



Highlights from the 2020 State of the Market Report for the NYISO Markets: Public Policy

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Introduction

- As the Market Monitoring Unit for NYISO, we produce an annual State of the Market (SOM) Report to:
 - ✓ Evaluate the performance of the markets;
 - ✓ Identify market flaws or market power concerns; and
 - ✓ Recommend improvements in the market design.
- Given the breadth of the report, this presentation covers only highlights from our 2020 SOM Report pertinent to:
 - ✓ How NYISO markets can facilitate public policy goals; and
 - ✓ Discussion of recommendations that:
 - Help integrate intermittent renewables reliably and efficiently
 - Relate to the Public Policy Transmission Planning process



Schedule

- The 2020 SOM will be presented at several meetings:
 - ✓ May 26: Management Committee – Overview
 - ✓ June 9: MIWG/ICAPWG
 - Public Policy focus – 1 hour
 - ✓ June 17: MIWG/ICAPWG
 - Capacity Market focus – 1 hour
 - ✓ June 25: MIWG/ICAPWG
 - Energy and Ancillary Services focus – 1 hour
 - ✓ TBD: Details of recommendation on capacity accreditation
 - ✓ Additional slots can be scheduled if there is interest.

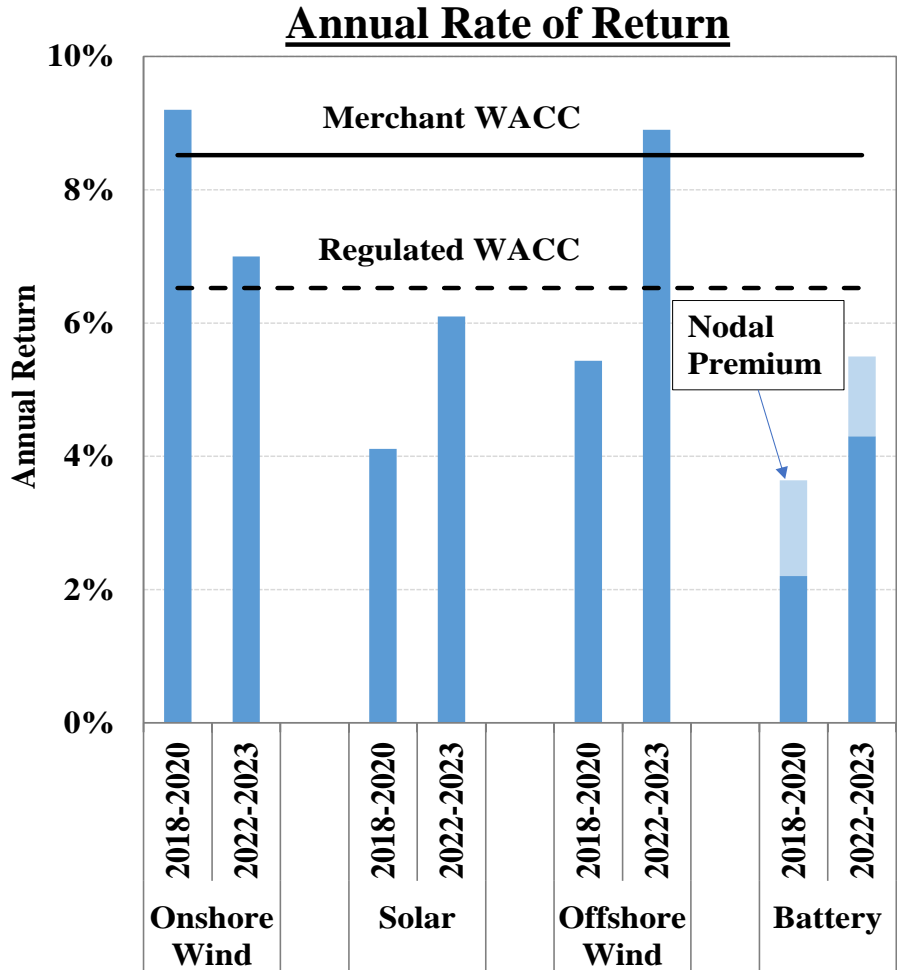


Using Markets to Achieve Policy Goals

Markets Influence Incentives for Investment in New Clean Resources

- Most of the costs of developing intermittent generation are recouped by state and federal incentives.
- However, energy, ancillary services, and capacity revenues give a boost to projects that are more valuable to the power system
 - ✓ Higher wholesale revenues make economic projects more competitive in an RFP for RECs
 - ✓ The wholesale market encourages development of complementary technologies such as battery/hybrid storage
 - ✓ As conventional generators retire, the market encourages the more flexible ones to remain in service longer
- Wholesale markets value location, timing of output, flexibility
 - ✓ Index REC contracts are designed to reduce market risk to developers while preserving some market incentives

Investment Incentives for New Clean Resources

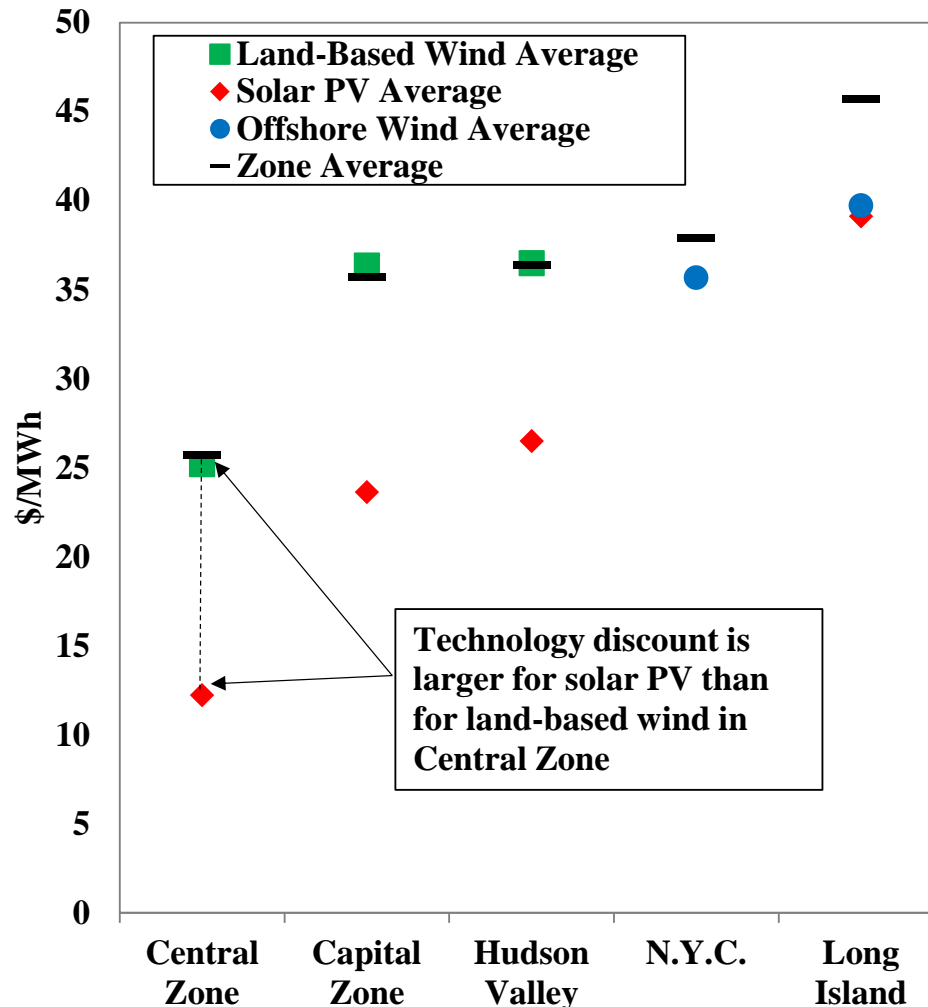


- Onshore wind profits falling as PTC expires.
- Solar/OSW/battery outlook improving as costs fall.
 - ✓ Nodal premiums can be significant.
- Solar & battery outlook poor through 2023 without higher subsidies, capacity prices, and/or LBMPs.

Markets Guide Investment in Policy Resources

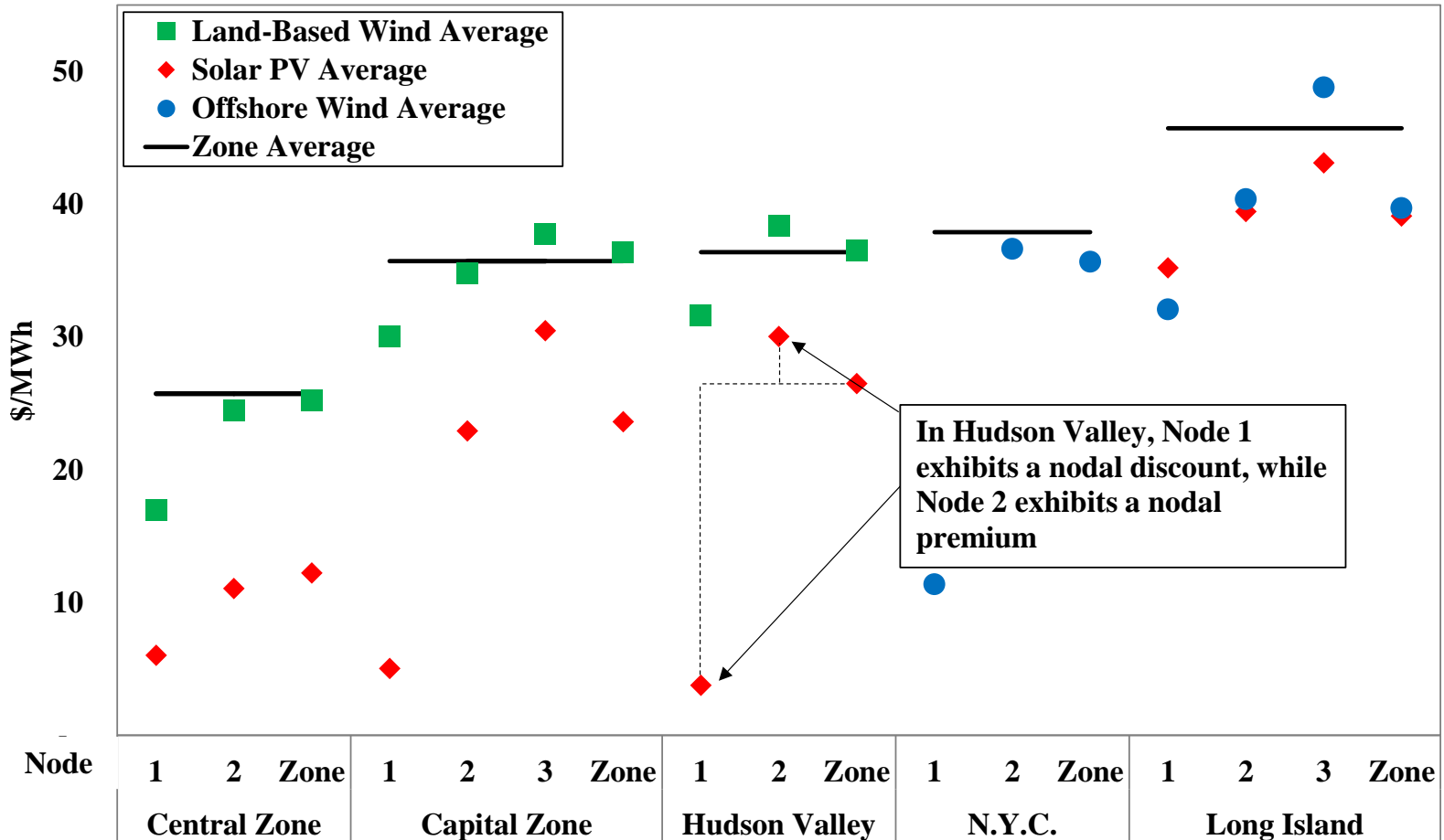
- Developers with long-term contracts for Fixed RECs and Index RECs still face significant market risks that help guide investment.
- NYPSC has expressed a preference for Index REC contracts.
 - ✓ “...it is important to preserve structural incentives...to maximize generation during peak pricing periods.”
 - ✓ They eliminate market risks from variations in (a) day-ahead average zonal LBMPs and (b) capacity prices
- Fixed and Index RECs retain the following market risks:
 - ✓ Technology discount
 - ✓ Nodal discount
 - ✓ Capacity value uncertainty
- The following charts analyze these risks based on projected prices and outcomes in a 70x30 scenario.

Markets Guide Clean Energy Investment: Evaluation of 70x30 Scenario

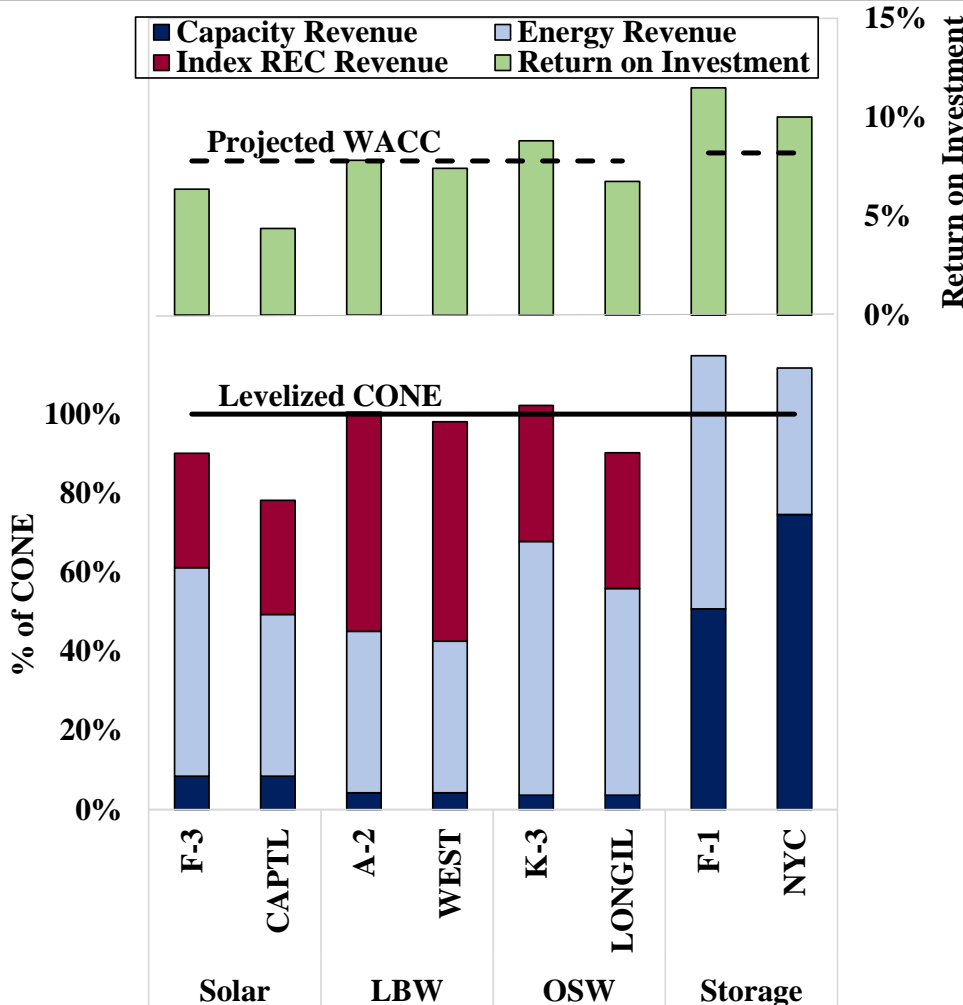


- Realized prices depend on generation timing
- High penetration (18 GW) of solar in scenario
 - ✓ Large technology discount
 - ✓ Incentives for battery/hybrid storage
- One possible scenario: illustrates that markets guide investment to better uses.

Markets Guide Clean Energy Investment: Evaluation for 12 Nodes and 5 Zones in 70x30 Scenario



Markets Guide Clean Energy Investment: Revenues of Projects in 70x30 Scenario

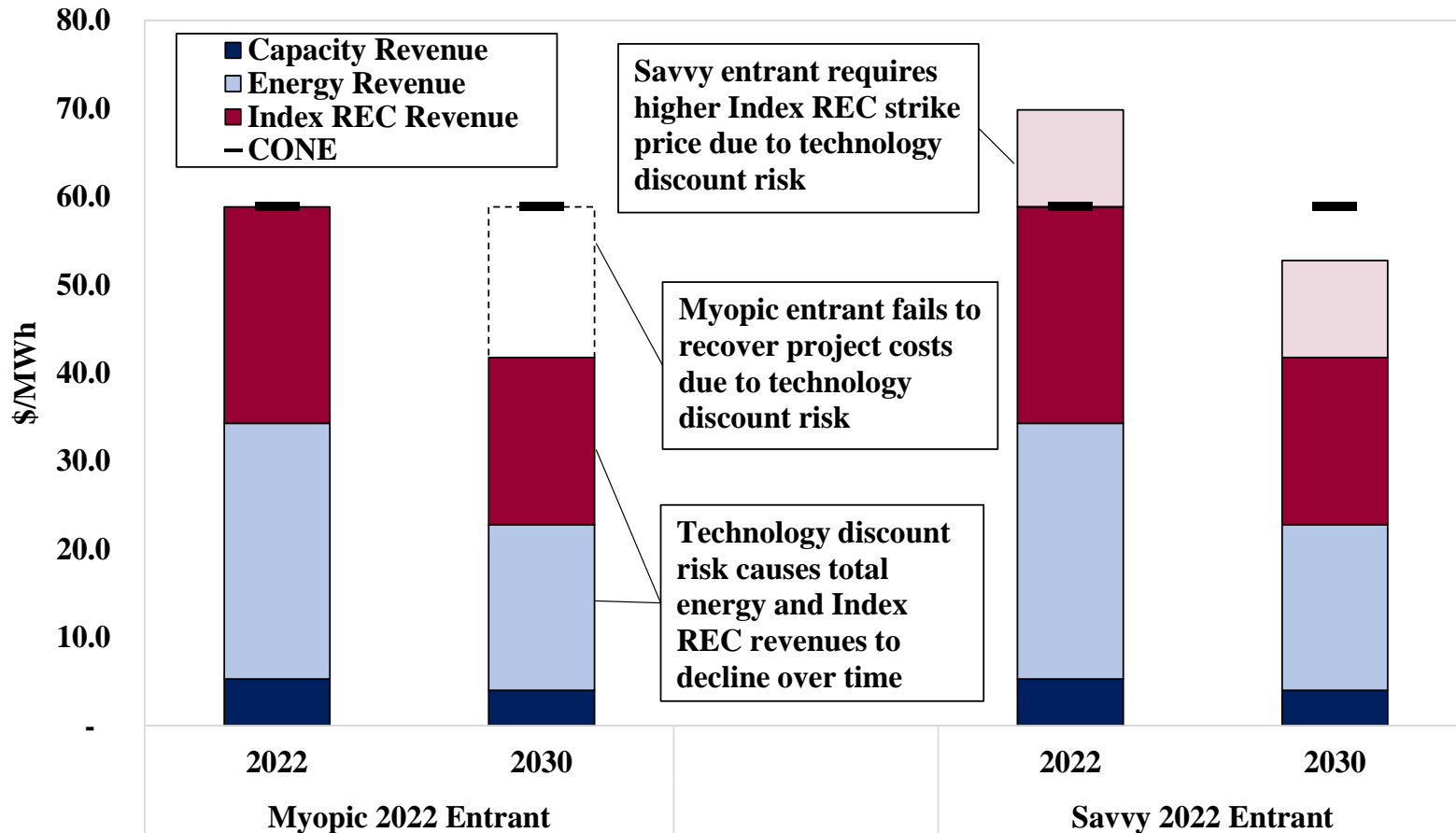


- Assumes projects contract at strike price assuming no discounts
- Technology discounts large for:
 - ✓ Solar (Zone F)
 - ✓ OSW (Zone K)
- LBW is marginally economic
- Storage is economic without incentives
- Nodal premiums can be substantial

Risks Faced by Early Entrant Renewable Generators

- In recent years, NYSERDA has entered into long-term contracts for fixed RECs and index RECs
 - ✓ Either way, a developer's REC offer depends on its estimate of wholesale market revenues
 - ✓ Both REC types expose developers to market risks from: nodal basis, technology basis, capacity value declines
- The following figure illustrates the potential risks for a project built in 2022 from future investment by comparing:
 - ✓ A myopic developer – Firm does not anticipate that future investment will lead to a substantial technology discount
 - ✓ A savvy developer – Firm raises REC offer anticipating technology discount

Risk to Early Entrant Renewable Generator in 70x30 Scenario



Risks Faced by Early Entrant Renewable Generators

- Early investors in renewable generators with long-term contracts for Fixed or Index RECs still face market risk
 - ✓ Their revenues will be reduced if subsequent investment pushes down wholesale prices
 - ✓ Increasing REC payments in later years will push down wholesale prices
 - ✓ Savvy investors will demand higher REC contract prices in the near-term.
- Changing goals may increase difficulty for developers to obtain financing—even with a long-term contract.
- Incentives for clean resource development that treat new and old projects comparably will reduce market risk for developers.



Recommendations Related to Public Policy

Prioritizing Market Enhancements

- Unprecedented levels of policy-driven investment expected over the coming decade
- The NYISO should focus on enhancements that:
 - ✓ Guide renewable investment to where it is most deliverable
 - ✓ Provide incentives for investment in flexible resources that help with:
 - Integrating intermittent renewables, while
 - Maintaining reliability
 - ✓ Encourage retirement of inflexible existing generators
- These enhancements will facilitate state policy goals at the lowest cost and minimize market disruption.

Recommendations to Facilitate Public Policy

- E&AS recommendations to enhance incentives & performance:
 - ✓ 2015-16: Dynamic reserve requirements
 - ✓ 2017-1: NYC locational reserve requirements
 - ✓ 2016-1: Compensate reserves that increase transfer capability
 - ✓ 2017-2: Reserve demand curve increases
- Capacity recommendation to improve accreditation to better recognize the value of resources for maintaining reliability.
 - ✓ Provide efficient sustainable rules to guide future investment
 - ✓ Recognize diminishing value as penetration rises
 - ✓ Increase compensation for complementary technologies
 - ✓ Encourage retirements of low-value units
- Several incremental enhancements to BSM may be preempted by efforts to eliminate BSM rules

Public Policy Transmission Planning Process

- NYISO solicits transmission projects designed to address public policy needs defined by the NYPSC
 - ✓ The PSC recently ordered NYISO to consider solutions to deliver offshore wind energy
- NYISO compares competing projects using benefit-cost analysis based on forecasted future benefits
 - ✓ Results are sensitive to modeling assumptions
- We have recommended changes to:
 - ✓ Consider economic entry and retirement
 - ✓ Recognize additional project benefits (e.g., capacity value) in B/C assessment. This is illustrated in the next slide.

B/C Analysis of AC PPTN Projects

