacity of a given type while holding a reliability metric constant.
  - ✓ Include Average ELCC and "Portfolio ELCC".

Illustration of Marginal vs. Average Approach
500 MW Solar

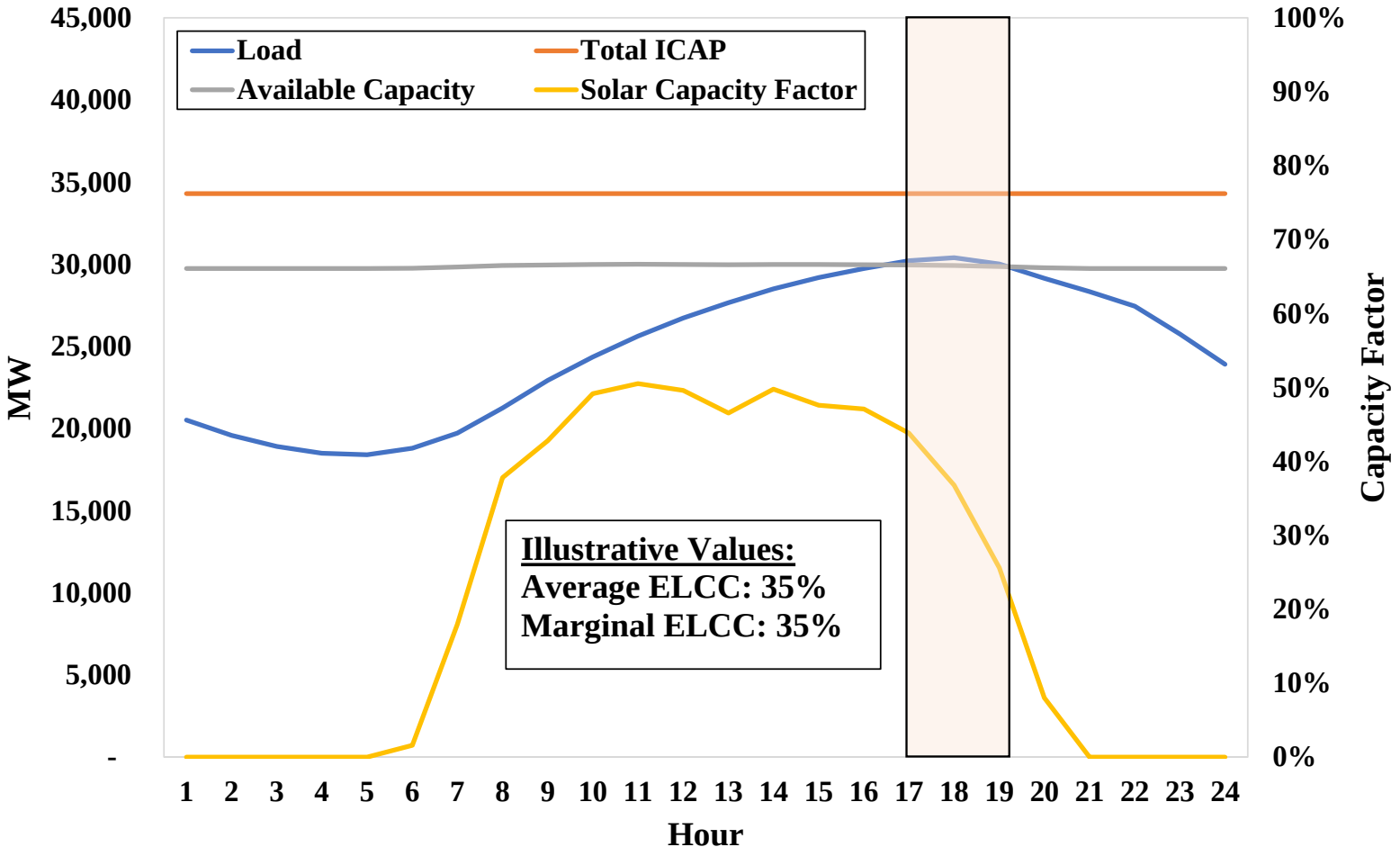

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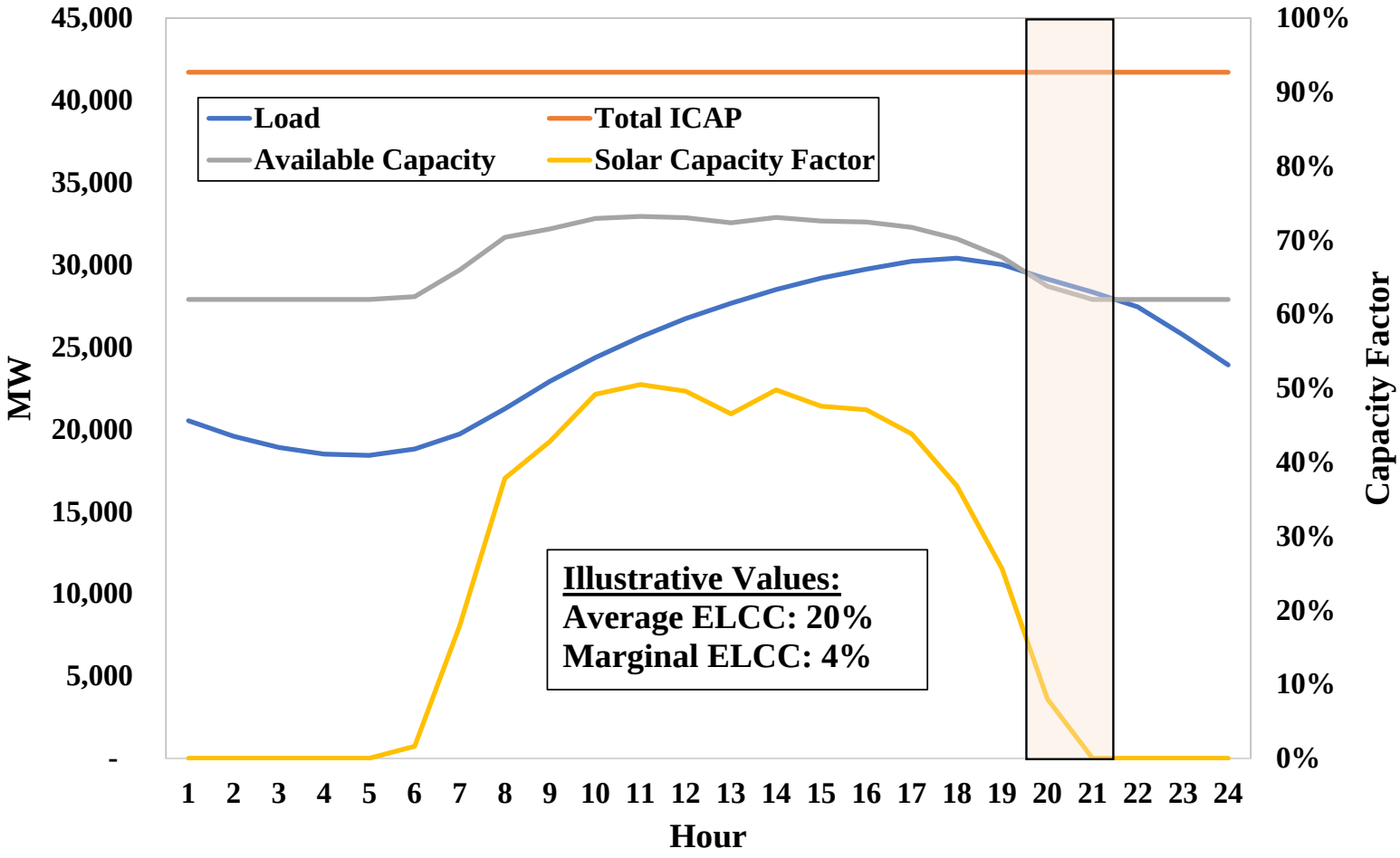
Illustration of Marginal vs. Average Approach 10,000 MW Solar



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Marginal Accreditation

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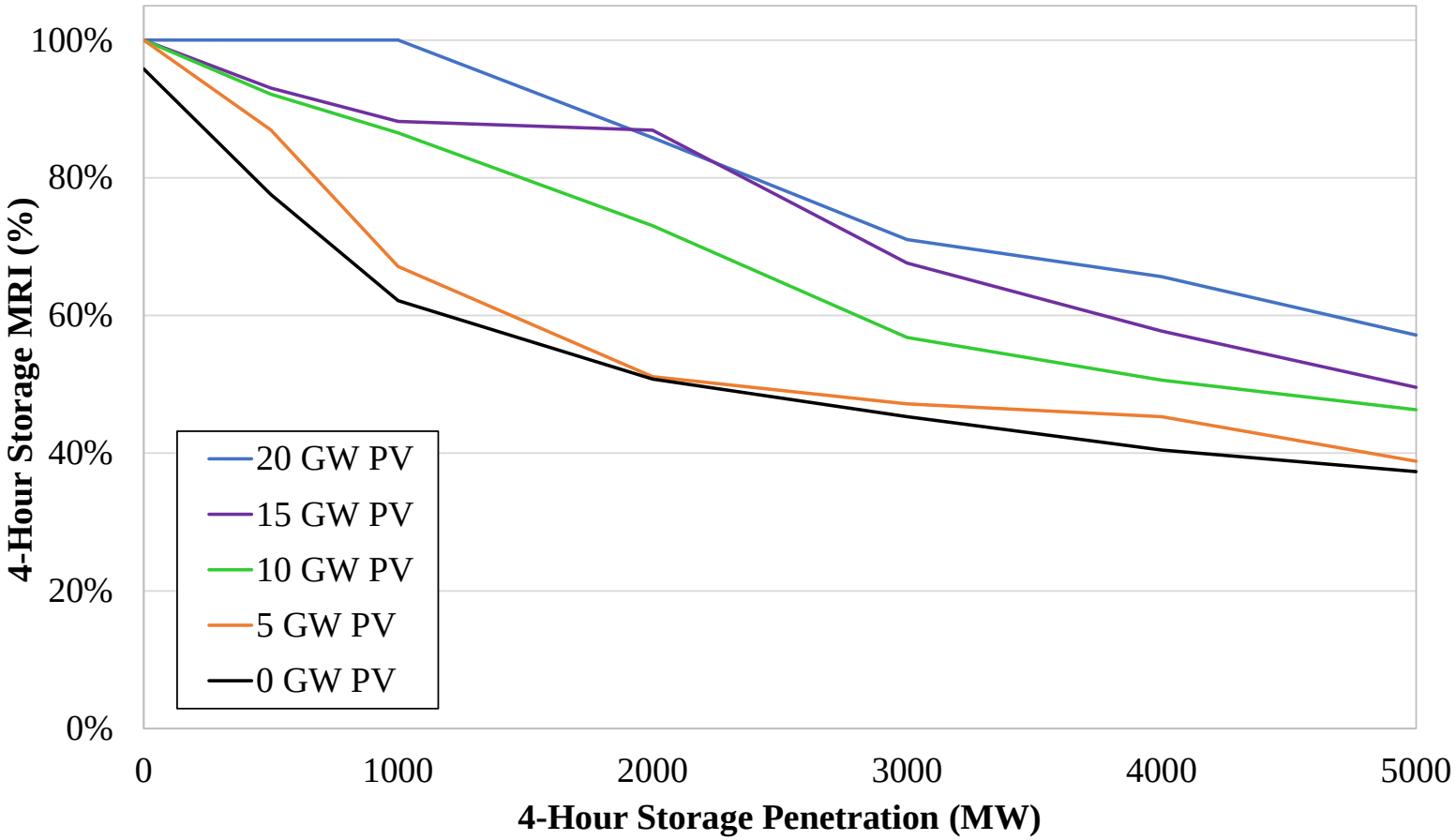
Alignment with MISO Market Design

- **Marginal cost scheduling and pricing is a core principle of efficient wholesale market design.**
- All key market products rely on this:
  - ✓ Energy prices (LMP)
  - ✓ Reserve prices
  - ✓ Capacity market demand curve
- Marginal accreditation is consistent with the marginal pricing approach in capacity market.
- Frequently, the value of the service to the consumer exceeds the marginal price that is paid to suppliers.
  - ✓ This is the source of consumer surplus in MISO and all other market-based systems.

Advantages of Marginal Accreditation

- Price signal consistent with reliability impact
- Recognizes diminishing returns and synergies
- Provides efficient incentives to:
  - ✓ Avoid saturation by a particular technology
  - ✓ Invest in diverse/complementary resources
  - ✓ Efficiently pair storage with intermittent resources
  - ✓ Efficiently choose storage project durations
  - ✓ Maintain flexible conventional resources if they are needed
- The next slide illustrates these benefits for an investment in 4-hour storage in the NYISO market.

Illustration of Marginal Approach
4-Hour Storage with Varying Solar Penetration



Results are illustrative and are not predictions of MRI values.

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Common Misconceptions about Marginal Accreditation

- Need for 'over-procurement' as accreditation declines
  - ✓ ICAP Requirements are determined independently of the capacity accreditation methodology.
  - ✓ For a given resource mix, the supply/demand balance is unaffected
  - ✓ Lower accreditation leads to a lower UCAP requirement.
- Perceived volatility of capacity credit
  - ✓ Often based on studies that don't consider incentive effects
  - ✓ Marginal capacity credit can change, but it is not arbitrary
- Perceived unfairness to resources with declining marginal value
  - ✓ Value of all resources declines as surplus increases
- Perceived discrimination against clean energy resources
  - ✓ Same principles applied to conventional resources

Average Accreditation

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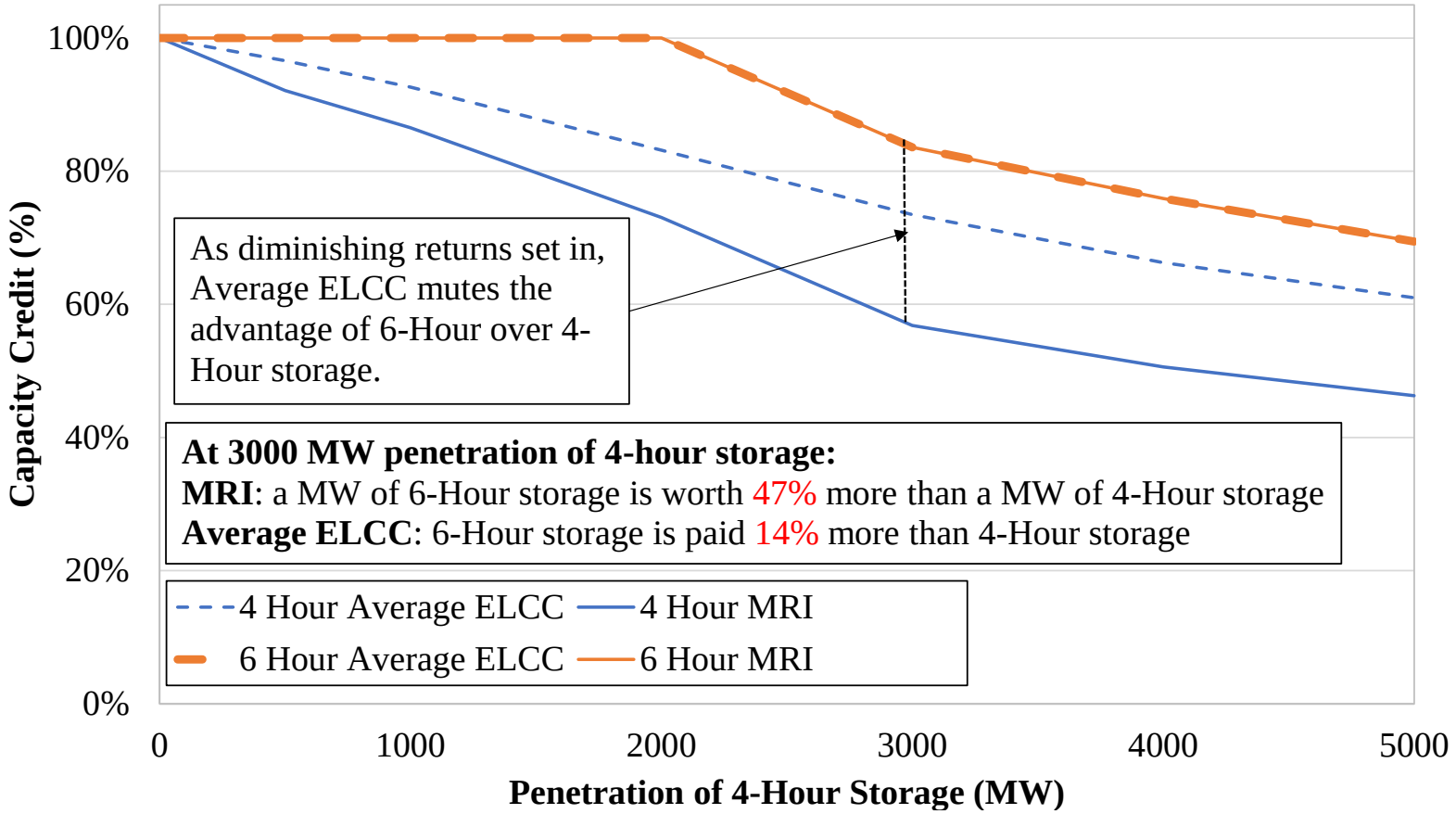
Problems with Average Accreditation Inefficient Incentives

- Compensation misaligned with impact on reliability
  - ✓ Detaches resource owner decisions from their impacts
- Arbitrarily favors/over-compensates more saturated resource types
- Likely consequences of average ELCC approach:
  - ✓ Under-investment in resources with greater reliability benefits (including storage-paired renewables, longer duration storage)
  - ✓ Over-investment in resources with diminishing reliability benefits (undiversified intermittent type, shorter duration storage, retention of gas-only thermal generation)

Illustrative Marginal vs. Average ELCC
Assuming 10 GW Solar, 0 MW 6-hour Storage



Results are illustrative and are not predictions of MRI or ELCC values.

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Problems with Average Accreditation Overpayment by Consumers

- Excess payments under average accreditation lead to inflated consumer costs.
  - ✓ Capacity requirements must rise to reflect the over-accreditation.
- Efficient capacity payments reflect what is needed to attract or retain capacity at the current level of reliability.
- Under average accreditation, capacity payments to some resources exceed what is needed to attract or retain capacity.

Conclusion

- MISO should prioritize sound economics in all of its market design choices, regardless of the interests of specific participants.
  - ✓ In accrediting resources whose availability is highly correlated, marginal accreditation is the only economically sound choice.
- FERC has recently considered this question when NYISO filed to adopt marginal accreditation of renewables.
- In the Order approving the NYISO's filing (May 2022), FERC stated:

  …NYISO's proposed marginal capacity accreditation approach will send a more accurate investment signal to market participants about the reliability value of various resource types in each Capability Year as compared to the average accreditation approach.
- Hence, we encourage MISO and its participants to pursue a marginal accreditation approach.