New York ISO
Independent System Operator

10 Krey Boulevard, Rensselaer, NY 12144
Ph: 518.356.6000 | **Fax:** 518.356.8899

March 14, 2023

By Electronic Delivery

Hon. Kimberly D. Bose,
Secretary, Federal Energy Regulatory Commission
888 First Street,
NE Washington, DC 20426

Re: New York Independent System Operator, Inc.*, Informational Filing Regarding Phase 2 Work Completing the NYISO's Marginal Capacity Accreditation Market Design,* Docket No. ER22-772-00_

Dear Secretary Bose:

In compliance with the directive of the Federal Energy Regulatory Commission's ("Commission's") May 10, 2022 "Order Accepting Tariff Revisions Subject to Conditions" in this docket ("May 10 Order"),[1] the New York Independent System Operator, Inc. ("NYISO") submits this informational filing. As required by the May 10 Order, the informational filing includes a "Phase 2 Report" describing the implementation details concerning the NYISO's Commission-accepted marginal capacity accreditation market design that were developed through the NYISO's "Phase 2" stakeholder process. This informational filing also includes a copy of a presentation entitled "Capacity Market Accreditation Implementation Details" that the NYISO made at the December 14, 2022 meeting of the Business Issues Committee ("BIC"). The BIC's December 14 approval of implementation details and administrative rules and procedures that have now been incorporated into the NYISO's revised Installed Capacity Manual ("ICAP Manual")[2] marked the end of the NYISO's "Phase 2" work related to the marginal capacity accreditation market design.

The NYISO is not requesting any Commission action in response to this informational filing. As stated in the May 10 Order, this informational filing is not subject to the Commission's notice or comment procedures.[3]

[1] *N.Y. Indep. Sys. Operator, Inc.*, 179 FERC ¶ 61,102 at P 114 (2022).

[2] The redlined ICAP Manual posted with the December 14, 2022 BIC materials includes additional incremental revisions suggested by stakeholders during the BIC discussion and is available on the NYISO website at: https://www.nyiso.com/documents/20142/34963268/ICAP%20Manual%20Revisions%20-%20Updated%20at%20BIC%20Meeting.pdf/ba2f7aad-7023-7539-a4cf-4ebb02b7d997.

[3] *See* May 10 Order at P 267.

I. BACKGROUND

In the May 10 Order the Commission accepted tariff revisions that require the NYISO to accredit all resources' capacity value beginning in the 2024 Capability Year based on their marginal contribution to resource adequacy and directed the NYISO to submit a one-time informational filing within 90 days of the completion of its "Phase 2" stakeholder process.[4]

The attached Phase 2 Report complies with the Commission's directive to report the outcome of its Phase 2 work with its stakeholders. The primary objective of this informational filing is to articulate the final implementation details of the NYISO's marginal capacity accreditation market design and, in so doing, provide additional transparency to the Commission and the parties in this proceeding regarding the new market design.

The Phase 2 Report discusses the Phase 2 stakeholder process and the results of scenario and sensitivity analysis conducted by GE Energy Consulting that informed the selection of the Marginal Reliability Improvement ("MRI") modeling technique to annually calculate Capacity Accreditation Factors ("CAFs"). The Phase 2 Report also describes the resulting technical specifications and procedural revisions made to the NYISO Installed Capacity Manual that were accepted by the BIC on December 14, 2022.[5] The technical specification and procedures developed in Phase 2 include the development of an annual timeline and procedures to identify Capacity Accreditation Resource Classes ("CARCs") and calculate and assign CAFs to all Installed Capacity Suppliers ("ICAP Suppliers").[6] They also reflect the selection of the MRI modeling technique as the appropriate technique to calculate CAFs.[7]

---

[4] May 10 Order at PP 22, 114. Consistent with the paragraph 114 of May 10 Order, the NYISO identified one additional conforming revision to its tariff during its Phase 2 stakeholder process that the NYISO will file with the Commission under a separate Federal Power Act section 205 filing. This tariff revision to Section 5.12.7 of the Market Administration and Control Area Services Tariff ("Services Tariff") clarifies bidding requirements for Installed Capacity Suppliers with Energy Duration Limitations that are equal to or less than the duration of the Peak Load Window as well as Installed Capacity Suppliers with Energy Duration Limitations that exceed the Peak Load Window and was brought to the December 14, 2022 BIC for separate action, and then to the December 21, 2022 Management Committee ("MC"). Both the BIC and the MC recommended the NYISO Board of Directors direct the NYISO to file these revisions to the Services Tariff with the Commission.

[5] In accordance with Section 4.13 of the BIC By-laws, the ICAP Manual revisions that completed the NYISO Phase 2 project work were accepted by the BIC on December 14, 2022, but became final and effective on January 3, 2023, the day following the ten (10) business day process for an appeal to be noticed to the NYISO's Management Committee. No appeal of BIC's action was taken and the period for a timely appeal ended on December 30, 2022.

[6] Capitalized terms that are not otherwise defined herein shall have the meaning specified in Article 2 of the Services Tariff.

[7] As discussed in the Phase 2 Report, GE Energy Consulting worked with the NYISO and its stakeholders throughout 2022 producing modeling results for several different scenarios and sensitivities using the 2022 resource adequacy model as its starting point to evaluate and compare the MRI technique with the Effective Load Carrying Capacity technique as well as evaluating several other modeling choices such as size of the representative unit used for each CARC and the locations for siting these representative units when running the GE MARS software using the database that was developed through the New York State Reliability Council's year long process to establish the annual statewide Installed Capacity Requirement for the New York Control Area ("IRM") and then subsequently used by the NYISO to calculate the Minimum Locational Installed Capacity Requirements ("LCRs").

The development of these non-tariff administration and implementation details and related procedures completes the Phase 2 work regarding the marginal capacity accreditation design. However, additional work is still underway. The NYISO is now undertaking Phase 3 of the project – implementation of the marginal capacity accreditation design into the ICAP Market software and administration. This was discussed by the NYISO in its January 5, 2022 filing[8] of the marginal capacity accreditation tariff provisions. It is discussed in more detail below and in the attached Phase 2 Report.

In addition, the NYISO has committed to stakeholders that it will continue to work with stakeholders and the New York State Reliability Council ("NYSRC")[9] to evaluate future enhancements to the resource adequacy model. Such enhancements may facilitate additional refinements to the NYSRC and NYISO requirement-setting processes and further improve market signals derived from the use of the marginal capacity accreditation market design. This work began during the Phase 2 stakeholder discussions and several of these tasks are currently underway in parallel with the NYISO's Phase 3 efforts. This additional work is discussed in more detail in the Phase 2 report as well as within recent presentations made at the ICAP Working Group on February 28, 2023.[10]

[8] New York Independent System Operator, Inc., *Excluding Certain Resources from the "Buyer-Side" Capacity Market Power Mitigation Measures, Adopting a Marginal Capacity Accreditation Market Design, and Enhancing Capacity Reference Point Price Translation*, Docket No. ER22-772-000 (January 5, 2022) ("January 5 Filing").

[9] The New York State Reliability Council (NYSRC) is a not-for-profit corporation responsible for promoting and preserving the reliability of the New York State power system by developing, maintaining and, from time to time, updating the reliability rules which must be complied with by the New York Independent System Operator and all entities engaging in electric power transactions on the New York State power system. One of the responsibilities of the NYSRC is the establishment of the IRM. NYSRC typically files the IRM it has established for the NYISO's upcoming Capability Year with the Commission after a year-long study process that establishes a final base case resource adequacy model. Most recently, NYSRC filed the IRM it established for the 2023-2024 Capability Year, on December 22, 2022, and on February 14, 2023, the Commission accepted the 20.0% IRM established by NYSRC in Docket ER23-821-000.

[10] See "Modeling Improvements for Capacity Accreditation: Natural Gas Constraints," February 28, 2023 ICAP Working Group, https://www.nyiso.com/documents/20142/36499713/Gas%20Constraints%2002_28_2023%20ICAPWG_Final.pdf/e258d867-12f9-8453-c93b-49bc94b8e803; "Modeling Improvements for Capacity Accreditation: SCR Modeling," February 28, 2023 ICAP Working Group, https://www.nyiso.com/documents/20142/36499713/2023-02-28%20ICAPWG%20Modeling%20Improvements%20-%20SCR%20Modeling.pdf/c1a52495-bc30-3e7c-f5c1-61c38f30fbe4; and "Modeling Improvements for Capacity Accreditation: Correlated Derates," February 28, 2023 ICAP Working Group, https://www.nyiso.com/documents/20142/36499713/Correlated_Derates_MIWG_022823_FINAL.pdf/35eaab46-740e-aed0-9e2d-2207c06a0659

II. COMMUNICATIONS

All communications, pleadings, and orders with respect to this informational filing should be directed to the following individuals:

Robert E. Fernandez, Executive Vice President,
General Counsel, & Chief Compliance Officer
Karen Georgenson Gach, Deputy General Counsel
Raymond Stalter, Director of Regulatory Affairs
* David Allen, Senior Attorney
New York Independent System Operator, Inc.
10 Krey Boulevard
Rensselaer, NY 12144
Tel: (518) 356-6000
Fax: (518) 356-4702
rfernandez@nyiso.com
kgach@nyiso.com
rstalter@nyiso.com
dallen@nyiso.com

* Ted J. Murphy
Hunton Andrews Kurth LLP
2200 Pennsylvania Avenue, NW
Washington, D.C. 20037
Tel: (202) 955-1500
Fax: (202) 778-2201
tmurphy@huntonak.com

III. STAKEHOLDER PROCESS

The May 10 Order accepted the marginal capacity accreditation design to be implemented and administered in the NYISO's Installed Capacity market starting on May 1, 2024. In order to achieve that starting date, the NYISO indicated in the January 5 Filing that it had broken down its marginal capacity accreditation work into 3 phases.[11] "Phase 1" was the Federal Power Act section 205 submission of proposed tariff changes establishing the marginal capacity accreditation market design's overarching principles, framework and features in the NYISO tariff. This phase was complete when FERC accepted the NYISO's tariff revisions in the May 10 Order.

"Phase 2," which is the subject of this informational filing, was necessary to establish non-tariff implementation details and related administrative procedures pertaining to the marginal capacity accreditation design. Phase 2 needed to be completed within a year so that the "Phase 3" implementation and market administration software development and testing work, discussed below, could be completed in time to conduct the annual marginal capacity accreditation review in advance of the 2024 Capability Year. For some of the work required in Phase 2, discussions began during Phase 1; however, Phase 2 work in 2022 officially

[11] January 5 Filing at pp.43-44.

commenced at the February 24, 2022 ICAP Working Group.[12] It was originally targeted for completion late in the third quarter of 2022, but was completed with the December 14, 2022 BIC action accepting the implementation details, rules and procedures that are now incorporated into the revised ICAP Manual.

A. Phase 2 Project Discussions at the Installed Capacity Working Group

Overall, the NYISO led substantive discussions of the modeling techniques, the implementation details, and the administrative rules, procedures, and processes to complete the implementation details for the marginal capacity accreditation market design at nineteen different ICAP Working Group meetings. At ten of those meetings, GE Energy Consulting led discussions of the different modeling techniques to calculate CAFs and presented the results from the sensitivity and scenario modeling analyses it had conducted using its GE Multi-Area Reliability Simulation software ("GE MARS") to test whether the techniques produced similar CAF results across modeling techniques under current and possible future NYISO system conditions. The results of this modeling have been compiled into an appendix to the Phase 2 Report.

In addition, after the results were presented and the stakeholders had provided significant feedback on the technical and implementation details required to administer the marginal capacity accreditation tariff, the NYISO drafted ICAP Manual revisions and revisions to the ICAP Manual attachments and brought these proposed revisions to the ICAP Working Group for discussion.[13] Revisions, reflecting the final implementation details, rules and procedures for the marginal capacity accreditation market design, were discussed at the October 27, November 6, November 21 and December 6 ICAP Working Groups prior to posting the revised ICAP Manual and bringing it to the December 14 BIC for action. The NYISO also updated its consumer impact assessment of the marginal capacity accreditation market design that it completed in 2021. The NYISO led four separate presentations with stakeholders as part of its Phase 2 project at the ICAP Working Group to discuss the updated indicative assessment on the costs and benefits expected to be observed in the marketplace as a result of implementation details established for the marginal capacity accreditation market design.

Finally, as a result of the stakeholder feedback, the NYISO, in consultation with the NYSRC, identified several areas where the functionality currently utilized in the GE MARS

[12] See "Improving Capacity Accreditation: Project Kick Off," February 24, 2022 ICAP Working Group; https://www.nyiso.com/documents/20142/28687884/Capacity%20Accreditation%20Kick%20Off%2002-24-22%20v7.pdf/5ab742c4-650b-5094-6a22-d41a2f29da6f

[13] Much of the final technical specifications and implementation details proposed by the NYISO were presented at the November 8, 2022 ICAP Working Group. The remaining ICAP Working Group meetings established the final necessary revisions to the ICAP Manual.

resource adequacy model developed and approved by the NYSRC for establishing the IRM could be enhanced. NYISO consulted with the NYSRC and its Installed Capacity Subcommittee (ICS) Chair to develop a 5-Year ICAP Market Resource Adequacy Plan ("5-Year Work Plan"), which was presented at the October 19, 2022 ICAP Working Group and is discussed in section IV below and in the Phase 2 Report in more detail.[14]

B. Business Issues Committee Action

At its December 14 BIC the NYISO presented the final implementation details, technical specifications and administrative rules and procedures for the NYISO's marginal capacity accreditation design. The presentation to the BIC is included as Attachment II to this informational filing. In addition, 15 days prior to the BIC, the NYISO posted the revised Installed Capacity Manual containing the final rules and procedures from the Phase 2 work on the marginal capacity accreditation market design. BIC members asked questions during the presentation including whether the basis for the development of the proposed implementation details was the marginal capacity accreditation market design accepted by the May 10 Order and whether the ICAP Manual revisions should be assessed for consistency and completeness with that market design, as described in the tariff. The NYISO confirmed that the tariff provisions accepted by the Commission in its May 10 Order were the foundation for the implementation details and procedures being added to the Installed Capacity Manual.

Additional questions from stakeholders sought confirmation that the ICAP Manual provisions would provide for sufficient time for the NYISO to calculate the Unforced Capacity ("UCAP") values associated for each ICAP Supplier prior to the start of the Capability Year and that the marginal capacity accreditation design would be accounted for in the upcoming quadrennial Demand Curve Reset ("DCR") process. The NYISO confirmed that UCAP values will be made available to each resource in advance of the Capability Year and that the DCR independent consultant is expected to account for the CAFs of the different peaking plant technologies being considered as a potential proxy unit for the DCR. One suggested clarification was made at the BIC to revise footnote 8 in section 7.2.1 of the ICAP Manual, which the NYISO agreed to make and reposted the ICAP Manual following the meeting.

Finally, Multiple Intervenors read a statement into the minutes explaining its vote against the ICAP Manual changes. They had several concerns including their belief that the updated

[14] This 5-Year Work Plan is consistent with the NYSRC's 5-year strategic plan to improve the Resource Adequacy Model for the IRM Study. NYSRC strategic plan was presented at ICS meeting on November 2, 2022 and EC meeting on November 10, 2022. Coordination with NYSRC's initiatives is underway and being managed by the NYISO in collaboration with the NYSRC's Installed Capacity Subcommittee. See, https://www.nysrc.org/PDF/MeetingMaterial/ECMeetingMaterial/EC%20Agenda%20283/4.1.3%20RA_Strategic_Plan%20-%20Attachment%204.1.3.pdf

consumer impact assessment was too narrowly focused on cost savings observed in the NYISO's market. They also expressed an overarching concern regarding the NYISO's commitment to implement the marginal capacity accreditation design for May 1, 2024 while several enhancements to the resource adequacy model were outstanding. They contended that these issues should be fully addressed and resolved prior to BIC action. Multiple Intervenors pointed to concerns that certain features that may impact CAFs are not available in the resource adequacy model used today. The NYISO has identified several of these issues and prioritized its future work, in concert with the NYSRC, that could result in enhancements to the market outcomes under the existing framework. The NYISO has highlighted this work in its 5-Year Work Plan and reiterated its commitment to those priorities established in it. The motion was amended by BIC to read:

> The Business Issues Committee ("BIC") hereby approves the revisions to the Installed Capacity Manual, as more fully described in the presentation "Capacity Accreditation: Implementation Details" made to, and further revised during, the BIC on December 14, 2022, acknowledging the NYISO's stated commitment to address the Work Plan presented to Market Participants at the October 19, 2022 ICAP meeting and to address associated enhancements, as needed.

The motion passed by a majority show of hands with abstentions. This vote by the BIC completed the Phase 2 Project.[15]

IV. ONGOING WORK IN 2023

A. Phase 3 – Implementation of Completed Marginal Capacity Accreditation Market Design

Phase 2 resulted in a complete market design that the NYISO could effectively implement for the Capability Year that begins May 1, 2024, which the NYISO has begun to do under Phase 3 of the project. While Phase 3 primarily involves the completion of the first capacity accreditation review called for in the marginal capacity accreditation tariff provisions, the NYISO has also agreed to conduct preliminary calculations of CAFs using the NYSRC's preliminary base case model being developed at its ICS as part of establishing the final IRM base case for the 2024 IRM.[16]

[15] BIC subsequently also voted to recommend that the MC approve the conforming changes proposed to Section 5.12.7 of the Services Tariff made within this same presentation. This conforming revision to the tariff was subsequently approved by the MC and pending review and action by the NYISO Board of Directors will be filed separately with the Commission pursuant to section 205 of the FPA later this month.

[16] The NYISO agreed to this action at the February 28, 2023 ICAP Working Group.

The primary work to implement the marginal capacity accreditation market design has already begun. NYISO efforts are well underway to update the market software needed to implement the marginal capacity accreditation design. In order to ensure this work is implemented successfully, NYISO Market Operations created – and has staffed – a new team, Capacity Market Accreditation, that will be focused on executing the annual marginal capacity accreditation process that the NYISO must administer beginning this Fall for the May 1, 2024 start of the Capability Year. The NYISO anticipates the testing of the application software to calculate CAFs will be completed in the second quarter of 2023. After testing, the software will first be utilized using the 2024 preliminary base case assumptions for the resource adequacy model developed by the ICS. This informational study will calculate informational CAFs for the 2024 Capability Year, which will be reviewed with stakeholders through the ICAP Working Group. These informational CAFs will help provide transparency to the marketplace regarding the expected changes that are likely to occur with the implementation of the marginal capacity accreditation market design in the 2024 Capability Year.

The final CARC and CAF implementation into the market will occur in the fall of 2023 through March of 2024, consistent with the annual review process described in Sections 7.1 and 7.2 of the revised ICAP Manual. Because this process will impact current UCAP calculations for all ICAP Suppliers, rigorous testing will be conducted to ensure the new formulae are correctly and accurately applied to all resource categories. In addition, ICAP Event Calendar updates are being developed to make sure the administrative timeline found in the ICAP Manuals is readily transparent to all market participants.

B. Ongoing Work to Evaluate Future Enhancements to the Resource Adequacy Model

Consistent with the 5-Year Work Plan shared with stakeholders at the October 19, 2022 ICAP Working Group and recommitted to by the NYISO and its stakeholders at the December 14 BIC, the NYISO has begun assessing improvements that it may be able to advance to completion through its stakeholder process, and where necessary with the NYSRC's ICS process to develop the resource adequacy model used to establish the 2024 IRM, to potentially apply the improvements to the final annual marginal capacity accreditation review and CAF calculations for the 2024 Capability Year. These modeling improvement efforts are expected to enhance the market design going forward such that the IRM determination along with both the calculation of LCRs and CAFs by the NYISO better reflect reliability risks to resource adequacy and better align these risks with the marginal contribution of all ICAP Suppliers required to meet the resource adequacy criterion of 0.1-day Loss-of-Load Event ("LOLE") for the year. The NYISO kicked-off stakeholder discussions for three possible areas of improvement at the February 28, 2023 ICAP Working Group.

V. LIST OF DOCUMENTS SUBMITTED

The NYISO submits the following documents with this transmittal letter.

1. The NYISO's Phase 2 Report ("Attachment I"); and

2. The NYISO's "Capacity Accreditation: Implementation Details" presentation provided to the December 14, 2022 BIC ("Attachment II").

VI. CONCLUSION

In accordance with the May 10 Order's directive, the NYISO submits, for informational purposes only, the attached Phase 2 Report and the NYISO presentation summarizing the ICAP Manual rules and procedures approved by the NYISO's Business Issues Committee at its December 14, 2022 meeting. This informational filing provides the additional transparency directed by the May 10 Order and confirms that the NYISO's marginal capacity accreditation market design is now complete. The technical details and administrative rules and procedures developed during this Phase 2 work and described fully in the ICAP Manual and its attachments are consistent with the marginal capacity accreditation framework established by the tariff provisions accepted by the May 10 Order.

Respectfully Submitted,

/s/ David Allen
David Allen, Senior Attorney, NYISO

cc:
Janel Burdick	Emily Chen
Matthew Christiansen	Robert Fares
Jignasa Gadani	Jette Gebhart
Leanne Khammal	Jaime Knepper
Kurt Longo	David Morenoff
Douglas Roe	Eric Vandenberg
Gary Will	

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding in accordance with the requirements of Rule 2010 of the Rules of Practice and Procedure, 18 C.F.R. §385.2010.

Dated at Rensselaer, NY this 14th day of March 2023.

/s/ Mitchell W. Lucas

Mitchell W. Lucas
New York Independent System Operator, Inc.
10 Krey Blvd.
Rensselaer, NY 12144
(518) 356-6242

Attachment I

PHASE 2 INFORMATIONAL REPORT:
MARGINAL CAPACITY ACCREDITATION

I. INTRODUCTION

In its May 10, 2022 Order, the Federal Energy Regulatory Commission ("Commission") accepted tariff revisions that require the NYISO to accredit all resources' capacity values based on their marginal contributions to resource adequacy ("marginal capacity accreditation") beginning with the 2024 Capability Year and directed the NYISO to submit a one-time informational filing within 90 days of the completion of its "Phase 2" stakeholder process to report on the final implementation details for marginal capacity accreditation. This report, as detailed below, complies with the Commission directive for the NYISO to submit a one-time informational filing in this docket detailing the outcome of its Phase 2 work with its stakeholders.

The goals of Phase 2 were to work through the NYISO's stakeholder process – primarily with its Installed Capacity Working Group ("ICAPWG") – to develop the implementation details and technical specifications for the marginal capacity accreditation market design and finalize the documentation of those details and specifications in the NYISO's Installed Capacity Manual ("ICAP Manual"). In particular, the NYISO needed to (i) determine the technical details and procedures to annually a) identify all applicable Capacity Resource Accreditation Classes ("CARCs") that meet the tariff-defined criteria, b) assign each ICAP Supplier to the correct CARC and c) calculate and assign each ICAP Supplier the applicable Capacity Accreditation Factor ("CAF") that corresponds with its CARC assignment and capacity location, (ii) determine which modeling technique – Effective Load Carrying Capacity ("ELCC") or Marginal Reliability Improvement ("MRI") – to utilize in calculating the CAFs using the New York State Reliability Council ("NYSRC")'s resource adequacy model,[1] (iii) determine the modeling characteristics of the representative unit for each CARC when calculating CAFs, (iv) establish the methodology to annually assess and set the Peak Load Windows ("PLWs"), (v) assess the need for other

[1] The tariff requires the NYISO use the Installed Reserve Margin/Locational Minimum Installed Capacity Requirement study model that is vetted and approved by the NYSRC during its the year-long process and utilized to establish the Installed Capacity Reserve Margin for the New York Control Area and the Minimum Locational Installed Capacity Requirements for the upcoming Capability Year.

conforming changes, and (vi) finalize the documentation of the implementation details and technical specifications in the NYISO's ICAP Manual. In support of its Phase 2 work, the NYISO contracted with GE Energy Consulting to conduct analyses to inform the selection of the modeling technique and representative unit modeling characteristics needed to calculate CAFs.

The NYISO completed its Phase 2 stakeholder process with the December 14, 2022, Business Issue Committee ("BIC") vote approving the applicable revisions to the NYISO's ICAP Manual and its attachments.[2] A summary of the ICAP Manual revisions and the BIC vote is provided in Section IV below.

The primary objective of this informational report is to articulate the final implementation details of the NYISO's marginal capacity accreditation market design and in so doing provide additional transparency to the Commission and other involved parties in this proceeding regarding these rules and procedures of the new market framework. This Phase 2 Report discusses the Phase 2 stakeholder process in Section II. The procedures and technical specifications to annually establish CARCs, assign resources to CARCs, and calculate CAFs are discussed in Section III. Section IV discusses other conforming changes adopted to implement the marginal capacity accreditation market design including changes to the calculation of resource specific derating factors for performance-based resources[3], the establishment of the procedures to annually review and set the PLWs, changes to the Energy Duration Limitation rules, incorporating marginal capacity accreditation in the translation of the ICAP Demand Curve prices to Unforced Capacity ("UCAP") terms, and changes to the procedures for calculating translation factors for use in the shifting methodology utilized in the NYSRC's resource adequacy studies and the NYISO's deliverability studies. Section V describes the resulting procedural revisions made to the NYISO ICAP Manual that were accepted and became final by the BIC vote on December 14, 2022, and Sections VI and VII present the ongoing work regarding implementation details and potential enhancements to the NYSRC's resource adequacy model that are expected to continue to refine and improve upon the marginal capacity accreditation market design to be implemented on May 1, 2024.

[2] See "ICAP Manual Revisions," December 14, 2022 Business Issues Committee, https://www.nyiso.com/documents/20142/34963268/4%20CA%20ICAP%20Manual%20Revisions.pdf/7a1bb127-5e8f-1b45-ca0f-0ff131bd2dbe; "ICAP Manual Appendix Revisions," December 14, 2022 Business Issues Committee, https://www.nyiso.com/documents/20142/34963268/4%20CA%20ICAP%20Manual%20Appendix%20Revisions.pdf/96d1db1a-1ff8-8cd1-bbc8-cd1efdc2b16f; "ICAP Manual Attachment N," December 14, 2022 Business Issues Committee, https://www.nyiso.com/documents/20142/34963268/4%20CA%20ICAP%20Manual%20Attachment%20N.pdf/a9b10342-d0d1-38d0-93d9-eb17323354bb;

[3] Performance-based resources includes Intermittent Power Resources (i.e., solar, land-based wind, offshore wind, and landfill gas) and Limited Control Run of River Hydro resources.

II. PHASE 2 STAKEHOLDER PROCESS

In its January 5, 2022, filing[4] of the tariff revisions that comprised the NYISO's marginal capacity accreditation market design, the NYISO identified that to achieve the May 1, 2024 implementation date, the NYISO was tackling the market reforms in three phases. "Phase 1" included the work leading up to and supporting the January 5 Filing and the Commission's acceptance of the tariff changes. The January 5 Filing indicated that Phase 2 work would entail the development of non-tariff implementation details and related procedures pertaining to the marginal capacity accreditation market design. The Phase 2 work began with stakeholder discussions at the February 24, 2022 ICAP Working Group.[5] Lastly, Phase 3 involves developing the software necessary to deploy marginal capacity accreditation starting May 1, 2024. Work on Phase 3 began shortly after the BIC's vote on December 14, 2022, which completed the Phase 2 work.

At the January 20th ICAPWG, Phase 2 began as the NYISO discussed all the upcoming Capacity Market projects it was undertaking with stakeholders during 2022. During that discussion, the schedule for Phase 2 was re-introduced as part of the 2022 Improving Capacity Accreditation project. The targeted completion for Phase 2 was September 2022. Additional discussions were had with stakeholders at the subsequent ICAPWG held on February 3rd, where a more detailed schedule for the Phase 2 work for the first half of the year was discussed.

Early on in these discussions the NYISO realized it must outline modeling considerations that could impact the Phase 2 project work. This included how to align the identification of CARCs (and the resulting calculation of CAFs) when certain operating characteristics of resources were not being reflected in NYSRC's resource adequacy model. Some examples that were discussed included resources with common fuel limitations and/or extended startup duration times.

Other concerns that needed to be considered for the annual modeling approach included how the incremental or representative unit for each CARC would be modeled. This included discussion of operating characteristics, megawatt size and the modeled location of this representative unit within the applicable capacity zones (e.g., Rest of State and the G-J Locality excluding Load Zone J). The Phase 2 work would also need to evaluate whether to capture storage availability dynamically or as a fixed shape and the correct loss of load expectation

[4] New York Independent System Operator, Inc., Excluding Certain Resources from the "Buyer-Side" Capacity Market Power Mitigation Measures, Adopting a Marginal Capacity Accreditation Market Design, and Enhancing Capacity Reference Point Price Translation, Docket No. ER22-772-000 (January 5, 2022) ("January 5 Filing") at pp.43-44.

[5] See "Improving Capacity Accreditation: Project Kick Off," February 24, 2022 ICAP Working Group; https://www.nyiso.com/documents/20142/28687884/Capacity%20Accreditation%20Kick%20Off%2002-24-22%20v7.pdf/5ab742c4-650b-5094-6a22-d41a2f29da6f

(LOLE) tolerance to use in the ELCC calculation. The NYISO would work with its consultant, GE Energy Consulting, to produce model runs early in the project to help inform the final outcomes of these modeling specifications.

The discussion of the preliminary identification of CARCs commenced in March and extended well into the second quarter of 2022. NYISO led discussions on the criteria it would use to establish CARCs, issued a preliminary list of CARCs and began discussions regarding the procedural steps and timing necessary for assigning resources to the appropriate CARC and the modeling characteristics of the representative unit for each CARC.

By the end of April, the NYISO continued these discussions, as well as reviewed initial CAF results for a subset of classes and locations based on the ELCC and MRI techniques. Throughout the second quarter of 2022, the NYISO schedule called for continued production of CAF results through both the ELCC and MRI techniques and a discussion of resource specific derating factors and how they could be impacted by the marginal capacity accreditation market design.

The NYISO had expected to have completed a review of the CAF results for both current and possible future system conditions using both ELCC and MRI techniques and complete its review and documentation of revisions to the ICAP Manual procedures that would be required to implement the marginal capacity accreditation market design by late second quarter or early third quarter in 2022. However, it became clear that more time was required to produce modeling results and that stakeholders needed to better understand how UCAP megawatt values were currently being calculated for different resource types before addressing the issues associated with calculating UCAP for resources using CAFs.

The NYISO announced early in the third quarter at the July 21, 2022, ICAPWG meeting that Phase 2 was no longer expected to be completed by the end of September and the new target completion date was established for December 2022. During this discussion, the NYISO identified several Phase 2 tasks that had been achieved. These included CARC identification and assignment criteria, an annual process for executing CARC assignments, the annual methodology for evaluating and determining the hours that will comprise the Summer PLW for the upcoming Capability Year, and updated bidding and capability testing requirements for ICAP Suppliers with Energy Duration Limitations. The NYISO also identified the remaining tasks that needed to be completed for Phase 2. These included determining (i) the appropriate size and location for the modeled representative units to calculate CAFs, (ii) whether to utilize the ELCC or MRI modeling technique, and (iii) whether to implement seasonal (Summer and Winter) or annual (Capability Year) CAFs. The method of evaluating and selecting the Winter PLW hours and finalizing the approach to determine resource specific derating factors for performance-based resources were also ongoing and required a final determination. Finally, the NYISO

needed to assess how the marginal capacity accreditation market design would impact the calculation of the ICAP Demand Curve reference point prices and make any necessary changes to account for these impacts.

All these tasks needed to be completed within the third quarter of 2022 so that the NYISO could incorporate the necessary rules and procedures into the ICAP Manual and bring the revised ICAP Manual to the BIC for action. Critical to this timeline being completed by the end of the year was a completed review of the results produced by the sensitivity and scenario analysis conducted by GE Energy Consulting. Phase 2 needed to be completed before the end of 2022 so that the NYISO could update the market software needed to implement the marginal capacity accreditation design as part of Phase 3, complete any modeling improvements that can be advanced in 2023 for the 2024 Capability Year and published the preliminary and final CARCs and CAFs list for the 2024 Capability Year.[6]

Ultimately, the NYISO completed its review of the modeling results and selected the MRI technique to calculate annual CAFs. The calculation of resource specific derating factors for performance-based resources was modified to reflect the difference between an individual resource's average capacity factor with the average capacity factor used for the representative unit for the corresponding CARC. The NYISO and its stakeholders concluded on maintaining the existing Winter PLW (HB16-21) until the NYSRC's resource adequacy model incorporates a specific winter focus with seasonally appropriate assumptions.[7] Finally, the NYISO determined how to account for marginal capacity accreditation in the translation of the ICAP Demand Curve reference point prices to UCAP terms. The final implementation details of the marginal capacity accreditation market design that came out of the Phase 2 work are detailed below and can also be found in the "Capacity Accreditation: Market Design Summary" presentation that was given to the ICAPWG on November 8, 2022.[8] A summary of the ICAP manual revisions reflecting the implementation details can be found in the presentation made to the BIC on December 14, 2022 along with the final ICAP Manual revisions that are now incorporated as final rules and procedures that the NYISO will follow in its administration of the Installed Capacity market.

[6] A discussion of the work the NYISO will complete in 2023 is described in Section VI of this Phase 2 Report.

[7] Today's resource adequacy model utilized by the NYSRC is focused on assumptions for the New York Control Area system for the peak of summer, which has historically been where the risk of a Resource Adequacy issue exists. However, the risk of Resource Adequacy issues in the peak winter period is expected to grow over the next decade, and corresponding updates to assumptions and modeling techniques are planned for exploration over the next couple of years.

[8] See "Capacity Accreditation: Market Design Summary," presented to November 8, 2022 ICAP Working Group. https://www.nyiso.com/documents/20142/34285499/7%20ICAPWG%20Capacity%20Accreditation%20-%20Market%20Design%20Summary.pdf/aa364bb3-766b-19fd-d5b3-dfc6af730e89

III. MARGINAL CAPACITY ACCREDITATION IMPLEMENTATION DETAILS

A. ANNUAL PROCEDURAL REQUIREMENTS FOR ESTABLISHING CARCS AND ASSIGNING ICAP SUPPLIERS TO CARCS

The Commission's acceptance in this proceeding of the revisions to Section 5.12.14 of the NYISO's Market Services Tariff requires the NYISO to annually establish Capacity Accreditation Resources Classes (CARCs) to which each ICAP Supplier will be assigned. The fundamental criteria that the NYISO will use to determine CARCs are specified in the tariff – similar technology and operating characteristics that are expected to result in similar marginal reliability contributions throughout a capacity zone. Certain features of technology and operating characteristics such as dispatchability, intermittency profiles, energy duration limits (physical or selected), and fuel supply limitations are some examples of what the NYISO will consider when it annually establishes the full list of CARCs for each upcoming Capability Year. The list of CARCs will change over time based upon the changes in the grid's resource mix and future enhancements in functionality in the NYSRC's resource adequacy model to capture additional operating characteristics that can further distinguish between resources that are otherwise similarly situated.

At the end of its Phase 2 work, the NYISO proposed the following preliminary CARC list based upon calculations of preliminary CAF values and the potential impact of possible enhancements to the NYSRC's resource adequacy model to account for non-firm fuel limitations of non-renewable resources and start up notification requirements:

- Solar
- Onshore Wind
- Offshore Wind
- Landfill Gas
- 2-hour Energy Duration Limited
- 4-hour Energy Duration Limited
- 6-hour Energy Duration Limited
- 8-hour Energy Duration Limited
- Limited Control Run-of-River Hydro
- Large Hydro
- Unlimited Conventional Resource
- Conventional Resource with Non-Firm Fuel
- Startup Notification Limited Conventional Resource

- Startup Notification Limited Conventional Resource with Non-Firm Fuel

To the extent that non-firm fuel limitations of non-renewable resources and start up notification requirements are not incorporated into the NYSRC's resource adequacy model for initial implementation or do not materially impact marginal reliability contributions, or there are no resources in service or anticipated to be in service in the next Capability Year that would utilize that CARC, for example offshore wind, the final CARC list for initial implementation of marginal capacity accreditation on May 1, 2024 may differ.

Because each ICAP Supplier must be assigned to a CARC to participate in the NYISO's ICAP Market, the NYISO's annual process to establish CARCs will start with an identification of resources that are expected to participate in the ICAP market in the upcoming Capability Year. This identification will leverage existing processes that closely monitor the development of new facilities and new generation technologies that will be interconnecting in the NYCA in the future. Based on this identification and initial assessments of expected marginal reliability contributions, the NYISO will post the preliminary list of CARCs for the upcoming Capability Year by September 30th of each year on the NYISO Capacity Accreditation web page. After receiving stakeholder feedback on the preliminary list, the NYISO will post the final list of CARCs for the upcoming Capability Year by November 30th of each year on the NYISO Capacity Accreditation web page.

Each ICAP Supplier will be assigned to the applicable CARC based on the combination of the Supplier's participation model, elected Energy Duration Limitation, and resource characteristics provided to the NYISO upon interconnection to the grid or registration with the NYISO as a Market Participant. The combination of these characteristics impacts how each resource is expected to operate in the NYISO's market, and therefore, also impacts the marginal reliability contribution of each resource. The preliminary and final CARC lists will identify the combinations of participation models, elected Energy Duration Limitation, and resource characteristics that will lead to the assignment of ICAP Suppliers to each CARC.

Participation models are utilized in the ICAP Market to distinguish the participation requirements of different types of resources in the ICAP Market. Current participation models include[9]:

- Conventional Generator
- Control Area System Resource
- Energy Limited Resource (ELR)
- Capacity Limited Resource (CLR)

[9] Participation models are subject to change over time.

- Special Case Resource (SCR)
- Intermittent Power Resource (IPR)
- Behind-the-Meter Net Generation Resource (BTM:NG)
- Limited Control Run-of-River Hydro (LCROR)
- Energy Storage Resource (ESR)
- Co-located Storage Resource (CSR)
- Imports (External CRIS/Import Rights)
- External-to-ROS Deliverability Rights (EDRs)
- External ICAP Suppliers that have access to Unforced Capacity Deliverability Rights (UDRs)

A resource's participation model is one factor that impacts its expected operation in the NYISO's market. Other factors such as elected Energy Duration Limitation, technology, and fuel source will also impact a resource's expected operation and marginal reliability contribution and thus will be utilized together in the assignment of the resource to the applicable CARC. For example, resources participating in the ICAP Market through the Intermittent Power Resource participation model may be assigned to different CARCs if the resources depend on different fuel sources (e.g., wind, solar, or landfill gas). Additionally, resources utilizing different participation models may be assigned to the same CARC if the resources have elected the same Energy Duration Limitation or share other resource characteristics. For example, resources participating in the ICAP Market through the Energy Limited Resource or Energy Storage Resource participation model may be assigned the same CARC if the resources have elected the same Energy Duration Limitation.

ICAP Suppliers can request to change their participation model and/or elected Energy Duration Limitation for the upcoming Capability Year by August 1 of the preceding Capability Year. ICAP Suppliers requesting a change must follow the prescribed NYISO procedures to elect the new participation model and/or Energy Duration Limitation.[10] If approved by the NYISO, the elections are final and immutable for the upcoming Capability Year. These elections are also represented in the NYSRC's resource adequacy model utilized to set the ICAP requirements and calculate the CAFs for the upcoming Capability Year. Because these elections are immutable over the course of the Capability Year and represented as such in the NYSRC's resource adequacy model, CARC assignments will also occur on an annual basis and reflect the ICAP Suppliers' elections.

[10] Resources can only elect to participate with an Energy Duration Limitation for which it is capable of operating. For example, a resource that can physically operate for 8 continuous hours can participate at any currently available duration limits (currently 2-, 4-, 6-, and 8-hour duration limits are permitted), but a resource that cannot sustain a four-hour energy injection can only elect to participate as a 2 hour duration limited resources.

Following the posting of the final CARC list by November 30th, the NYISO will assign each ICAP Supplier to the applicable CARC for the upcoming Capability Year based on its elected Energy Duration Limitation, participation model, and resource characteristics for the upcoming Capability Year. The CARC assignments will be available to ICAP Suppliers prior to the applicable deadline that will be identified in the ICAP Event Calendar.

The annual procedure for CARC assignments includes an opportunity for ICAP Suppliers to review their CARC assignments before they are finalized. If an ICAP Supplier believes it has been assigned to the incorrect CARC based upon the combination of its elected participation model, Energy Duration Limitation, and resource characteristics for the upcoming Capability Year, the ICAP Supplier must notify the NYISO of the incorrect assignment prior to the applicable deadline that will be identified in the ICAP Event Calendar. If the ICAP Supplier and the NYISO are unable to resolve the disputed CARC assignment, the ICAP Supplier may provide a CARC assignment for the ICAP Supplier that the NYISO will then use. The ICAP Supplier-provided CARC assignment must be provided to the NYISO prior to the applicable deadline that will be identified in the ICAP Event Calendar. The ICAP Supplier-provided CARC must be one of the CARCs posted to the NYISO Capacity Accreditation web page for the upcoming Capability Year. The NYISO's Market Mitigation and Analysis department may perform an audit of the ICAP Supplier-provided CARC assignment. If the Market Mitigation and Analysis department determines that the CARC assignment provided by the ICAP Supplier is inaccurate, based upon the applicable CARC assignment criteria provided on the NYISO Capacity Accreditation web page for the applicable Capability Year, then the ICAP Supplier shall be subject to the applicable ICAP shortfall penalty as determined by the NYISO's existing tariff-defined procedures.

CARC assignments cannot be changed for the upcoming Capability Year at any point after the deadline identified in the ICAP Event Calendar for CARC assignments to be considered final. The deadline identified in the ICAP Event Calendar for CARC assignments to be considered final will be set prior to the posting of the CAFs for the upcoming Capability Year. Since all ICAP Suppliers must be assigned a CARC to participate in the ICAP market, ICAP Suppliers that enter the ICAP Market after the deadline identified in the ICAP Event Calendar for CARC assignments to be considered final will be assigned to the applicable CARC by the NYISO during the ICAP Market registration process for the applicable Capability Year.

B. CAF Modeling, Annual Process for Calculating CAFs For Each CARC, and Assigning the Applicable CAF to Each ICAP Supplier

1. Modeling Technique

One of the primary goals of Phase 2 was to determine the modeling technique to calculate CAFs. As identified in the NYISO's marginal capacity accreditation filing and deficiency response, the NYISO planned to use either the ELCC or MRI technique to calculate CAFs. The ELCC technique is a standard, decades-old, industry technique for measuring resource adequacy values. The ELCC technique requires iterating through numerous runs of a probabilistic resource adequacy model to calculate the marginal reliability contribution of a resource and is therefore time consuming and computationally complex. The MRI technique was recommended by the NYISO's external Market Monitoring Unit as a less computationally complex and time-consuming alternative to ELCC for evaluating marginal reliability contributions. The MRI technique is fundamentally similar to ELCC but requires only two runs of a probabilistic resource adequacy model. However, at the time of the NYISO's filing, the results of the MRI technique had yet to be compared to the ELCC technique to validate the MRI technique as sufficient approximation of the industry standard ELCC technique. Therefore, in Phase 2 the NYISO contracted with GE Energy Consulting to test both the MRI and ELCC technique under current and possible future system conditions to determine if the MRI technique produces similar marginal reliability contribution results to the ELCC technique.

The results of GE Energy Consulting's testing are included in Appendix A to this report.[11] The results show that the MRI technique consistently approximated the results of the ELCC technique across resource types under both current and possible future system conditions. Figure 1 shows the average difference between the MRI and ELCC results by resource type. On average, the MRI technique produced a CAF value within 3.4 percentage points of the CAF value produced from the ELCC technique for the same resource. In addition, the MRI technique did not systematically bias any one resource type compared to another. Due to these results, the NYISO and its stakeholders concluded that the MRI technique sufficiently approximated the ELCC technique and would be utilized as the modeling technique to calculate CAFs for the marginal capacity accreditation market design.

[11] Appendix A is comprised of GE Energy Consulting's presentations of CAF results at the August 29th, September 30th, and October 27th ICAPWG meetings in 2022. All CAF results included in Appendix A are also available in the Excel file available on the NYISO website at: https://www.nyiso.com/documents/20142/34087499/10-27-22%20ICAPWG%20Compiled%20CAF%20Results%20v3.xlsx/46982a75-2fac-fcc6-01a8-ae9161edb742

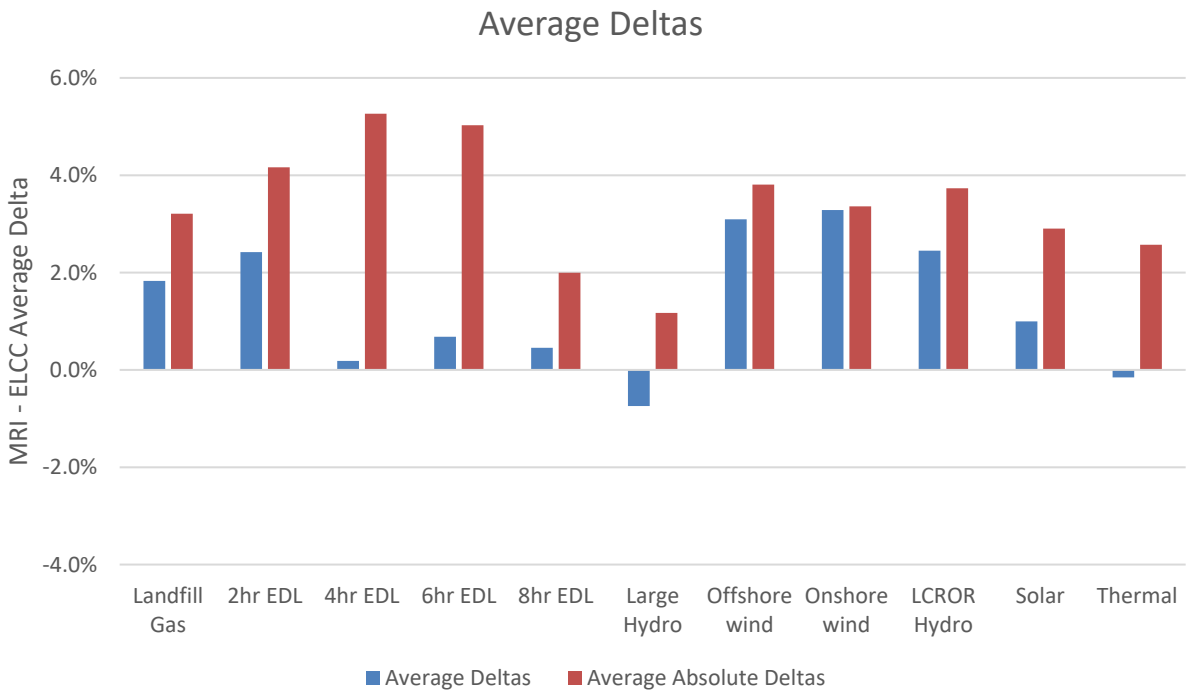


Figure 1 shows the average of the difference and absolute difference between the CAF results produced by the MRI and ELCC techniques by resource type. More information regarding this figure can be found in the presentation posted to the October 27th, 2022 meeting of the ICAPWG.

2. Representative Unit Modeling

A critical decision point regarding the Phase 2 implementation details revolved around how to model the marginal representative unit of supply from each CARC ("representative unit") in the NYSRC resource adequacy model in order to calculate the marginal contribution such supply provides to meeting the resource adequacy criterion of a LOLE of 0.1 days per year. Critical factors that needed to be determined were the adequate size of the representative unit, the modeling zone to utilize for capacity zones that contain multiple Load Zones, and the generation/availability characteristics of the representative unit.

GE Energy Consulting tested four MW sizes for the representative unit across resource types and study cases: 50, 100, 150, and 200. The goal of this analysis was to determine a unit size that is sufficiently large to produce a stable CAF result while sufficiently small to reflect a marginal reliability contribution. By measuring the variance of the CAFs calculated at each unit size from the average of the CAFs for each capacity zone by resource type and study case, it was clear that the 100 MW unit size produced the least variance and thus the most stable and representative CAF result (see Figure 2). Therefore, the 100 MW unit size was selected as the representative unit size for all CARCs.

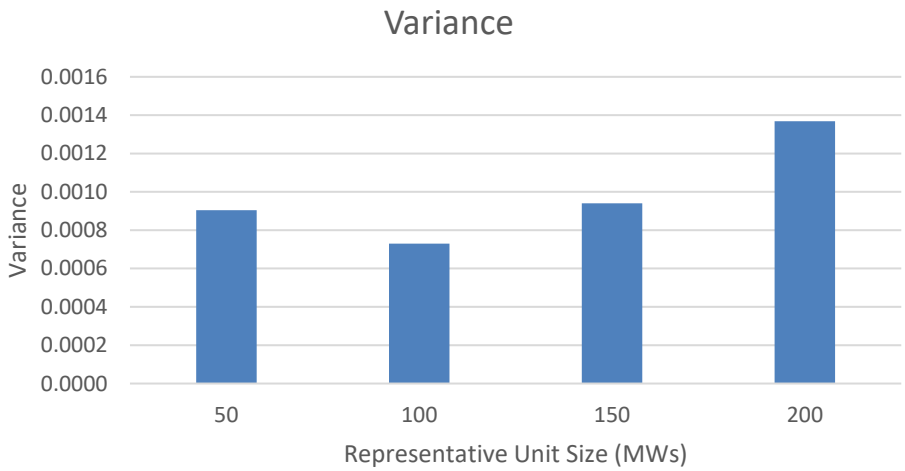


Figure 2 shows the variance by representative unit size in CAF results to the average CAF for each capacity zone by resource type and study case. More information regarding this figure can be found in the presentation posted to the October 27th, 2022, meeting of the ICAPWG.

The marginal capacity accreditation market design also requires the NYISO to calculate a CAF for each CARC in each capacity zone (Rest of State, G-J Locality (excluding Load Zone J), NYC Locality, and Long Island Locality).[12] However, the New York electric system is represented at a more granular level in the NYSRC resource adequacy model than the boundaries of the capacity zones. Specifically, each Load Zone in the NYCA is represented by at least one modeling zone in the resource adequacy model. Therefore, for the Rest of State (Zones A – F) and G-J Locality (excluding Load Zone J) capacity zones – which are comprised of multiple Load Zones – a modeling zone needed to be chosen in which to add the representative units for the CAF calculations. Based on the modeling zones tested by GE Energy Consulting, the modeling zones corresponding to Load Zone F and Load Zone G produced CAFs with the smallest variance from the average CAF for each capacity zone by resource type and study case (see Figure 3). Due to

[12] MST 5.12.14.3 requires to the NYISO to calculate a CAF for Rest of State, G-J Locality (excluding Load Zone J), NYC Locality, and Long Island Locality to the extent there exists an ICAP Supplier or projected ICAP Supplier in the given CARC in the applicable location.

this result, the modeling zone corresponding to Load Zone F was selected as the modeling zone for the calculation of the CAFs for the Rest of State capacity zone, and the modeling zone corresponding to Load Zone G was selected as the modeling zone for the calculation of the CAFs for the G-J Locality (excluding Load Zone J) capacity zone.

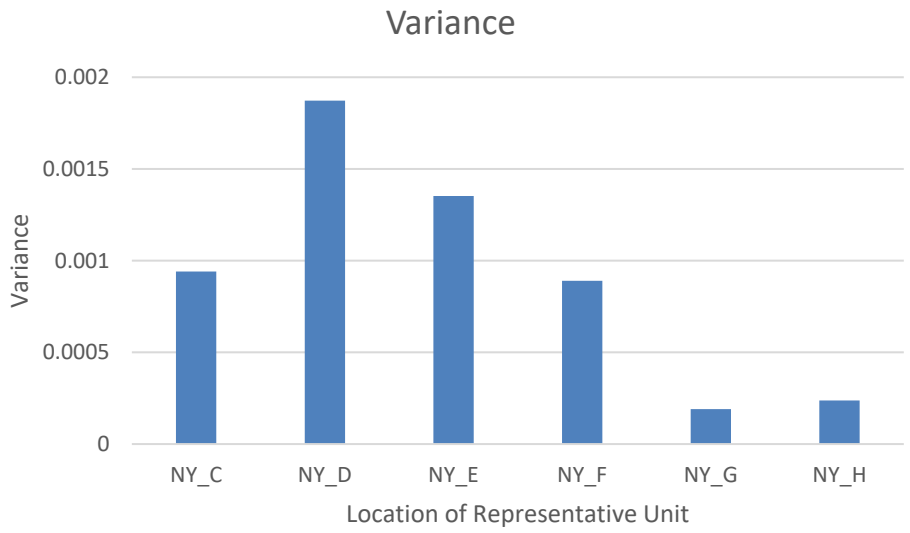


Figure 3 shows the variance by modeling zone in CAF results to the average CAF for each capacity zone by resource type and study case. More information regarding this figure can be found in the presentation posted to the October 27th, 2022, meeting of the ICAPWG.

The selected generation/availability characteristics for the representative units were determined based on how resource types are currently represented in the NYSRC's resource adequacy model. For example, performance-based resources (i.e., IPRs and LCRORs) are currently modeled using the specific resource's hourly production profiles from the most recent five-year period. Each iteration, the resource adequacy model randomly selects the production profile from one of the five years of historical production. When adding a new performance-based resource to the model that does not have historical production, the new performance-based resource is assigned a zonal weighted-average hourly production profile of the existing IPRs or LCROR units in the Load Zone. Therefore, a similar procedure was decided to be utilized to represent the representative unit for CARCs comprised of performance-based resources (e.g., solar, onshore wind, offshore wind, landfill gas, and limited control run of river CARCs). Specifically, the representative units for CARCs comprised of performance-based resources will be modeled using weighted-average historic hourly production profiles of the existing ICAP Suppliers in the CARC in the capacity zone for which the CAF is being calculated. The weighted-average production profiles will be produced from the same years of historic production as the

years used to model the existing performance-based resources in the NYSRC's resource adequacy model (e.g., 5 years for today's model).[13]

The representative unit for CARCs that are comprised of availability-based resources (e.g., ICAP Suppliers participating as Generators, Control Area System Resources, Energy Limited Resources, Capacity Limited Resources, Behind-the-Meter Net Generation Resources, Energy Storage Resources, or Distributed Energy Resources) will be modeled with no random forced outages. This modeling choice was driven by the results of GE Energy Consulting's testing of CAF values for thermal resources with 5% and 10% Equivalent Demand Forced Outage Rate (EFORd) values. The resulting CAF values were consistently around 95% and 90%. Because the UCAP of each ICAP Supplier still needs to account for historic resource specific performance/availability in addition to the marginal reliability contribution of the ICAP Supplier's assigned CARC, the NYISO and its stakeholders determined that the impact of EFORd would be assessed in the resource specific derating factor and not assumed in the modeling of the representative unit used to calculate the CAF. Additionally, the representative unit for CARCs that are comprised of ICAP Suppliers with the same Energy Duration Limitation will be modeled with the corresponding Energy Duration Limitation and model type used to represent existing resources with that Energy Duration Limitation in the NYSRC's resource adequacy model.

3. Annual Process to Calculate CAFs and Assign the Applicable CAF to Each ICAP Supplier

Due to the tight time frame between the NYSRC's approval of the final resource adequacy base case used to establish the IRM and the applicable market auctions for which the CAFs must be used, the NYISO will calculate informational CAFs for each CARC.[14] Informational CAFs will be calculated using a NYSRC-approved base case model, which is generally approved in late Fall or early Winter the year before final CAFs are calculated. The final CAFs for each CARC will be calculated by March of each year using the resource adequacy model used to calculate the Locational Capacity Requirements, approved by the NYISO Operating Committee, for the upcoming Capability Year ("LCR model"). The LCR model incorporates the NYSRC-established Installed Reserve Margin ("IRM") and the NYSRC-approved IRM base case. Utilizing

[13] If there are no existing ICAP Suppliers in the capacity zone of a CARC comprised of performance-based resources, the NYISO will use a representative hourly production profile based on the production of existing units in other capacity zones or simulated units, consistent with what is used to model new performance-based resources in the resource adequacy model if there are not a sufficient number of existing units in a Load Zone to produce a weighted-average hourly production profile.

[14] For the 2024 Capability Year, the NYISO is going to leverage the NYSRC's preliminary base case of the resource adequacy model utilized to set the 2024 IRM to calculate informational CAFs for the 2024 Capability Year.

the LCR model, the NYISO will calculate CAFs using the MRI technique and the representative unit modeling characteristics previously discussed.

The final CAFs will be posted to the NYISO Capacity Accreditation web page by March 1st of each year following the approval of LCRs by the NYISO Operating Committee. After the final CAFs are posted, the NYISO will assign the applicable CAF to each ICAP Supplier that corresponds to its assigned CARC and capacity zone in which the ICAP Supplier is qualified to supply capacity to the NYCA. ICAP Suppliers will be able to view their assigned CAF by the applicable deadline that will be identified in the ICAP Event Calendar. If an ICAP Supplier believes it has been assigned the incorrect CAF based on its capacity zone and assigned CARC for the upcoming Capability Year, the ICAP Supplier must notify the NYISO of the incorrect assignment prior to the applicable deadline that will be identified in the ICAP Event Calendar. CAF assignments cannot be changed for the upcoming Capability Year at any point after the deadline that will be identified in the ICAP Event Calendar for CAF assignments to be considered final. If an ICAP Supplier enters the ICAP Market after the deadline identified in the ICAP Event Calendar for CAF assignments to be considered final, the NYISO will provide the ICAP Supplier its assigned CAF during the ICAP Market registration process for the applicable Capability Year.

Each CAF reflects the marginal reliability contribution of the representative unit of a CARC to the annual resource adequacy criterion of a LOLE of 0.1 days per year.[15] Therefore, an ICAP Supplier's assigned CAF will be used to calculate its UCAP for both the Summer and Winter Capability Periods. The first auction for which the assigned CAF will impact the ICAP Supplier will be the strip auction conducted for the Summer Capability Period, which typically begins at the end of March.

IV. Conforming Changes

A. Resource Specific Derating Factors for Performance-Based Resources

The NYISO's marginal capacity accreditation market design is a fundamental overhaul of the manner in which ICAP Suppliers will be compensated. Under this new design, an ICAP Supplier will be paid based upon the marginal reliability contribution toward the NYSRC resource adequacy requirements of the next increment of Installed Capacity that would come from a representative unit of the ICAP Supplier's assigned CARC (i.e., the ICAP Supplier's

[15] In its presentation to the August 29, 2022 ICAPWG, the NYISO committed to evaluate moving to seasonal CAFs after 1) winter modeling approaches and assumptions are incorporated into the NYSRC's resource adequacy model and 2) the ICAP Demand Curves are adjusted to reflect seasonal reliability risks. As discussed in its presentation, implementing seasonal CAFs prior to these enhancements would likely send inaccurate investment signals and produce winter CAFs inconsistent with expected winter reliability needs.

assigned CAF) as well as the ICAP Supplier's historic performance or availability. The UCAP of ICAP Suppliers will be calculated taking both of these factors into account.

The general rule adopted by the NYISO and its stakeholders is to account for the marginal reliability contribution impacts of technology and broad operating characteristics of each resource type or CARC in the calculation of CAFs and for all other unit specific attributes to be reflected in resource specific derating factors. Thus, CAFs will reflect the impact on marginal reliability contributions of characteristics such as Energy Duration Limitations and correlated unavailability/reduced performance due to weather and/or fuel supply limitations while resource specific derating factors will capture any difference in availability that is specific to an individual ICAP Supplier and not captured in the CAF of the ICAP Supplier's CARC. Examples of individual resource characteristics that will be reflected in resource specific derating factors are historical non-correlated forced outages, forced derates, and failed starts – that are currently captured in a unit's EFORd or similar availability-based metric for availability-based resources – as well as historical individual resource output that is different from the modeled production profile of the representative unit for the performance-based resource's assigned CARC.

Currently, the methodology for calculating an ICAP Supplier's UCAP varies by the participation model that the ICAP Supplier utilizes in the ICAP Market. There are two general categories of ICAP Suppliers based on UCAP calculation methodology: performance-based resources and availability-based resources. Performance-based resources includes Intermittent Power Resources (i.e., solar, land-based wind, offshore wind, and landfill gas) and Limited Control Run of River Hydro resources. These resources are referred to as performance-based because their UCAP is currently calculated based on their historic performance during hours with higher risk of loss of load. In contrast, the UCAP of availability-based resources (e.g., ICAP Suppliers participating as Generators, Control Area System Resources, Energy Limited Resources, Capacity Limited Resources, Behind-the-Meter Net Generation Resources, Energy Storage Resources, or Distributed Energy Resources) is currently calculated with respect to the resource's historic availability. Historic availability is commonly reflected in the calculation of UCAP through an availability-based metric, such as a resource's EFORd for a thermal-based generator or the unavailability factor utilizing real-time operating limits calculated for Energy Storage Resources.

As discussed in Section III.B.2 of this report, the representative unit for CARCs comprised of availability-based resources will be modeled with no assumed EFORd. Because no EFORd is assumed in the representative unit modeled to calculate the CAFs, availability-based resources can continue to utilize the current methodologies for capturing historic availability in their resource specific derating factors without double counting unavailability. However, the current methodology for capturing historic performance of individual performance-based resources

takes into account reduced performance that is correlated across resources due to factors such as weather. Because CAFs will already capture the impact of correlated reduced performance of the representative unit due to weather and other factors, the current methodology for capturing historic performance of individual performance-based resources in the UCAP calculation needed to be revised to avoid double counting of unavailability with the implementation of marginal capacity accreditation.

As discussed in Section III.B.2, the representative unit for performance-based resources will be modeled with a weighted-average production profile based on the production of existing ICAP Suppliers in the CARC and capacity zone for which the CAF is being calculated. That production profile represents the average production of existing units in the CARC and captures correlated changes in performance due to weather. To reflect that individual units may have performed better or worse than the average, the new methodology for capturing historic performance in the UCAP calculation will be based on a comparison of the resource's applicable average capacity factor to the applicable average capacity factor of the representative unit used to calculate the resource's assigned CAF. The measurement window for the calculation of the average capacity factors for use in calculating a performance-based resource's UCAP for a summer Capability Period is the PLW hours for the months of June, July, and August during the previous two like-Capability Periods. The measurement window for the calculation of the average capacity factors for use in calculating the performance-based resource's UCAP for a winter Capability Period is the PLW hours for the months of December, January, and February during the previous two like-Capability Periods. The new resource specific derating factor methodology compares the average capacity factor of the individual resource to that of the representative unit used to calculate the resource's CAF through either a ratio-based approach or a difference-based approach, depending on which approach results in the smallest difference between the individual resource's effective capacity value and CAF.[16] By comparing the average capacity factor of an individual resource to that of the representative unit used to calculate the resource's CAF, the new resource specific derating factor methodology avoids double counting of unavailability and results in a higher UCAP value for resources that performed better than the average performance reflected in the CAF and a lower UCAP value for resources that performed worse than the average performance reflected in the CAF. Section 6.4 of Attachment J of the ICAP Manual provides additional detail on the calculation of the resource specific derating factor for performance-based resources.

[16] This methodology produces reasonable UCAP values for both Summer and Winter Capability Periods as demonstrated in the "Capacity Accreditation" presentation to the September 30, 2022 ICAPWG meeting available at: https://www.nyiso.com/documents/20142/33520089/9-30-2022%20ICAPWG%20Capacity%20Accreditation%20v3.pdf/0178b3b4-4398-ce4a-3197-224e24086c51.

B. Annual Review of the PLWs

As part of its tariff revisions accepted as part of the January 5 Filing, the NYISO replaced a review of its PLW and Duration Adjustment Factors ("DAFs") with an annual process. While the bulk of this report discusses the calculation and application of the CAFs that will replace DAFs when administering the Capacity Markets for all future Capability Years starting May 1, 2024, or thereafter, a new process to evaluate the appropriate hours that comprise the NYISO's PLWs is described below.

For the Summer PLW, the NYISO worked with its stakeholders to establish an annual review that will utilize the same resource adequacy model used to calculate the CAFs. To start, the NYISO will calculate the distribution of hourly LOLE occurring in the Summer Capability Period in the model. If the PLW from the prior Summer Capability Period captures at least 90% of the hourly LOLE in that distribution, the PLW from the prior Summer Capability Period will be maintained for the upcoming Summer Capability Period. If the PLW from the prior Summer Capability Period does not capture at least 90% of the hourly LOLE in the distribution, the NYISO must develop a new PLW for the upcoming Summer Capability Period that contains the 2 consecutive hours with the highest percentage of hourly LOLE. Additional hours, contiguous with the 2 consecutive hours with the highest percentage of hourly LOLE, will be added in even increments (*i.e.*, 2, 4, 6, 8, etc.) until at least 90 percent of the total hourly Summer LOLE is captured in the new Summer PLW.

For the Winter PLW because the resource adequacy model currently exhibits little to no hourly LOLE during the winter, the NYISO and its stakeholders approved keeping the current Winter PLW of Hour Beginning ("HB") 16 – HB 21 until winter modeling approaches and assumptions are incorporated into the resource adequacy model. Once winter modeling approaches and assumptions are incorporated into the model and Winter hourly LOLE is reflected by the model results, the NYISO will, subject to stakeholder input and approval, evaluate applying a similar process to the review of the Summer PLW to annually assess the Winter PLW.

The NYISO and its stakeholders also approved a separate process to allow the setting of the PLWs in the event that the existing PLWs and/or new Summer PLW developed from the resource adequacy model are inconsistent with the expected hours of reliability risk for the upcoming Capability Year. If the NYISO determines the existing PLWs and/or new Summer PLW are inconsistent with the expected hours of reliability risk for the upcoming Capability Year based upon its operating experience and/or its expectation of the actual operating conditions of the grid, the NYISO may propose a different PLW(s). For the NYISO to place such PLW(s) into effect, the NYISO Operating Committee must approve the proposed PLW(s) no later than March

1 immediately preceding the Capability Year. If the Operating Committee does not approve the proposed PLW(s) by this time, the existing PLWs and/or new Summer PLW developed from the resource adequacy model will apply for the upcoming Capability Year. Both the final Summer and Winter PLWs for the upcoming Capability Year are required to be posted on the NYISO Capacity Accreditation web page by March 1 immediately preceding the start of the Capability Year.

C. Conforming Changes Related to the Requirements for ICAP Suppliers with Energy Duration Limitations

With the new annual review of the PLWs, the number of hours comprised by the PLWs may change from year to year. Because the NYISO currently uses the PLWs to define certain requirements for ICAP Suppliers with Energy Duration Limitations, conforming changes to these requirements needed to be developed in Phase 2 to reflect the possible changes in the length of the PLWs from year to year. This section describes the conforming changes to the bidding requirements as well as capability testing requirements for ICAP Suppliers with Energy Duration Limitations developed as part of Phase 2.

The Energy Duration Limitation options that an ICAP Supplier can elect are 2, 4, 6, or 8 hours[17]. With the implementation of the annual PLW review, it may be possible for a PLW to be shorter than the longest Energy Duration Limitation that an ICAP Supplier may elect. For example, it may be possible for an ICAP Supplier to elect to participate as an eight-hour resource when the PLW is six hours. If no changes were made to the bidding requirements for ICAP Suppliers with an Energy Duration Limitation, an ICAP Supplier with an Energy Duration Limitation longer than the PLW would have no bidding obligation for the number of hours of the Supplier's Energy Duration Limitation that exceed the length of the PLW. Therefore, the NYISO and its stakeholders developed updated bidding requirements for ICAP Suppliers with an Energy Duration Limitation longer than the PLW that comprise the entirety of the PLW and additional hours immediately preceding and following the PLW covering the remaining hours of the Supplier's Energy Duration Limitation that are not captured in the PLW.[18]

Additionally, the current capability testing requirements for ICAP Suppliers with Energy Duration Limitations require the Suppliers to test within the PLW. The rules do not specify the

[17] The range of Energy Duration Limitation participation options may be modified in the future, subject to the NYISO's stakeholder governance process.

[18] This conforming change requires a revision to the NYISO's Market Services Tariff and will be filed with FERC in a separate 205.

additional hours for which a Supplier with an Energy Duration Limitation longer than the PLW must include in their capability testing. Therefore, the NYISO added specification in the ICAP Manual that the additional hours for which a Supplier with an Energy Duration Limitation longer than the PLW must include in their capability testing will be the same hours included in the Supplier's bidding requirements.

D. CAF Interaction with ICAP Demand Curves

ICAP Demand Curves are calculated in accordance with the NYISO tariff and ISO Procedures. Currently, the denominator of the formula – found in Section 5.5 of the ICAP Manual – for calculating the reference point prices for the ICAP Demand Curves includes the use of the DAF of the peaking plant used to establish the applicable ICAP Demand Curve. Further, the Services Tariff requires that the NYISO translate the ICAP Demand Curves from ICAP terms to UCAP terms. Currently, the conversion from ICAP to UCAP for ICAP Suppliers involves accounting for both the Supplier's applicable derating factor and applicable DAF [the DAF is equal to 100% for Suppliers without an Energy Duration Limitation]. The current reference point price formula accounts for part of this adjustment from ICAP to UCAP terms by including the DAF of the peaking plant used to establish the applicable ICAP Demand Curve. Starting with the ICAP Demand Curves for the 2024/2025 Capability Year, CAFs will be used in place of DAFs when calculating Suppliers' UCAP values, and DAFs will no longer be used in the administration of the NYISO Capacity market. In addition, because CAFs for the upcoming Capability Year will not be calculated until March each year for the upcoming Capability Year and the ICAP Demand Curves must be posted, or in the case of the first year of the quadrennial Demand Curve Reset period, filed by November 30 each year for the upcoming Capability Year, the NYISO will not utilize the CAF of the peaking plant used to establish the applicable ICAP Demand Curve as a replacement of the DAF in the calculation of the ICAP Demand Curve reference point prices.

Instead, the NYISO will account for the applicable CAF only when translating the ICAP Demand Curves to UCAP terms. This ICAP to UCAP translation will use the same methodology that will be used to translate individual ICAP Supplier's ICAP to UCAP in the market by accounting for both the applicable derating factor and CAF of the peaking plant used to establish the applicable ICAP Demand Curve.[19] This approach ensures that UCAP reference point prices provide revenue adequacy for the applicable peaking plant at the level of excess conditions assumed in establishing the ICAP Demand Curves during the quadrennial reset

[19] This methodology reflects the "ICAP/UCAP Reference Price Translation" changes filed as part of the January 5 Filing and approved in the May 10 Order

process without impacting the November 30th ICAP Demand Curve deadlines outlined in the Services Tariff.

E. Translation Factors for IRM/LCR Studies and Deliverability Testing

Translation factors are currently used as part of the ICAP-to-UCAP translation for 1) the shifting methodology carried out in the IRM and LCR studies and 2) modeling resources in NYISO deliverability studies. The NYISO calculates translation factors for both performance-based resources and availability-based resources following ISO Procedure and NYSRC Policy. The current ISO procedure to calculate translation factors for performance-based resources utilizes the existing market UCAP calculation applied to the 5-year-historical production of the resource. With the implementation of marginal capacity accreditation, the market UCAP calculation for all resources will reflect the use of marginal CAFs. The UCAP values utilized in the shifting methodology in the IRM and LCR studies and NYISO deliverability studies are intended to reflect the average availability of resources during peak hours of loss of load risk rather than resources' marginal contributions to reliability. Therefore, a separate ISO procedure needed to be developed in Phase 2 to calculate the translation factors for performance-based resources for use in the shifting methodology in the IRM and LCR studies and NYISO deliverability studies.[20]

The new ISO procedure is similar to the current methodology for capturing historic performance of IPRs in the IPRs' UCAP calculation through weighting historic performance by hourly weighting factors. This new procedure starts by calculating the sum product of 1) the average production of each performance-based resource by hour from the current months with the highest risk of loss of load (June, July, and August) and 2) the hourly weighting factors calculated from the hourly distribution of loss of load events from the most recent NYSRC resource adequacy model. The sum product is divided by the resource's ICAP to calculate a resource's availability factor. To finally translate the performance-based resource's ICAP to UCAP for use in the shifting methodology in the IRM and LCR studies and NYISO deliverability studies, the resource's ICAP is multiplied by 1 minus its availability factor. This new methodology will ensure that the UCAP values utilized in the shifting methodology in the IRM

[20] The current ISO procedure for calculating translation factors for availability-based resources (i.e., using a blended average of the derating factors of availability-based resources) will not reflect the use of marginal CAFs. Therefore, the current ISO procedure for availability-based resources could be maintained.

and LCR studies and NYISO deliverability studies reflect the average availability of resources during peak hours of loss of load risk.[21]

V. COMPLETION OF PHASE 2 PROJECT

A. DRAFT AND REVIEW ICAP MANUAL PROCEDURAL REQUIREMENTS

The culmination of the Phase 2 work was the drafting and approval of the documentation of the marginal capacity accreditation market design and final implementation details in the NYISO's ICAP Manual and its attachments. This section describes the revisions made to the ICAP Manual to reflect the market design and final implementation details that were approved by the BIC at its December 14, 2022 meeting.

Sections 2.5 and 2.6 of the ICAP Manual describe the translation of ICAP requirements to UCAP requirements for use in the NYISO's ICAP Market. The NYISO and its stakeholders replaced "Adjusted Installed Capacity" with "Installed Capacity" in these translations, beginning with the 2024 Capability Year, to reflect the changes to MST 5.10 and MST 5.11 that were accepted by the Commission as part of the 30-day compliance filing in this proceeding. Additionally, the current description of the calculation of Adjusted Installed Capacity in Section 2.5 was also sunset with the 2024 Capability Year.

Section 4.1.1 of the ICAP Manual details the Energy Duration Limitations that ICAP Suppliers may elect as well as the current application of DAFs for ICAP Suppliers with Energy Duration Limitations and the existing PLWs. Revisions to this section were made to sunset the DAFs for ICAP Suppliers with Energy Duration Limitations and the existing PLWs with the 2024 Capability Year. Starting with the 2024 Capability Year, CAFs will replace DAFs for all ICAP Suppliers. Additionally, the annual review of the PLWs detailed in the new Section 7.3 of the ICAP Manual will replace the existing PLWs.

Sections 4.2.1 and 4.2.2.2 of the ICAP Manual reflect the current capability testing requirements for most ICAP Suppliers with further details regarding the capability testing requirements for ICAP Suppliers with Energy Duration Limitations provided in Attachment M of the ICAP Manual. These sections and Attachment M were revised to reflect the specification of the capability testing requirements for ICAP Suppliers with Energy Duration Limitations longer than the PLW, described in Section IV.C of this report. Additionally, Sections 4.8.1 and 4.8.2 of the ICAP Manual were revised to reflect the updated bidding requirements for ICAP Suppliers

[21] Implementing the new procedure for deliverability studies required an associated tariff revision to the NYISO's Open Access Transmission Tariff (OATT) Attachment S, which was included in the NYISO's filing in docket ER23-1098-000.

with Energy Duration Limitations longer than the PLW, also described in Section IV.C of this report.

Section 4.5 and Attachment J of the ICAP Manual describe the current calculation of UCAP for most ICAP Suppliers, and therefore, needed to be revised to reflect the new methodology for calculating UCAP under the marginal capacity accreditation market design. Because the calculation of UCAP for all ICAP Suppliers utilizes the Supplier's Adjusted Installed Capacity, the new calculation of Adjusted Installed Capacity, which will reflect an ICAP Supplier's assigned CAF, was added to Section 4.5. Section 4.5 and Attachment J were also updated to reflect the new resource specific derating factor methodology for performance-based resources. Additionally, the DAF term in the current calculation of UCAP was replaced with the ICAP Supplier's assigned CAF throughout Attachment J. Other clarifying revisions were made throughout Attachment J to reflect the new bidding requirements for ICAP Suppliers with Energy Duration Limitations longer than the PLW, which govern the hours utilized in the measurement of historic availability for those Suppliers. Lastly, the methodology for calculating initial UCAPs for new ICAP Suppliers in Section 4.5 was revised to reflect the use of CAFs beginning with the 2024 Capability Year.

The UCAP calculations for ICAP Suppliers participating as SCRs and BTM:NGs are currently specified in Sections 4.12 and 4.15.3, respectively. Thus, these sections were revised to reflect the use of CAFs in the calculation of UCAP for those Suppliers, beginning with the 2024 Capability Year.

Section 5.5 of the ICAP Manual details the calculation of the monthly reference point prices of the ICAP Demand Curves and the translation of the ICAP Demand Curves from ICAP to UCAP terms. This section was revised to remove the DAF of the peaking plant used to establish the applicable ICAP Demand Curve from the equation of the monthly reference point prices and clarified the utilization of the CAF and derating factor of the applicable peaking plant in the translation of the prices on the ICAP Demand Curves from ICAP to UCAP terms, as described in Section IV.D of this report.

Section 7 is a new section of the ICAP Manual that was added to describe the new annual process for establishing CARCs, calculating CAFs, assigning CARCs and CAFs to ICAP Suppliers, and the new annual PLW review process, all of which become effective for the 2024 Capability Year. Section 7.1 details the annual process for establishing CARCs and the considerations for assigning each ICAP Supplier to a CARC. Section 7.2 covers the annual process for calculating CAFs, the modeling to be utilized in the calculation of the CAFs, and the process for assigning CAFs to ICAP Suppliers. Lastly, Section 7.3 details the annual review process for establishing the PLWs.

The last revision to the ICAP Manual was the creation of a new Attachment N. The new attachment describes the new procedure for calculating the translation factors for performance-based resources for use in the shifting methodology in the IRM and LCR studies and for studying resources in deliverability testing.[22]

B. BIC VOTE

At its December 14, 2022 BIC, the NYISO presented the final implementation details, technical specifications and administrative rules and procedures for the NYISO's marginal capacity accreditation design. In addition, 15 days prior to the BIC, the NYISO posted the revised Installed Capacity Manual containing the final rules and procedures from the Phase 2 work on the marginal capacity accreditation. BIC members asked questions during the presentation including whether the basis for the development of the proposed implementation details was the marginal capacity accreditation market design accepted by the May 10 Order and whether the ICAP Manual revisions should be assessed for consistency and completeness with that market design, as described in the tariff. The NYISO confirmed that the tariff provisions accepted by the Commission in its May 10 Order were in fact the foundation for the implementation details and procedures being added to the Installed Capacity Manual.

Additional questions from stakeholders sought confirmation that the ICAP Manual provisions would provide for sufficient time for the NYISO to calculate the UCAP values associated for each ICAP Supplier prior to the start of the Capability Year and that the marginal capacity accreditation design would be accounted for in the upcoming quadrennial Demand Curve Reset ("DCR") process. The NYISO confirmed that UCAP values will be made available to each resource in advance of the Capability Year and that the DCR independent consultant is expected to account for the CAFs of the different peaking plant technologies being considered as a potential proxy unit for the DCR. One suggested clarification was made at the BIC to revise footnote 8 in section 7.2.1 of the ICAP Manual, which the NYISO agreed to make and reposted the ICAP Manual following the meeting.

Finally, Multiple Intervenors read a statement into the minutes explaining its vote against the ICAP Manual changes. They had several concerns including their belief that the updated consumer impact assessment was too narrowly focused on cost savings observed in the NYISO's market. They also expressed an overarching concern regarding the NYISO's commitment to implement the marginal capacity accreditation design for May 1, 2024 while

[22] While Attachment N was approved by stakeholders, it will only be added to the effective ICAP Manual following the Commission's approval of the associated revisions to OATT Attachment S, included in docket ER23-1098-000.

several enhancements to the resource adequacy model were outstanding. They contended that these issues should be fully addressed and resolved prior to BIC action. Multiple Intervenors pointed to concerns that certain features that may impact CAFs are not available in the resource adequacy model used today. The NYISO has identified several of these issues and prioritized its future work, in concert with the NYSRC, that could result in enhancements to the market outcomes under the existing framework. The NYISO has highlighted this work in its 5-Year Work Plan and reiterated its commitment to those priorities established in it. The motion was amended by BIC to read:

> The Business Issues Committee ("BIC") hereby approves the revisions to the Installed Capacity Manual, as more fully described in the presentation "Capacity Accreditation: Implementation Details" made to, and further revised during, the BIC on December 14, 2022, acknowledging the NYISO's stated commitment to address the Work Plan presented to Market Participants at the October 19, 2022 ICAP meeting and to address associated enhancements, as needed.

The motion passed by a majority show of hands with abstentions. This vote by the BIC completed the Phase 2 Project.[23]

VI. Additional Work for Future Enhancements to Marginal Capacity Accreditation

Throughout the Phase 2 work, the NYISO and its stakeholders identified that the functionality utilized in the NYSRC's resource adequacy model related to the modeling of and accounting for attributes, such as correlated fuel unavailability for non-renewable resources, long start up notification requirements, non-fuel-related correlated outages, etc., may limit the basis for identifying certain CARCs and calculating CAFs for some resource types. It was also recognized that enhancing the resource adequacy model's functionality would enable more accurate calculations of the resource adequacy requirements needed to maintain reliability and CAFs. Therefore, the NYISO worked with the NYSRC to develop a strategic plan to research, develop, and implement enhancements to the resource adequacy model through 2026 ("5-Year Work Plan"). [24]

[23] The BIC subsequently also voted to recommend that the MC approve the conforming changes proposed to Section 5.12.7 of the Services Tariff made within this same presentation. This conforming revision to the tariff was subsequently approved by the MC and pending review and action by the NYISO Board of Directors will be filed separately with the Commission pursuant to section 205 of the Federal Power Act later this month.

[24] This strategic plan was presented to the November 10, 2022 NYSRC Executive Committee meeting.

Because enhancements to the resource adequacy model could impact resource adequacy requirements more than CARC and CAF determinations, separate tracks for researching and developing enhancements were developed between the NYSRC and the NYISO in the 5-Year Work Plan. Over the next four years, the NYSRC will be leading research and development on model enhancements related to 1) the methodology for shifting capacity between zones to arrive at a system that meets the 0.1 days per year LOLE reliability criteria, 2) representation of winter conditions, 3) energy limited resource modeling and structure of emergency operating procedures, 4) load modeling, and 5) extreme weather. Over the long term, the NYISO will support the NYSRC in the research and development of enhancements related to the representation of winter conditions and load modeling. In the near term however, the NYISO will be leading research and development on enhancements related to reflecting the impact of certain resource attributes that may impact marginal reliability contributions.

The resource attributes that the NYISO will investigate in 2023 are 1) correlated fuel unavailability for non-renewable resources (particularly due to constraints on the natural gas system), 2) start up notification requirements, 3) operating characteristics of SCRs not currently represented in the NYSRC model, and 4) non-fuel-related correlated outages/derates, as identified by the NYISO's Market Monitoring Unit.[25] The culmination of the NYISO's investigation will be the recommendation of potential enhancements to account for these attributes in the resource adequacy model for the NYSRC's consideration as well as potential changes in the ICAP Market. Additional resource attributes the NYISO will investigate over the next four years include unit size and any remaining non-fuel-related correlated outages/derates that are not addressed in 2023.

As new resource attributes are incorporated into the NYSRC's resource adequacy model and are found to have an identifiable impact on marginal reliability contributions, those characteristics will be used in determining an ICAP Supplier's CARC assignment and in the calculation of CAFs. Therefore, as the NYISO develops the recommendations to reflect new resource attributes in the NYSRC's resource adequacy model, the NYISO and its stakeholders will also develop the procedures for determining how those attributes are to be assessed in the assignment of ICAP Suppliers to the appropriate CARC and in the calculation of CAFs. Those procedures will require stakeholder approval to be included in the ICAP Manual and utilized in the annual review of CARC and CAFs. In this way, marginal capacity accreditation will be able to evolve over time as new factors impacting marginal reliability contributions are identified.

[25] Non-fuel-related correlated derates were identified by the NYISO's Market Monitoring Unit in its Q3 State of the Market report presented at the December 18, 2022 ICAPWG meeting

VII. Implementation Work and Schedule for May 1, 2024 Market Effective Date

Phase 2 resulted in a complete market design that the NYISO could effectively implement for the capability year that begins May 1, 2024, which the NYISO has begun to do under Phase 3 of the project. While Phase 3 primarily involves the completion of the first capacity accreditation review called for in the marginal capacity accreditation tariff provisions, the NYISO has also agreed to conduct preliminary calculations of CAFs using the NYSRC's preliminary base case model being developed at its Installed Capacity Subcommittee ("ICS") as part of establishing the final IRM base case for the 2024 IRM.[26]

The primary work to implement the marginal capacity accreditation market design has already begun. NYISO efforts are well underway to update the market software needed to implement the marginal capacity accreditation design. In order to ensure this work is implemented successfully, NYISO Market Operations created – and has staffed – a new team, Capacity Market Accreditation, that will be focused on executing the annual marginal capacity accreditation process that the NYISO must administer beginning this Fall for the May 1, 2024 start of the Capability Year. The NYISO anticipates the testing of the application software to calculate CAFs will be completed in the second quarter of 2023. After testing, the software will first be utilized using the 2024 preliminary base case assumptions for the resource adequacy model developed by the ICS. This informational study will calculate informational CAFs for the 2024 Capability Year, which will be reviewed with stakeholders through the ICAPWG. These informational CAFs will help provide transparency to the marketplace regarding the expected changes that are likely to occur with the implementation of the marginal capacity accreditation market design in the 2024 Capability Year.

The final CARC and CAF implementation into the market will occur in the fall of 2023 through March of 2024, consistent with the annual review process described in Sections 7.1 and 7.2 of the revised ICAP Manual. Because this process will impact current UCAP calculations for all ICAP Suppliers, rigorous testing will be conducted to ensure the new formulae are correctly and accurately applied to all resource categories. In addition, ICAP Event Calendar updates are being developed to make sure the administrative timeline found in the ICAP Manuals is readily transparent to all market participants.

[26] The NYISO agreed to this action at the February 28, 2023 ICAP Working Group.

VIII. CONCLUSION

With the completion of this informational report detailing the results of NYISO's Phase 2 capacity accreditation project, the NYISO has provided additional transparency concerning the technical specifications and administrative rules that it will follow when implementing the marginal capacity accreditation market design approved by the May 10 Order. The NYISO has already moved into Phase 3 of its capacity accreditation project, having begun the work on its internal processes and systems that is necessary to effectively administer the marginal capacity accreditation design. The NYISO will be discussing this implementation, software developments, and market system testing work with its ICAP Working Group on March 31, 2023. Additionally, the NYISO will also continue to pursue the resource adequacy modeling enhancements discussed above. This work will also primarily proceed through discussions with its stakeholders at future ICAP Working Groups. Finally, the NYISO has committed to calculate informational CAFs in the Fall of 2023 utilizing the NYSRC's Preliminary Base Case developed at its Installed Capacity Subcommittee. These informational results and other developments for capacity accreditation will be discussed with the ICAP Working Group as well as posted on the NYISO's Capacity Accreditation web page (https://www.nyiso.com/accreditation). The NYISO's meeting calendar (https://www.nyiso.com/calendar) will contain the materials for these upcoming ICAP Working Group discussions.

Final CAFs for the 2024 Capability Year will be calculated by the NYISO and made available no later than March 1, 2024. Additional administrative timeline requirements for ICAP Suppliers are discussed in detail in the final ICAP Manual revisions. The ICAP Event Calendar will also be updated to include significant milestones and deadlines in the annual administration of the marginal capacity accreditation market design.

Appendix A

8/29/2022 ICAPWG

Support for NYISO Capacity Accreditation Project

Eduardo Ibanez, Ph.D.; Mitch Bringolf

GE Energy consulting

Overview

This slide deck summarizes the capacity value calculations, evaluated for the 2022 NYISO LCR database.

Results include calculations with:

- Expected Load Carrying Capability (ELCC) technique
- Marginal Reliability Improvement (MRI) technique

Reference

For methodology, assumptions, and more details please refer to previous presentations:

- 3/31: https://www.nyiso.com/documents/20142/29607069/3%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0331.pdf
- 4/28: https://www.nyiso.com/documents/20142/30276257/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0428.pdf
- 5/24: https://www.nyiso.com/documents/20142/30888946/2%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0524.pdf
- 6/28: https://www.nyiso.com/documents/20142/31830389/GE-Support-for-NYISO-Capacity-Accreditation-Project-0628.pdf

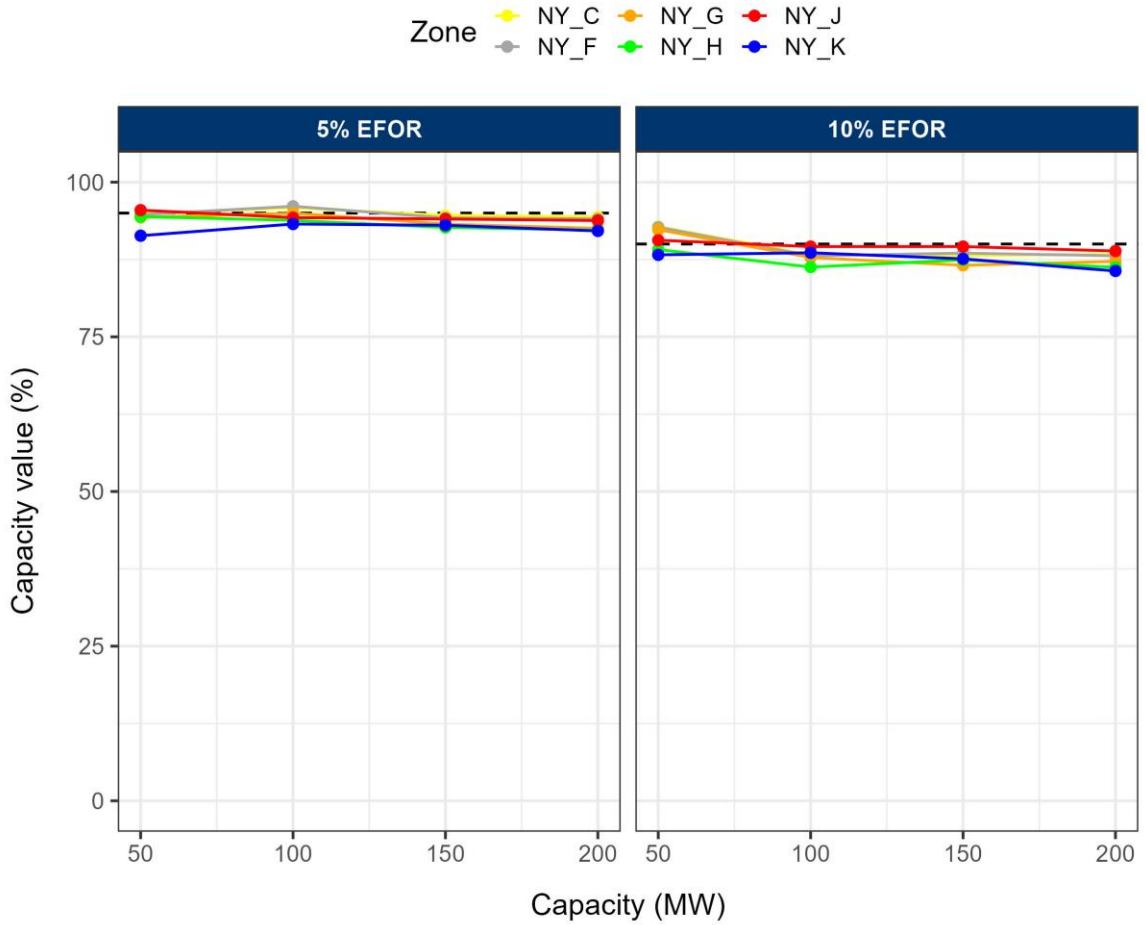
All results in this slide deck have been previously presented at ICAPWG meetings:

- 04/28: 5% and 10% EFOR Thermal, Solar, Offshore Wind
- 05/24: Large Hydro, and the 2/4/6/8-hour Energy Duration Limited
- 06/28: Onshore Wind, Run of River Hydro, Landfill Biomass

ELCC technique results

Thermal - ELCC capacity values (MW and %)

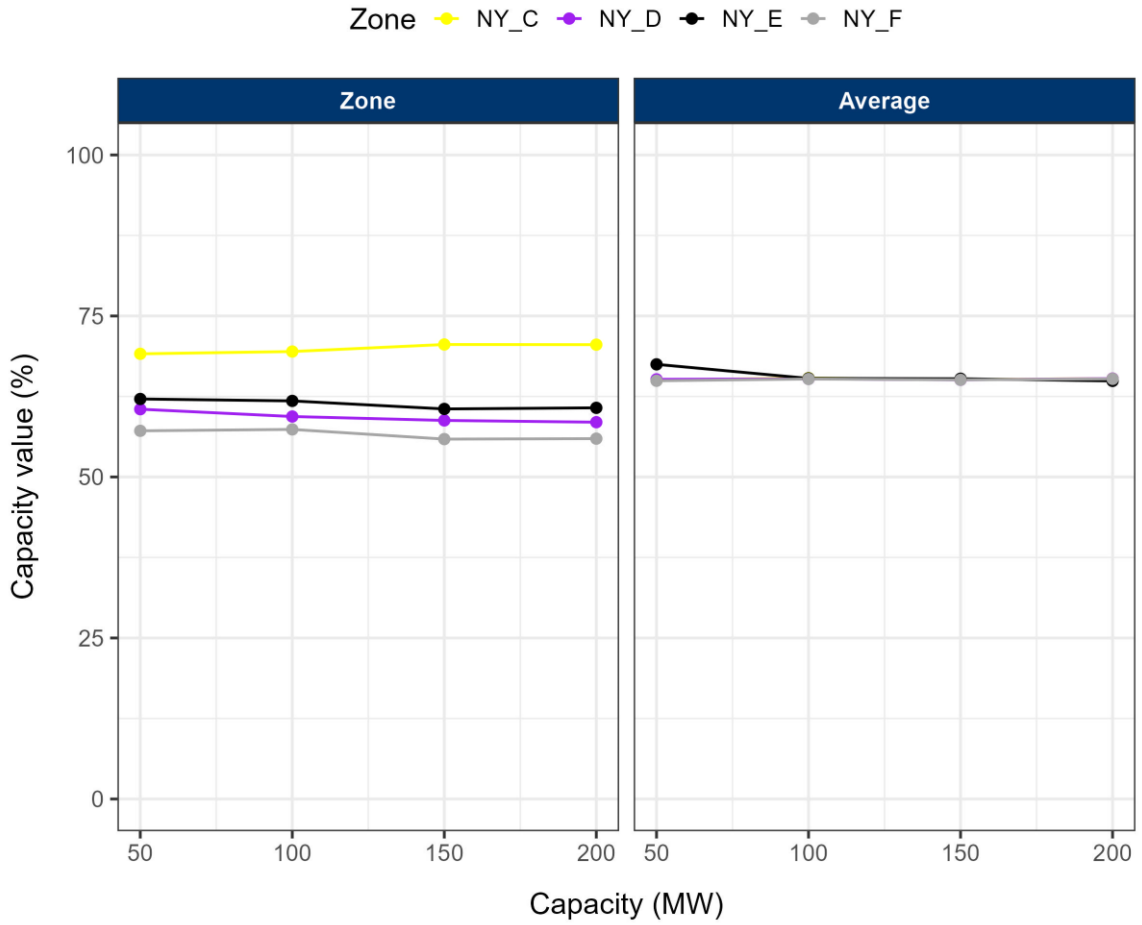
		Nameplate capacity (MW)			
EFOR	**Zone**	**50**	**100**	**150**	**200**
5%	NY_C	47.4	95.9	141.9	188.8
	NY_F	47.4	96.1	141.3	188.1
	NY_G	47.2	95.0	139.8	185.1
	NY_H	47.2	93.8	139.0	184.5
	NY_J	47.7	94.3	141.1	187.6
	NY_K	45.7	93.2	139.5	184.2
10%	NY_C	46.4	88.2	132.2	176.7
	NY_F	46.4	88.1	132.8	176.2
	NY_G	46.2	87.8	129.8	174.4
	NY_H	44.6	86.3	131.1	172.5
	NY_J	45.3	89.6	134.4	177.7
	NY_K	44.1	88.6	131.4	171.3



(Dashed lines represent 95% and 90%, respectively)

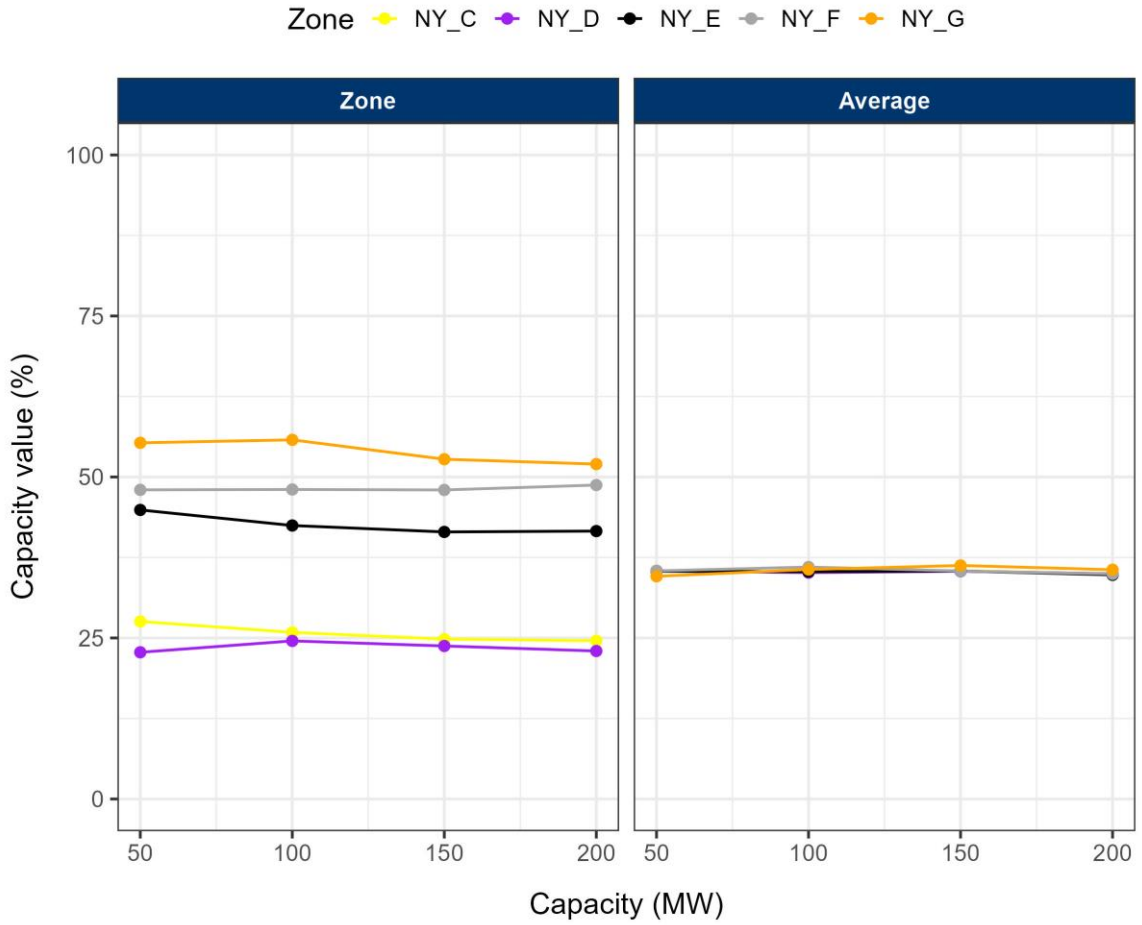
Landfill biomass - ELCC capacity values (MW and %)

		Nameplate capacity (MW)			
Shape	**Zone**	**50**	**100**	**150**	**200**
Zone	NY_C	34.6	69.5	105.9	141.1
	NY_D	30.3	59.4	88.2	117.0
	NY_E	31.1	61.8	90.8	121.5
	NY_F	28.6	57.4	83.8	111.9
Average	NY_C	32.5	65.3	97.7	130.5
	NY_D	32.6	65.2	97.6	130.6
	NY_E	33.7	65.3	97.9	129.8
	NY_F	32.5	65.2	97.6	130.5



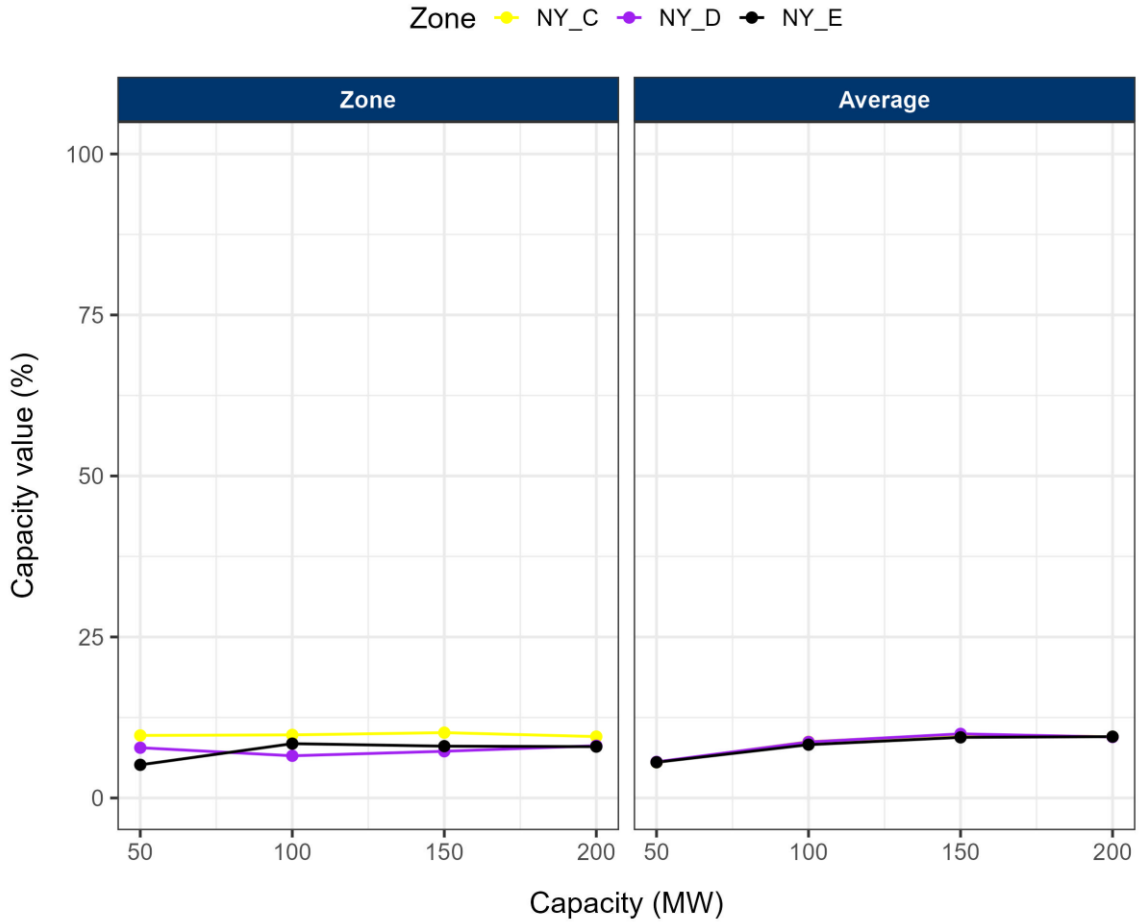
Run-of-river - ELCC capacity values (MW and %)

		Nameplate capacity (MW)			
Shape	**Zone**	**50**	**100**	**150**	**200**
Zone	NY_C	13.8	25.9	37.2	49.2
	NY_D	11.4	24.5	35.6	46.0
	NY_E	22.4	42.5	62.2	83.2
	NY_F	24.0	48.1	72.0	97.5
	NY_G	27.7	55.8	79.1	104.0
Average	NY_C	17.7	35.2	53.2	69.9
	NY_D	17.7	35.2	53.1	70.0
	NY_E	17.7	35.3	53.1	69.6
	NY_F	17.7	36.0	53.1	69.9
	NY_G	17.3	35.6	54.4	71.2



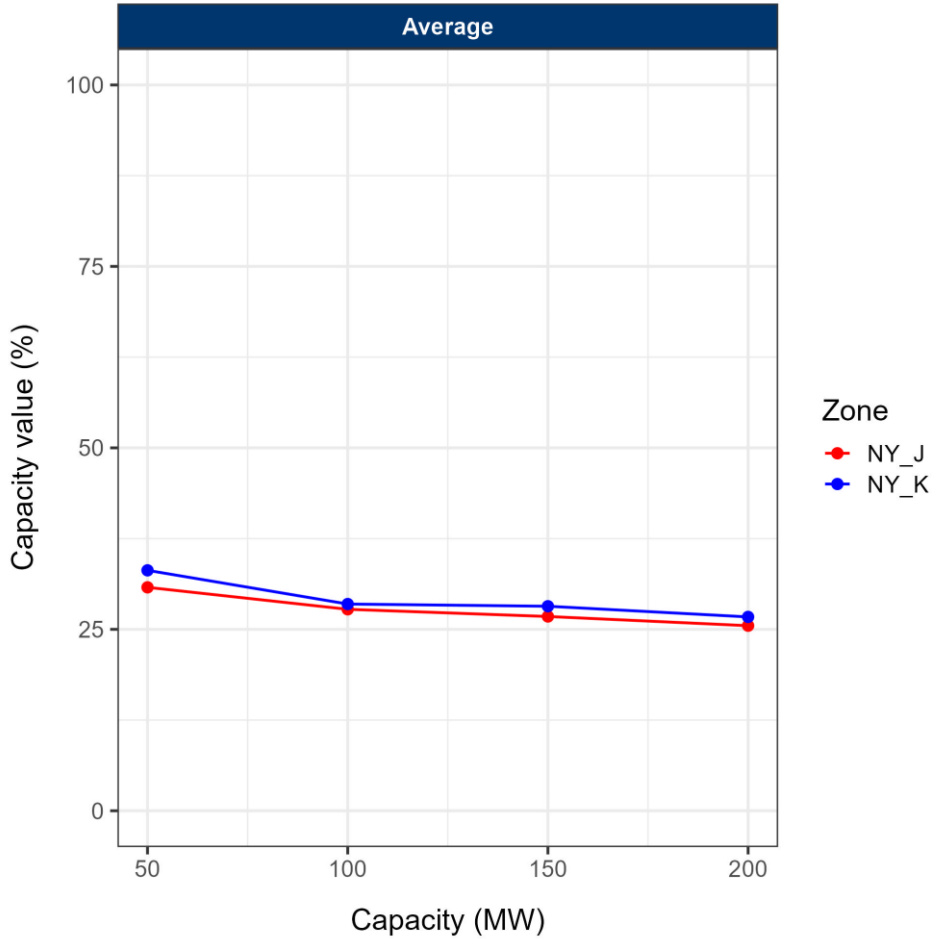
Onshore wind - ELCC capacity values (MW and %)

		Nameplate capacity (MW)			
Shape	**Zone**	**50**	**100**	**150**	**200**
Zone	NY_C	4.9	9.8	15.2	19.1
	NY_D	3.9	6.6	10.9	16.2
	NY_E	2.6	8.4	12.1	15.9
Average	NY_C	2.8	8.7	14.8	19.0
	NY_D	2.8	8.7	14.9	18.9
	NY_E	2.8	8.3	14.1	19.0



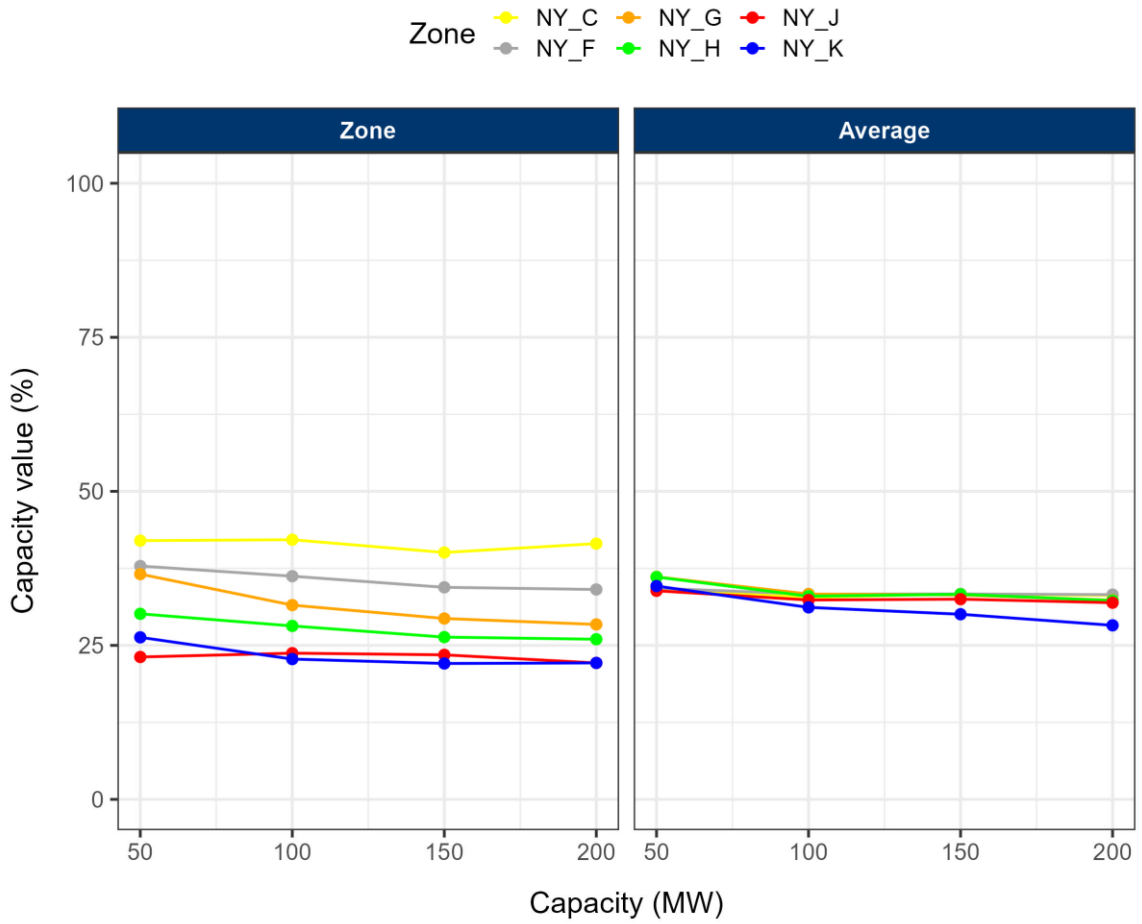
Offshore wind - ELCC capacity values (MW and %)

		Nameplate capacity (MW)			
Shape	**Zone**	**50**	**100**	**150**	**200**
Average	NY_J	15.4	27.8	40.2	51.0
	NY_K	16.6	28.5	42.3	53.4



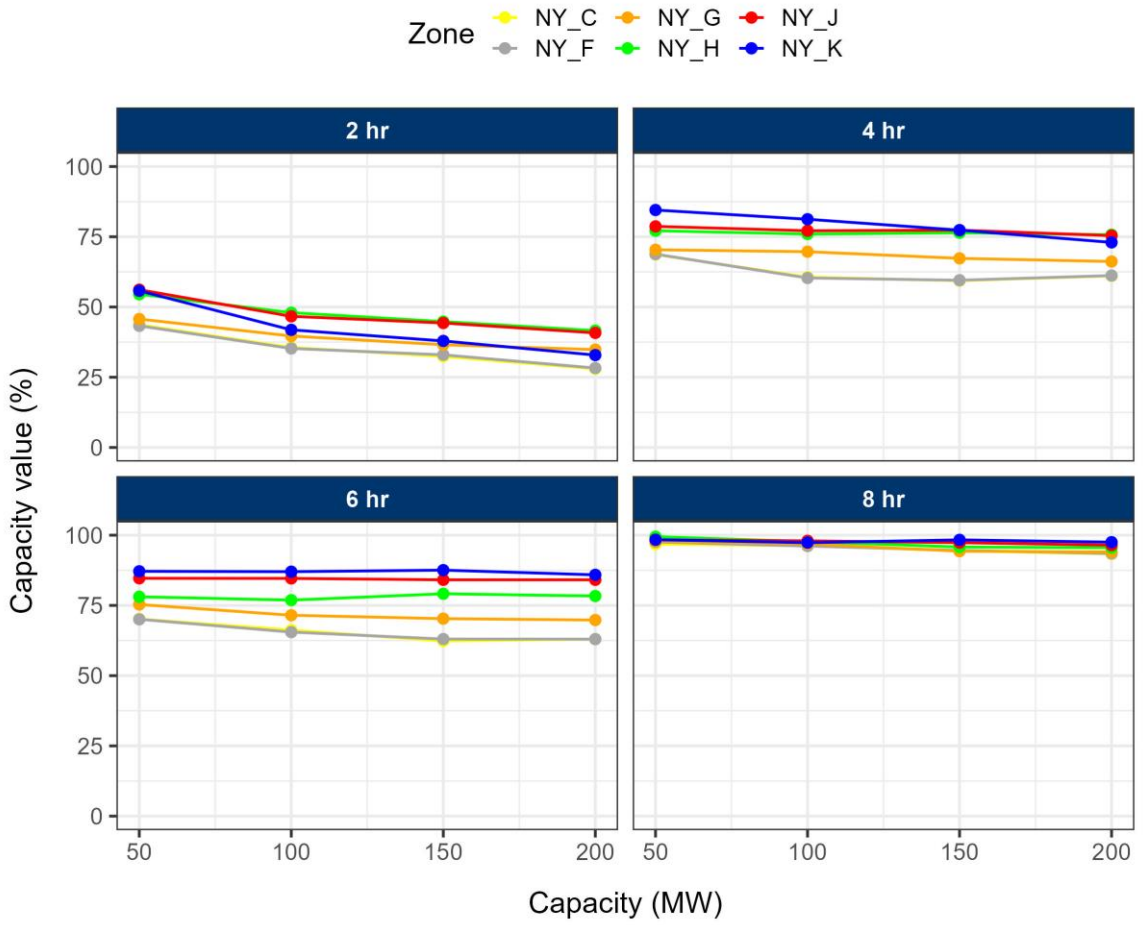
Solar - ELCC capacity values (MW and %)

		Nameplate capacity (MW)			
Shape	**Zone**	**50**	**100**	**150**	**200**
Zone	NY_C	21.0	42.1	60.1	83.0
	NY_F	18.9	36.2	51.6	68.1
	NY_G	18.3	31.5	44.0	56.8
	NY_H	15.1	28.2	39.5	52.0
	NY_J	11.6	23.7	35.2	44.3
	NY_K	13.2	22.8	33.1	44.3
Average	NY_C	17.1	32.8	50.0	66.2
	NY_F	17.1	33.3	50.0	66.5
	NY_G	18.1	33.3	49.8	64.7
	NY_H	18.0	33.0	49.9	64.5
	NY_J	16.9	32.4	48.7	63.8
	NY_K	17.3	31.2	45.1	56.5



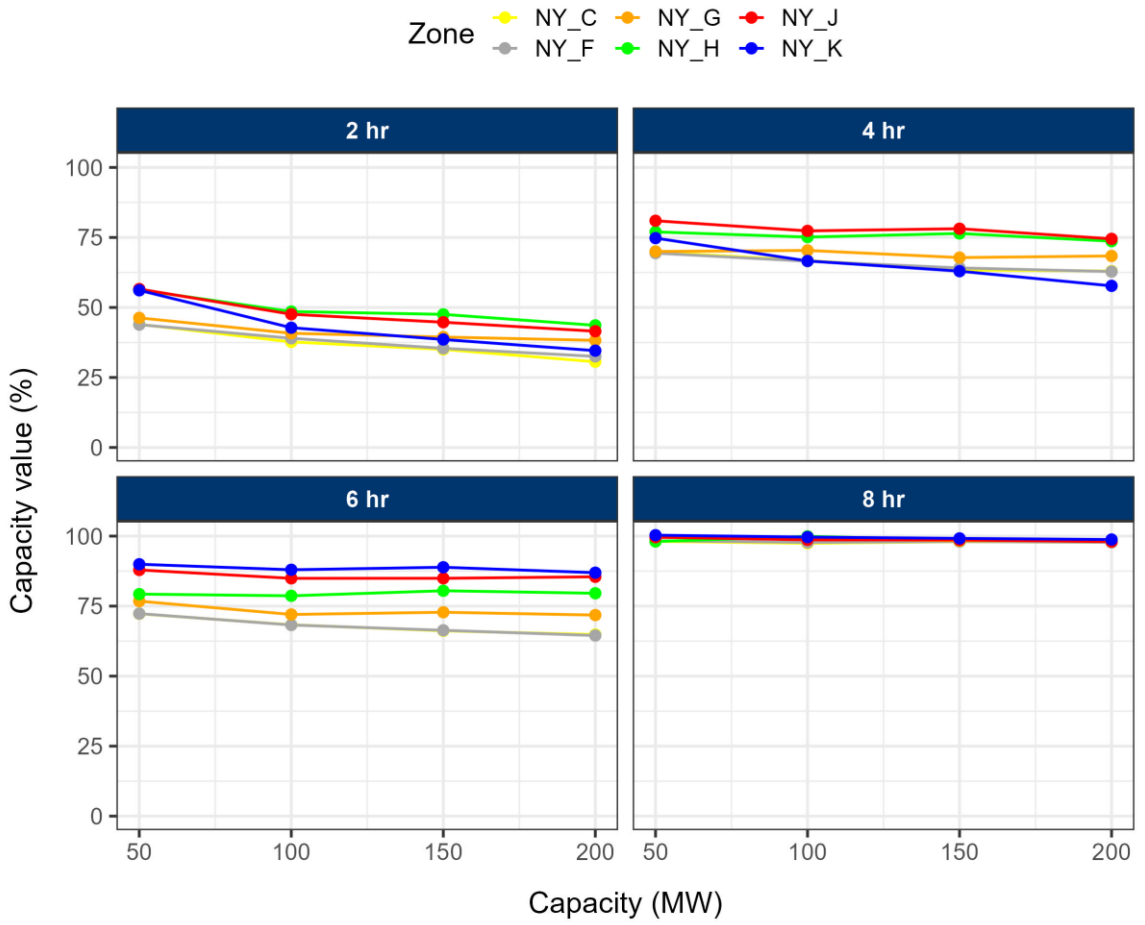
Energy Duration Limited – Shape-based model ELCC capacity values (MW and %)

		Nameplate capacity (MW)			
Duration (h)	**Zone**	**50**	**100**	**150**	**200**
2	NY_C	21.8	35.6	48.6	56.0
	NY_F	21.6	35.2	49.5	56.6
	NY_G	22.9	39.7	54.8	69.7
	NY_H	27.3	48.0	67.2	83.2
	NY_J	28.1	46.7	66.5	81.6
	NY_K	27.9	41.9	56.9	65.8
4	NY_C	34.3	60.7	89.1	122.2
	NY_F	34.4	60.3	89.3	122.4
	NY_G	35.2	69.7	101.0	132.4
	NY_H	38.6	76.0	114.6	151.4
	NY_J	39.3	77.1	116.0	150.8
	NY_K	42.3	81.2	116.0	146.0
6	NY_C	35.1	66.2	93.5	126.0
	NY_F	35.0	65.5	94.5	126.0
	NY_G	37.7	71.5	105.4	139.6
	NY_H	39.0	76.9	118.7	156.7
	NY_J	42.3	84.6	126.2	168.2
	NY_K	43.6	87.0	131.3	171.8
8	NY_C	48.4	96.3	141.7	186.6
	NY_F	48.8	96.1	141.9	187.0
	NY_G	49.0	96.9	141.4	188.1
	NY_H	49.7	97.7	143.7	191.1
	NY_J	49.2	98.0	146.0	192.9
	NY_K	49.2	97.3	147.5	195.0



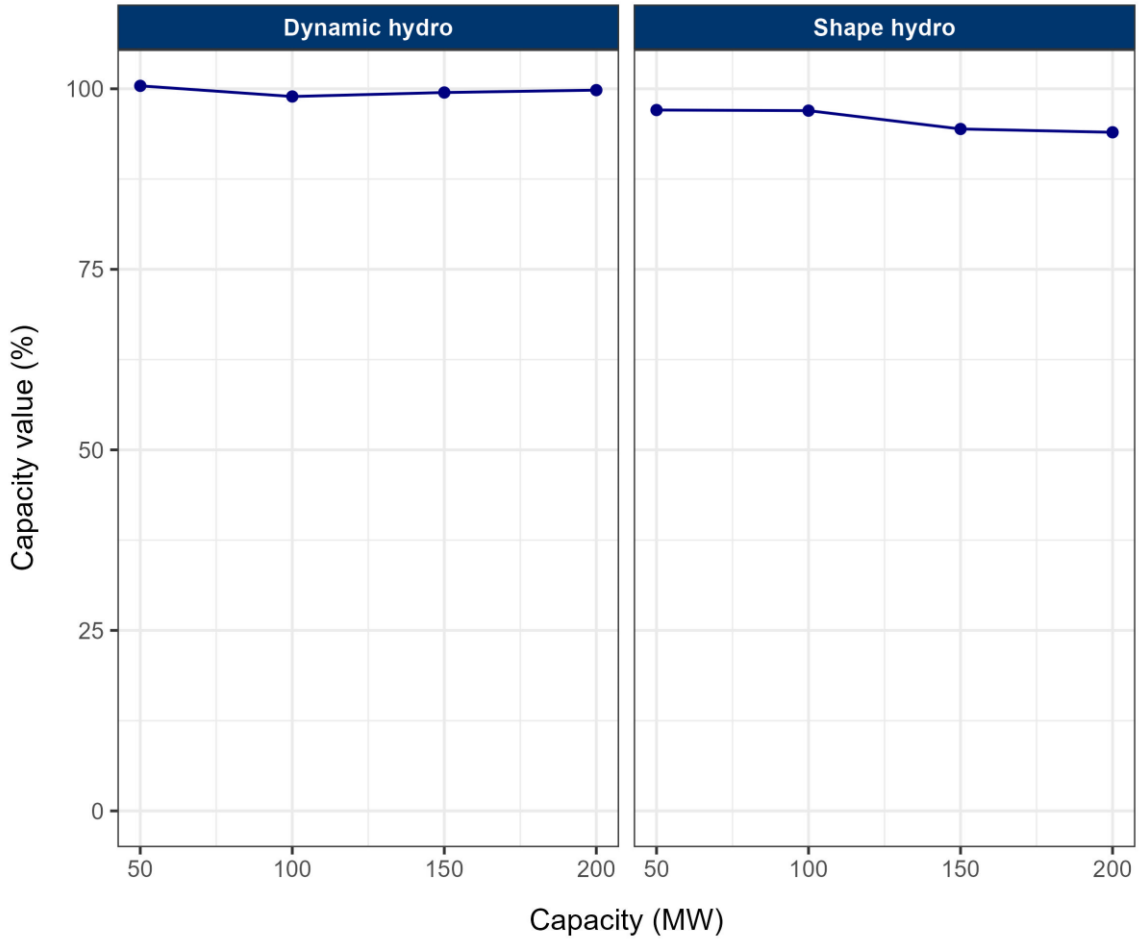
Energy Duration Limited – Dynamic model ELCC capacity values (MW and %)

		Nameplate capacity (MW)			
Duration (h)	**Zone**	**50**	**100**	**150**	**200**
2	NY_C	22.0	37.7	52.5	61.3
	NY_F	21.9	39.0	53.1	65.1
	NY_G	23.1	40.8	59.2	76.5
	NY_H	28.1	48.6	71.3	87.2
	NY_J	28.3	47.6	67.1	83.0
	NY_K	28.1	42.8	57.8	69.2
4	NY_C	34.9	66.8	95.1	126.0
	NY_F	34.7	66.5	96.2	125.6
	NY_G	35.0	70.4	101.7	136.8
	NY_H	38.5	75.1	114.6	147.3
	NY_J	40.5	77.3	117.2	149.0
	NY_K	37.4	66.6	94.4	115.4
6	NY_C	36.1	68.3	99.3	129.7
	NY_F	36.2	68.3	99.5	129.0
	NY_G	38.4	72.0	109.2	143.6
	NY_H	39.6	78.7	120.7	159.2
	NY_J	44.0	84.9	127.4	170.9
	NY_K	45.0	88.0	133.3	173.9
8	NY_C	49.1	97.4	147.0	195.6
	NY_F	49.2	97.7	147.1	195.6
	NY_G	49.8	99.0	147.5	196.7
	NY_H	49.0	99.9	148.0	196.7
	NY_J	49.8	98.7	147.9	196.1
	NY_K	50.2	99.7	148.8	197.5



Large Hydro - ELCC capacity values (MW and %)

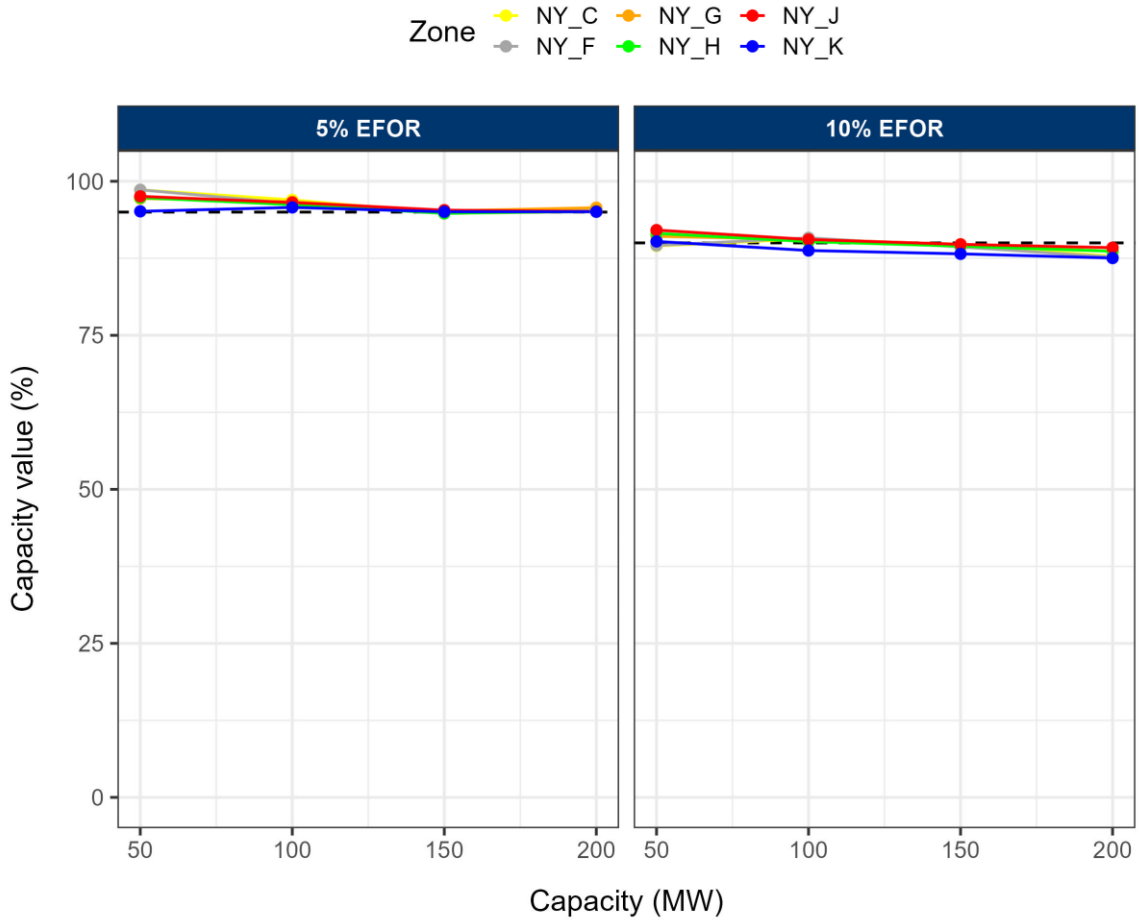
	Nameplate capacity (MW)			
Model	**50**	**100**	**150**	**200**
Dynamic large hydro	50.0	98.9	149.2	199.6
Shape large hydro	48.5	97.0	141.7	188.0



MRI technique results

Thermal - MRI capacity values (MW and %)

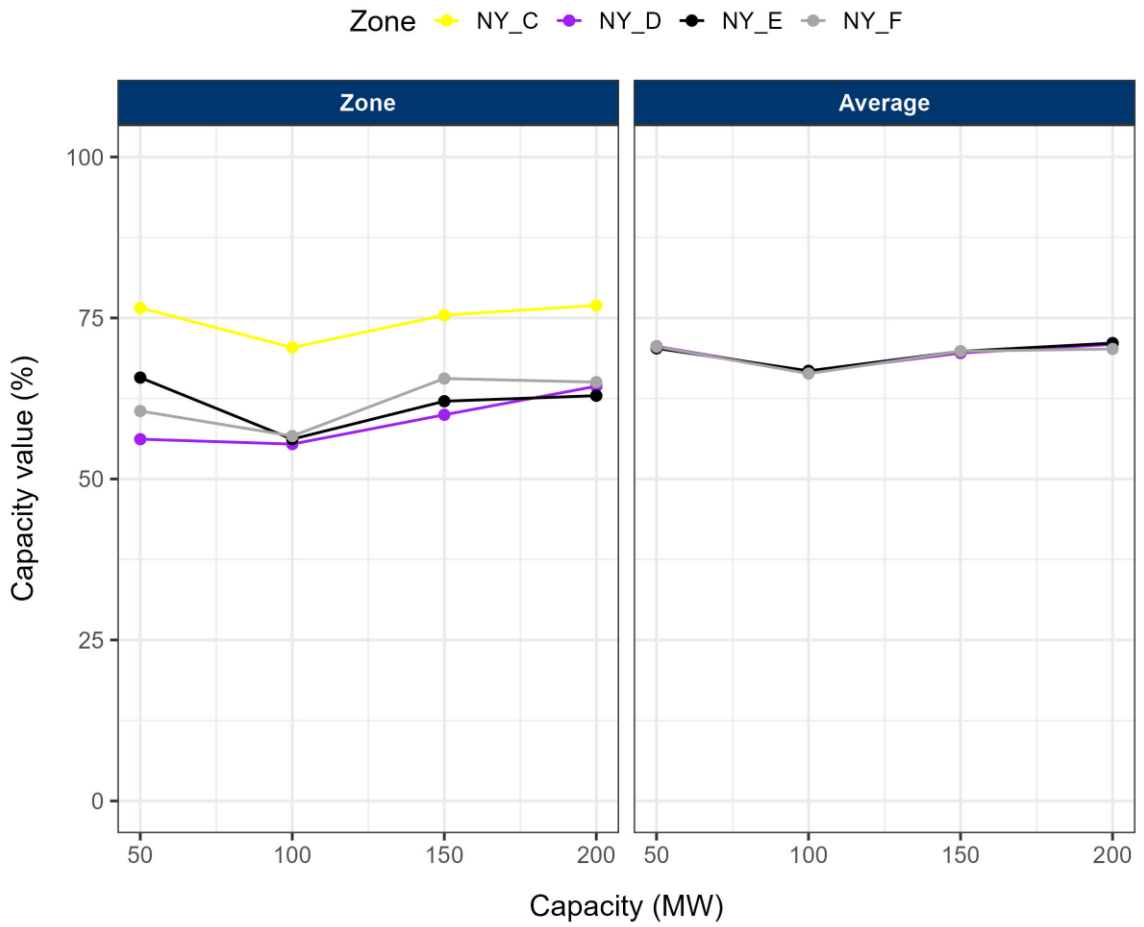
		Nameplate capacity (MW)			
EFOR	**Zone**	**50**	**100**	**150**	**200**
5%	NY_C	49.3	97.0	142.2	190.1
	NY_F	49.3	96.4	142.1	190.8
	NY_G	48.6	96.7	142.8	191.4
	NY_H	48.7	96.2	142.2	190.2
	NY_J	48.8	96.5	143.0	190.2
	NY_K	47.6	95.8	142.6	190.1
10%	NY_C	44.8	90.7	134.4	175.7
	NY_F	44.8	90.8	134.0	175.4
	NY_G	45.5	90.5	134.7	177.2
	NY_H	45.8	90.2	134.2	177.3
	NY_J	46.0	90.6	134.6	178.4
	NY_K	45.1	88.8	132.3	175.1



(Dashed lines represent 95% and 90%, respectively)

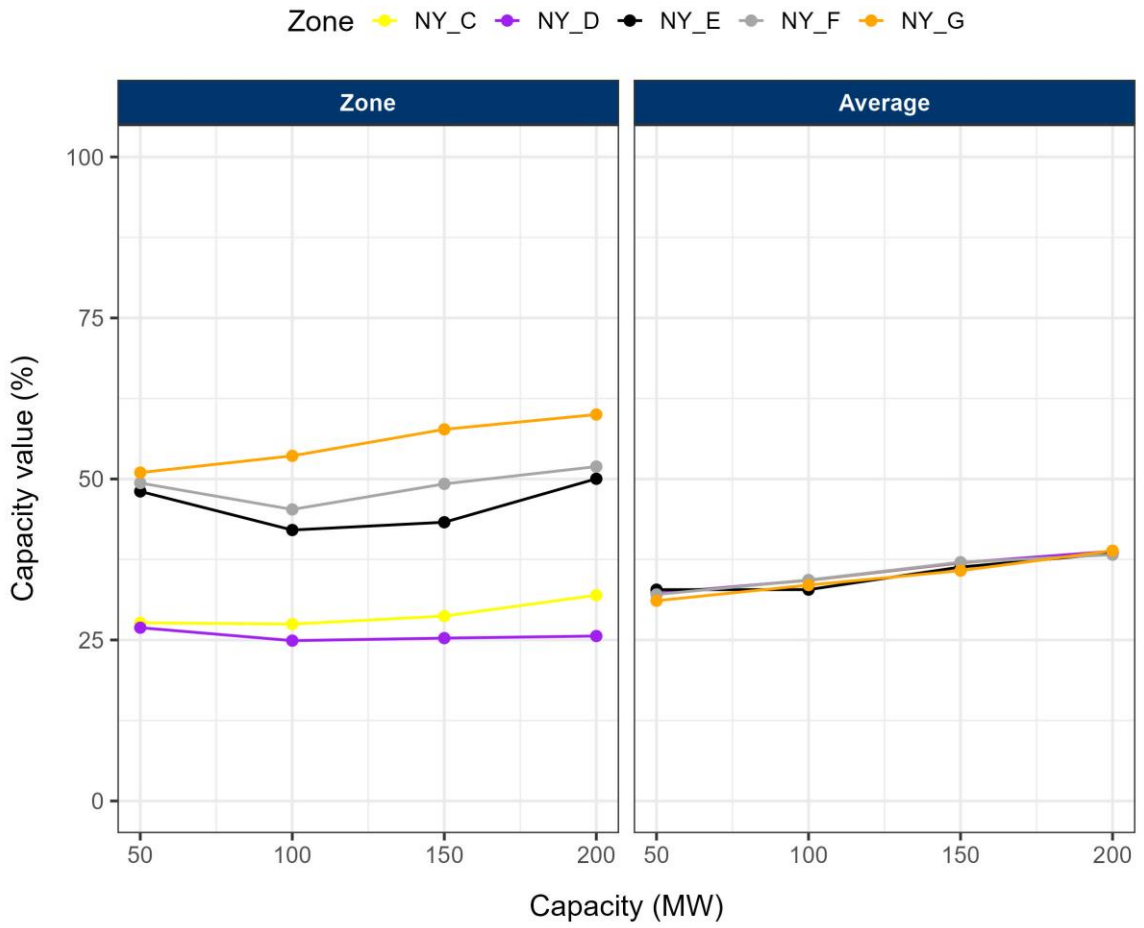
Landfill biomass - MRI capacity values (MW and %)

		Nameplate capacity (MW)			
Shape	**Zone**	**50**	**100**	**150**	**200**
Zone	NY_C	38.3	70.4	113.1	153.9
	NY_D	28.1	55.4	89.9	128.8
	NY_E	32.9	56.2	93.1	125.9
	NY_F	30.3	56.7	98.4	130.1
Average	NY_C	35.3	66.7	104.3	141.9
	NY_D	35.3	66.6	104.3	141.8
	NY_E	35.1	66.8	104.7	142.2
	NY_F	35.3	66.4	104.7	140.4



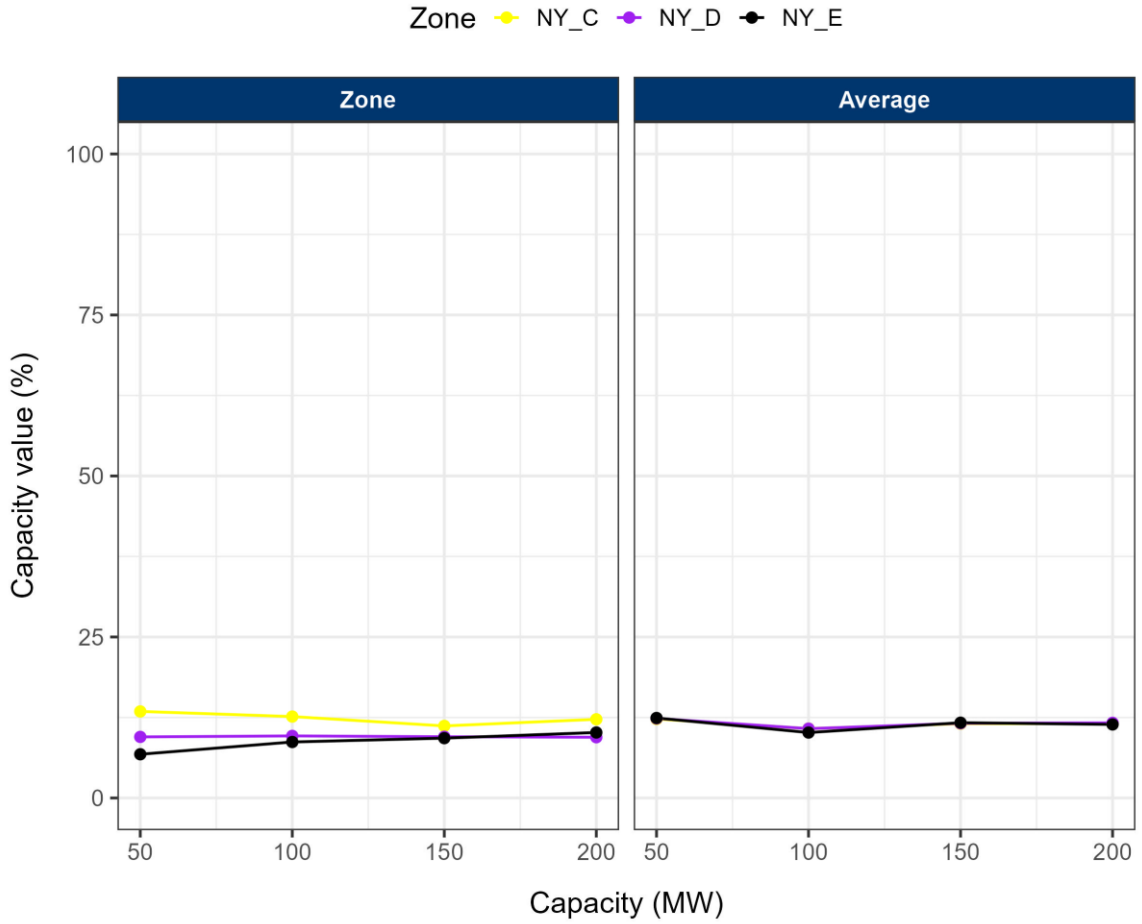
Run-of-river - MRI capacity values (MW and %)

		Nameplate capacity (MW)			
Shape	**Zone**	**50**	**100**	**150**	**200**
Zone	NY_C	13.8	27.5	43.1	63.9
	NY_D	13.5	24.9	37.9	51.2
	NY_E	24.0	42.1	64.9	100.1
	NY_F	24.7	45.3	73.9	103.8
	NY_G	25.5	53.6	86.6	120.0
Average	NY_C	16.1	34.2	55.4	77.5
	NY_D	16.1	34.3	55.5	77.6
	NY_E	16.4	32.8	54.5	76.9
	NY_F	16.0	34.3	55.6	76.5
	NY_G	15.5	33.5	53.6	77.7



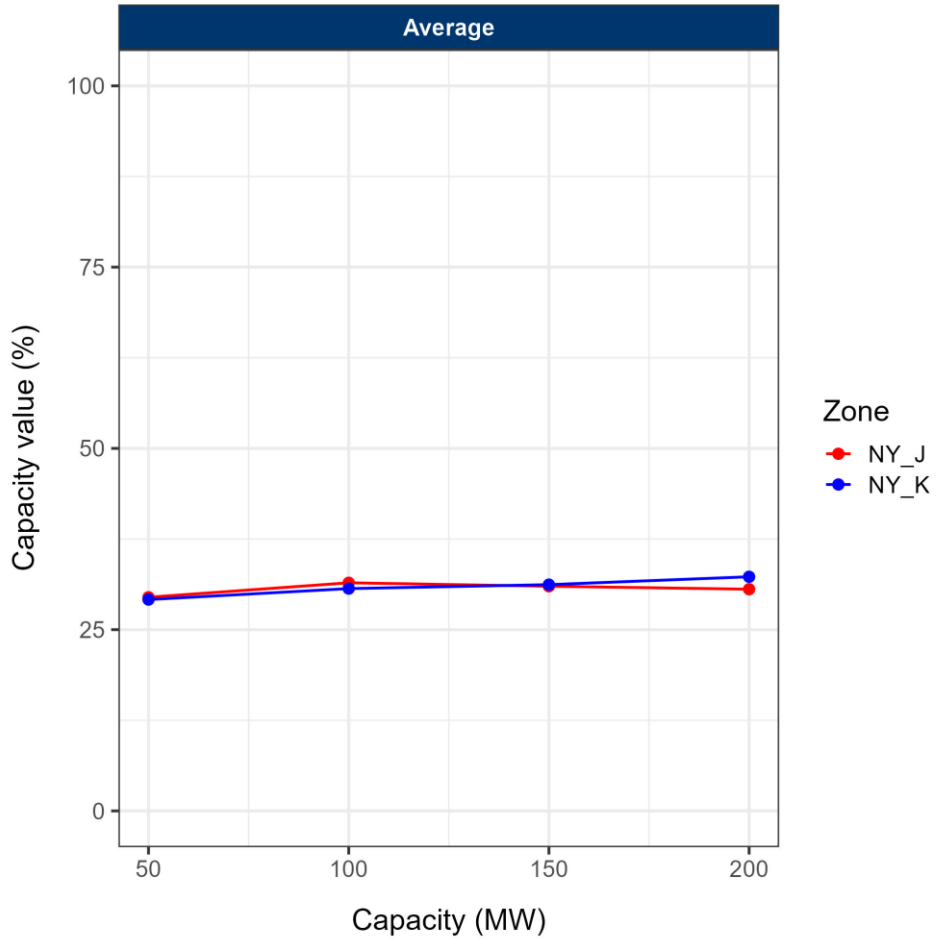
Onshore wind - MRI capacity values (MW and %)

		Nameplate capacity (MW)			
Shape	**Zone**	**50**	**100**	**150**	**200**
Zone	NY_C	6.7	12.6	16.8	24.4
	NY_D	4.7	9.6	14.3	18.9
	NY_E	3.4	8.7	13.9	20.3
Average	NY_C	6.1	10.8	17.3	23.2
	NY_D	6.2	10.8	17.4	23.3
	NY_E	6.2	10.2	17.5	22.8



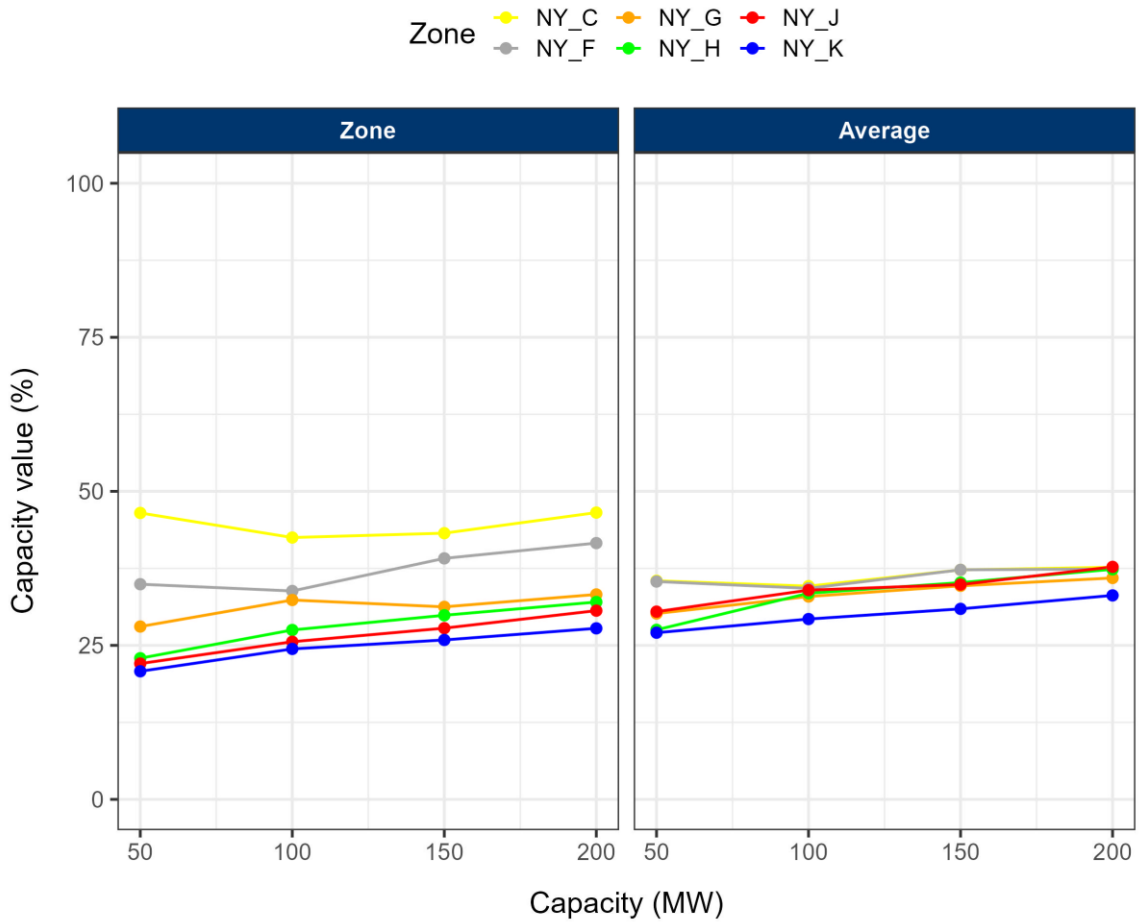
Offshore wind - MRI capacity values (MW and %)

		Nameplate capacity (MW)			
Shape	**Zone**	**50**	**100**	**150**	**200**
Average	NY_J	14.4	29.5	43.3	58.2
	NY_K	14.6	28.0	43.5	59.6



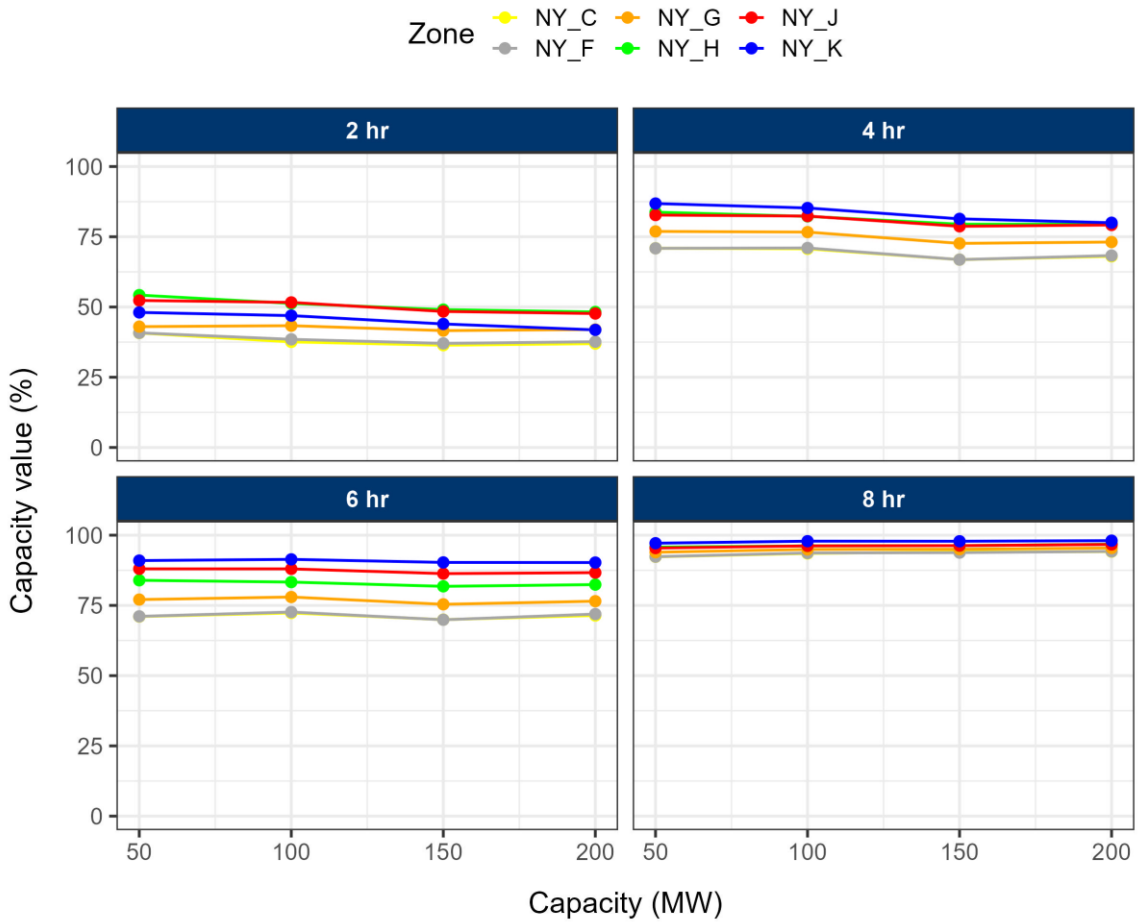
Solar - MRI capacity values (MW and %)

		Nameplate capacity (MW)			
Shape	**Zone**	**50**	**100**	**150**	**200**
Zone	NY_C	23.2	42.5	64.8	93.1
	NY_F	17.5	33.8	58.7	83.2
	NY_G	14.0	32.4	46.9	66.5
	NY_H	11.5	27.5	44.8	64.1
	NY_J	11.0	25.6	41.7	61.3
	NY_K	10.4	24.4	38.8	55.5
Average	NY_C	17.7	34.6	55.9	75.4
	NY_F	17.7	34.3	55.9	74.8
	NY_G	15.1	32.9	52.0	71.9
	NY_H	13.8	33.5	52.8	74.7
	NY_J	15.2	34.0	52.3	75.5
	NY_K	13.5	29.3	46.4	66.2



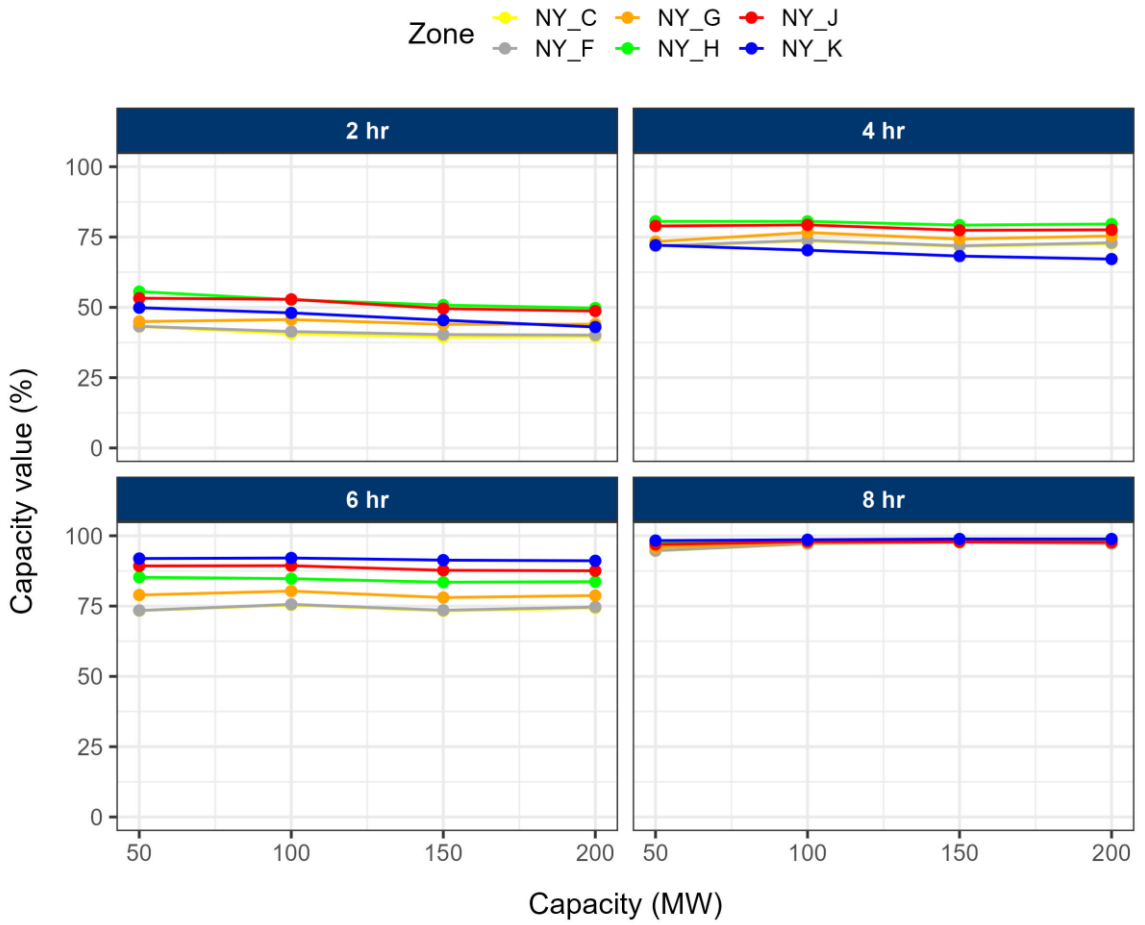
Energy Duration Limited – Shape-based model MRI capacity values (MW and %)

		Nameplate capacity (MW)			
Duration (h)	**Zone**	**50**	**100**	**150**	**200**
2	NY_C	20.4	37.6	54.6	73.9
	NY_F	20.4	38.5	55.6	75.3
	NY_G	21.5	43.3	62.4	84.0
	NY_H	27.1	51.3	73.6	96.5
	NY_J	26.2	51.6	72.6	95.4
	NY_K	24.0	46.9	65.9	83.7
4	NY_C	35.5	70.7	100.3	136.1
	NY_F	35.4	71.0	100.3	136.6
	NY_G	38.5	76.7	109.0	146.3
	NY_H	41.9	82.3	119.2	159.0
	NY_J	41.4	82.4	118.1	158.4
	NY_K	43.4	85.2	122.1	160.0
6	NY_C	35.5	72.3	104.9	142.8
	NY_F	35.6	72.6	104.8	143.8
	NY_G	38.5	78.0	113.1	153.0
	NY_H	42.0	83.3	122.7	164.8
	NY_J	44.0	88.0	129.5	173.3
	NY_K	45.5	91.4	135.5	180.5
8	NY_C	46.2	93.5	141.1	188.3
	NY_F	46.2	93.7	140.7	188.5
	NY_G	47.0	94.9	142.5	190.9
	NY_H	47.9	96.2	144.4	193.6
	NY_J	47.7	96.2	144.4	193.4
	NY_K	48.6	97.9	146.8	196.1



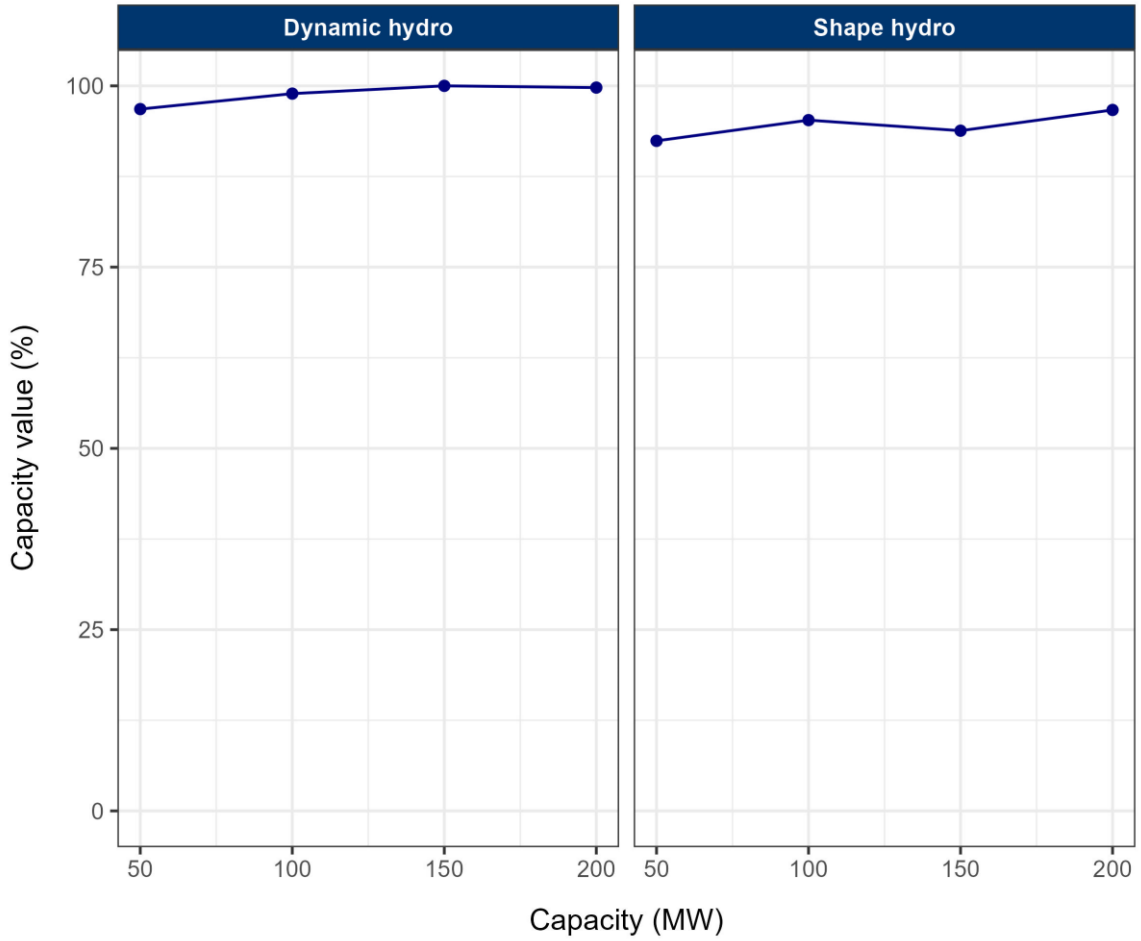
Energy Duration Limited – Dynamic model MRI capacity values (MW and %)

		Nameplate capacity (MW)			
Duration (h)	**Zone**	**50**	**100**	**150**	**200**
2	NY_C	21.6	40.6	59.1	79.1
	NY_F	21.6	41.4	60.5	80.3
	NY_G	22.5	45.6	65.9	88.0
	NY_H	27.8	52.7	76.2	99.5
	NY_J	26.6	52.8	74.3	97.4
	NY_K	24.9	48.0	68.2	86.0
4	NY_C	35.9	73.6	107.5	145.2
	NY_F	35.9	73.8	107.8	145.9
	NY_G	36.7	76.6	111.4	150.8
	NY_H	40.3	80.6	118.9	159.2
	NY_J	39.5	79.3	116.1	155.1
	NY_K	36.1	70.3	102.4	134.3
6	NY_C	36.7	75.4	109.9	148.6
	NY_F	36.7	75.6	110.3	149.3
	NY_G	39.5	80.3	117.0	157.5
	NY_H	42.6	84.8	125.2	167.4
	NY_J	44.6	89.4	131.6	175.1
	NY_K	46.0	92.1	137.0	182.2
8	NY_C	47.3	97.1	146.5	194.4
	NY_F	47.3	97.2	146.5	194.4
	NY_G	47.9	97.7	146.8	195.6
	NY_H	48.6	98.0	147.2	196.3
	NY_J	48.5	97.9	146.8	195.4
	NY_K	49.1	98.6	148.3	197.7



Large Hydro - MRI capacity values (MW and %)

	Nameplate capacity (MW)			
Model	**50**	**100**	**150**	**200**
Dynamic large hydro	48.4	98.9	150.0	199.5
Shape large hydro	46.2	95.3	140.7	193.4



9/30/2022 ICAPWG

Capacity Value Results for 2022 LCR at LOE and 2022 RNA 2030 Base Case

Eduardo Ibanez, Ph.D.; Mitch Bringolf

GE Energy consulting

Overview

This slide deck summarizes the capacity value calculations, evaluated for the first two sensitivities:

- NYISO 2022 LCR model at Level of Excess (LOE)
- NYISO 2022 RNA for model year 2030

The capacity value calculations were performed for the same list of marginal units, as presented in previous presentations:

Only includes the 50 MW and 100 MW sizes for incremental units, to reduce the number of simulations

Both ELCC and MRI techniques were applied to the results

Reference

For methodology, assumptions, and more details please refer to previous presentations:

- 3/31: https://www.nyiso.com/documents/20142/29607069/3%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0331.pdf
- 4/28: https://www.nyiso.com/documents/20142/30276257/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0428.pdf
- 5/24: https://www.nyiso.com/documents/20142/30888946/2%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0524.pdf
- 6/28: https://www.nyiso.com/documents/20142/31830389/GE-Support-for-NYISO-Capacity-Accreditation-Project-0628.pdf

The base results (based on the 2022 LCR database) were previously presented at ICAPWG meetings:

- 04/28: 5% and 10% EFOR Thermal, Solar, Offshore Wind
- 05/24: Large Hydro, and the 2/4/6/8-hour Energy Duration Limited
- 06/28: Onshore Wind, Run of River Hydro, Landfill Biomass

2022 Level of Excess (LOE) Results

First sensitivity: Level of Excess (LOE) database

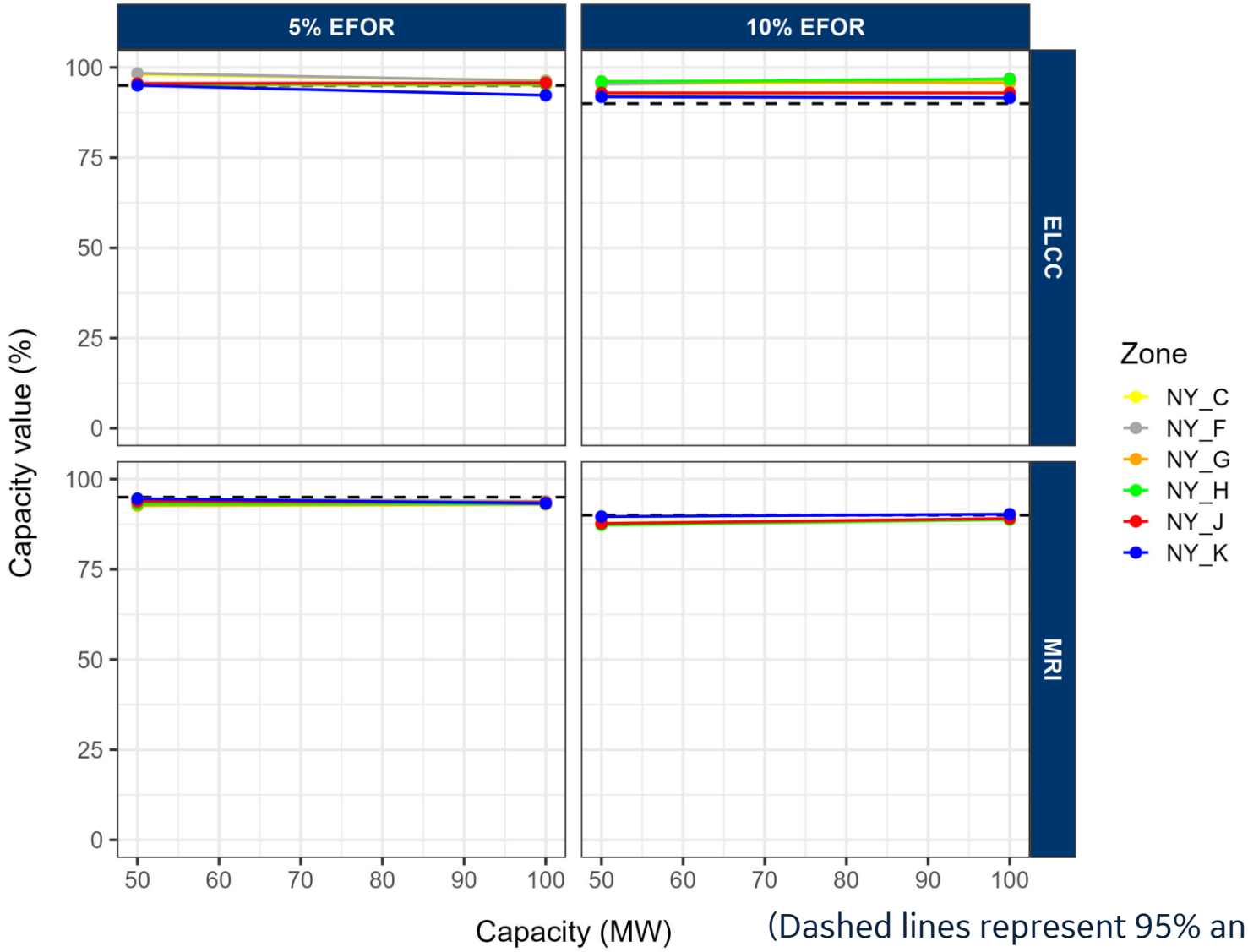
For the first proposed sensitivity, we performed the capacity value calculations using the LOE database

In layman's terms, the LOE database is very similar to the 2022 LCR database used to date, but has increased margins, which lead to a smaller base-case LOLE of 0.0548 days/year (instead of 0.10006)

The graphs in the next slides are organized as follows:

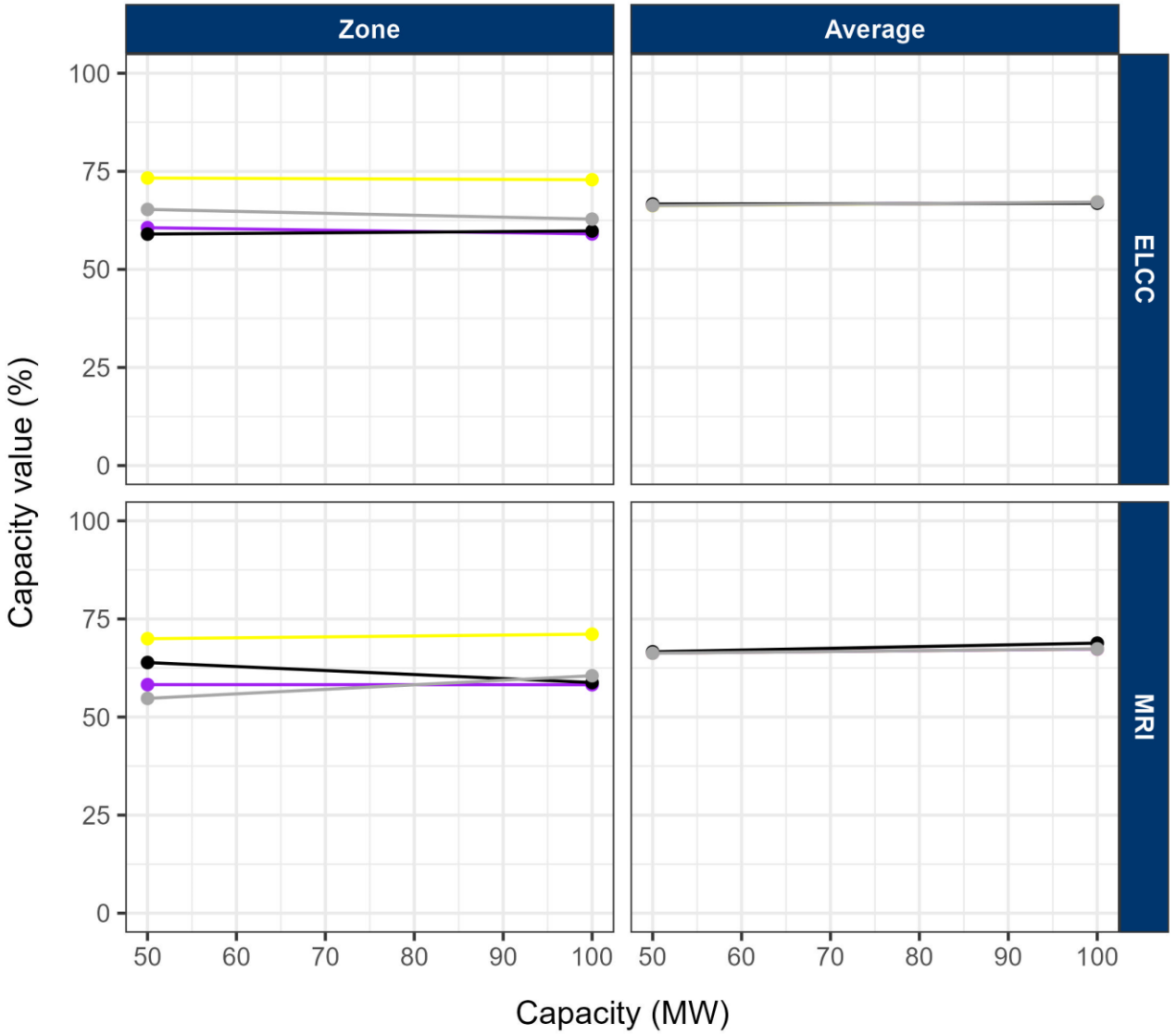
- Top row shows the ELCC technique results, bottom shows MRI results
- Columns show different cases modeled (e.g., different EFOR, shape, or ELR duration)
- Horizontal axis shows capacity of incremental unit (50 or 100 MW)
- Colors represent location of the unit
- Values are normalized, as percentage of nameplate capacity of the incremental unit

Thermal - ELCC and MRI capacity values (%)



(Dashed lines represent 95% and 90%, respectively)

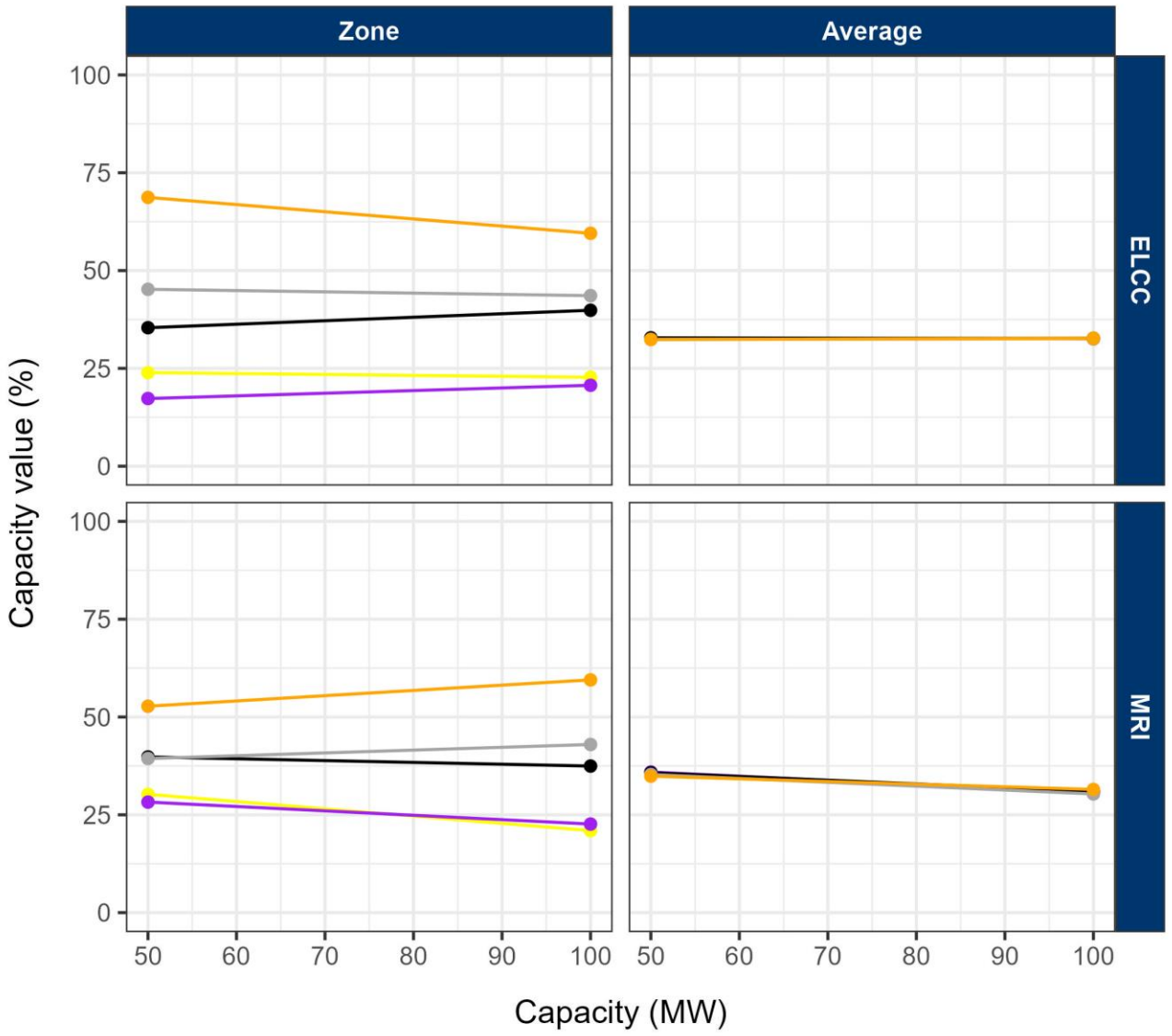
Landfill biomass - ELCC and MRI capacity values (%)



Zone = each zone uses a different shape

Average = all zones use the same shape

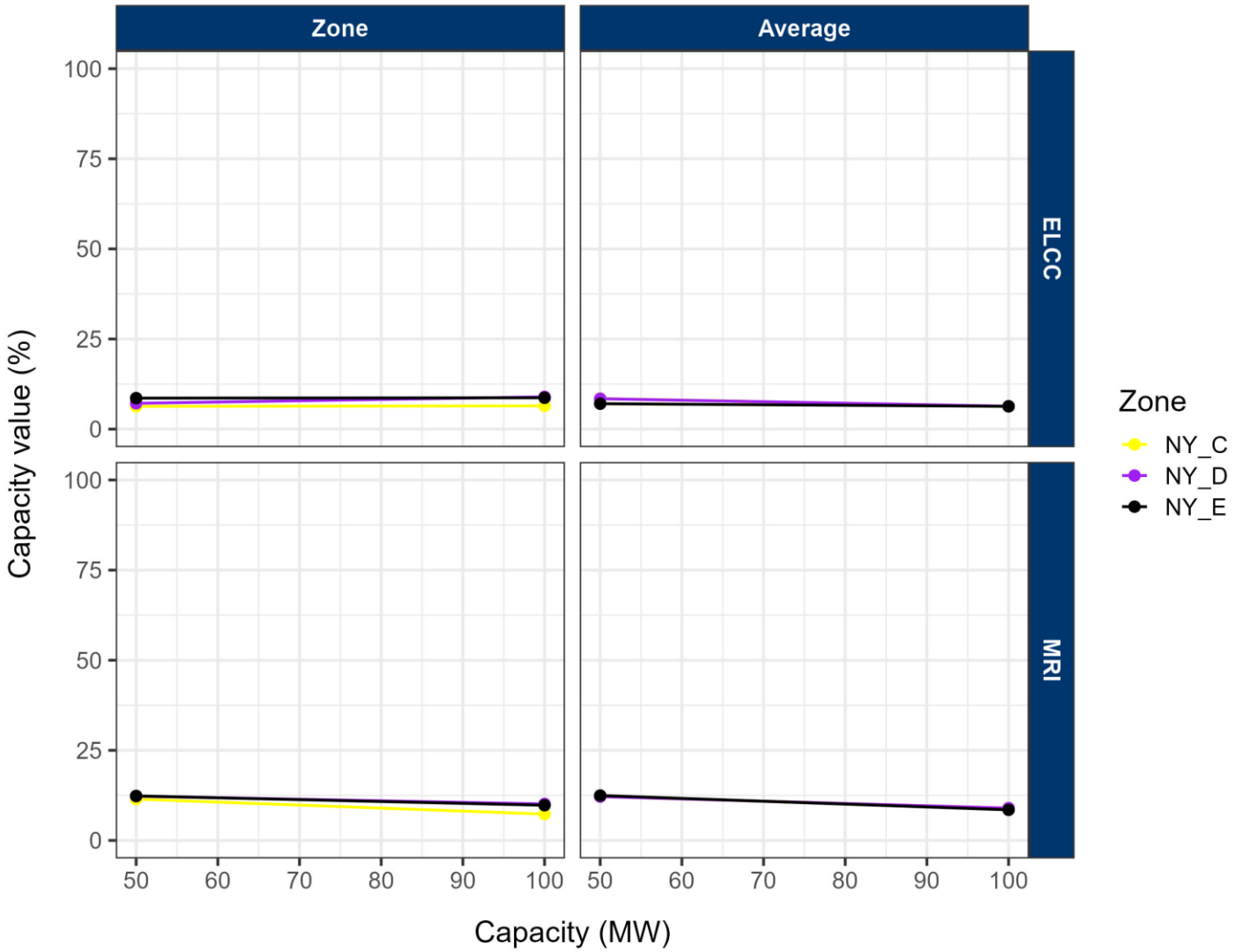
Run-of-river - ELCC and MRI capacity values (%)



Zone = each zone uses a different shape

Average = all zones use the same shape

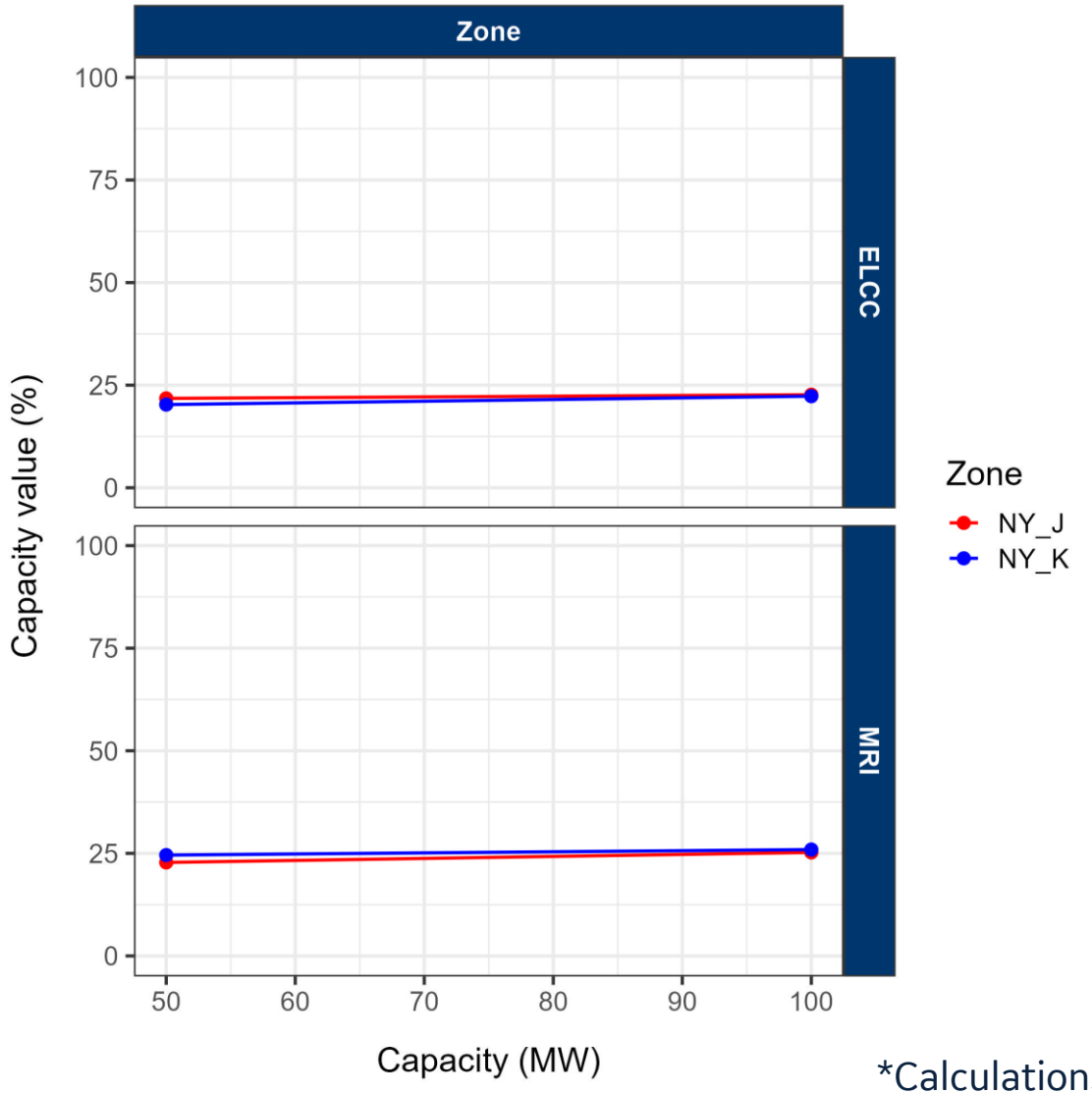
Onshore wind - ELCC and MRI capacity values (%)



Zone = each zone uses a different shape

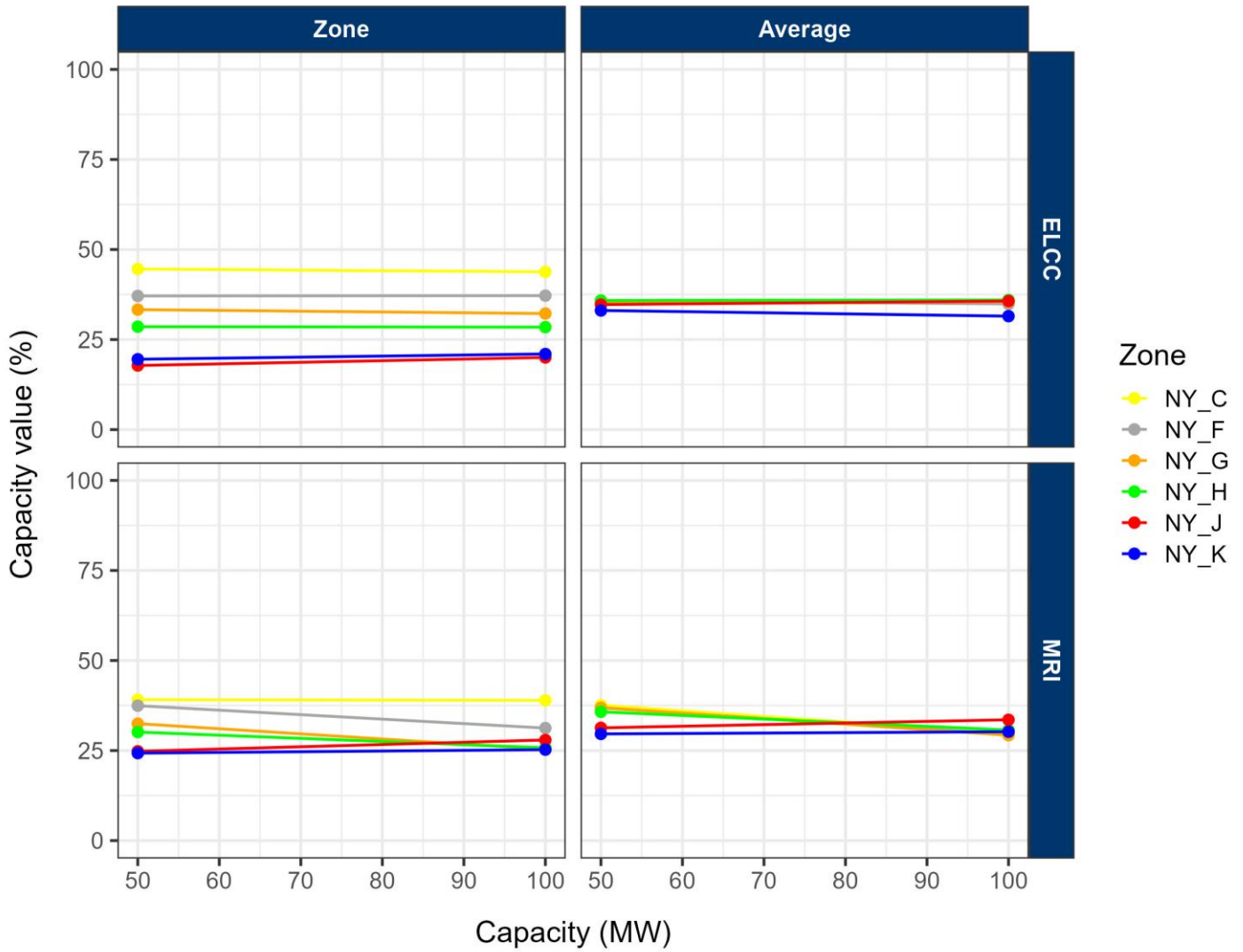
Average = all zones use the same shape

Offshore wind - ELCC and MRI capacity values (%)



*Calculations use simulated data

Solar – ELCC and MRI capacity values (%)

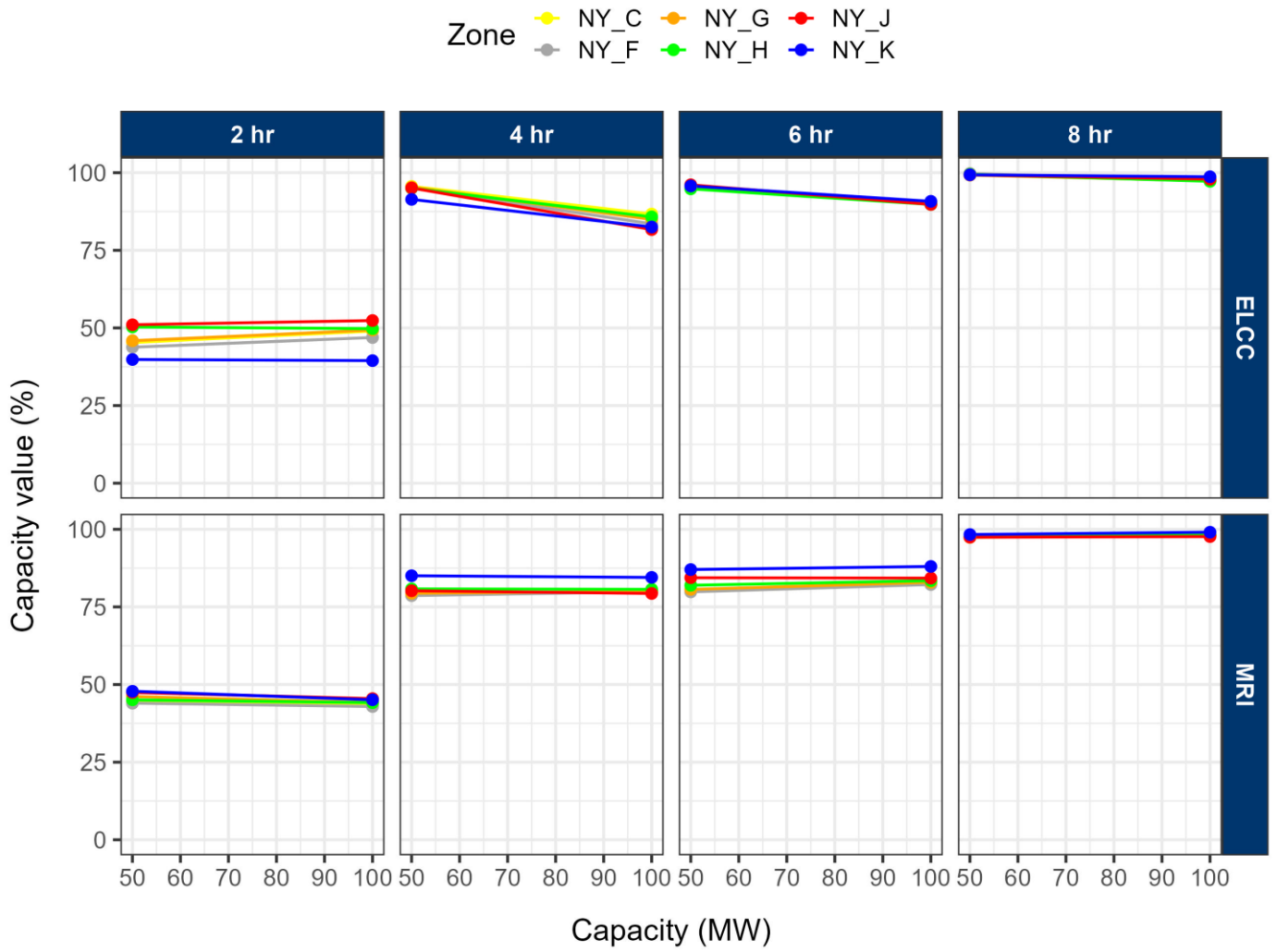


Zone = each zone uses a different shape

Average = all zones use the same shape

*Simulations use behind-the-meter shapes

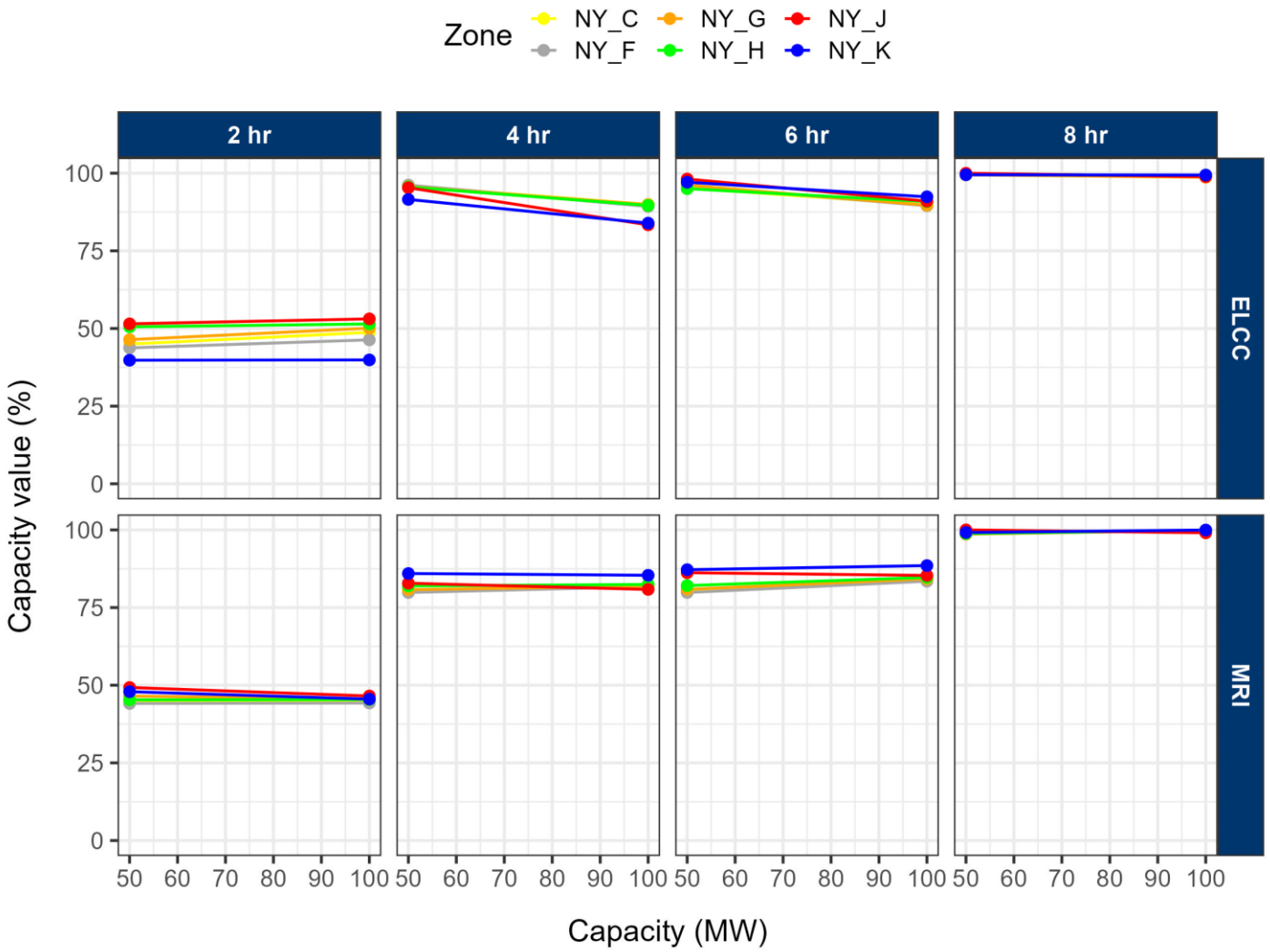
Energy Duration Limited – Shape-based model
ELCC and MRI capacity values (%)



Shape = fixed shape dispatch

Dynamic = MARS dispatch algorithm

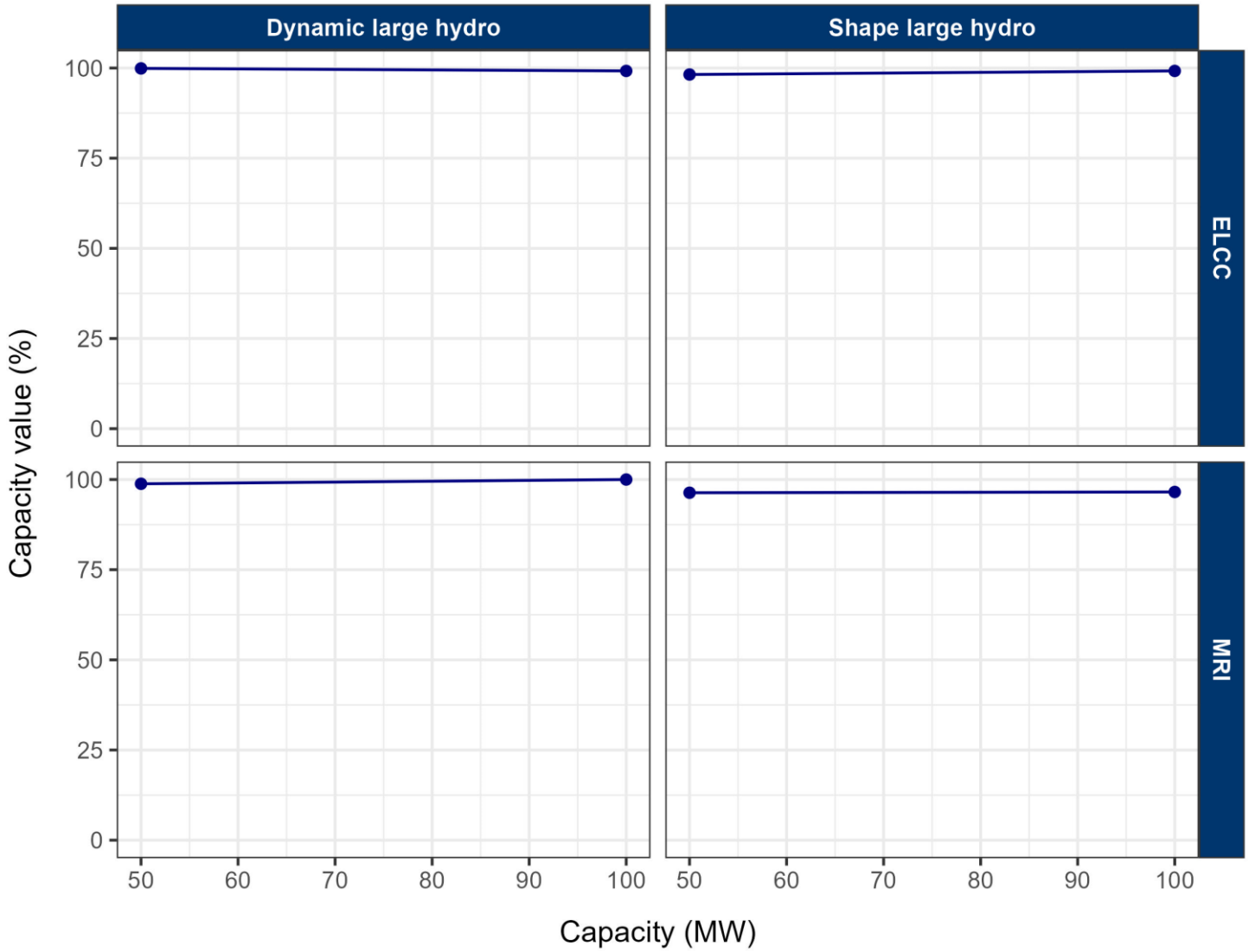
Energy Duration Limited – Dynamic model
ELCC and MRI capacity values (%)



Shape = fixed shape dispatch

Dynamic = MARS dispatch algorithm

Large Hydro - ELCC and MRI capacity values (%)



Shape = fixed shape dispatch

Dynamic = MARS dispatch algorithm

2022 LOE Capacity Value Results (MW)
50-MW incremental unit

		ELCC								MRI							
Class	**Subtype**	**NY_C**	**NY_D**	**NY_E**	**NY_F**	**NY_G**	**NY_H**	**NY_J**	**NY_K**	**NY_C**	**NY_D**	**NY_E**	**NY_F**	**NY_G**	**NY_H**	**NY_J**	**NY_K**
Thermal	5% EFOR	49.0			49.2	47.6	47.7	47.8	47.5	46.7			47.3	46.3	46.6	46.9	47.3
	10% EFOR	47.7			47.7	48.1	48.0	46.5	45.9	43.8			43.8	43.9	43.6	43.8	44.8
Biomass	Zone	36.6	30.3	29.5	32.6					35.0	29.1	31.9	27.4				
	Average	33.1	33.2	33.3	33.1					33.2	33.2	33.3	33.1				
Run of river	Zone	12.0	8.6	17.7	22.6	34.4				15.1	14.1	19.9	19.7	26.4			
	Average	16.2	16.3	16.4	16.2	16.2				17.9	18.0	17.9	17.6	17.4			
Onshore wind	Zone	3.2	3.6	4.3						5.7	6.1	6.2					
	Average	4.2	4.2	3.5						6.1	6.1	6.2					
Offshore wind	Zone							10.9	10.1							11.4	12.3
Solar	Zone	22.3			18.6	16.7	14.3	8.9	9.8	19.6			18.7	16.2	15.1	12.4	12.1
	Average	17.8			17.9	17.7	17.9	17.4	16.5	18.8			18.4	18.5	17.9	15.7	14.8
Shape ELR	2h	22.7			21.9	22.9	25.2	25.5	19.9	22.3			22.0	23.1	22.5	23.7	23.9
	4h	47.8			47.5	47.7	47.5	47.5	45.7	39.4			39.3	39.7	40.4	40.1	42.5
	6h	47.9			47.6	47.5	47.4	48.0	47.9	40.0			39.9	40.3	41.0	42.2	43.5
	8h	49.6			49.9	49.6	49.7	49.6	49.7	48.7			48.7	48.8	48.8	48.7	49.2
Dynamic ELR	2h	22.5			21.9	23.2	25.3	25.7	19.9	22.4			22.1	23.2	22.6	24.6	24.0
	4h	48.0			48.1	47.8	47.8	47.7	45.8	40.1			39.9	40.4	41.0	41.4	43.0
	6h	47.6			48.1	48.1	47.5	49.1	48.5	40.1			39.9	40.4	41.0	43.1	43.6
	8h	49.9			49.9	49.7	49.9	50.0	49.7	49.3			49.3	49.3	49.4	50.0	49.6
Large hydro	Dynamic	49.9								49.4							
	Shape	49.1								48.2							

2022 LOE Capacity Value Results (MW)
100-MW incremental unit

		ELCC								MRI							
Class	**Subtype**	**NY_C**	**NY_D**	**NY_E**	**NY_F**	**NY_G**	**NY_H**	**NY_J**	**NY_K**	**NY_C**	**NY_D**	**NY_E**	**NY_F**	**NY_G**	**NY_H**	**NY_J**	**NY_K**
Thermal	5% EFOR	96.4			96.3	95.2	95.4	95.7	92.3	93.4			93.9	93.0	93.2	93.5	93.3
	10% EFOR	96.1			96.9	95.7	96.8	93.0	91.6	88.8			88.8	89.0	88.8	89.1	90.3
Biomass	Zone	72.9	59.0	59.8	62.8					71.1	58.2	58.8	60.5				
	Average	67.1	67.1	66.9	67.2					67.3	67.3	68.8	67.4				
Run of river	Zone	22.7	20.7	39.9	43.6	59.5				21.0	22.6	37.5	43.0	59.5			
	Average	32.8	32.7	32.6	32.6	32.6				30.6	30.6	31.0	30.3	31.5			
Onshore wind	Zone	6.5	9.0	8.7						7.3	10.1	9.8					
	Average	6.3	6.4	6.3						9.0	9.0	8.5					
Offshore wind	Zone							22.7	22.3							25.2	25.9
Solar	Zone	43.8			37.2	32.2	28.4	20.0	21.0	39.0			31.2	25.4	25.7	27.9	25.2
	Average	35.0			34.9	35.5	36.0	35.7	31.5	29.8			29.5	29.3	30.7	33.5	30.2
Shape ELR	2h	49.0			46.9	49.3	49.8	52.4	39.5	43.4			42.9	44.2	44.2	45.5	45.1
	4h	86.7			83.5	84.9	85.8	81.7	82.5	80.0			79.9	80.0	80.7	79.3	84.5
	6h	90.4			89.8	90.3	89.8	89.8	90.8	82.3			82.2	82.9	83.5	84.3	88.0
	8h	98.1			97.5	97.4	97.2	97.9	98.7	98.2			98.1	98.1	98.1	97.7	99.1
Dynamic ELR	2h	48.8			46.3	50.1	51.5	53.1	39.9	44.7			44.3	45.5	45.4	46.5	45.5
	4h	89.9			89.3	89.9	89.6	83.4	83.9	81.8			81.7	81.9	82.4	80.8	85.4
	6h	89.8			89.5	89.7	90.9	91.0	92.4	83.6			83.5	84.3	84.7	85.3	88.5
	8h	99.0			99.1	98.7	99.1	98.9	99.4	99.9			99.9	99.9	99.8	99.1	100.0
Large hydro	Dynamic	99.2								100.0							
	Shape	99.2								96.6							

2022 RNA 2030 Base Case Results

Second sensitivity: Reliability Needs Assessment (RNA) database (I)

The second sensitivity uses the 2022 1st pass Base Case Study for study year 2030, recently assembled by the NYISO RNA team

GE used the LCR Optimizer to bring the RNA Base Case for year 2030 to the at criteria LOLE of 0.1

The IRM and LCRs selected as the least-cost requirements by the LCR Optimizer are shown on the right for year 2030 of the RNA Base Case and compared to the current IRM and LCRs

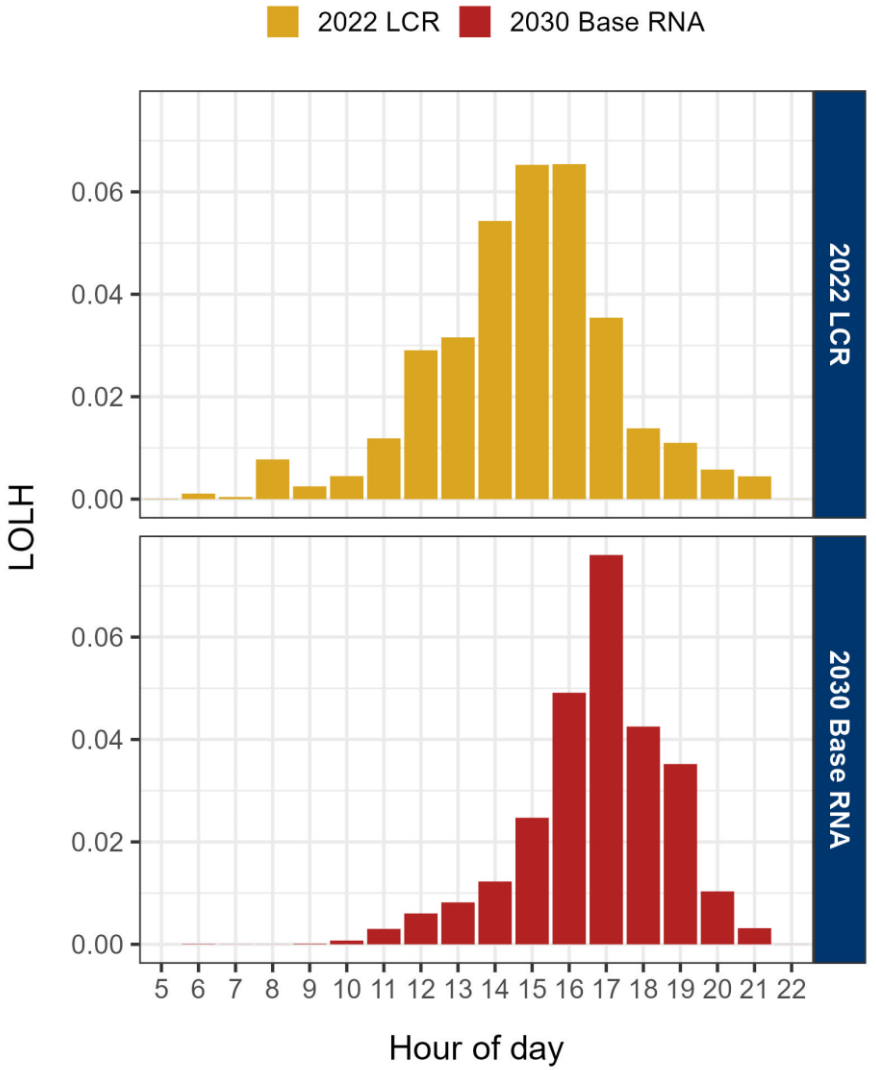
	Current	RNA Base Case 2030
NYCA IRM	119.6%	126.2%
G-J LCR	89.2%	84.2%
J LCR	81.2%	98.1%
K LCR	99.5%	114.5%

Second sensitivity: Reliability Needs Assessment (RNA) database (II)

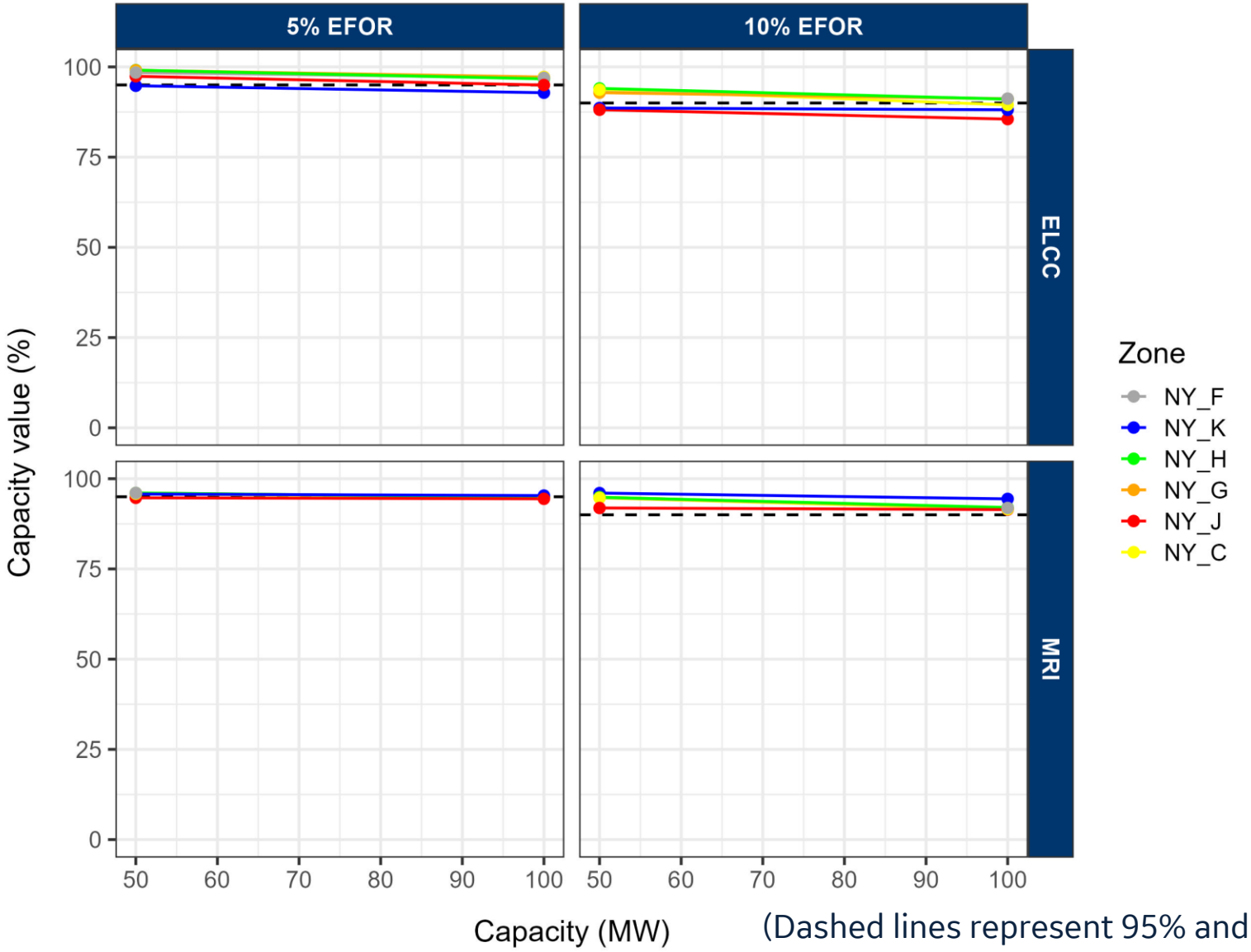
The hourly LOLE distribution shifts to later in the day for study year 2030 of the 2022 1st pass Base Case Study in comparison to the hourly LOLE distribution from the 2022 NYISO LCR database, as shown in the table and figures

- Highlighted in yellow below are the four hours with the highest percentage of total hourly LOLE in each case

HB	2022 LCR	RNA Base Case Year 2030
10	1.3%	0.3%
11	3.4%	1.1%
12	8.4%	2.2%
13	9.2%	3.0%
14	15.8%	4.5%
15	19.0%	9.1%
16	19.0%	18.1%
17	10.3%	28.0%
18	4.0%	15.7%
19	3.2%	13.0%
20	1.7%	3.8%
21	1.3%	1.2%

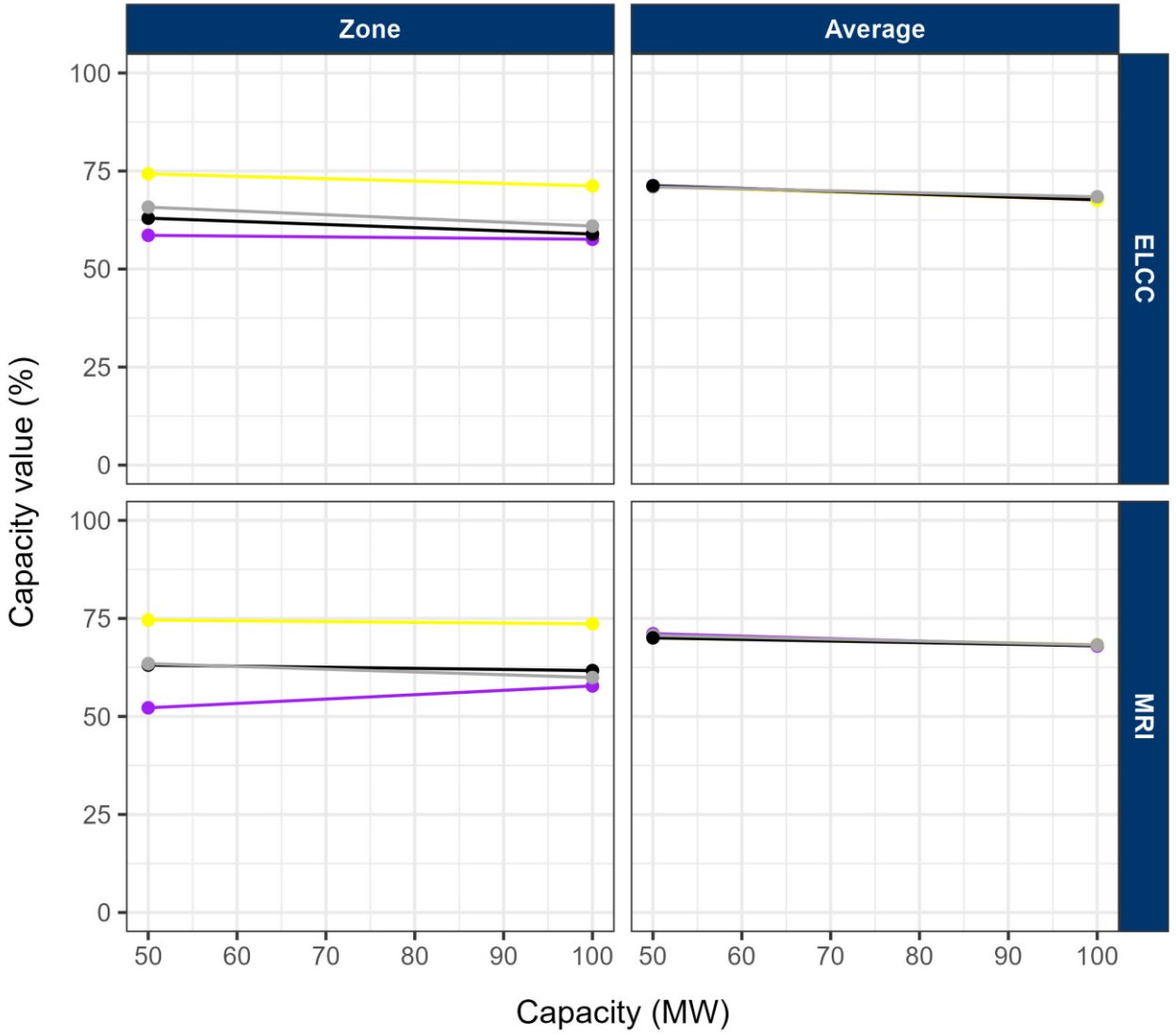


Thermal - ELCC and MRI capacity values (%)



(Dashed lines represent 95% and 90%, respectively)

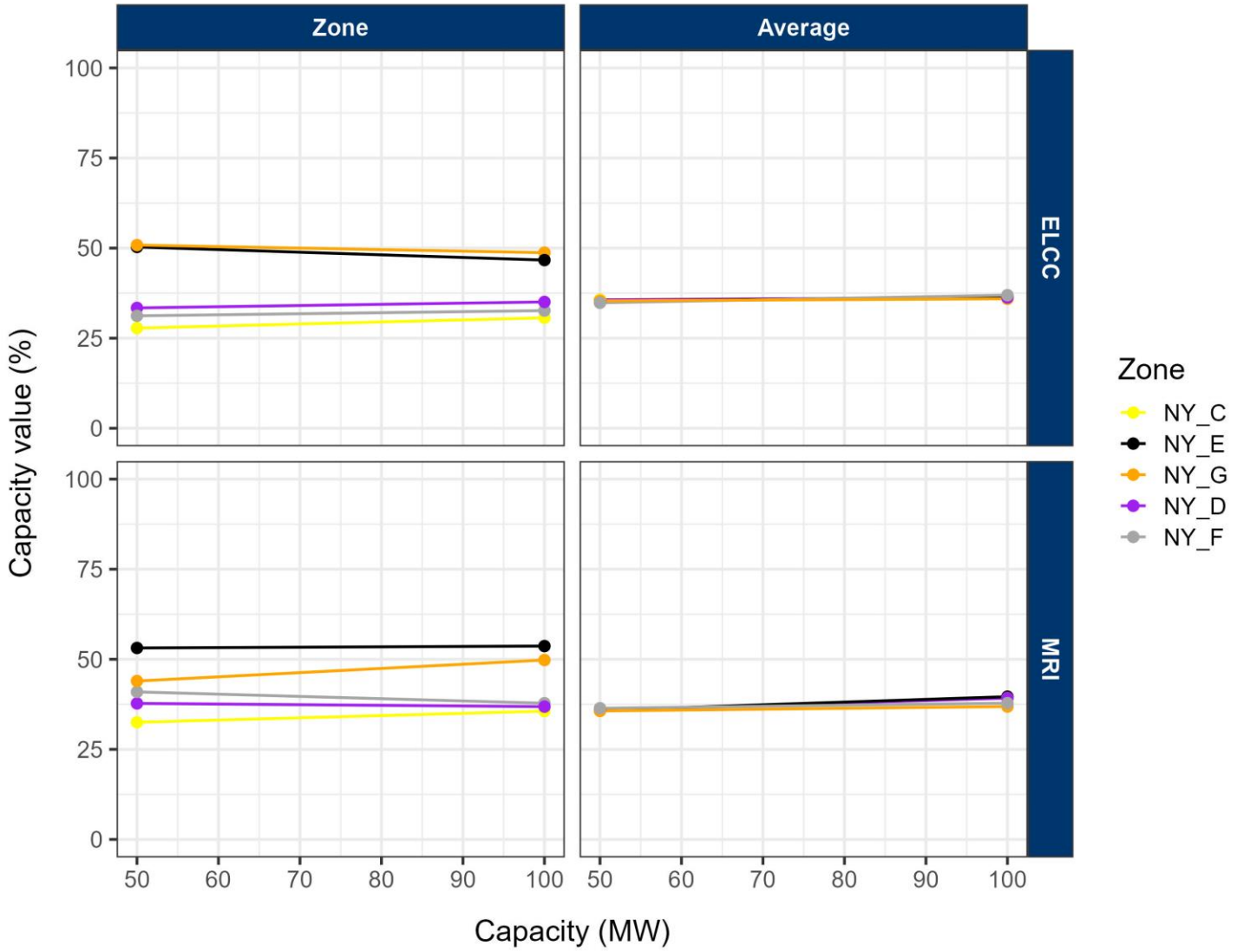
Landfill biomass - ELCC and MRI capacity values (%)



Zone = each zone uses a different shape

Average = all zones use the same shape

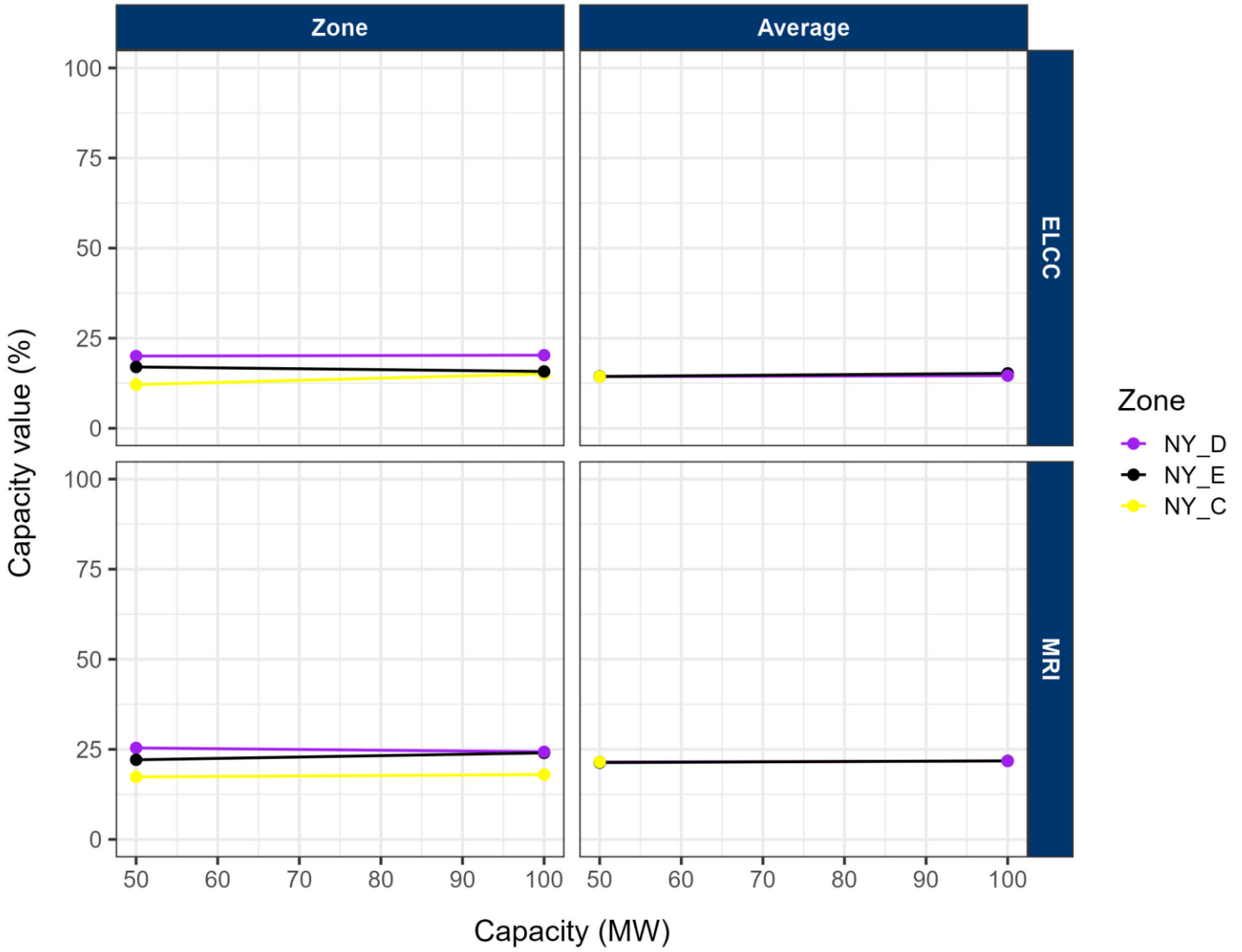
Run-of-river - ELCC and MRI capacity values (%)



Zone = each zone uses a different shape

Average = all zones use the same shape

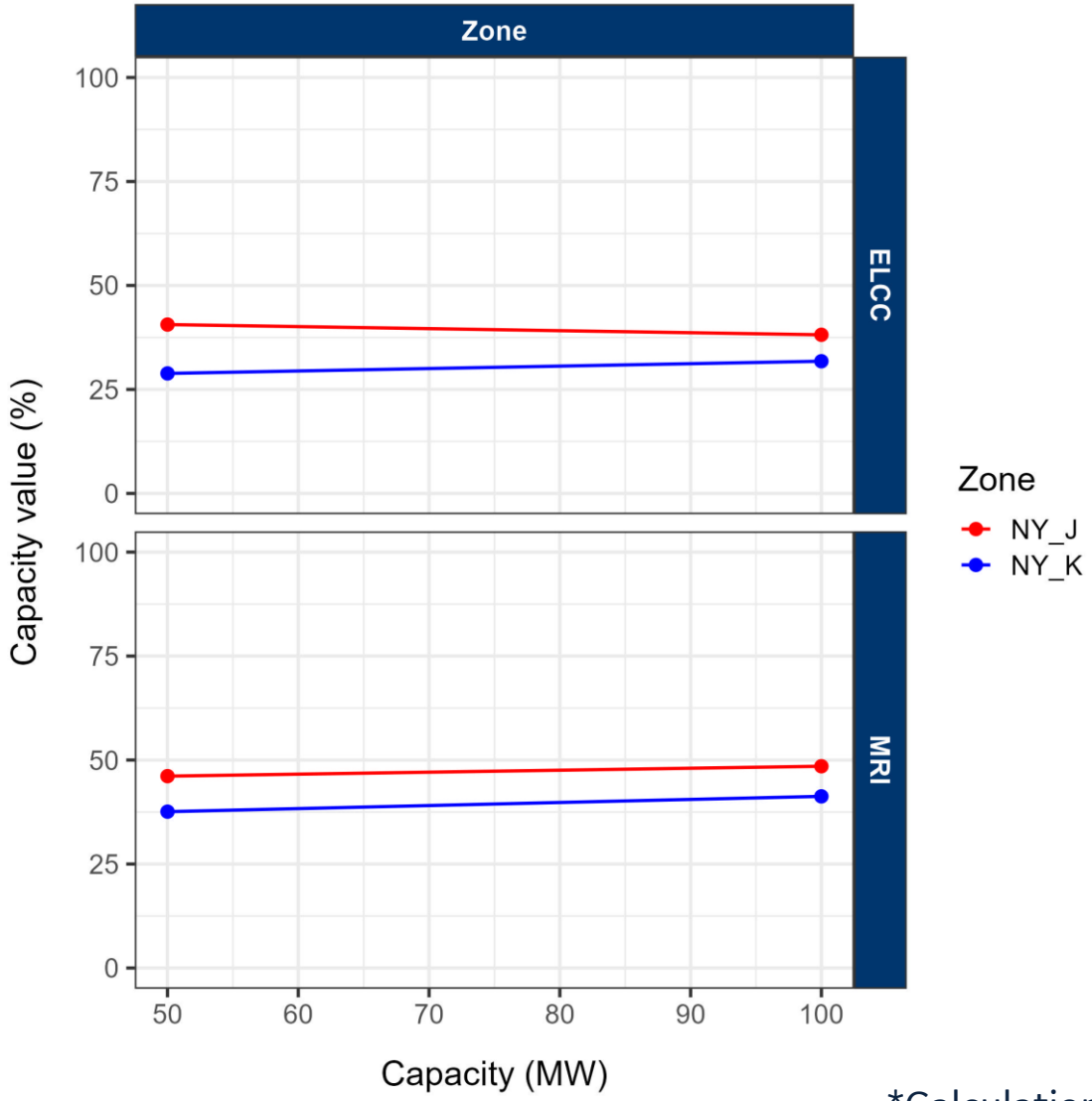
Onshore wind - ELCC and MRI capacity values (%)



Zone = each zone uses a different shape

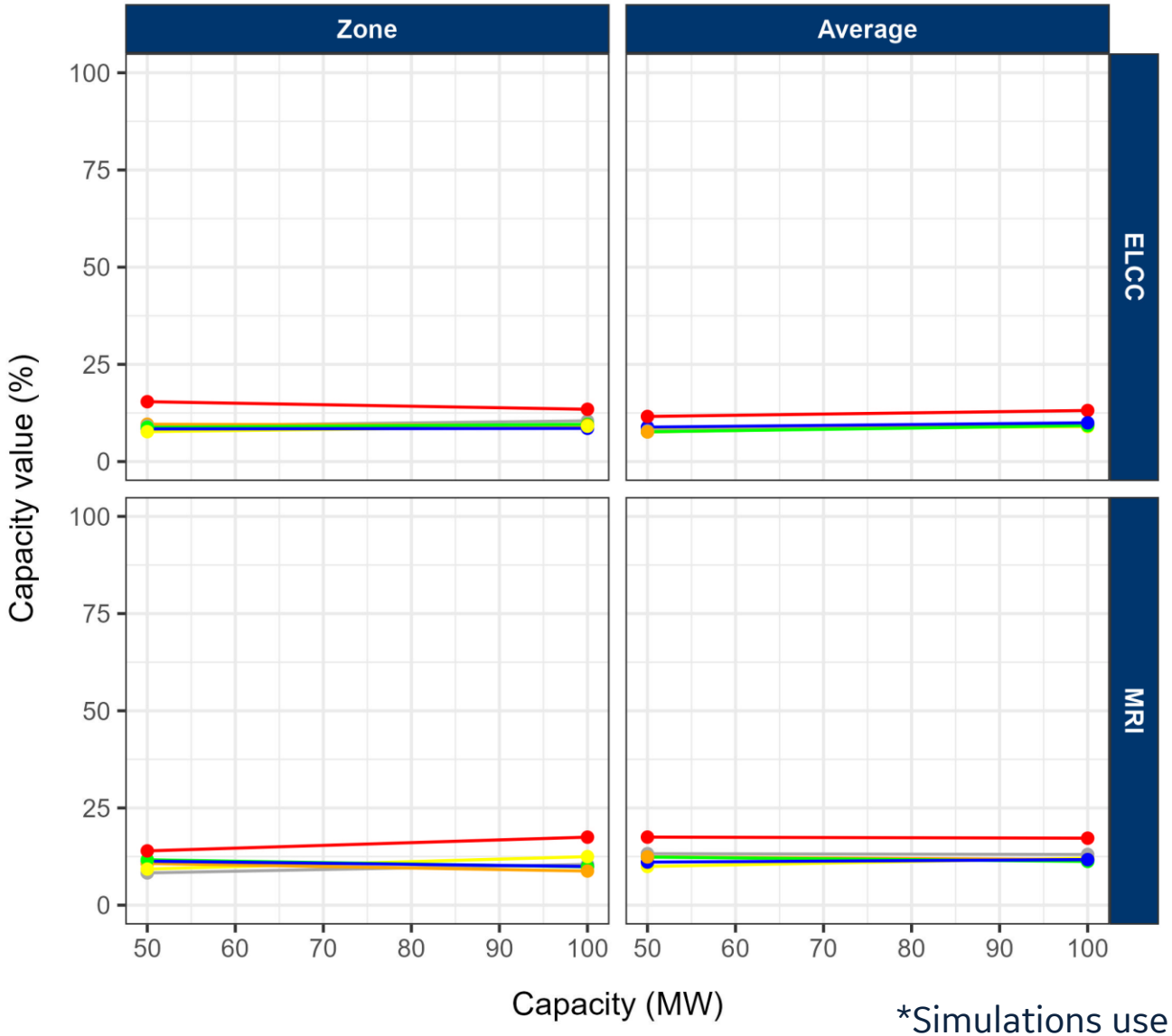
Average = all zones use the same shape

Offshore wind - ELCC and MRI capacity values (%)



*Calculations use simulated data

Solar – ELCC and MRI capacity values (%)

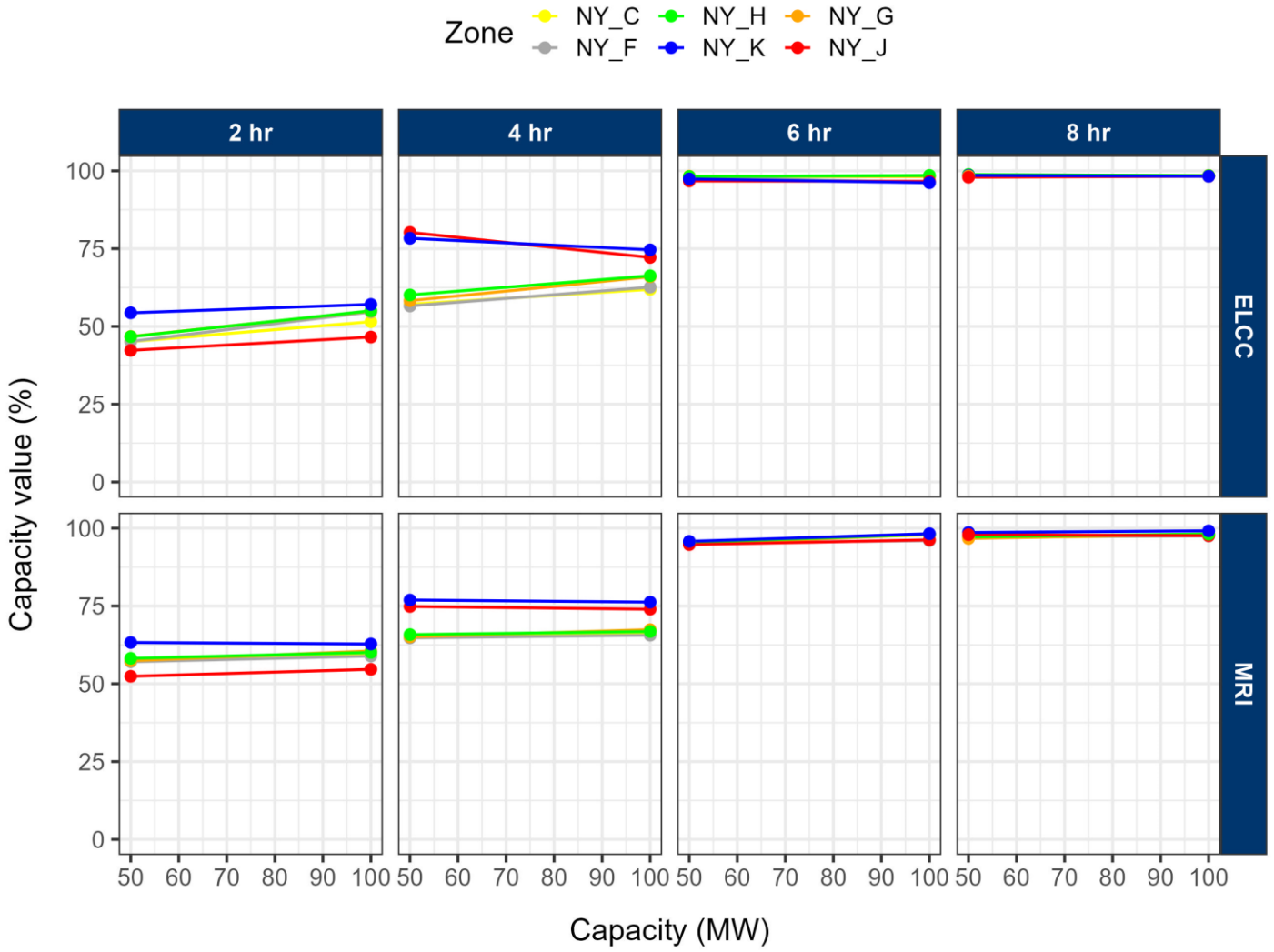


Zone = each zone uses a different shape

Average = all zones use the same shape

*Simulations use behind-the-meter shapes

Energy Duration Limited – Shape-based model
ELCC and MRI capacity values (%)

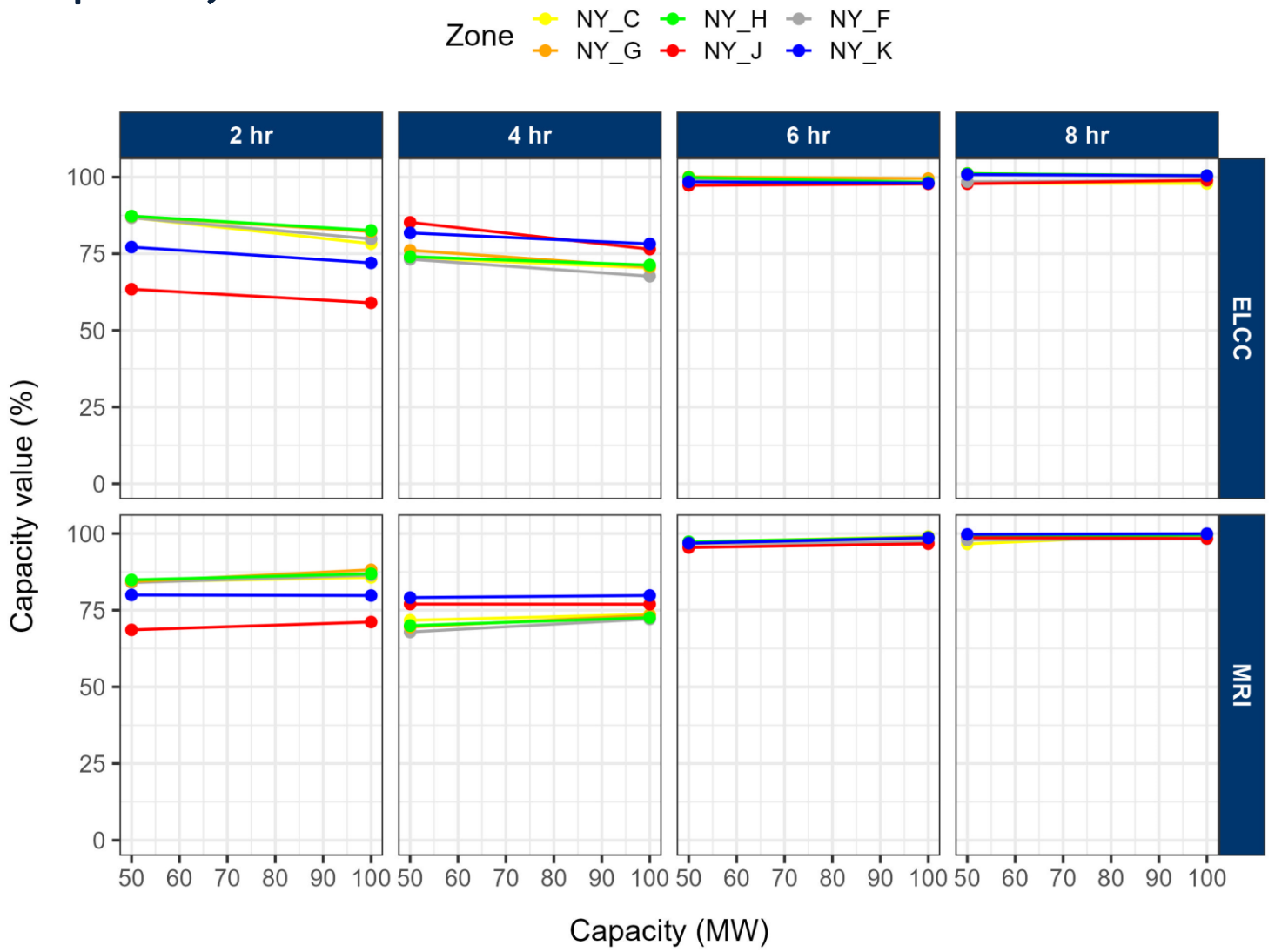


Shape = fixed shape dispatch

Dynamic = MARS dispatch algorithm

Dispatch shifted back 1 hour to match events hours

Energy Duration Limited – Dynamic model
ELCC and MRI capacity values (%)

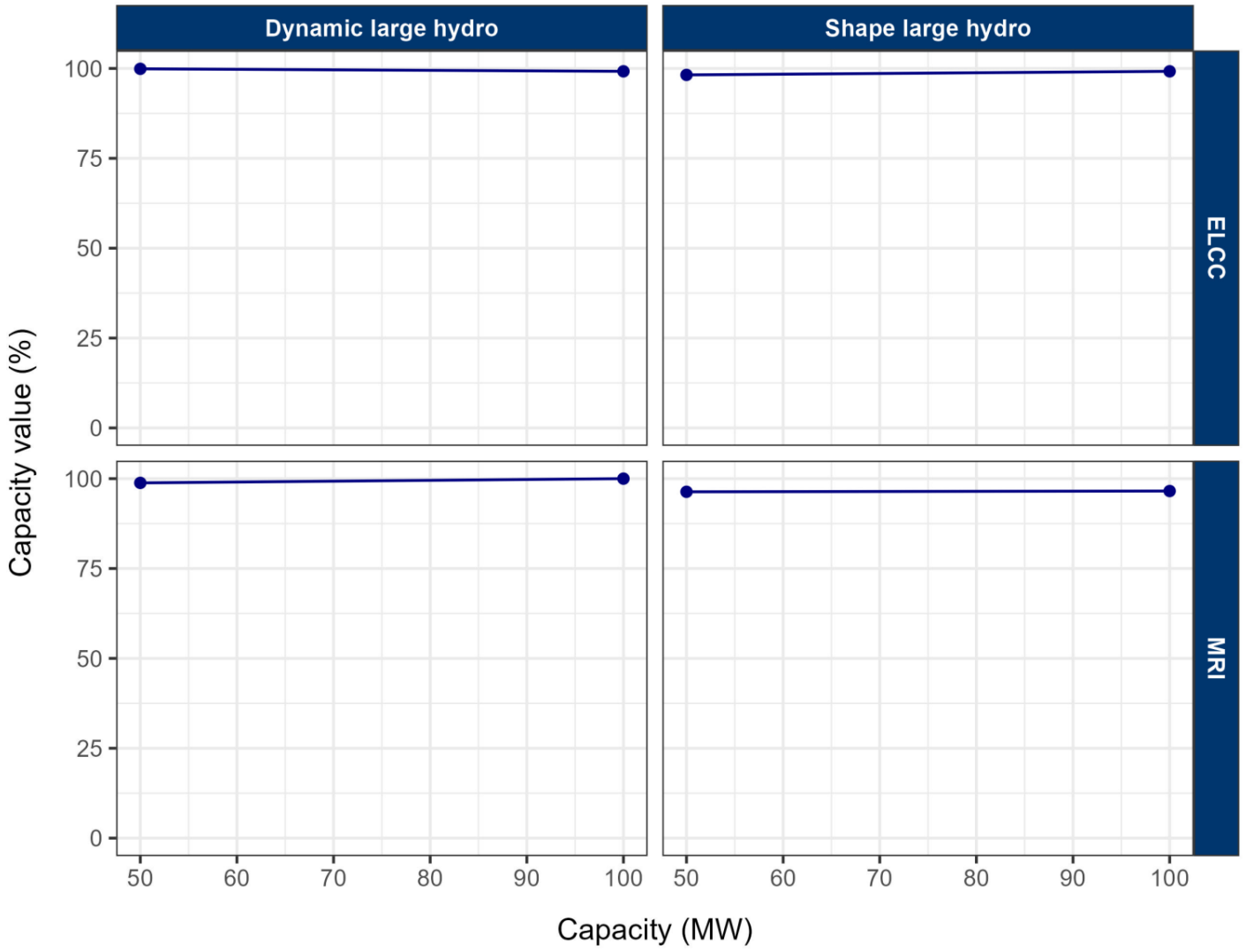


Shape = fixed shape dispatch

Dynamic = MARS dispatch algorithm

Dispatch shifted back 1 hour to match events hours

Large Hydro - ELCC and MRI capacity values (%)



Shape = fixed shape dispatch

Dynamic = MARS dispatch algorithm

2023 RNA 2030 Base Case Capacity Value Results (MW)
50-MW incremental unit

		ELCC								MRI							
Class	**Subtype**	**NY_C**	**NY_D**	**NY_E**	**NY_F**	**NY_G**	**NY_H**	**NY_J**	**NY_K**	**NY_C**	**NY_D**	**NY_E**	**NY_F**	**NY_G**	**NY_H**	**NY_J**	**NY_K**
Thermal	5% EFOR	49.2			49.2	49.5	49.6	48.7	47.4	47.9			48.0	48.0	48.0	47.4	47.9
	10% EFOR	46.8			46.5	46.4	47.0	44.1	44.3	47.3			47.4	47.4	47.4	45.9	48.0
Biomass	Zone	37.1	29.3	31.5	32.9					37.3	26.1	31.6	31.7				
	Average	35.5	35.6	35.6	35.5					35.2	35.5	35.0	35.3				
Run of river	Zone	13.9	16.7	25.2	15.6	25.4				16.3	18.9	26.6	20.5	22.0			
	Average	17.8	17.8	17.6	17.4	17.7				17.9	17.9	17.9	18.2	17.8			
Onshore wind	Zone	6.1	10.0	8.5						8.7	12.7	11.1					
	Average	7.2	7.2	7.2						10.7	10.7	10.7					
Offshore wind	Zone							20.3	14.4							23.1	18.8
Solar	Zone	3.8			4.6	4.8	4.4	7.7	4.2	4.6			4.1	5.4	5.8	7.0	5.7
	Average	4.2			3.9	3.8	3.8	5.8	4.4	5.0			6.6	6.2	6.2	8.8	5.5
Shape ELR	2h	22.6			22.6	23.4	23.4	21.2	27.2	28.6			28.5	28.7	29.1	26.2	31.6
	4h	28.6			28.3	29.1	30.1	40.1	39.2	32.5			32.4	32.5	32.9	37.4	38.5
	6h	49.1			49.0	49.1	49.1	48.4	48.7	47.8			47.6	47.4	47.7	47.4	47.9
	8h	49.3			49.4	49.2	49.4	49.0	49.3	48.5			48.6	48.4	48.6	49.0	49.3
Dynamic ELR	2h	43.4			43.4	43.6	43.6	31.7	38.6	42.1			42.0	42.2	42.4	34.3	40.0
	4h	36.9			36.6	38.1	37.0	42.6	40.9	35.9			33.9	34.8	35.0	38.5	39.6
	6h	49.4			49.5	50.0	49.9	48.6	49.2	48.6			48.3	48.4	48.7	47.7	48.4
	8h	49.0			49.3	50.0	50.0	48.9	50.0	48.3			49.0	49.7	49.6	49.3	49.9
Large hydro	Dynamic	50.0								48.0							
	Shape	48.8								47.5							

2023 RNA 2030 Base Case Capacity Value Results (MW)
100-MW incremental unit

		ELCC								MRI							
Class	**Subtype**	**NY_C**	**NY_D**	**NY_E**	**NY_F**	**NY_G**	**NY_H**	**NY_J**	**NY_K**	**NY_C**	**NY_D**	**NY_E**	**NY_F**	**NY_G**	**NY_H**	**NY_J**	**NY_K**
Thermal	5% EFOR	97.2			97.0	97.2	96.7	95.0	92.8	94.8			94.8	94.8	94.9	94.4	95.3
	10% EFOR	89.5			91.2	91.2	91.1	85.5	88.1	91.6			91.9	91.8	92.0	91.4	94.4
Biomass	Zone	71.2	57.6	58.9	61.0					73.6	57.8	61.7	59.9				
	Average	67.6	67.6	67.7	68.4					68.3	68.0	68.0	68.2				
Run of river	Zone	30.6	35.1	46.7	32.7	48.7				35.6	36.9	53.7	37.8	49.8			
	Average	36.3	36.3	36.5	36.9	35.9				39.2	39.2	39.6	37.8	36.9			
Onshore wind	Zone	15.1	20.3	15.8						18.0	24.3	24.0					
	Average	14.6	14.6	15.2						21.8	21.8	21.8					
Offshore wind	Zone							38.1	31.8							48.5	41.3
Solar	Zone	9.1			10.5	9.3	9.6	13.4	8.5	12.5			10.5	8.8	9.9	17.5	9.9
	Average	9.0			9.5	9.5	9.3	13.1	10.0	12.1			13.0	11.7	11.3	17.2	11.7
Shape ELR	2h	51.5			54.7	54.9	55.0	46.6	57.1	59.5			58.9	60.6	60.1	54.6	62.8
	4h	61.9			62.6	66.0	66.3	72.2	74.6	66.0			65.6	67.4	66.8	74.0	76.2
	6h	98.2			96.3	98.3	98.5	96.6	96.2	97.9			96.0	98.1	98.1	96.3	98.2
	8h	98.4			98.5	98.5	98.4	98.3	98.3	97.6			97.5	98.1	98.1	97.6	99.2
Dynamic ELR	2h	78.3			79.9	82.2	82.6	59.0	72.0	85.7			86.4	88.2	86.9	71.1	79.8
	4h	70.4			67.7	70.7	71.3	76.5	78.2	73.7			72.1	73.4	72.6	76.9	79.8
	6h	98.0			98.1	99.5	98.3	97.8	98.0	99.0			97.3	98.8	98.7	96.7	98.6
	8h	97.9			98.9	100.0	100.0	99.0	100.0	99.9			98.3	99.8	99.5	98.4	99.9
Large hydro	Dynamic	100.0								99.4							
	Shape	96.4								98.2							

10/27/2022 ICAPWG

Capacity Value Results for 2022 RNA 2030 Cases and IRM 2023 PBC Cases

Eduardo Ibanez, Ph.D.; Mitch Bringolf

GE Energy consulting

Reposted: 11/09/2022

Overview

This slide deck summarizes the capacity value calculations, evaluated for the following sensitivities:

- Preliminary NYISO 2022 RNA Base Case for model year 2030 *(presented at the 9/30/22 ICAPWG)*
- Re-optimized NYISO 2022 RNA Base Case for model year 2030
- Preliminary NYISO 2022 RNA Policy Case for model year 2030
- Re-optimized NYISO 2022 RNA Policy Case for model year 2030
- NYISO 2023 IRM Preliminary Base Case (PBC)
- NYISO 2023 IRM PBC at Level of Excess (LOE)

The capacity value calculations were performed for the same list of marginal units, as presented in previous presentations:

Only includes the 50 MW and 100 MW sizes for incremental units, to reduce the number of simulations

Both ELCC and MRI techniques were applied to most cases

- The ELCC technique was not applied to calculate CAFs for the 2023 PBC LOE case
- The ELCC technique was applied to a subset of units for the re-optimized RNA Base Case and RNA Policy Case

Reference

For methodology, assumptions, and more details please refer to previous presentations:

- 3/31: https://www.nyiso.com/documents/20142/29607069/3%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0331.pdf
- 4/28: https://www.nyiso.com/documents/20142/30276257/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0428.pdf
- 5/24: https://www.nyiso.com/documents/20142/30888946/2%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0524.pdf
- 6/28: https://www.nyiso.com/documents/20142/31830389/GE-Support-for-NYISO-Capacity-Accreditation-Project-0628.pdf

For context, some of the slides also include results for:

- NYISO 2022 IRM LCR database
- NYISO 2022 IRM LCR at Level of Excess (LOE)

Results for all cases are posted in a single spreadsheet, available for download

Preliminary 2022 RNA Base and Policy Cases for Model Year 2030

Reliability Needs Assessment (RNA) database sensitivities

Two sensitivities:

- 2022 1st pass Base Case Study for study year 2030
- 2022 Policy Case Study for study year 2030

The LCR Optimizer was used to bring the RNA Cases for year 2030 to the at criteria LOLE of 0.1

As discussed on the 10/19 meeting, the preliminary results of the RNA 2030 Base and Policy Cases were calculated on at criteria systems that were not fully optimized

- The IRMs and LCRs for the preliminary results are shown in the table on the right
- IRMs, LCRs, and CAF results for the re-optimized cases will be discussed beginning on slide 16

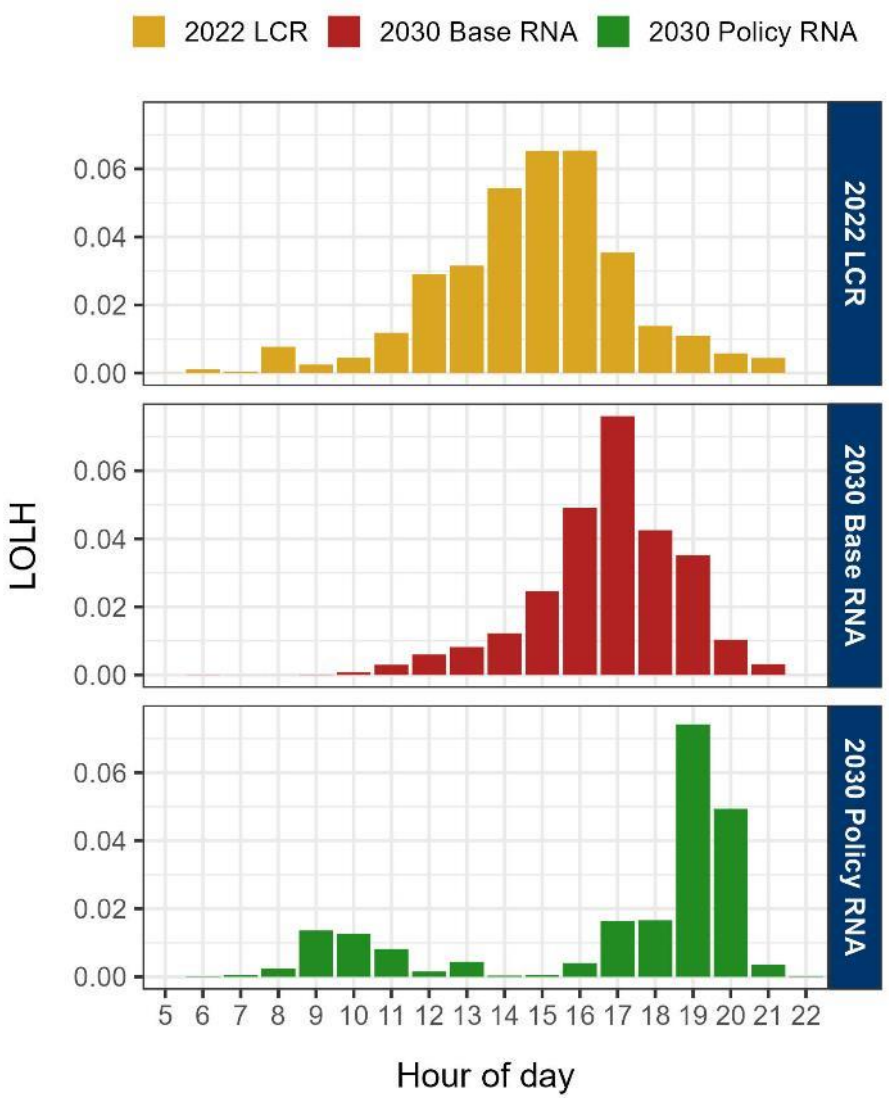
	Preliminary RNA Base Case 2030	Preliminary RNA Policy Case 2030
NYCA IRM	125.5%	162.3%
G-J LCR	80.6%	108.7%
J LCR	80.7%	120.5%
K LCR	109.2%	140.1%

Reliability Needs Assessment (RNA) database sensitivities (II)

The hourly LOLE distribution shifts to later in the day for study year 2030 of the 2022 1st pass Base Case Study in comparison to the hourly LOLE distribution from the 2022 NYISO LCR database, as shown in the figure

The RNA Policy Case has more behind-the-meter and utility-scale solar, which reduces the risk in the middle of the day, which moves to hours after sunset and before dawn

Capacity value results for year 2030 of the 2022 RNA Policy Case may not be representative of expected capacity values due to limitations in the modeling of energy storage at high renewable and energy storage penetration levels



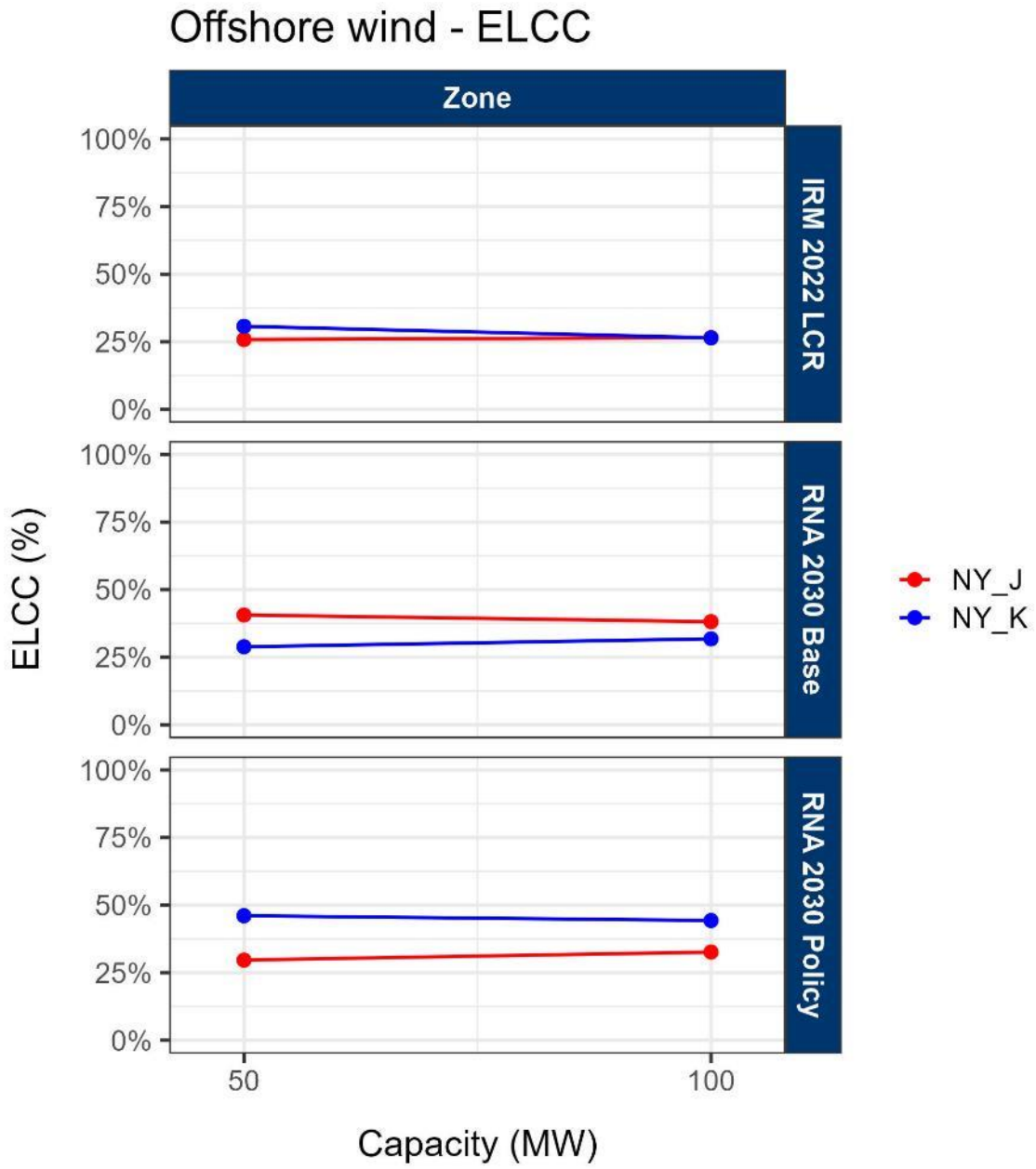
Comparison of preliminary RNA 2030 cases and IRM 2022 LCR

Table with capacity value for 100 MW size, averaged across zones

Biggest changes:

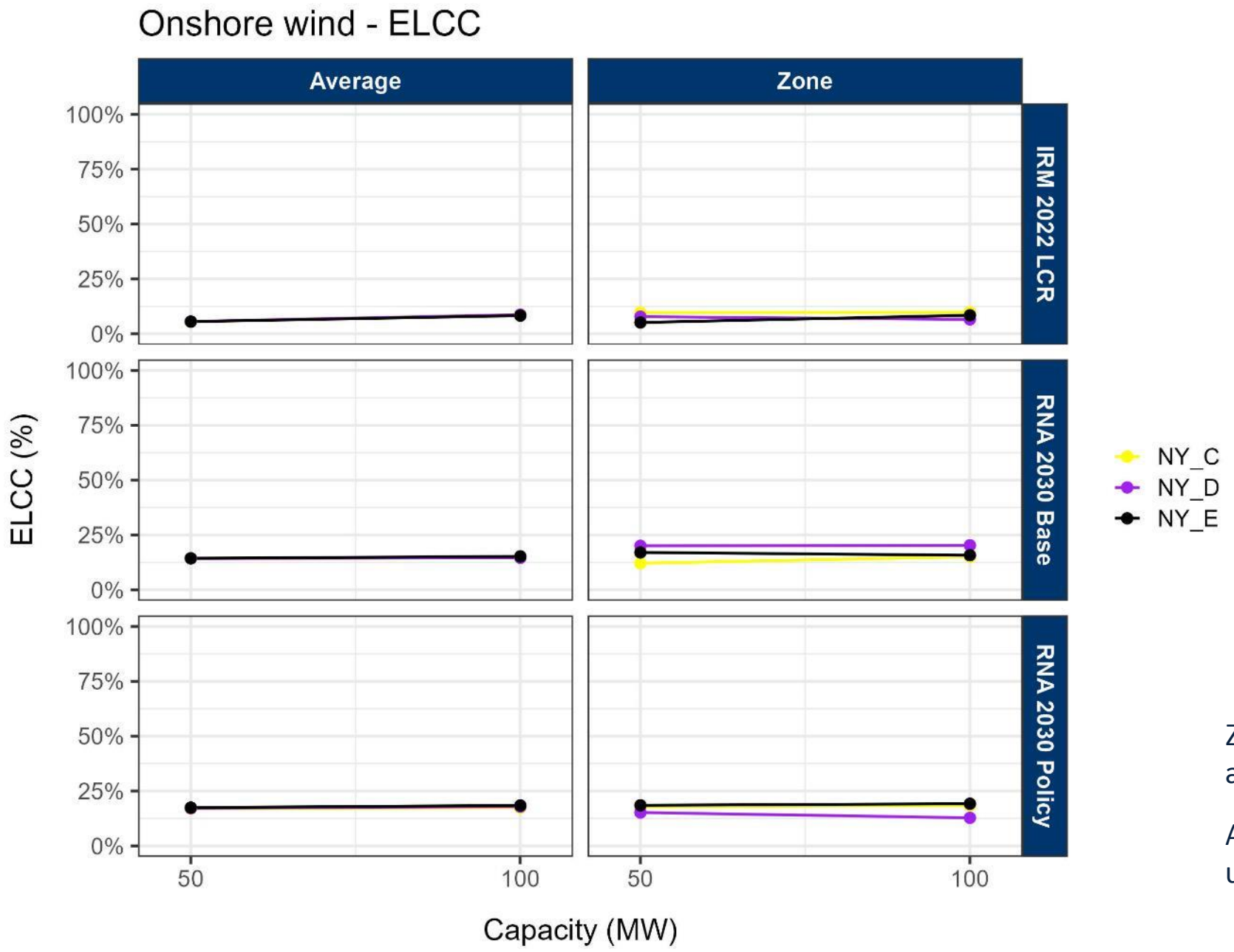
- Increase in offshore and offshore wind
- Reduction in solar
- Changes in ELR resources

		Average ELCC Capacity Value (100 MW)			Change from 2022 LCR	
Type	Subtype	IRM 2022 LCR	RNA 2030 Base	RNA 2030 Policy	RNA 2030 Base	RNA 2030 Policy
Thermal	5% EFOR	94.7%	96.0%	92.8%	1.3%	-1.9%
	10% EFOR	88.1%	89.4%	89.6%	1.3%	1.5%
Biomass	Average	65.3%	67.8%	68.1%	2.6%	2.8%
	Zone	62.0%	62.2%	62.4%	0.2%	0.4%
Run of river	Average	35.5%	36.4%	33.3%	0.9%	-2.1%
	Zone	39.3%	38.8%	37.6%	-0.6%	-1.8%
Onshore wind	Average	8.6%	14.8%	17.9%	6.2%	9.3%
	Zone	8.3%	17.1%	16.8%	8.8%	8.5%
Offshore wind	Zone	26.5%	35.0%	38.5%	8.5%	12.0%
Solar	Average	32.7%	10.1%	5.8%	-22.6%	-26.9%
	Zone	30.8%	10.1%	5.9%	-20.7%	-24.9%
Dynamic ELR	2h	42.7%	75.7%	37.8%	32.9%	-4.9%
	4h	70.5%	72.5%	42.5%	2.0%	-28.0%
	6h	76.7%	98.3%	73.1%	21.6%	-3.6%
	8h	98.7%	99.5%	67.5%	0.8%	-31.2%
Large hydro	Dynamic	98.9%	100.0%	100.0%	1.1%	1.1%
	Fixed shape	97.0%	96.4%	81.3%	-0.6%	-15.7%



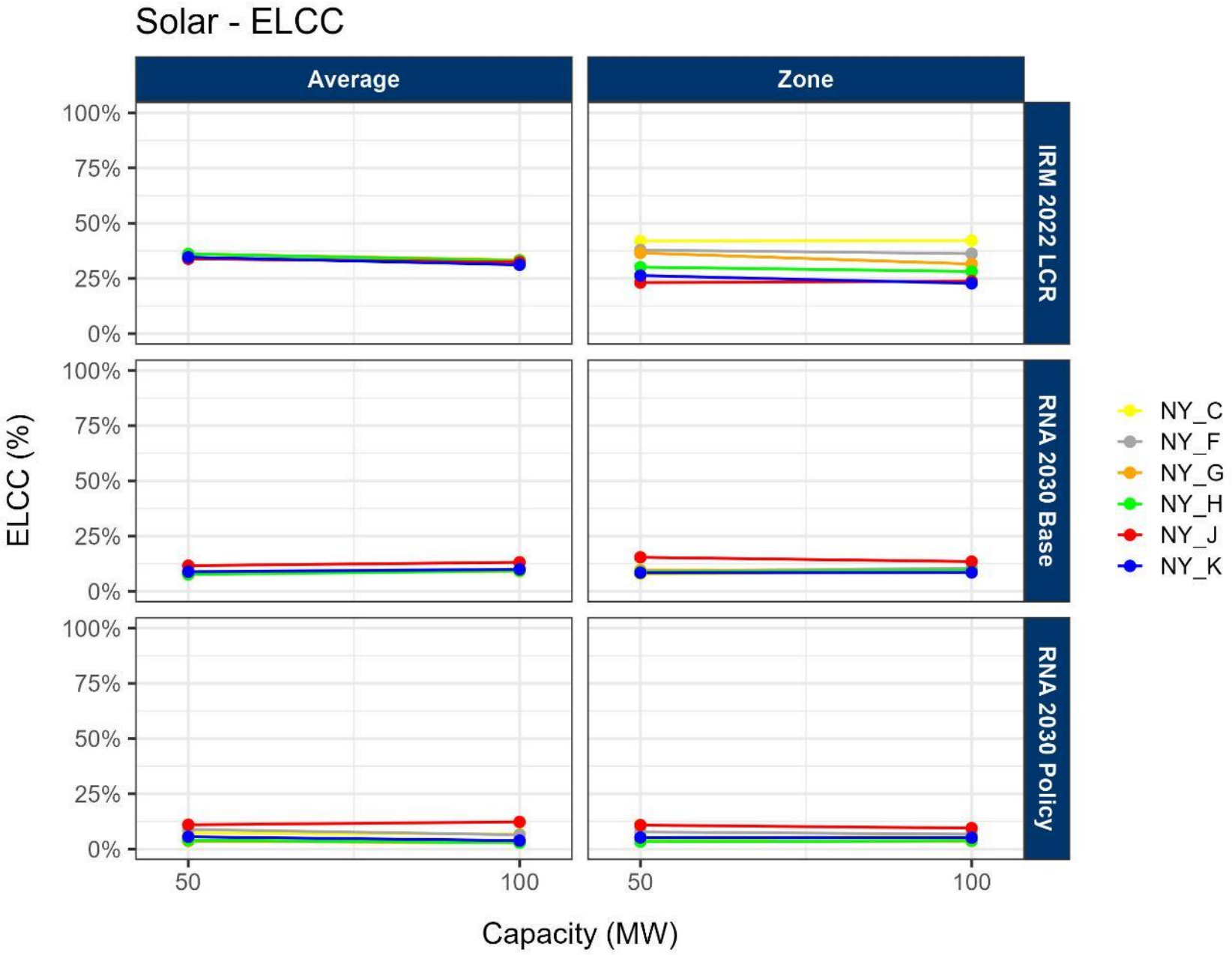
Zone = each zone uses a different shape

Average = all zones use the same shape



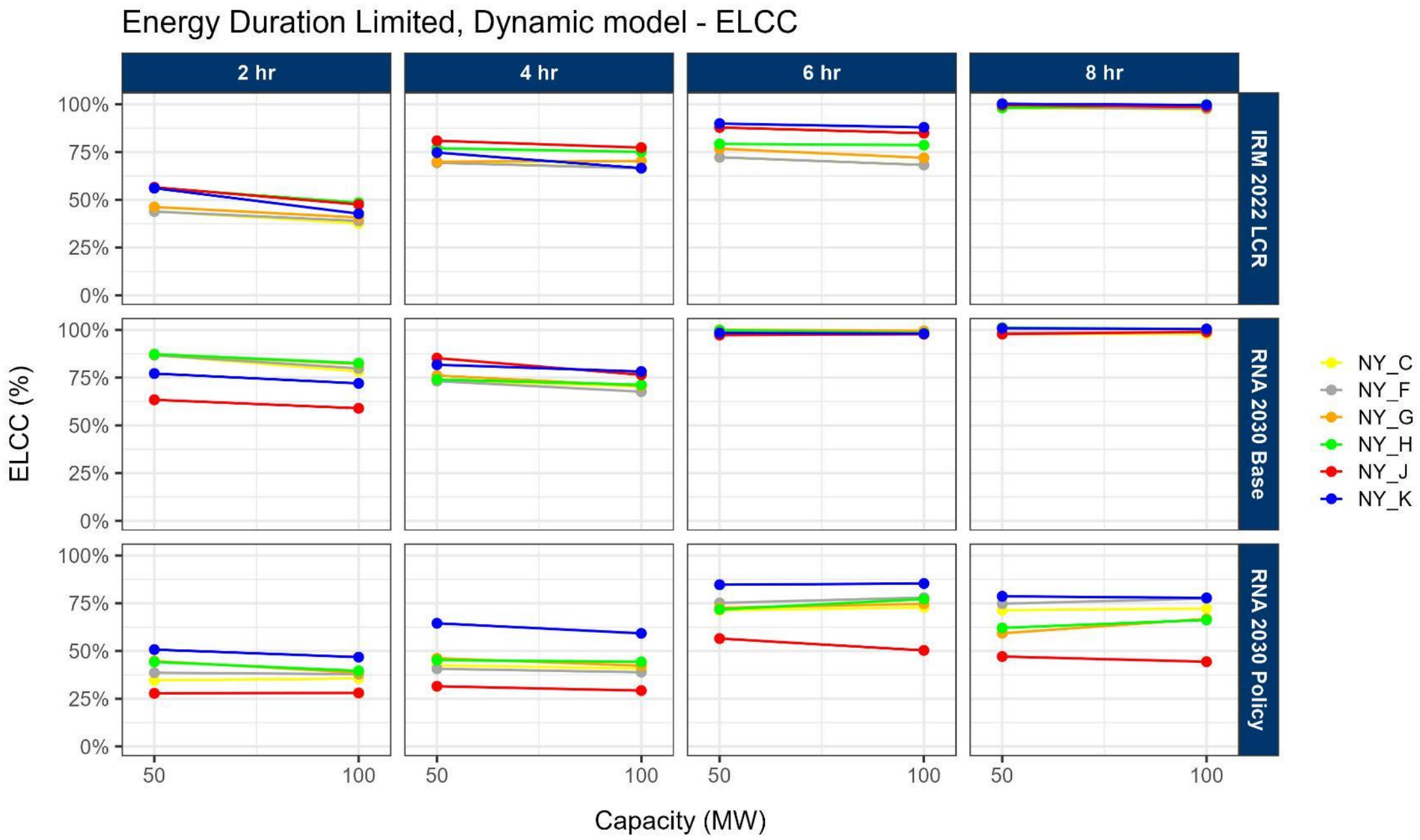
Zone = each zone uses a different shape

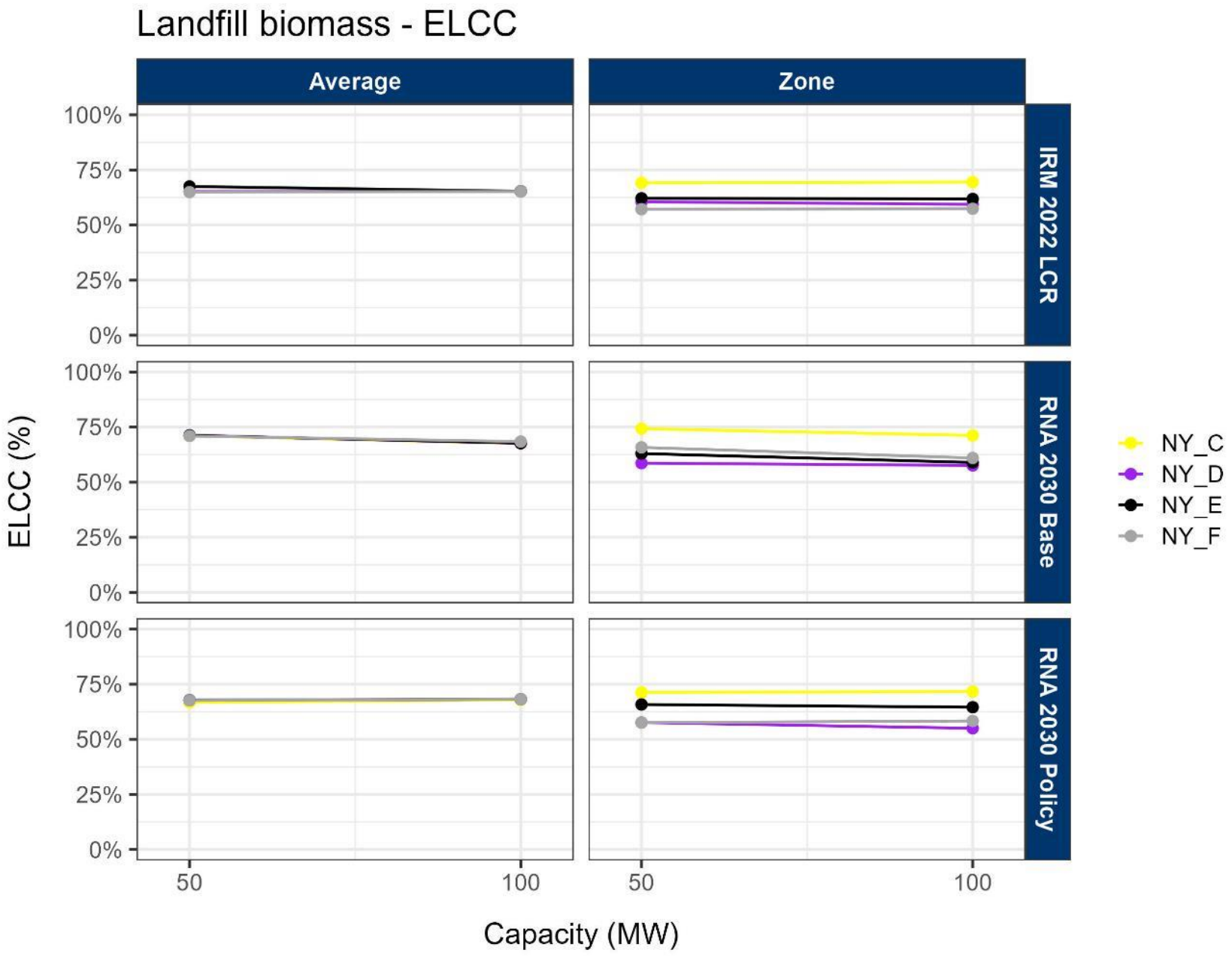
Average = all zones use the same shape



Zone = each zone uses a different shape

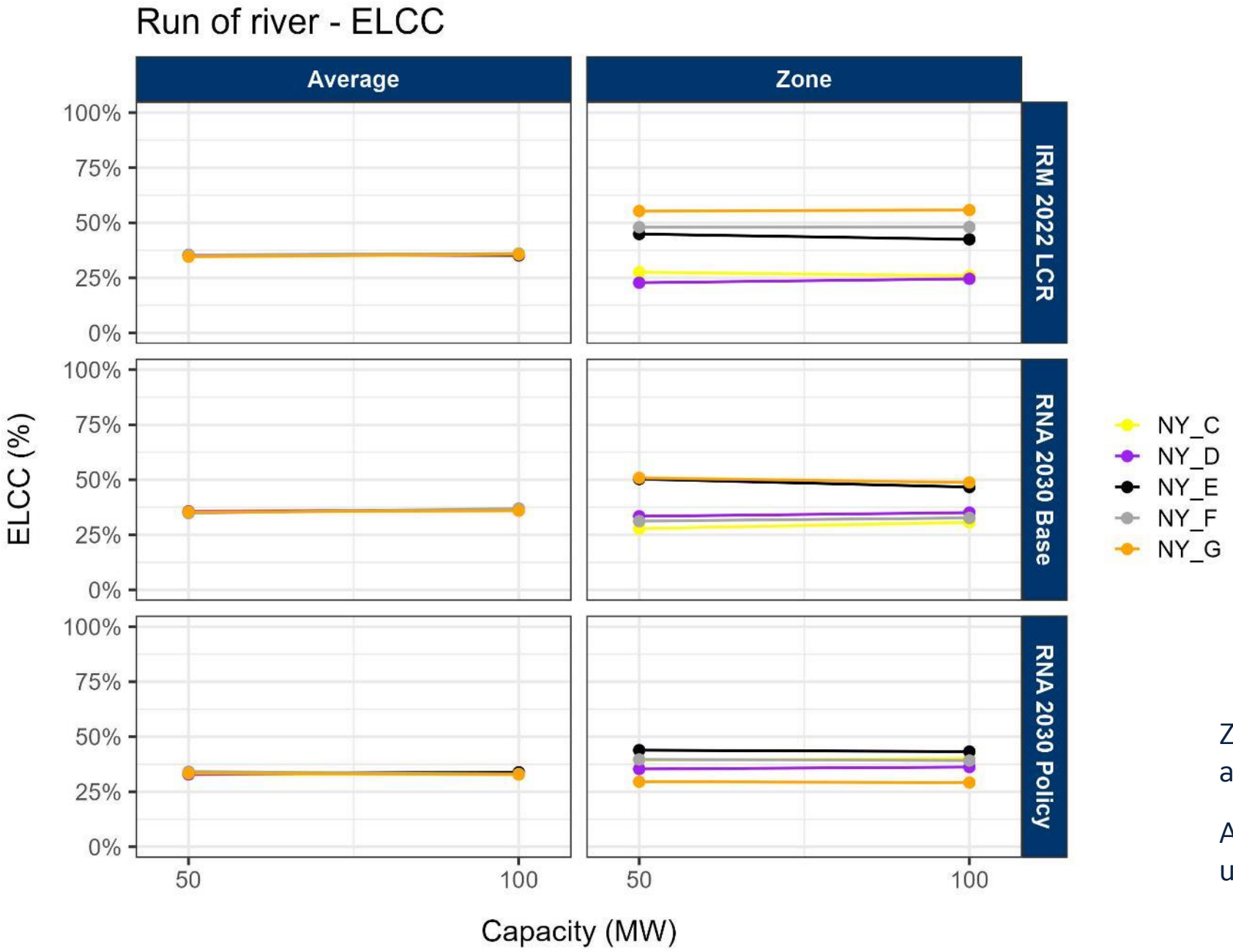
Average = all zones use the same shape





Zone = each zone uses a different shape

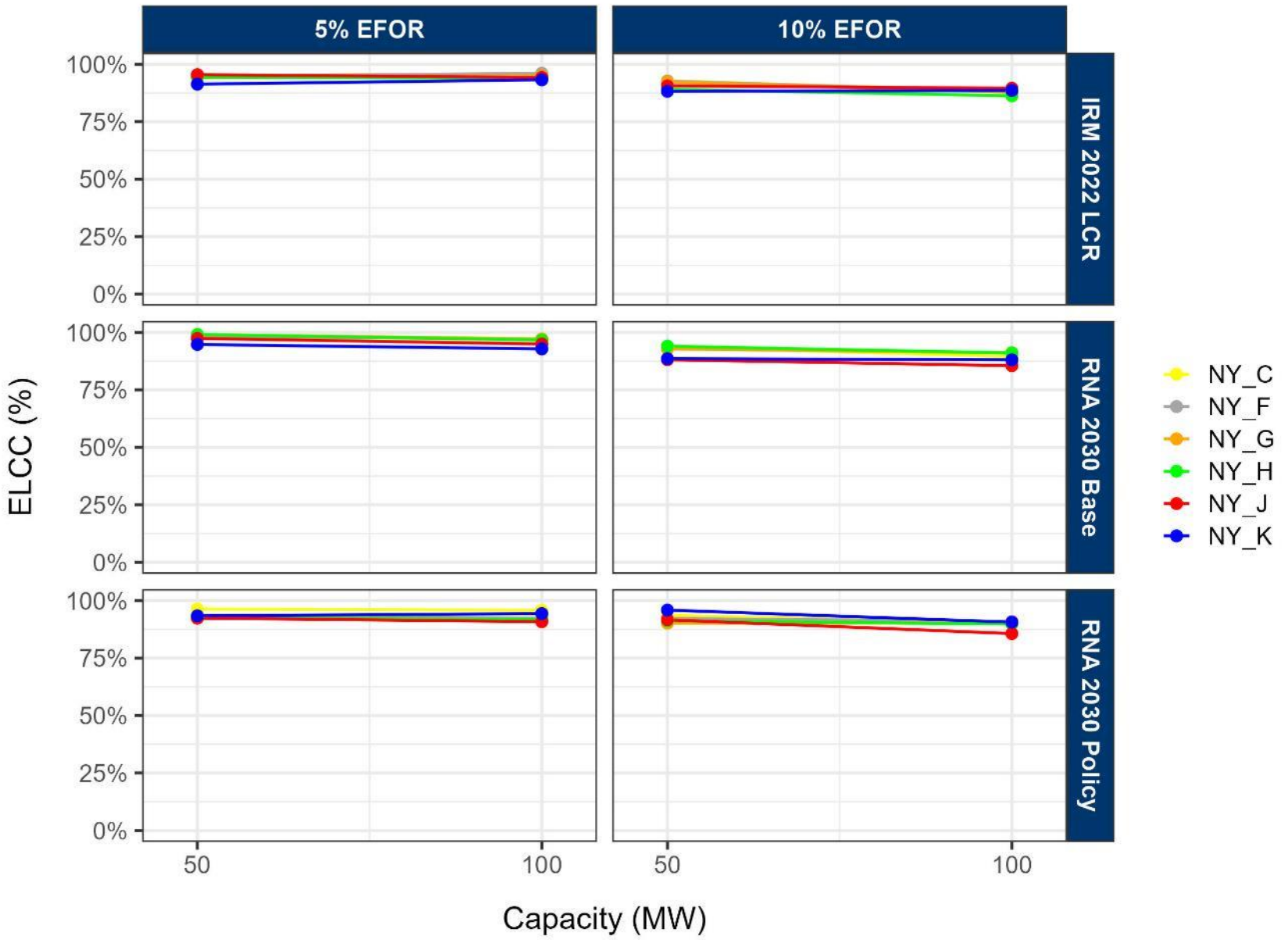
Average = all zones use the same shape

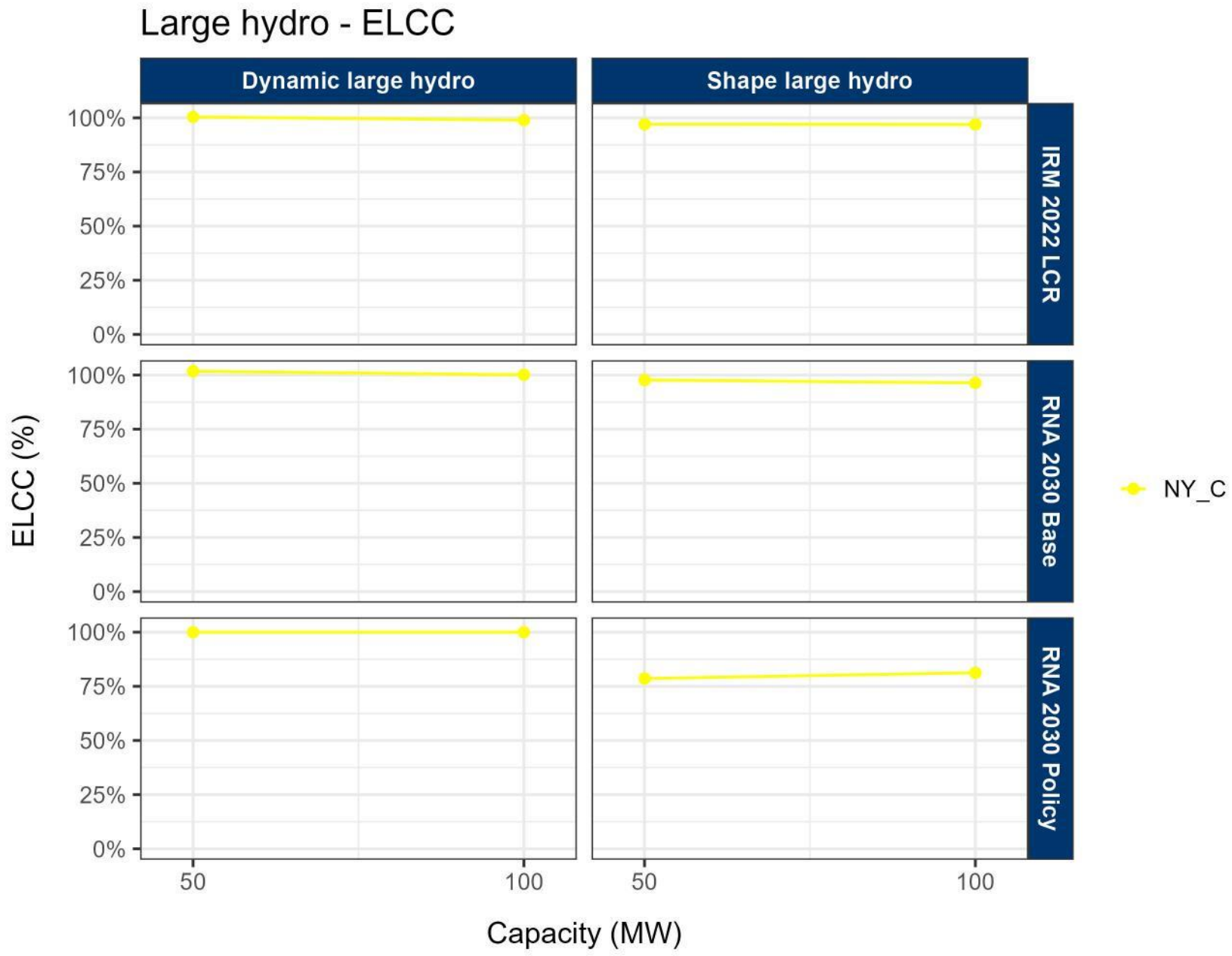


Zone = each zone uses a different shape

Average = all zones use the same shape

Thermal - ELCC





Shape = fixed shape dispatch

Dynamic = MARS dispatch algorithm

Re-optimization of the 2022 RNA 2030 Cases

Re-optimization of the RNA 2030 Cases

As discussed on the 10/19 meeting, the preliminary results of the RNA 2030 Base and Policy Cases were calculated on at criteria systems that were not fully optimized

The LCR optimizer was rerun for both cases with corrected inputs, resulting in similar, but distinct IRM/LCRs

The MRI-technique was applied to calculate CAFs on these re-optimized cases and compared to the preliminary results

The cases with the largest deviation of MRI results were recalculated through the ELCC technique

Update IRM/LCRs for RNA 2030 cases

The table below compares the correctly translated IRM and LCRs for the preliminary RNA Base Case and RNA Policy Case results and the IRM and LCRs for the re-optimized cases

	RNA Base Case 2030			RNA Policy Case 2030		
	Preliminary Results	Re-optimized Results	Change	Preliminary Results	Re-optimized Results	Change
NYCA IRM	125.5%	126.1%	0.6%	162.3%	162.4%	0.1%
G-J LCR	80.6%	79.5%	-1.1%	108.7%	111.9%	3.2%
J LCR	80.7%	79.1%	-1.6%	120.5%	119.5%	-1.0%
K LCR	109.2%	110.2%	1.1%	140.1%	138.4%	-1.7%

Comparison of preliminary and re-optimized RNA 2030 cases

Table with capacity value for 100 MW size, averaged across zones, using MRI technique

Biggest changes for RNA Base Case:

- Onshore wind
- Selected 2h ELRs
- 4h ELRs

Biggest changes for RNA Policy Case:

- Dynamic ELRs
- Selected solar cases
- Selected offshore wind

		RNA 2030 Base		RNA 2030 Policy		Change	
Type	Subtype	Preliminary	Re-optimized	Preliminary	Re-optimized	RNA Base	RNA Policy
Thermal	5% EFOR	94.8%	94.1%	95.0%	93.4%	-0.7%	-1.6%
	10% EFOR	92.2%	91.8%	89.5%	90.8%	-0.4%	1.3%
Biomass	Average	68.1%	69.5%	72.6%	70.6%	1.4%	-2.0%
	Zone	63.3%	63.8%	66.7%	66.3%	0.5%	-0.3%
Run of river	Average	38.5%	37.7%	37.6%	36.3%	-0.8%	-1.3%
	Zone	42.7%	42.2%	42.4%	39.7%	-0.5%	-2.7%
Onshore wind	Average	21.8%	15.9%	21.6%	17.9%	-5.8%	-3.7%
	Zone	22.1%	17.2%	20.4%	17.5%	-4.9%	-2.9%
Offshore wind	Zone	44.9%	47.7%	41.5%	39.6%	2.8%	-1.9%
Solar	Average	12.8%	11.8%	8.1%	9.5%	-1.1%	1.4%
	Zone	11.5%	11.4%	7.6%	9.1%	-0.1%	1.5%
Dynamic ELR	2h	83.0%	81.4%	42.1%	37.4%	-1.6%	-4.7%
	4h	74.8%	80.5%	46.4%	41.9%	5.7%	-4.5%
	6h	98.2%	98.7%	77.9%	66.3%	0.5%	-11.6%
	8h	99.3%	99.8%	74.2%	65.6%	0.5%	-8.5%
Large hydro	Dynamic	99.4%	98.2%	100.0%	94.3%	-1.2%	-5.7%
	Fixed shape	98.2%	97.4%	78.4%	77.6%	-0.8%	-0.8%

Largest changes for RNA 2030 Base Case re-run cases

In general, the changes observed for the ELCC- and MRI-based metrics are similar

For onshore wind, 4h ELRs: the magnitude of the changes is slightly smaller with ELCC, compared to MRI

			Preliminary		Re-optimized		Delta	
Type	Subtype	Zone	ELCC	MRI	ELCC	MRI	ELCC	MRI
Onshore wind	Average	NY_C	14.6%	21.8%	13.2%	16.0%	-1.4%	-5.8%
		NY_D	14.6%	21.8%	13.2%	16.0%	-1.4%	-5.8%
		NY_E	15.2%	21.8%	13.1%	15.9%	-2.2%	-5.9%
	Zone	NY_C	15.1%	18.0%	16.3%	17.2%	1.2%	-0.8%
		NY_D	20.3%	24.3%	15.5%	15.3%	-4.7%	-9.0%
		NY_E	15.8%	24.0%	13.8%	19.2%	-2.0%	-4.8%
Dynamic ELR	2hr	NY_J	59.0%	71.1%	46.9%	60.2%	-12.1%	-10.9%
		NY_K	72.0%	79.8%	76.7%	83.9%	4.7%	4.1%
	4hr	NY_C	70.4%	73.7%	73.2%	77.4%	2.8%	3.7%
		NY_F	67.7%	72.1%	71.9%	78.2%	4.2%	6.1%
		NY_G	70.7%	73.4%	72.6%	79.6%	1.9%	6.2%
		NY_H	71.3%	72.6%	74.4%	79.8%	3.1%	7.2%
		NY_J	76.5%	76.9%	78.2%	82.1%	1.7%	5.1%
		NY_K	78.2%	79.8%	85.0%	85.9%	6.8%	6.1%

Largest changes for RNA 2030 Policy Case re-run cases

Again, the changes observed for the ELCC- and MRI-based metrics are similar

6h and 8h ELRs: have largest deltas under MRI, more moderate with ELCC

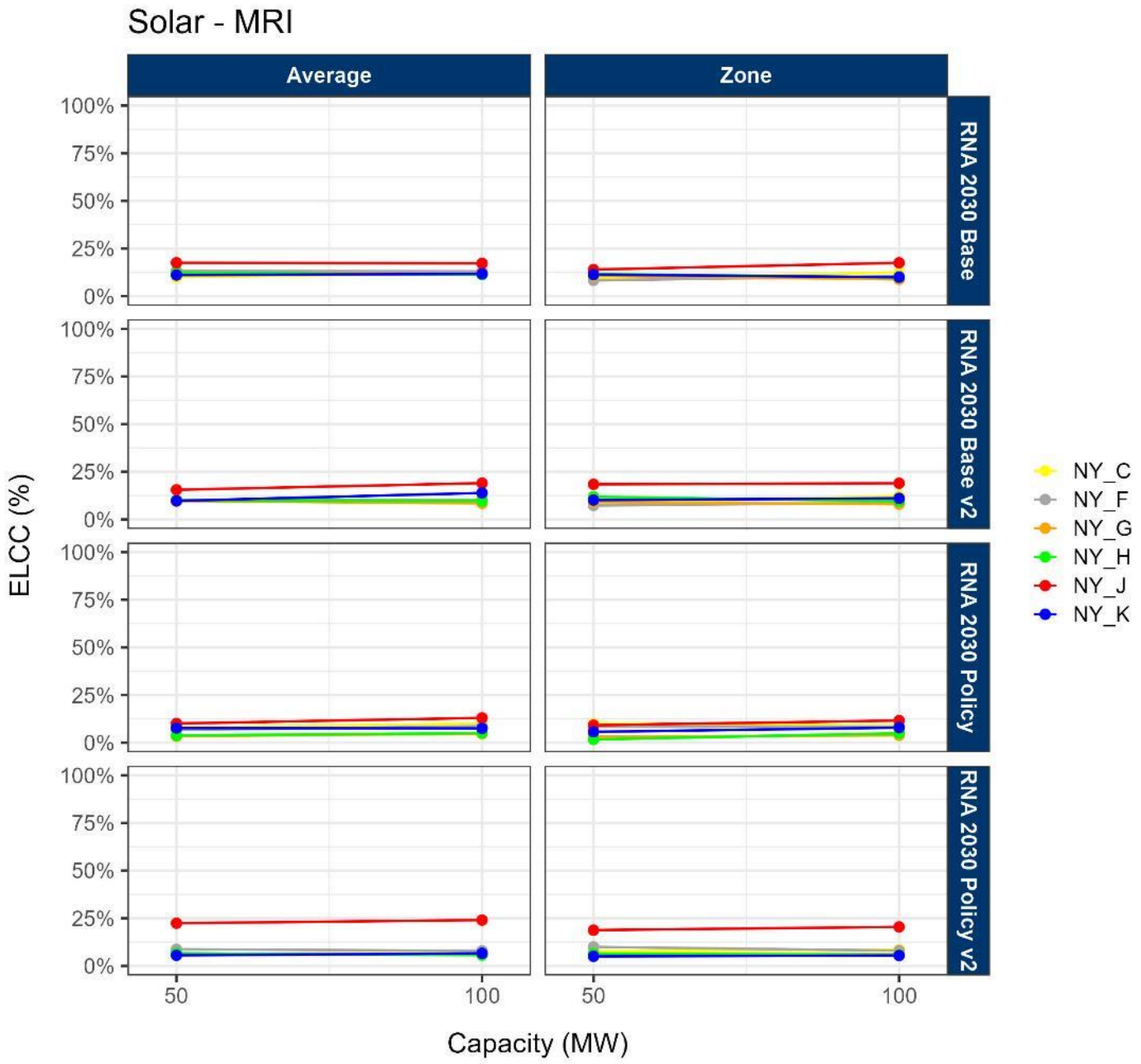
Those cases are not fully optimized because of the different pattern in daily risk (see slide 6)

			Preliminary		Re-optimized		Delta	
Type	Subtype	Zone	ELCC	MRI	ELCC	MRI	ELCC	MRI
Offshore wind	Zone	NY_J	32.6%	39.2%	28.3%	32.8%	-4.4%	-6.4%
Solar	Average	NY_J	12.2%	13.0%	19.2%	24.1%	7.0%	11.1%
	Zone	NY_J	9.5%	11.6%	16.4%	20.5%	7.0%	8.9%
Dynamic ELR	2hr	NY_C	35.6%	38.8%	35.7%	36.6%	0.1%	-2.2%
		NY_F	37.9%	38.9%	35.1%	35.6%	-2.8%	-3.3%
		NY_G	38.7%	44.0%	40.1%	38.5%	1.4%	-5.6%
		NY_H	39.6%	43.8%	40.7%	38.6%	1.1%	-5.2%
		NY_J	28.0%	35.1%	19.0%	24.5%	-9.0%	-10.5%
		NY_K	46.8%	51.8%	47.4%	50.6%	0.6%	-1.2%
	4hr	NY_C	40.8%	43.8%	37.6%	38.6%	-3.2%	-5.2%
		NY_F	38.9%	40.7%	37.7%	38.2%	-1.2%	-2.6%
		NY_G	42.3%	46.3%	41.9%	41.3%	-0.4%	-5.0%
		NY_H	44.3%	47.8%	43.1%	42.6%	-1.2%	-5.1%
		NY_J	29.3%	38.2%	21.5%	27.4%	-7.8%	-10.8%
		NY_K	59.3%	62.0%	61.9%	63.3%	2.7%	1.4%
	6hr	NY_C	72.9%	77.3%	62.5%	66.0%	-10.3%	-11.3%
		NY_F	77.9%	79.6%	68.6%	70.6%	-9.3%	-9.0%
		NY_G	74.7%	79.4%	67.1%	66.7%	-7.6%	-12.7%
		NY_H	77.2%	80.9%	68.5%	66.9%	-8.7%	-14.1%
		NY_J	50.3%	64.0%	43.1%	47.0%	-7.2%	-17.0%
		NY_K	85.3%	86.2%	78.3%	80.5%	-7.1%	-5.7%
	8hr	NY_C	72.3%	77.5%	62.1%	66.2%	-10.1%	-11.3%
		NY_F	77.5%	80.0%	68.4%	70.8%	-9.1%	-9.2%
		NY_G	66.9%	72.5%	63.8%	66.2%	-3.1%	-6.2%
		NY_H	66.3%	74.7%	65.1%	66.4%	-1.2%	-8.3%
		NY_J	44.4%	57.2%	41.8%	44.6%	-2.6%	-12.7%
		NY_K	77.8%	83.1%	76.0%	79.6%	-1.9%	-3.6%

Comparison of preliminary and re-optimized RNA 2030 cases

The graphs in the remainder of this section present the preliminary and re-optimized results for the RNA 2030 cases

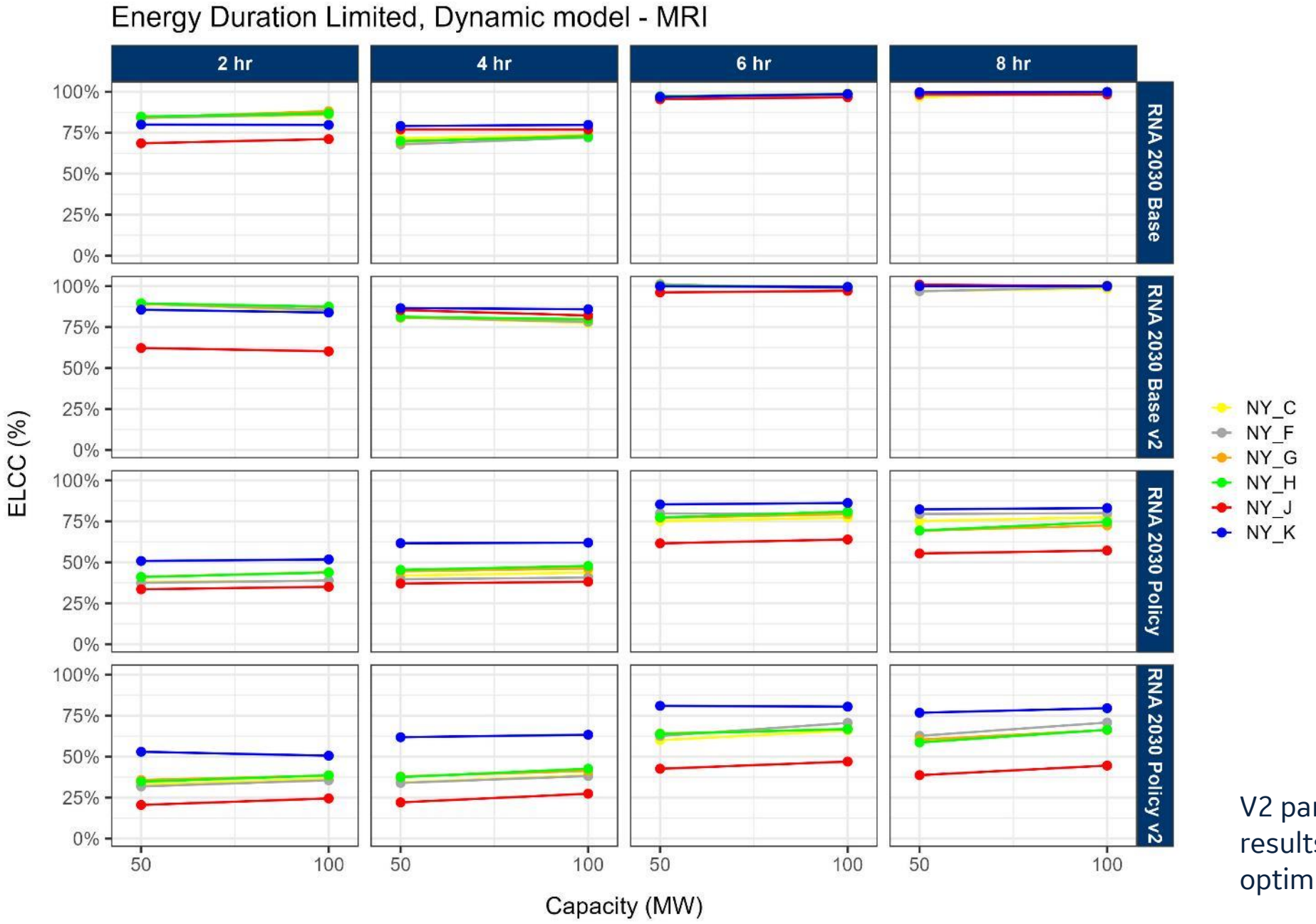
We present results with the MRI technique here



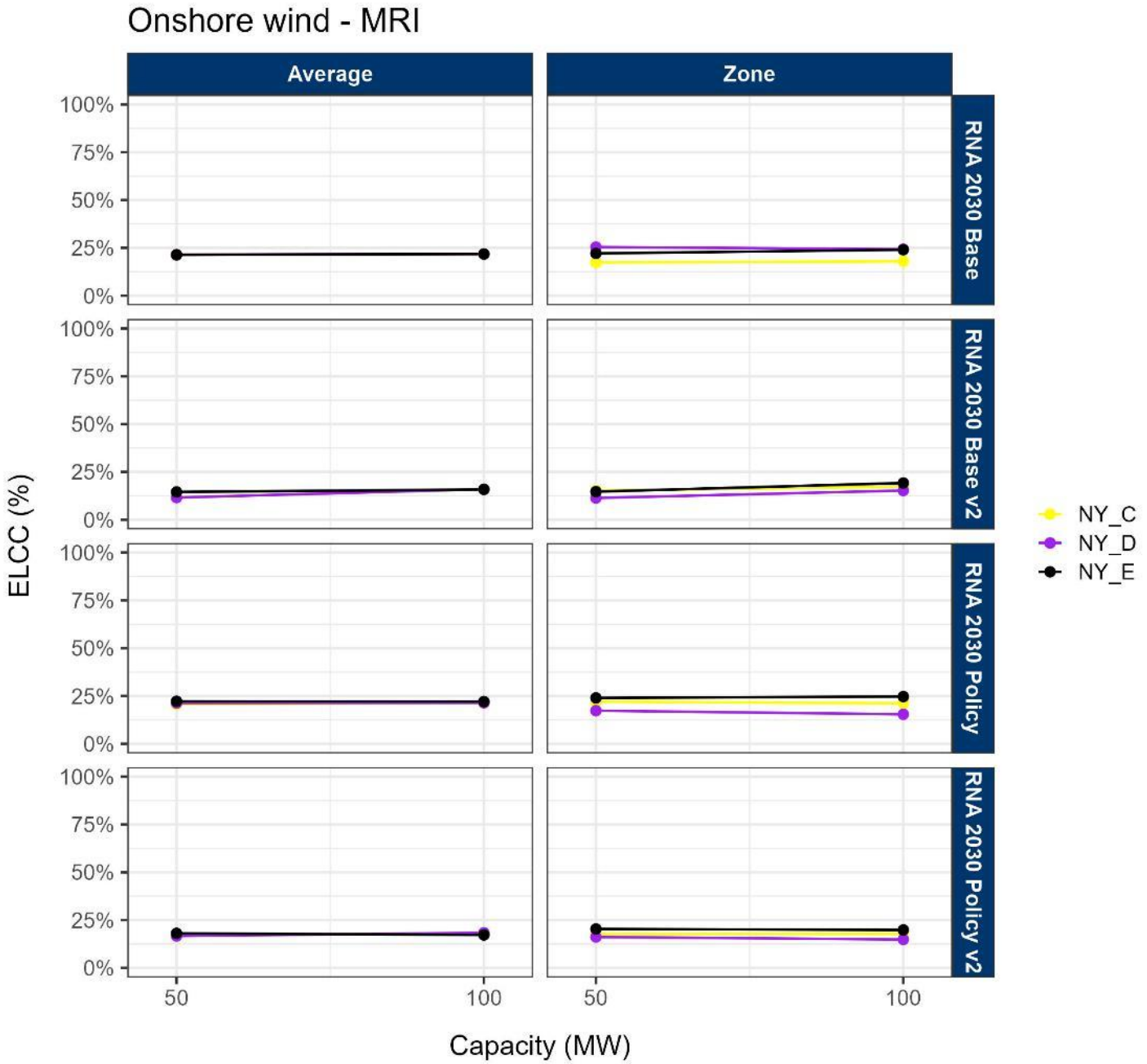
Zone = each zone uses a different shape

Average = all zones use the same shape

V2 panels show the results for the re-optimized system



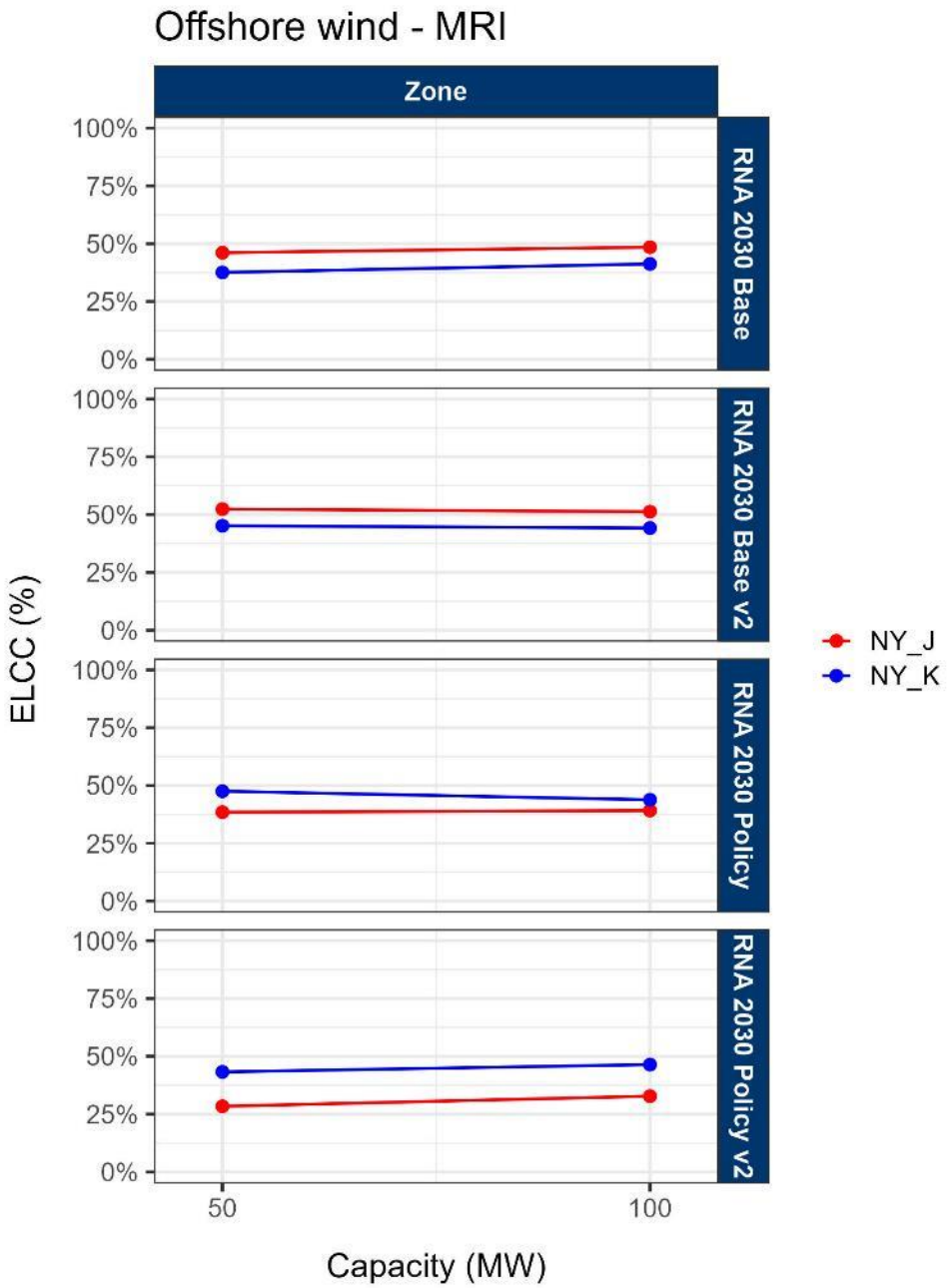
V2 panels show the results for the re-optimized system



Zone = each zone uses a different shape

Average = all zones use the same shape

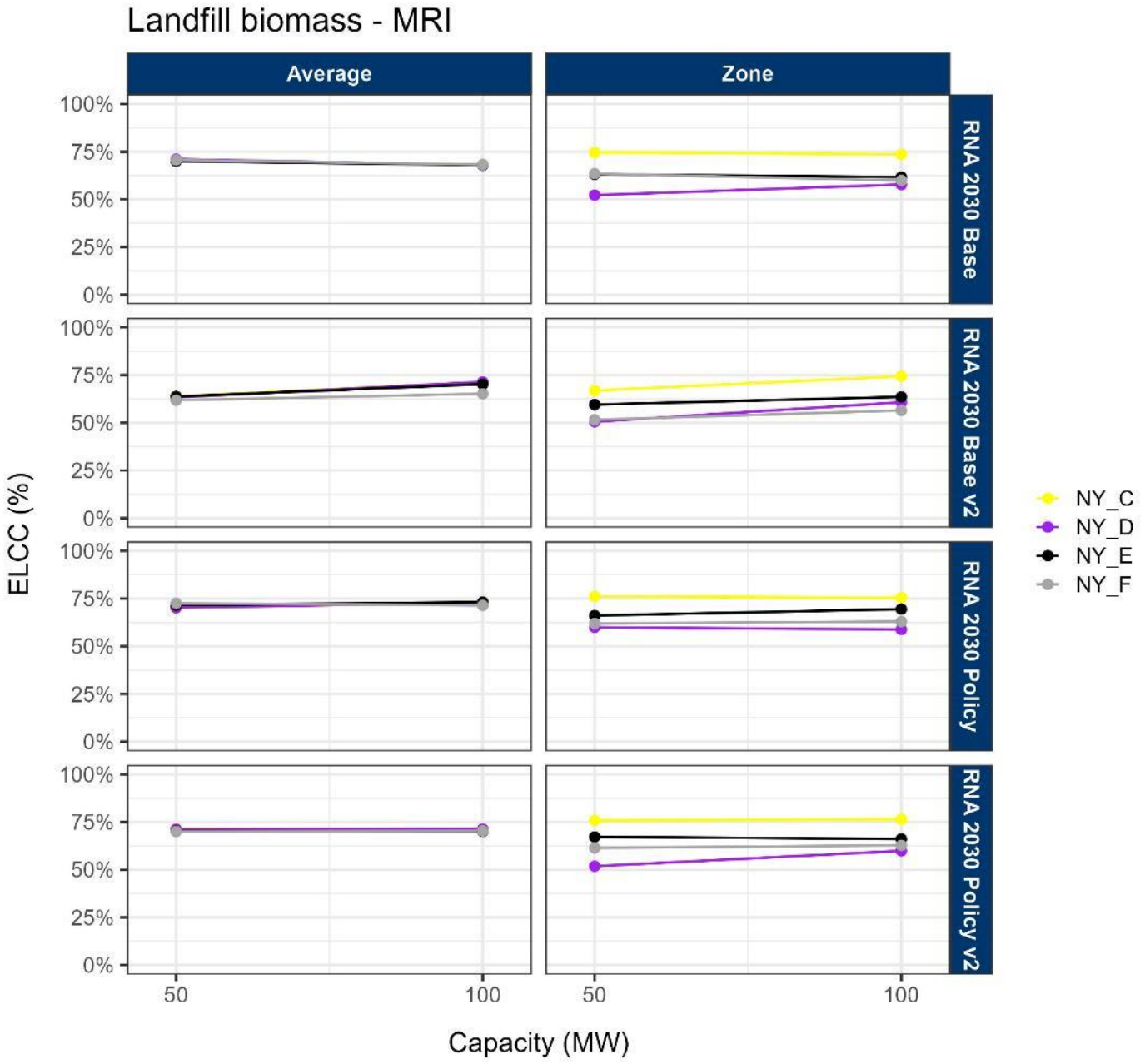
V2 panels show the results for the re-optimized system



Zone = each zone uses a different shape

Average = all zones use the same shape

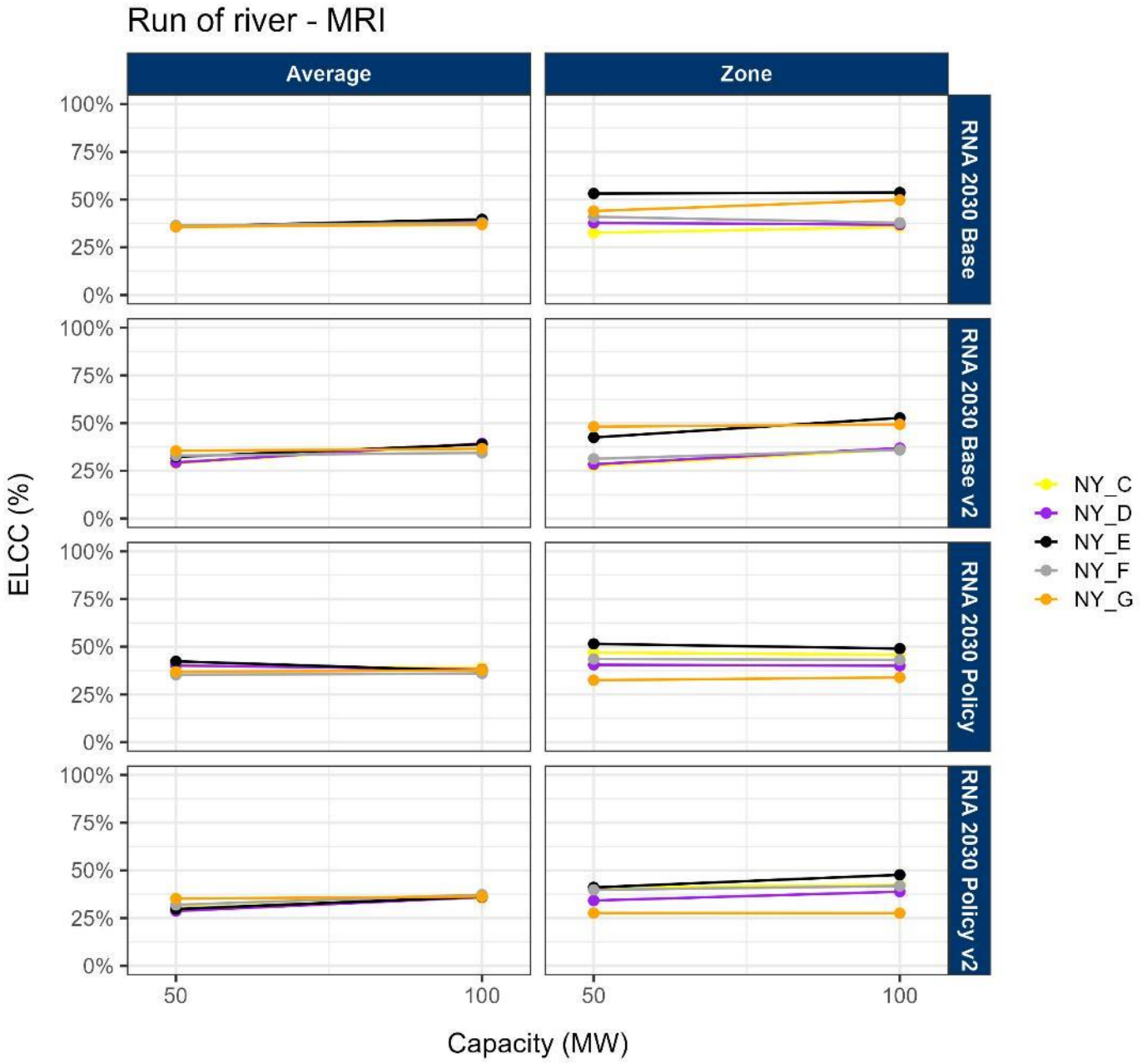
V2 panels show the results for the re-optimized system



Zone = each zone uses a different shape

Average = all zones use the same shape

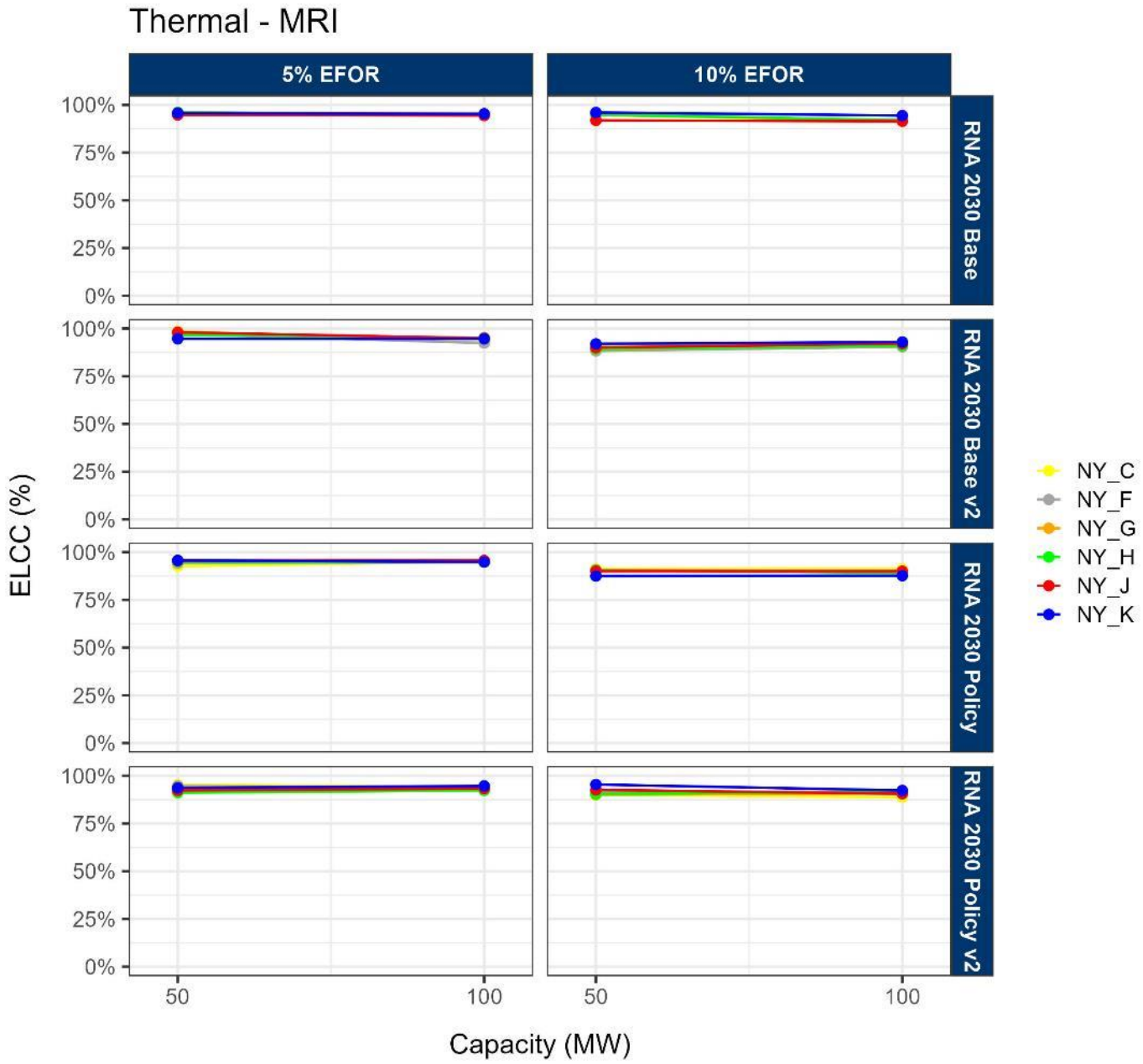
V2 panels show the results for the re-optimized system



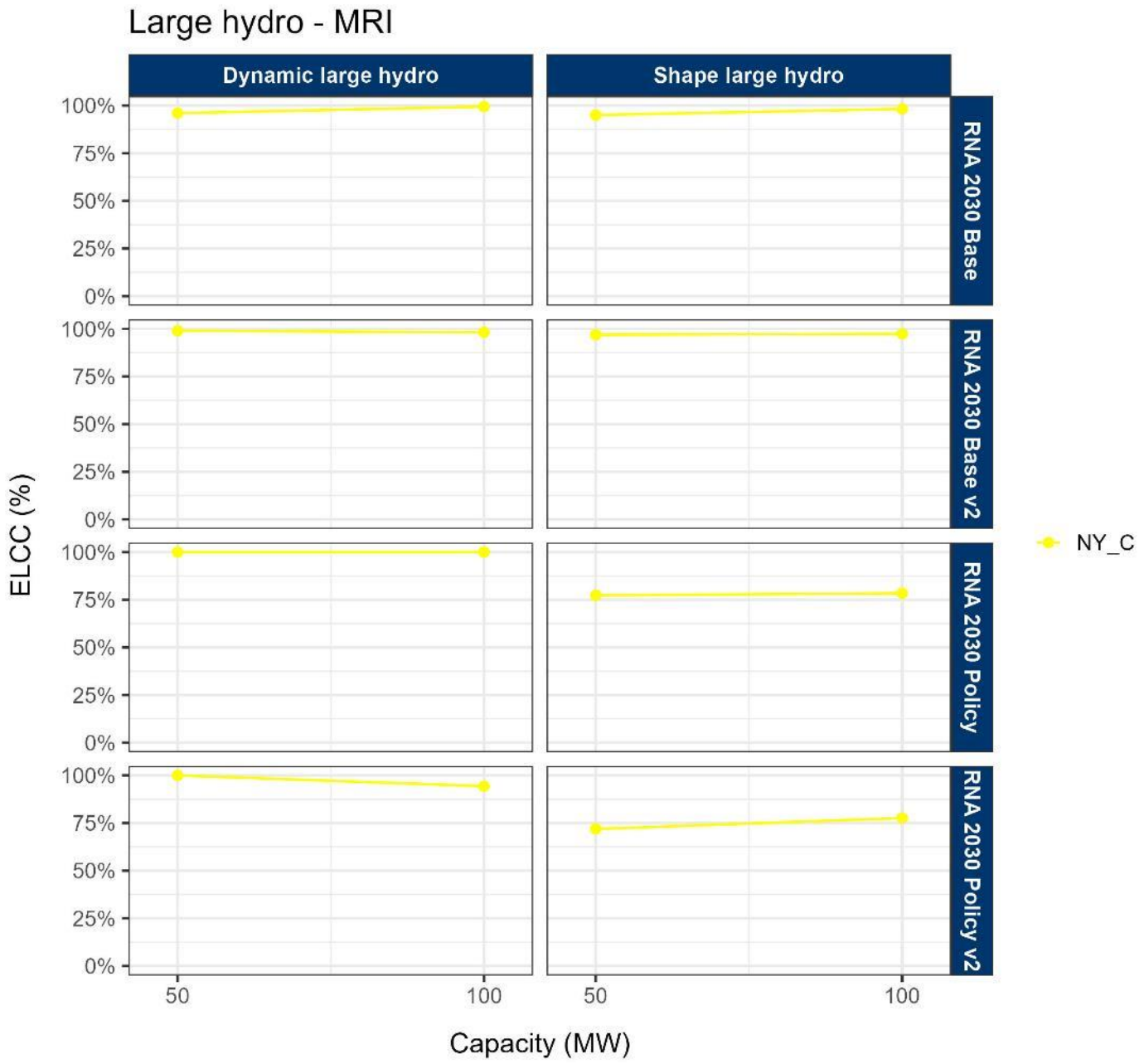
Zone = each zone uses a different shape

Average = all zones use the same shape

V2 panels show the results for the re-optimized system



V2 panels show the results for the re-optimized system



Shape = fixed shape dispatch

Dynamic = MARS dispatch algorithm

V2 panels show the results for the re-optimized system

2023 IRM PBC sensitivities

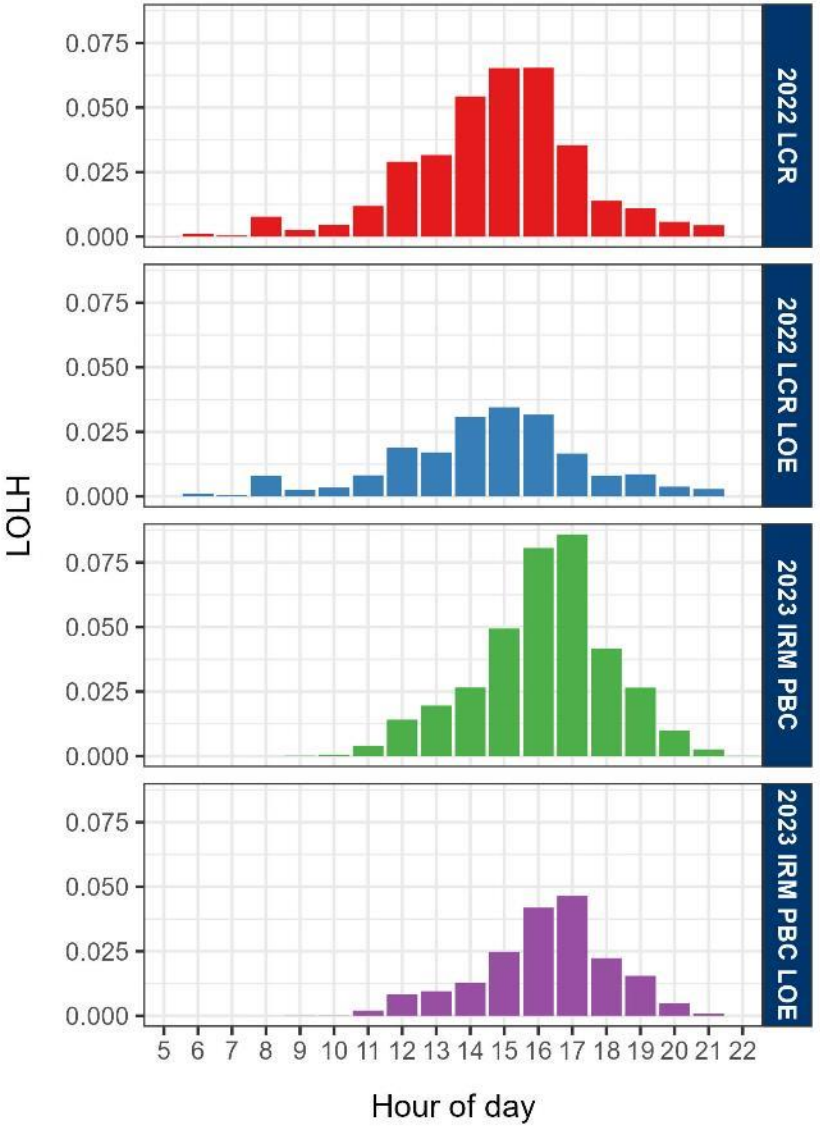
2023 Preliminary Base Case (PBC) database sensitivities

Two sensitivities:

- 2023 IRM Preliminary Base Case (PBC)*
  - 0.0998 LOLE
- 2023 IRM PBC at Level of Excess (LOE)*
  - 0.0531 LOLE

*Both cases include updated, newer load shapes (which were not included in the PBC, but will be included in the Final Base Case)

New load shapes cause the risk to shift later in the day. Distribution of outages is also tighter (an indicator or shorter outages being more frequent)



Comparison of 2023 PBC cases and IRM 2022 LCR

Table with capacity value for 100 MW size, averaged across zones, using MRI technique*

Biggest changes for 2023 PBC:

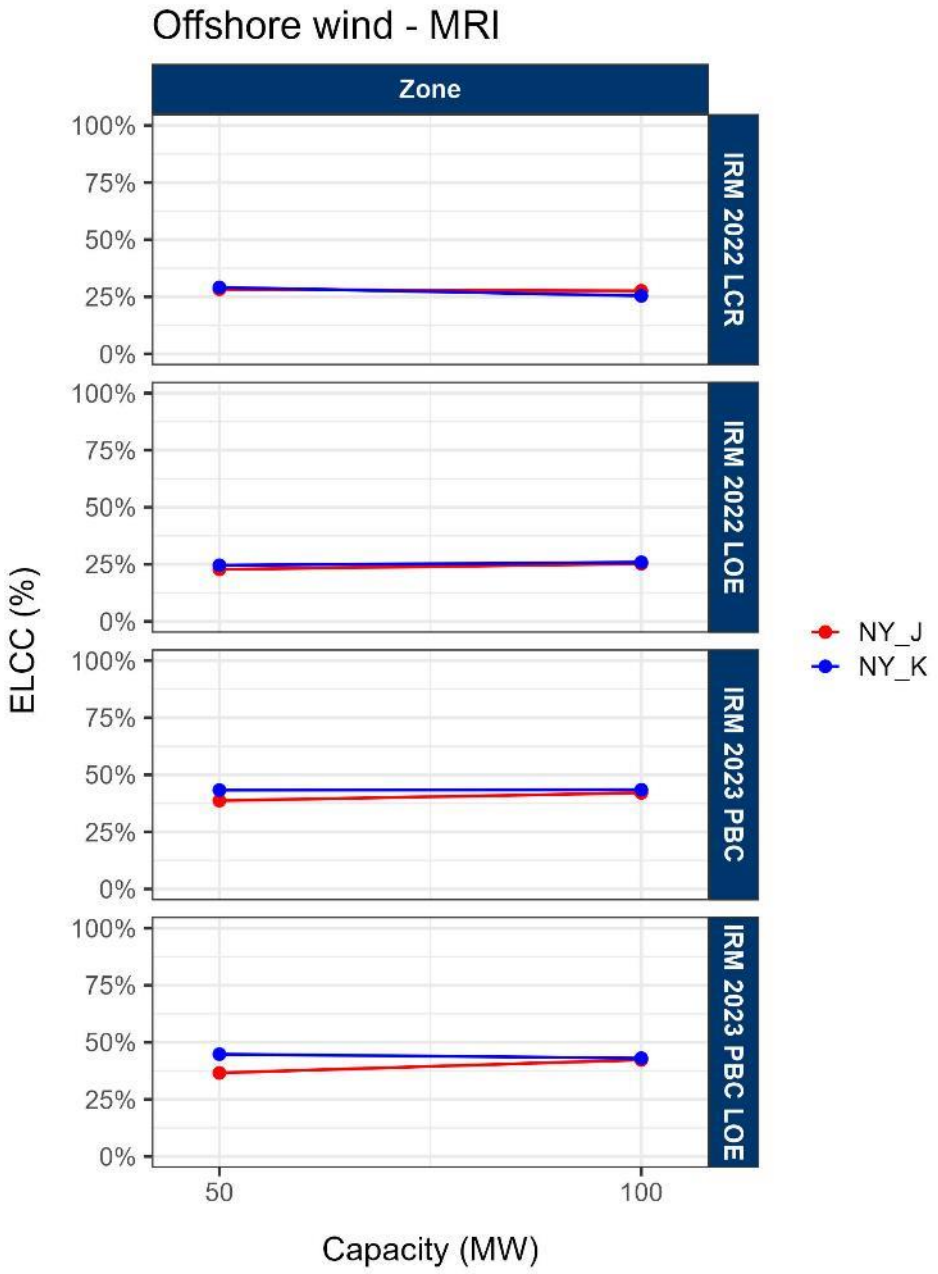
- Increase in offshore wind
- Reduction in solar
- Changes in ELR resources

Shape-base resources have updated shapes (the most recent 5 years are used)

* ELCC results available for all cases, except 2023 PBC LOE

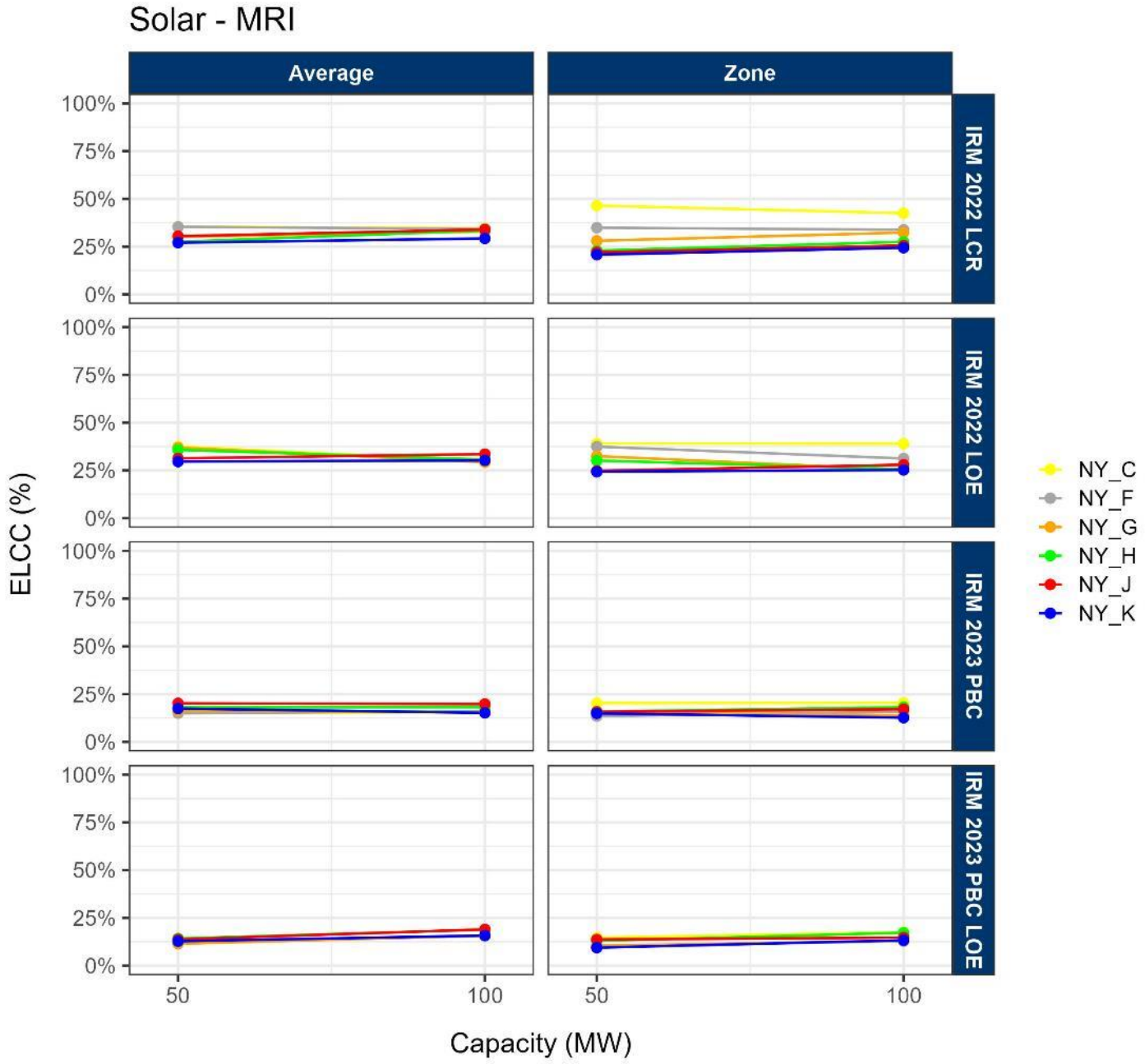
		Average MRI Capacity Value (100 MW)				Change from 2022 LCR	Change from 2022 LOE[1]
Type	Subtype	2022 LCR	2022 LOE	2023 PBC	2023 PBC LOE	2023 PBC	2023 PBC LOE
Thermal	5% EFOR	96.4%	93.4%	93.2%	94.4%	-3.3%	1.00%
	10% EFOR	90.3%	89.1%	92.6%	89.2%	2.3%	0.10%
Biomass	Average	66.6%	67.7%	71.3%	68.8%	4.7%	1.10%
	Zone	59.7%	62.2%	62.5%	61.7%	2.9%	-0.50%
Run of river	Average	33.8%	30.8%	39.2%	37.5%	5.3%	6.70%
	Zone	38.7%	36.7%	45.2%	40.9%	6.5%	4.20%
Onshore wind	Average	10.6%	8.8%	13.3%	9.3%	2.8%	0.50%
	Zone	10.3%	9.1%	15.3%	10.5%	5.0%	1.40%
Offshore wind	Zone	26.5%	25.6%	42.8%	42.7%	16.3%	17.10%
Solar	Average	33.1%	30.5%	16.7%	16.8%	-16.4%	-13.70%
	Zone	31.0%	29.1%	16.4%	14.8%	-14.7%	-14.30%
Dynamic ELR	2h	46.9%	45.3%	52.1%	61.2%	5.2%	15.90%
	4h	75.7%	82.4%	89.5%	88.4%	13.8%	6.00%
	6h	82.9%	85.0%	93.4%	91.6%	10.5%	6.60%
	8h	97.7%	99.8%	98.6%	97.7%	0.9%	-2.10%
Large hydro	Dynamic	98.9%	100.0%	100.0%	99.4%	1.1%	-0.60%
	Fixed shape	95.3%	96.6%	98.2%	97.2%	2.9%	0.60%

[1] Values updated to match new heading



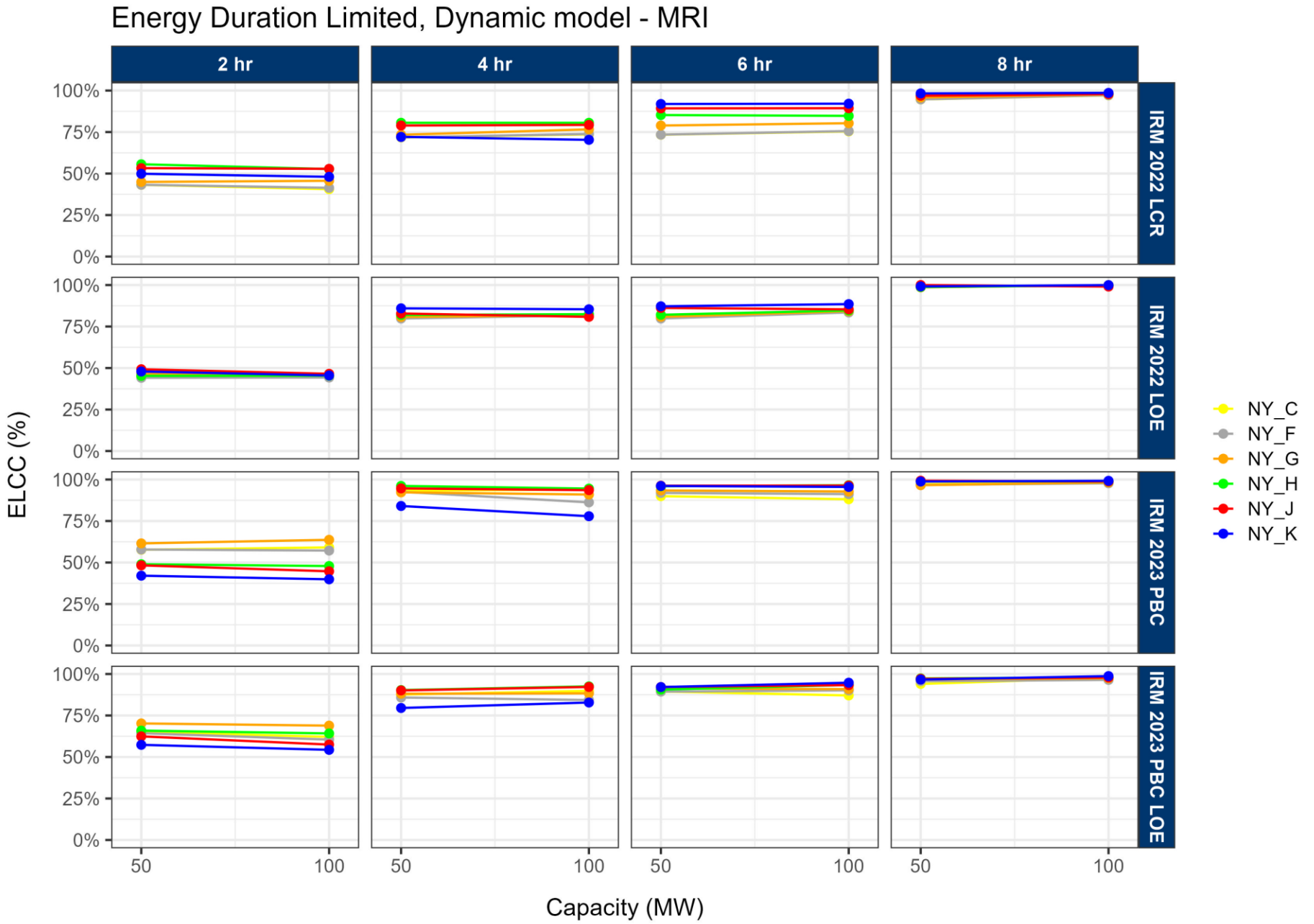
Zone = each zone uses a different shape

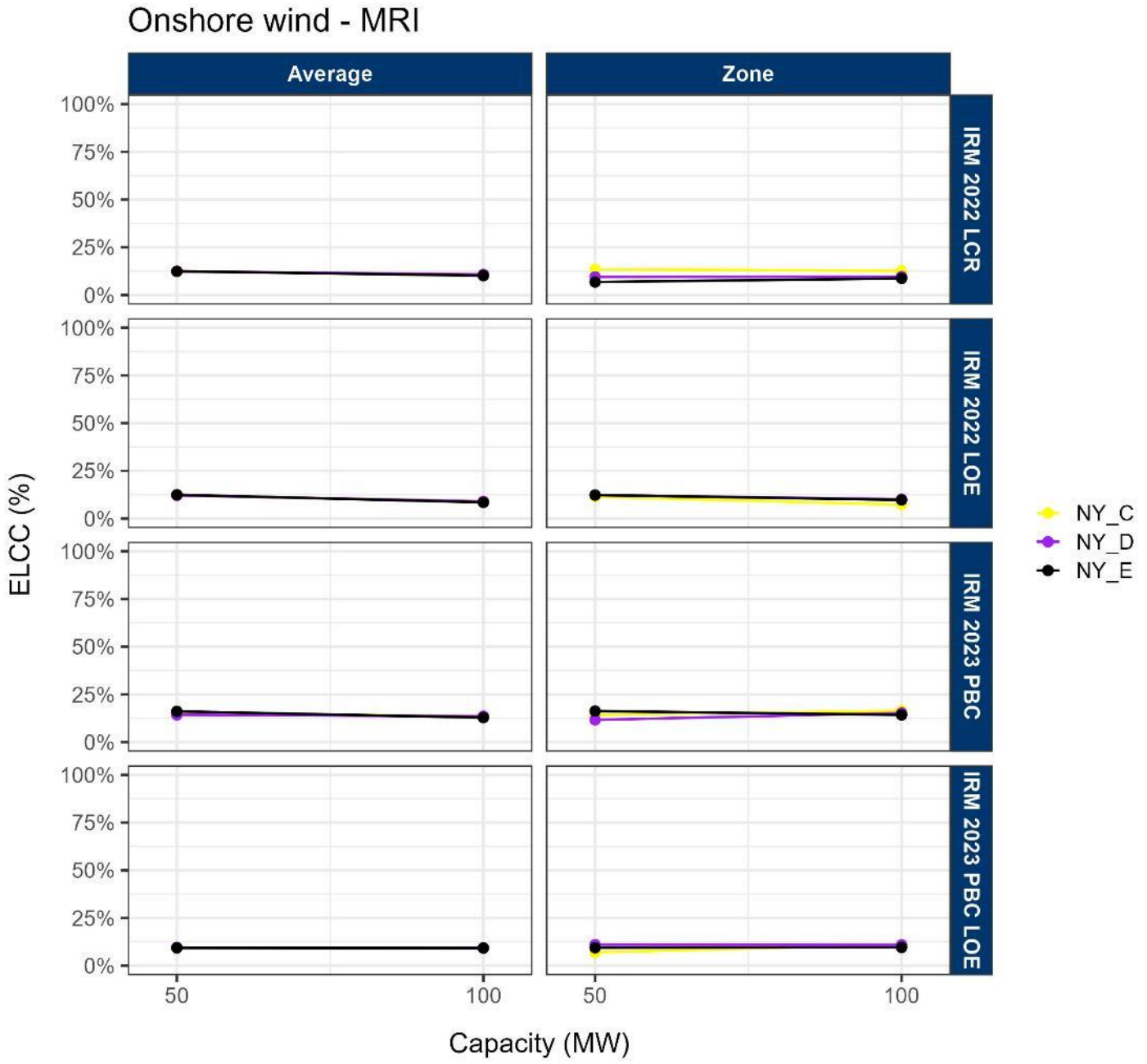
Average = all zones use the same shape



Zone = each zone uses a different shape

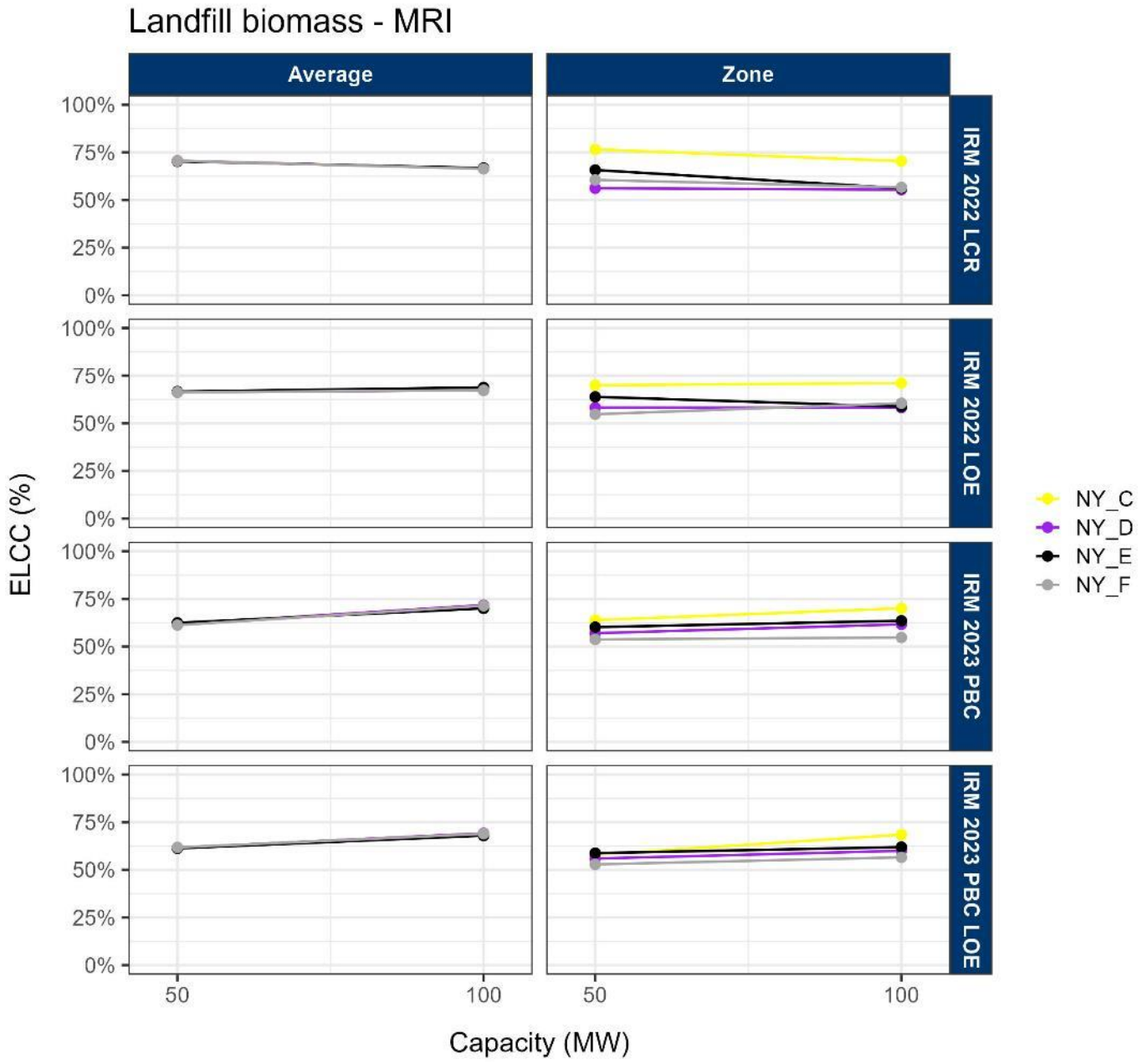
Average = all zones use the same shape





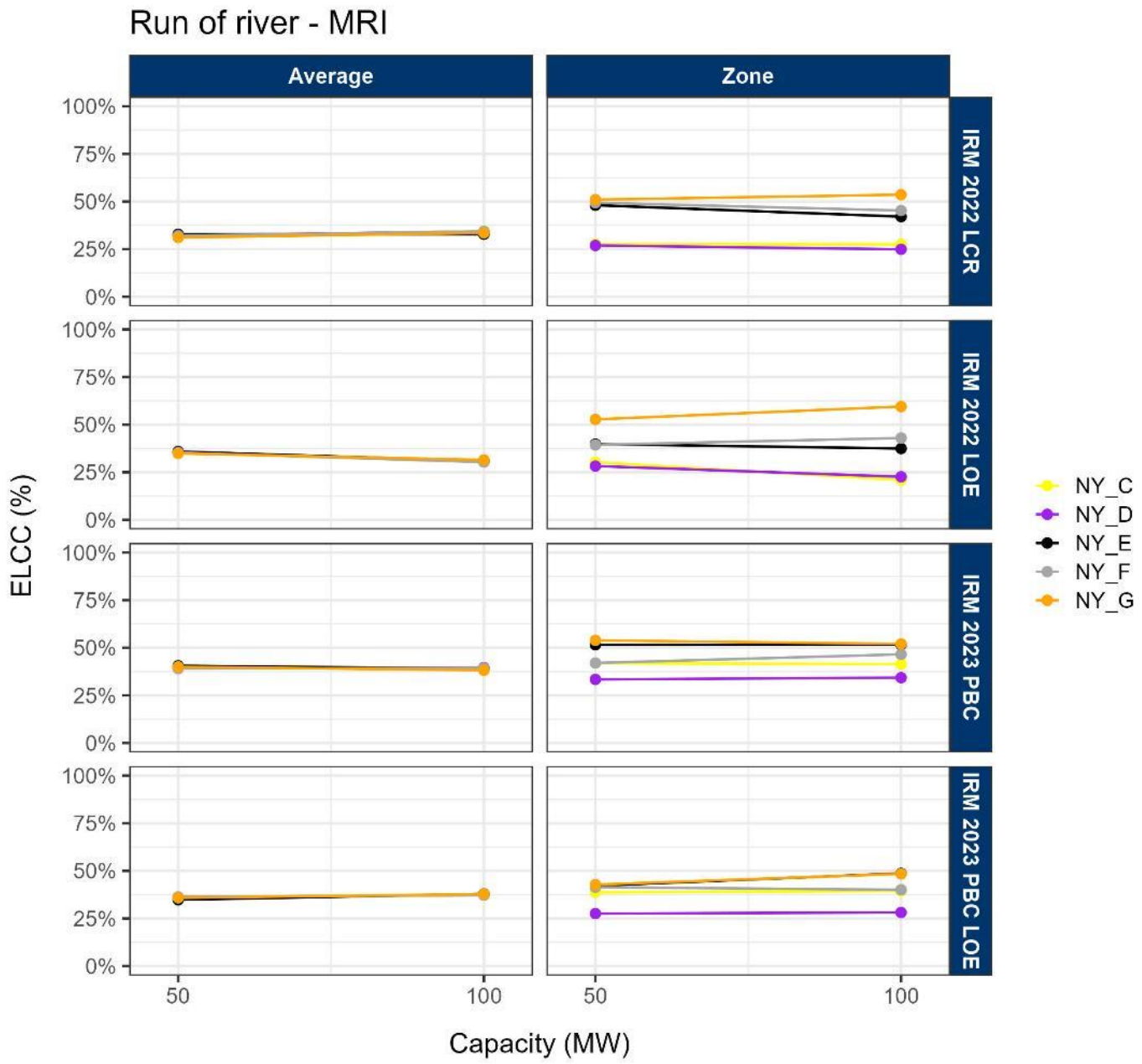
Zone = each zone uses a different shape

Average = all zones use the same shape



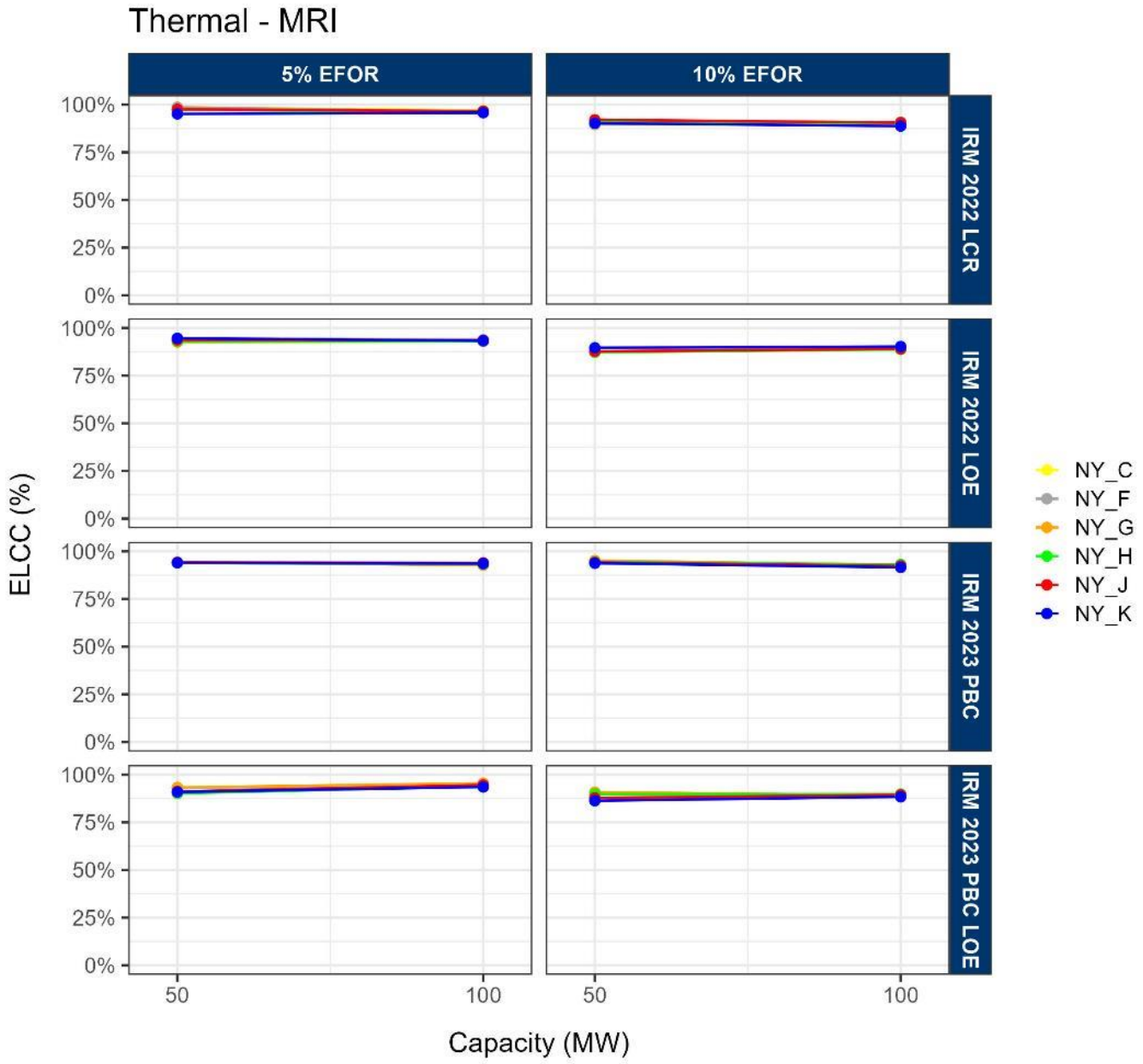
Zone = each zone uses a different shape

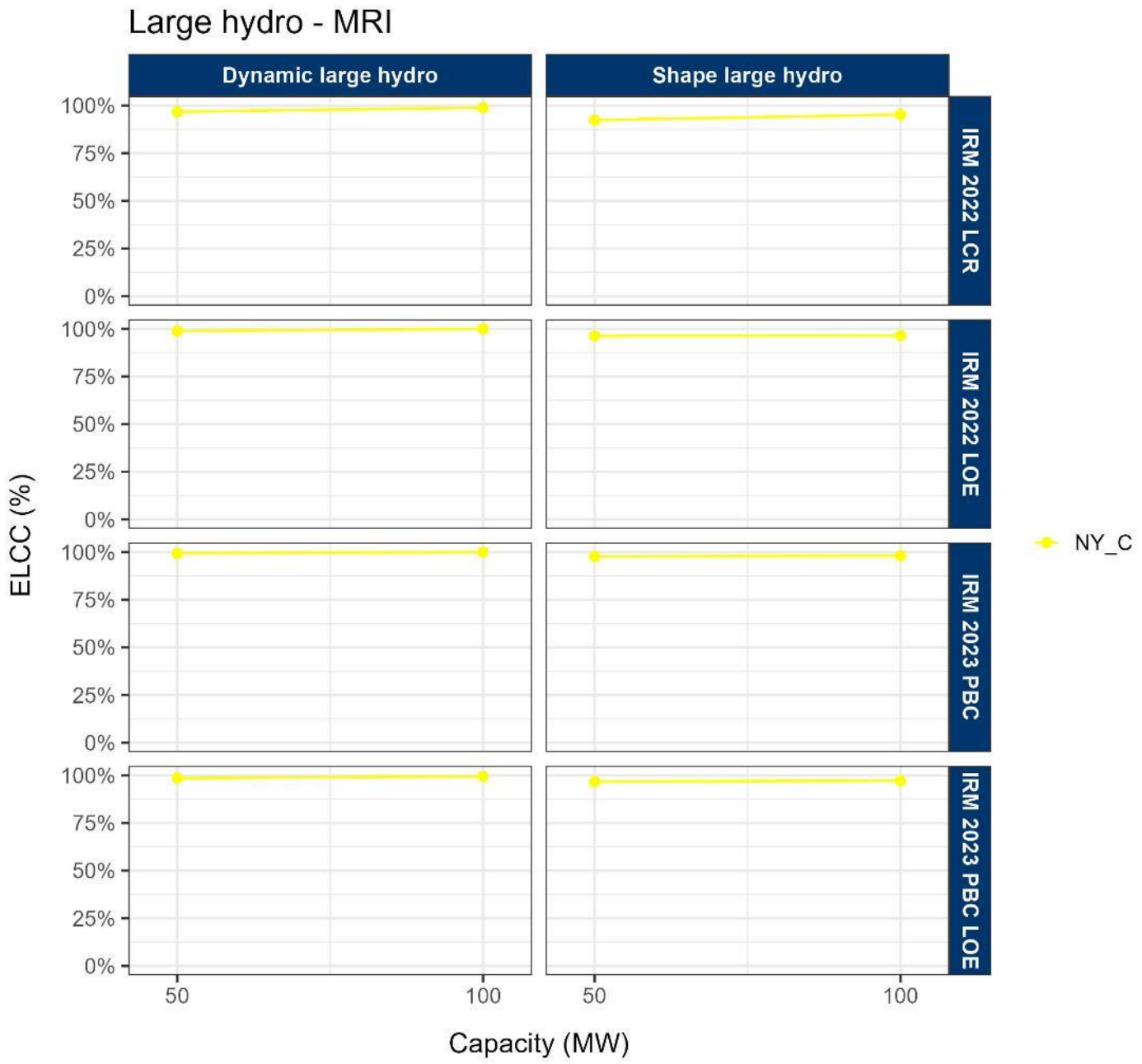
Average = all zones use the same shape



Zone = each zone uses a different shape

Average = all zones use the same shape





Shape = fixed shape dispatch

Dynamic = MARS dispatch algorithm

10/27/2022

Confidential. Not to be copied, reproduced, or distributed without prior approval.

CAUTION CONCERNING FORWARD-LOOKING STATEMENTS:

This document contains "forward-looking statements" – that is, statements related to future events that by their nature address matters that are, to different degrees, uncertain. For details on the uncertainties that may cause our actual future results to be materially different than those expressed in our forward-looking statements, see http://www.ge.com/investor-relations/disclaimer-caution-concerning-forwardlooking-statements as well as our annual reports on Form 10-K and quarterly reports on Form 10-Q. We do not undertake to update our forward-looking statements. This document also includes certain forward-looking projected financial information that is based on current estimates and forecasts. Actual results could differ materially. to total risk-weighted assets.]

NON-GAAP FINANCIAL MEASURES:

In this document, we sometimes use information derived from consolidated financial data but not presented in our financial statements prepared in accordance with U.S. generally accepted accounting principles (GAAP). Certain of these data are considered "non-GAAP financial measures" under the U.S. Securities and Exchange Commission rules. These non-GAAP financial measures supplement our GAAP disclosures and should not be considered an alternative to the GAAP measure. The reasons we use these non-GAAP financial measures and the reconciliations to their most directly comparable GAAP financial measures are posted to the investor relations section of our website at www.ge.com. [We use non-GAAP financial measures including the following:

- Operating earnings and EPS, which is earnings from continuing operations excluding non-service-related pension costs of our principal pension plans.
- GE Industrial operating & Vertical earnings and EPS, which is operating earnings of our industrial businesses and the GE Capital businesses that we expect to retain.
- GE Industrial & Verticals revenues, which is revenue of our industrial businesses and the GE Capital businesses that we expect to retain.
- Industrial segment organic revenue, which is the sum of revenue from all of our industrial segments less the effects of acquisitions/dispositions and currency exchange.
- Industrial segment organic operating profit, which is the sum of segment profit from all of our industrial segments less the effects of acquisitions/dispositions and currency exchange.
- Industrial cash flows from operating activities (Industrial CFOA), which is GE's cash flow from operating activities excluding dividends received from GE Capital.
- Capital ending net investment (ENI), excluding liquidity, which is a measure we use to measure the size of our Capital segment.
- GE Capital Tier 1 Common ratio estimate is a ratio of equity

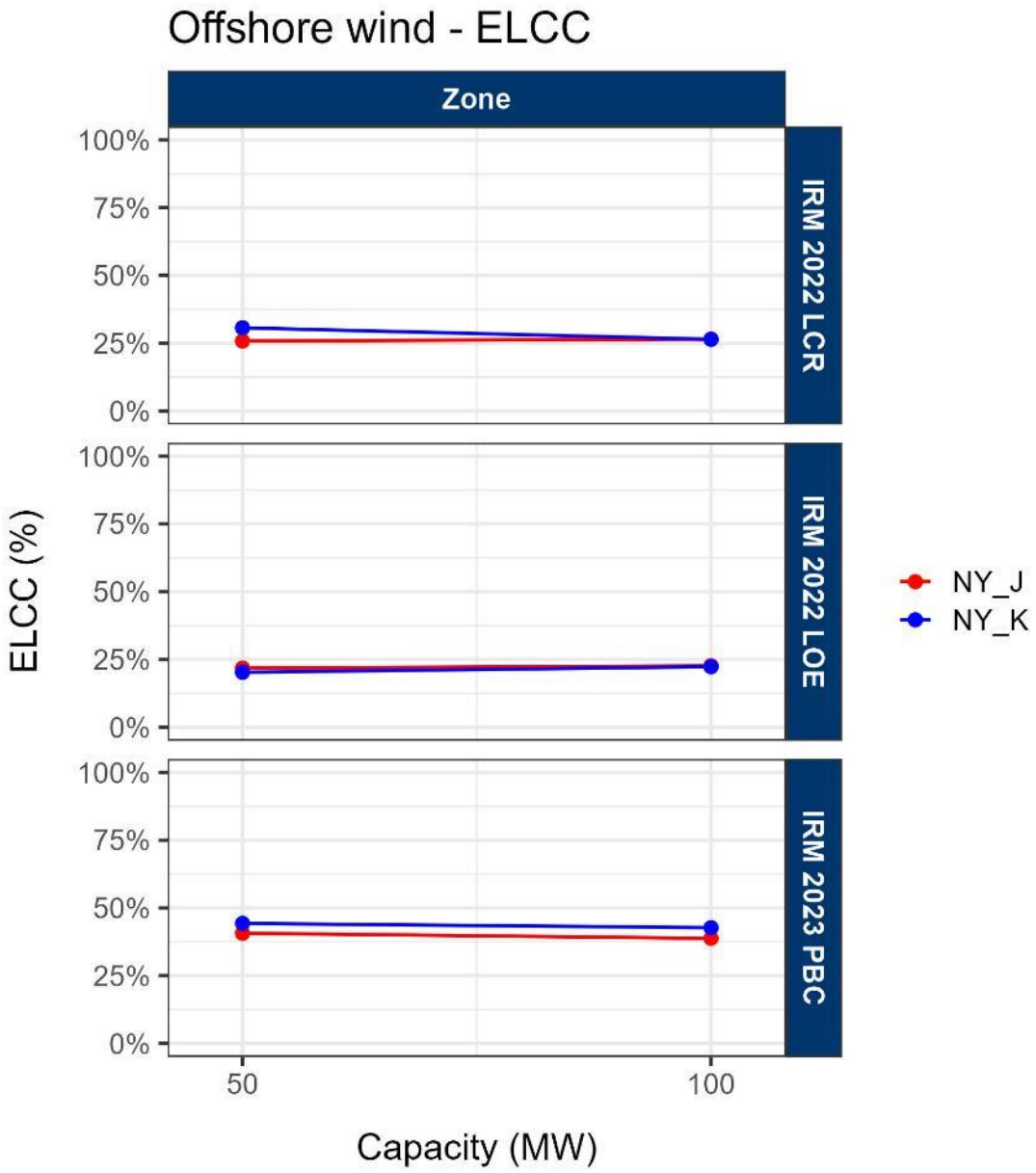
ADDITIONAL SLIDES

2023 IRM PBC - ELCC results

Comparison of 2023 PBC cases and IRM 2022 LCR

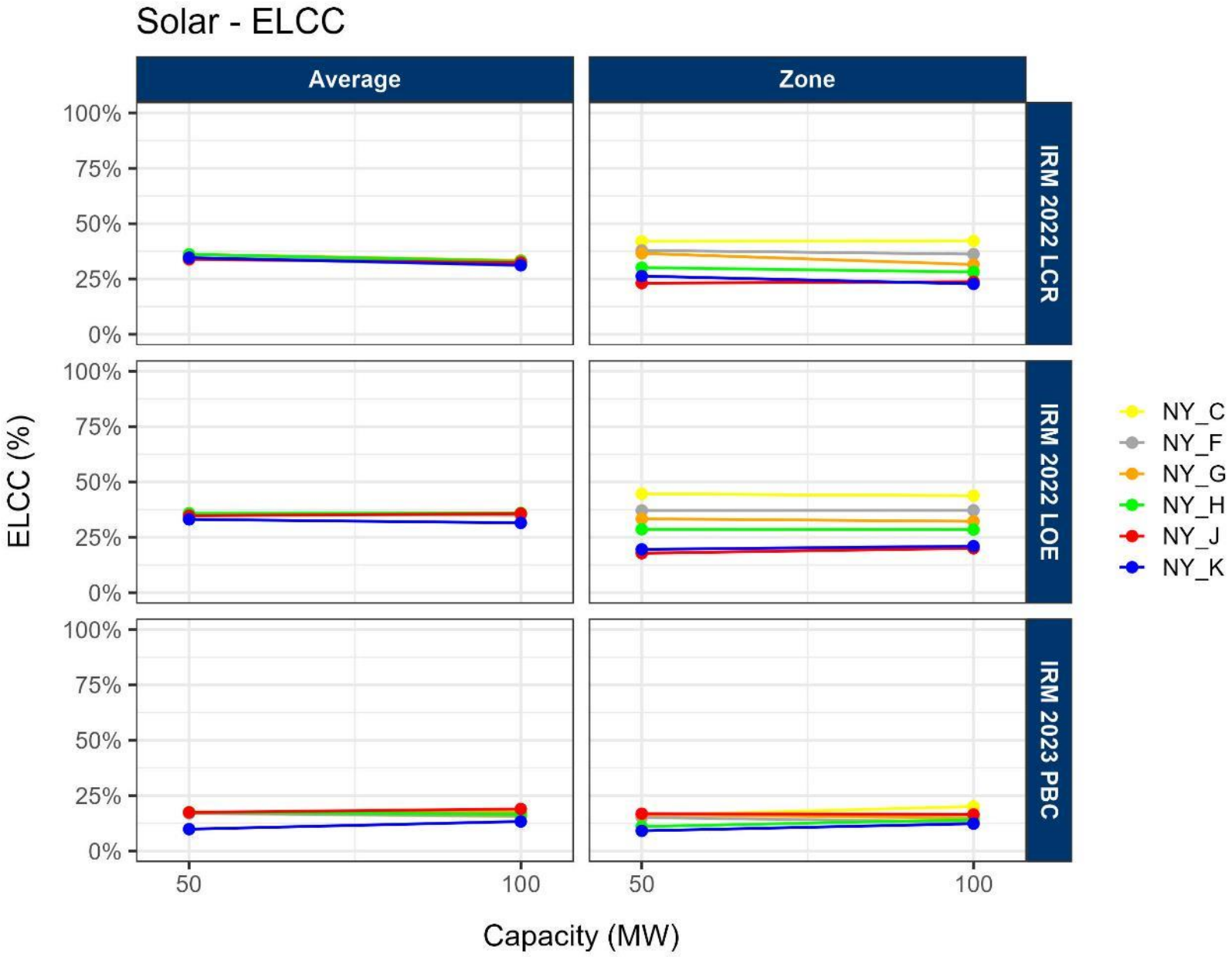
		Average ELCC Capacity Value (100 MW)			Change from 2022 LCR
Type	Subtype	IRM 2022 LCR	IRM 2022 LOE	IRM 2023 PBC	IRM 2023 PBC
Thermal	5% EFOR	94.7%	95.2%	95.4%	0.7%
	10% EFOR	88.1%	95.0%	92.5%	4.4%
Biomass	Average	65.3%	67.1%	65.4%	0.1%
	Zone	62.0%	63.6%	57.7%	-4.4%
Run of river	Average	35.5%	32.7%	35.6%	0.2%
	Zone	39.3%	37.3%	39.3%	0.0%
Onshore wind	Average	8.6%	6.3%	13.1%	4.5%
	Zone	8.3%	8.0%	11.2%	2.9%
Offshore wind	Zone	26.5%	22.5%	40.7%	14.3%
Solar	Average	32.7%	34.8%	16.3%	-16.4%
	Zone	30.8%	30.5%	15.1%	-15.6%
Dynamic ELR	2h	42.7%	48.3%	N/A	N/A
	4h	70.5%	87.7%	86.3%	15.9%
	6h	76.7%	90.5%	91.5%	14.8%
	8h	98.7%	99.0%	98.4%	-0.3%
Large hydro	Dynamic	98.9%	99.2%	98.8%	-0.2%
	Fixed shape	97.0%	99.2%	98.7%	1.8%

Similar trends were described for the MRI-based results in the main slides



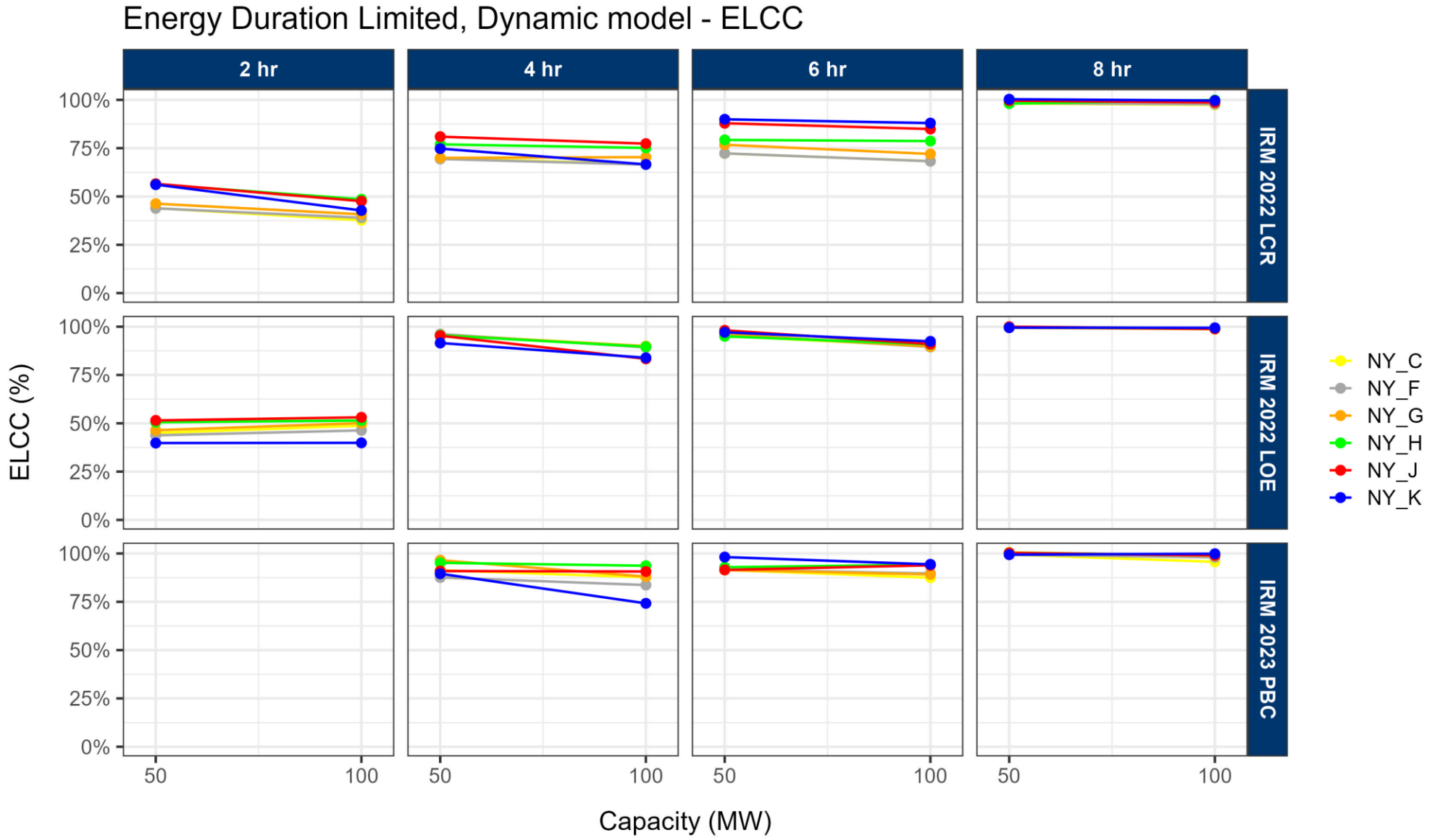
Zone = each zone uses a different shape

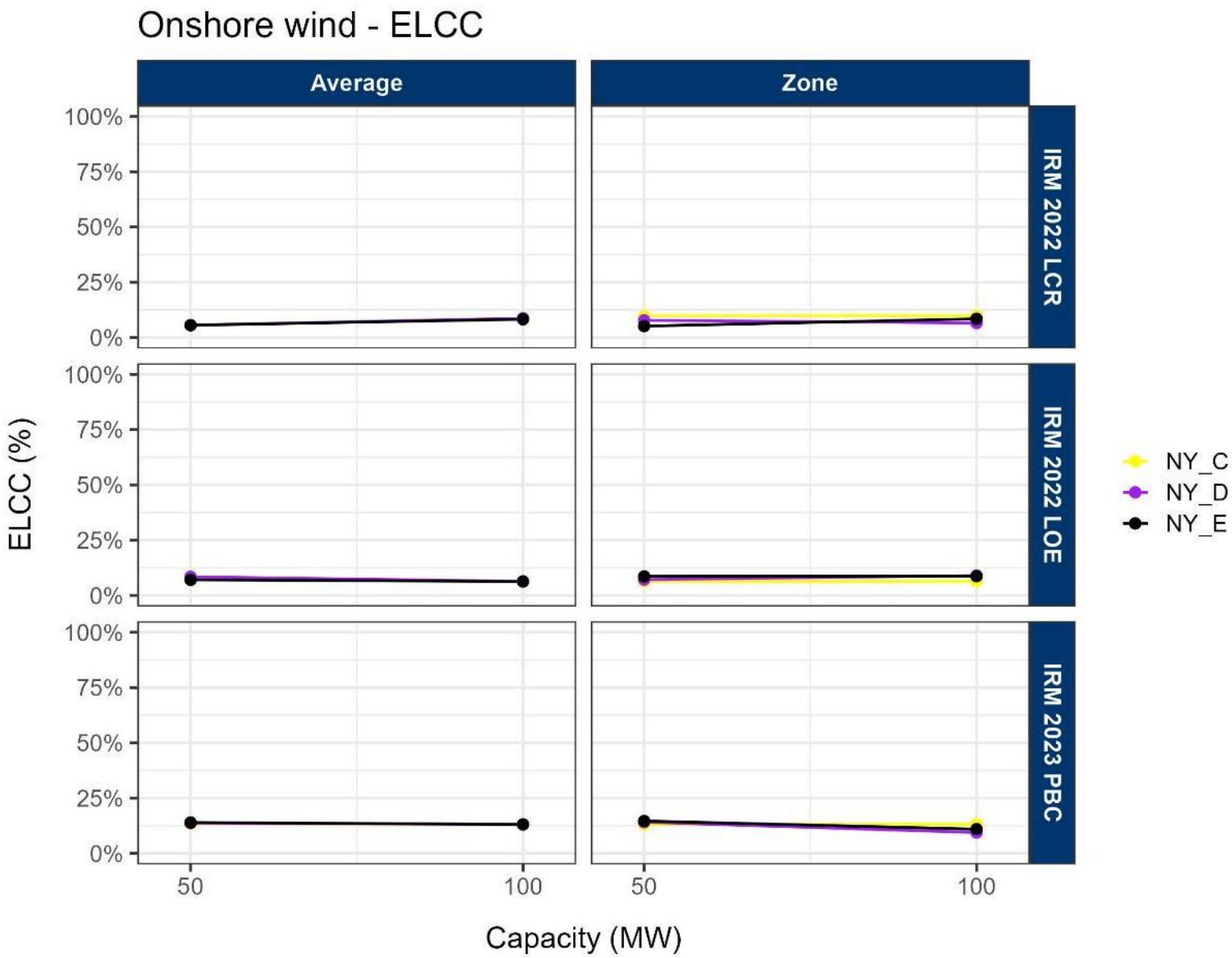
Average = all zones use the same shape



Zone = each zone uses a different shape

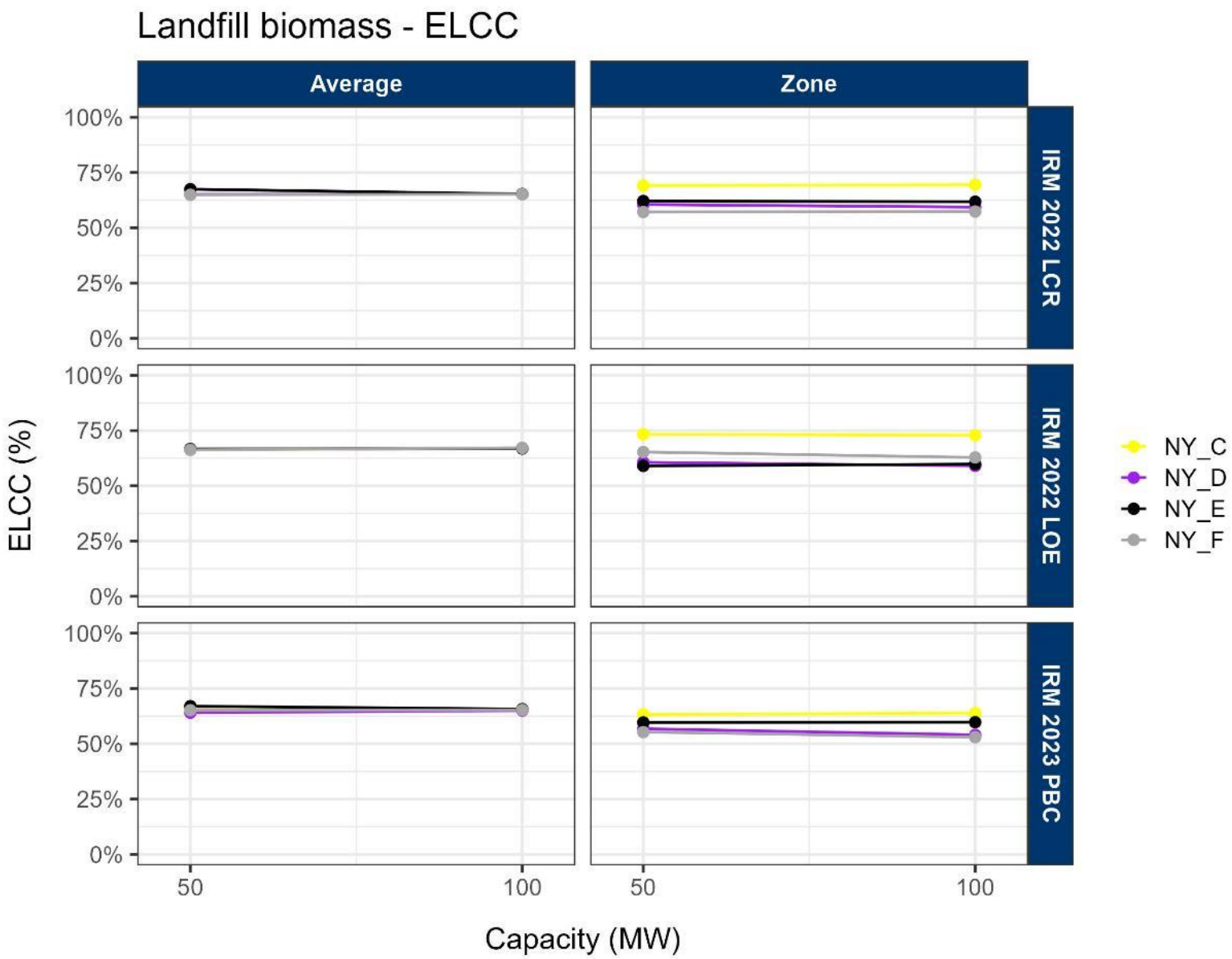
Average = all zones use the same shape





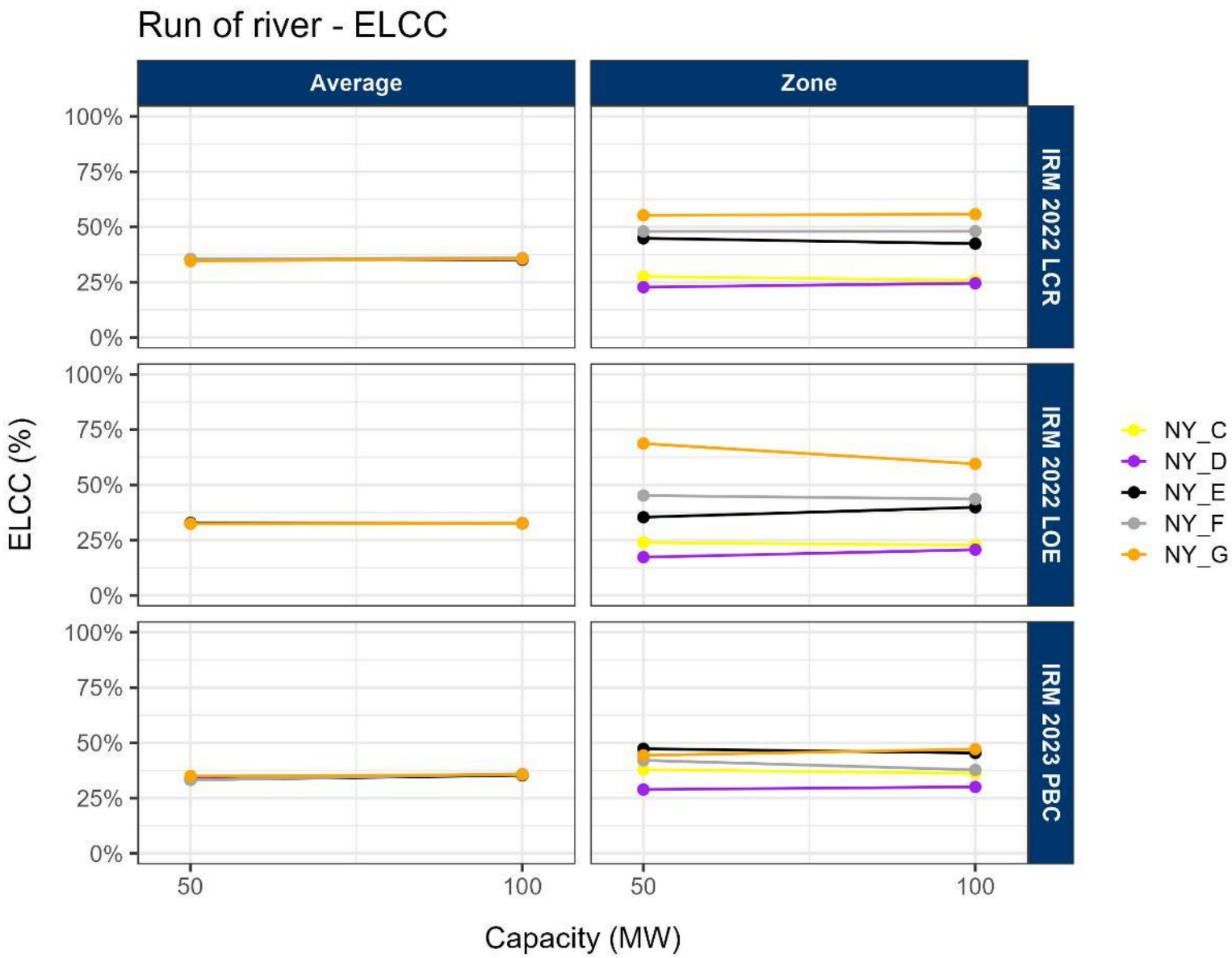
Zone = each zone uses a different shape

Average = all zones use the same shape



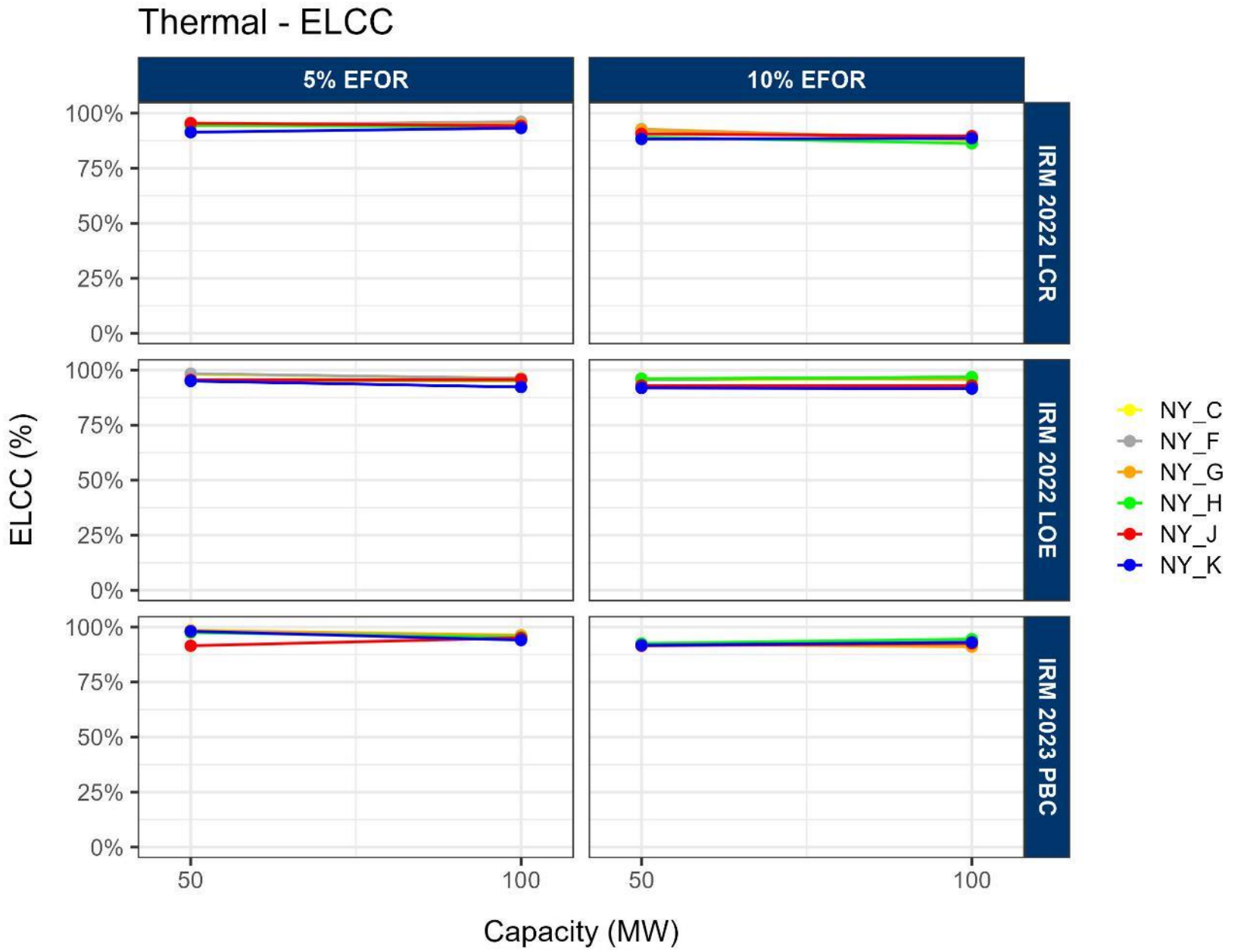
Zone = each zone uses a different shape

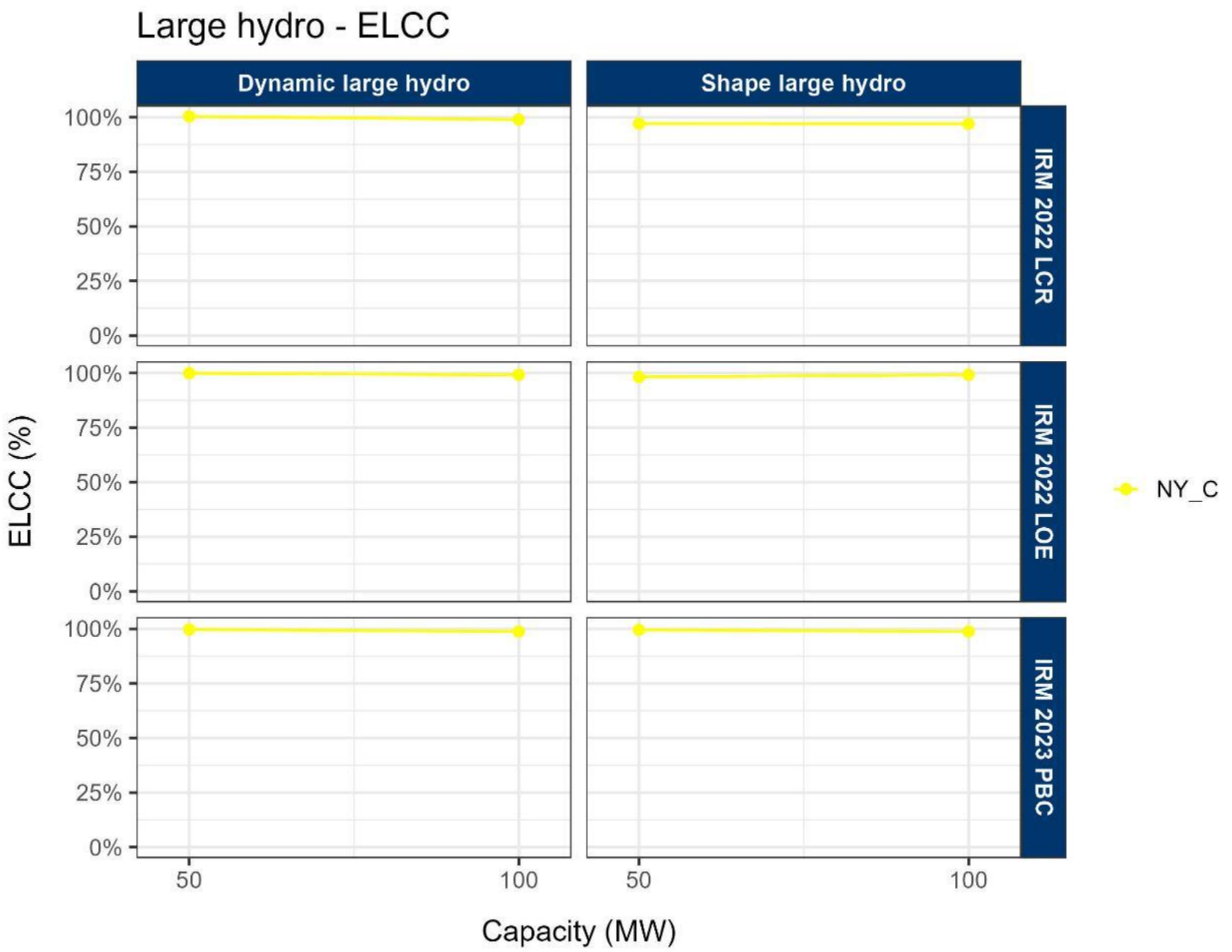
Average = all zones use the same shape



Zone = each zone uses a different shape

Average = all zones use the same shape





Shape = fixed shape dispatch

Dynamic = MARS dispatch algorithm

Attachment II

New York ISO
Independent System Operator

Capacity Accreditation: Implementation Details

Maddy Mohrman, Market Design Specialist

Business Issues Committee

December 14, 2022

Agenda

- Background
- Capacity Accreditation Overview
- Implementation Details Summary
- Next Steps
- Appendix

New York ISO

Background

Background

- On May 10th, 2022, the FERC approved the market design for Capacity Accreditation as part of the NYISO's Comprehensive Mitigation Review filing
- The goal of this year's Capacity Accreditation project was to (1) develop the implementation details and technical specifications for the market design and (2) propose necessary ICAP Manual revisions
  - The NYISO is seeking approval of the ICAP Manual revisions, which incorporate the Capacity Accreditation implementation details, and a recommendation to the Management Committee of an associated tariff revision

New York ISO

Capacity Accreditation Overview

New York ISO

Capacity Accreditation Overview

- **As approved by FERC and detailed in MST 2.3 and MST 5.12.14:**
  - Capacity Accreditation Factors (CAFs) will reflect the marginal reliability contribution of the ICAP Suppliers within each Capacity Accreditation Resource Class (CARC) toward meeting NYSRC resource adequacy requirements for the upcoming Capability Year, starting with the Capability Year that begins in May 2024
    - A CARC is a defined set of Resources and/or Aggregations with similar technologies and/or operating characteristics which are expected to have similar marginal reliability contributions toward meeting NYSRC resource adequacy requirements for the upcoming Capability Year
    - The NYISO will annually review and establish the CARCs and applicable CAFs for the upcoming Capability Year
    - Each ICAP Supplier will be assigned to a CARC and receive the applicable CAF for its assigned CARC and capacity zone
    - An ICAP Supplier's assigned CAF will be used in calculating its Adjusted ICAP and, in turn, the UCAP the Supplier is qualified to supply to the NYCA
      - A Supplier's CAF will replace its Duration Adjustment Factor (DAF) in the calculation of Adjusted ICAP
  - Starting with the Capability Year that begins in May 2024, the NYISO will annually review the Peak Load Window associated with the bidding requirements for Resources with Energy Duration Limitations and modify the Peak Load Window accordingly, pursuant to ISO Procedures

New York ISO

Implementation Details Summary

New York ISO

Capacity Accreditation Resource Classes

New York ISO

Capacity Accreditation Resource Classes

- **The NYISO will annually review the list of CARCs and the assignment of Resources to CARCs for the upcoming Capability Year**
  - The NYISO will establish CARCs for the upcoming Capability Year based on the resource types that may participate in the ICAP Market in the upcoming Capability Year and initial CAF testing
    - The NYISO will post the final list of CARCs for the upcoming Capability Year to the NYISO Installed Capacity Market web page by November 30th of the year preceding the upcoming Capability Year
      - The CARC list will identify what combinations of participation models, elected Energy Duration Limitations, and resource characteristics will lead to the assignment of a Resource to a specific CARC
  - Each Resource will be assigned to a specific CARC for the upcoming Capability Year based on the combination of the Resource's participation model, elected Energy Duration Limitation, and resource characteristics for the upcoming Capability Year
    - Each Resource's CARC assignment will be finalized after the posting of the final list of CARCs for the upcoming Capability Year and prior to the posting of the CAFs for the upcoming Capability Year (see slide 13 for the CARC and CAF assignment timeline)
      - Each Resource will have the opportunity to review its CARC assignment before it is finalized by a deadline identified in the ICAP Event Calendar
- **As additional resource characteristics are incorporated into the IRM/LCR model and found to have an identifiable impact on a Resource's marginal reliability contribution, those characteristics will be used in establishing CARCs and determining a Resource's CARC assignment**
  - Possible examples include, but are not limited to, firm fuel status and start-up notification time requirements

New York ISO

Preliminary Capacity Accreditation Resource Classes

- Solar
- Onshore Wind
- Offshore Wind
- Landfill Gas
- 2-hour Energy Duration Limited[1]
- 4-hour Energy Duration Limited[1,2]
- 6-hour Energy Duration Limited[1]
- 8-hour Energy Duration Limited[1]
- Limited Control Run-of-River Hydro
- Large Hydro[3]
- Unlimited Conventional Resource[4]
- Conventional Resource with Non-Firm Fuel[4]
- Startup Notification Limited Conventional Resource[4]
- Startup Notification Limited Conventional Resource with Non-Firm Fuel[4]

[1] Energy Duration Limited CARCs will apply to resources with Energy Duration Limitations, such as Energy Storage Resources, Energy Limited Resources, and dispatchable Distributed Energy Resources, that do not belong to another CARC

[2] Special Case Resources (SCRs) will be assigned to the 4-hour Energy Duration Limited CARC for initial implementation of Capacity Accreditation. As modeling of SCRs in the IRM/LCR model changes to reflect the expected operations of SCRs in the NYISO market, a separate SCR CARC will be established

[3] The Large Hydro CARC will apply to resources powered by hydraulic turbines that are not Limited Control Run-of-River Hydro or standalone pumped storage

[4] Conventional resources will be separated into these classes as firm fuel and start-up notification requirement characteristics are incorporated into the IRM/LCR model. Next year's Modeling Improvements for Capacity Accreditation project will evaluate how to incorporate these characteristics into the IRM/LCR model and the criteria for assigning each conventional resource to the appropriate CARC based on its firm fuel status and start-up notification requirement characteristics

Capacity Accreditation Factors

New York ISO

Capacity Accreditation Factors

- **The NYISO will annually calculate the CAFs for each CARC for the upcoming Capability Year**
- **The NYISO will use the Locational Minimum Installed Capacity Requirement study model ("LCR model") used to calculate the Locational Minimum Installed Capacity Requirements for the upcoming Capability Year, as the starting model to calculate the CAFs for the upcoming Capability Year**
  - The CAFs for each CARC for the upcoming Capability Year will be posted to the NYISO Installed Capacity Market web page by March 1st preceding the upcoming Capability Year
  - A CAF will be calculated for each CARC and each capacity zone (ROS, GHI, J, and K) to the extent an Installed Capacity Supplier in the CARC exists or is projected to exist in the capacity zone in the upcoming Capability Year
    - Each ICAP Supplier will be assigned the corresponding CAF for the Supplier's assigned CARC and capacity zone in which the ICAP Supplier is qualified to supply Unforced Capacity to the NYCA
      - Each ICAP Supplier will be provided its CAF assignment by a deadline identified in the ICAP Event Calendar (see slide 13 for the CARC and CAF assignment timeline)
- **Utilizing the LCR model, the ISO will calculate each CAF using the Marginal Reliability Improvement (MRI) technique**
  - Through extensive testing, the NYISO determined the MRI technique sufficiently approximates the Effective Load Carrying Capability (ELCC) technique for calculating marginal reliability contributions and requires a fraction of the computational time

New York ISO

CARC and CAF Assignment Timeline

New York ISO

CARC and CAF Assignment Timeline[1,2]

- **By August 1st**
  - A Resource can elect to change its Energy Duration Limitation and/or participation model for the upcoming Capability Year
    - The August 1 deadline for electing a different Energy Duration Limitation and/or participation model for the upcoming Capability Year exists in the ICAP Manual today
- **By September 30th**
  - The NYISO will post the preliminary CARC list for the upcoming Capability Year to the NYISO's website
- **By November 30th**
  - After receiving stakeholder feedback on the preliminary CARC list, the NYISO will post the final CARC list for the upcoming Capability Year to the NYISO's website
- **Approximately November 30th – March 1st**
  - The NYISO will assign each Resource to the applicable CARC for the upcoming Capability Year based on its Energy Duration Limitation, participation model, and resource characteristics for the upcoming Capability Year
    - During this window, each Resource will have the opportunity to review its CARC assignment before it is finalized by a date that will be identified in the ICAP Event Calendar

[1]This annual timeline would begin August 2023 for implementation of Capacity Accreditation in the Capability Year starting May 2024

[2] Each Resource's derating factor will continue to be available to the Resource by the applicable date Identified in the ICAP Event Calendar for the upcoming Capability Period. Derating factors are calculated on a Capability Period basis in accordance with Section 4.5 of the ICAP Manual

New York ISO

CARC and CAF Assignment Timeline[1,2]

- **By March 1st**
  - The NYISO will post the CAFs for each CARC for the upcoming Capability Year to the NYISO's website
- **By Mid-March**
  - The corresponding CAF will automatically be assigned to each Resource based on the Resource's assigned CARC for the upcoming Capability Year and capacity zone in which the Resource is qualified to supply Unforced Capacity to the NYCA
    - Each Resource will have the opportunity to review its assigned CAF before it is finalized by a date that will be identified in the ICAP Event Calendar
- **End of March**
  - The first auction for the upcoming Capability Year begins

[1]This annual timeline would begin August 2023 for implementation of Capacity Accreditation in the Capability Year starting May 2024

[2] Each Resource's derating factor will continue to be available to the Resource by the applicable date Identified in the ICAP Event Calendar for the upcoming Capability Period. Derating factors are calculated on a Capability Period basis in accordance with Section 4.5 of the ICAP Manual

Resource Specific Derating Factors

Resource Specific Derating Factors

- Generally, a Resource's UCAP will be determined by combining the Resource's ICAP, CAF, and resource specific derating factor as illustrated below
  - UCAP = Adjusted ICAP x (1 – resource specific derating factor)
    - Where:
      - Adjusted ICAP = ICAP * CAF
      - ICAP = min(DMNC, CRIS)
    - So, UCAP = min(DMNC, CRIS) * CAF * (1 – resource specific derating factor)
- Because the representative unit used to calculate the CAFs for CARCs comprised of availability-based Resources will be modeled with no random forced outages or forced derates, availability-based Resources can continue to utilize their existing resource specific derating factor calculations without any adjustment or double accounting of unavailability due to the introduction of CAFs
  - Availability-based Resources include Resources participating in the ICAP Market as Generators, Control Area System Resources, Energy Limited Resources, Capacity Limited Resources, Behind-the-Meter Net Generation Resources, Energy Storage Resources, and dispatchable Distributed Energy Resources
- Because the representative unit used to calculate the CAFs for CARCs comprised of IPRs or LCROR Hydro Resources will be modeled using weighted-average historic hourly production profiles, the resource specific derating factor calculation for IPRs and LCROR will be updated, as shown on the following slide, to avoid double accounting of unavailability due to the introduction of CAFs

New York ISO

Resource Specific Derating Factors

- **The resource specific derating factors for IPRs and LCROR Hydro Resources will be based on a comparison of the Resource's applicable average capacity factor for the Capability Period to the applicable average capacity factor for the same Capability Period of the representative unit used to calculate the Resource's CAF**
  - The resource specific derating factor will be calculated according to a ratio-based approach or a difference-based approach, depending on which approach will result in the smallest difference between a Resource's effective capacity value and CAF[1]
    - Ratio-based approach:
      - UCAP = ICAP * CAF * (1 – resource specific derating factor)
      - Resource specific derating factor = 1 – Average Capacity Factor Ratio
      - Average Capacity Factor Ratio = $\frac{Average\ Capacity\ Factor\ of\ Resource}{Average\ Capacity\ Factor\ of\ Representative\ Unit}$
    - Difference-based approach:
      - UCAP = ICAP * (CAF + Average Capacity Factor Difference)
      - Average Capacity Factor Difference = $Average\ Capacity\ Factor\ of\ Resource\ -\ Average\ Capacity\ Factor\ of\ Representative\ Unit$
  - Please refer to the revisions to Attachment J of the ICAP Manual for the detailed formulation of the resource specific derating factor calculation

[1] For background information on the new resource specific derating factor calculation, please refer to the 09/30/2022 ICAPWG presentation

New York ISO

Annual Peak Load Window Review

New York ISO

Proposal for Annual Peak Load Window Review

- MST 5.12.14.3 requires the NYISO to annually review the PLWs for the upcoming Capability Year and modify the PLWs if necessary
- The proposal for annually reviewing the Summer PLW involves analysis of the hourly LOLE for the upcoming Summer Capability Period, as calculated by the LCR model. If the PLW from the prior Summer Capability Period does not capture at least 90% of the hourly LOLE for the upcoming Summer Capability Period, the process requires a new Summer PLW to be established that would captures at least 90% of the hourly LOLE
- The NYISO proposes to maintain the existing Winter PLW (HB 16-21) until winter modeling approaches and assumptions are incorporated into the IRM/LCR model
  - Once winter modeling approaches and assumptions are incorporated into the IRM/LCR model, the NYISO will re-evaluate utilizing the proposed Summer PLW process to determine the Winter PLW
- The Summer and Winter PLWs will also be subject to review for consistency with expected hours of reliability risk based on NYISO operating experience and/or expected grid conditions
  - If either PLW is inconsistent with the expected hours of reliability risk based on ISO review, the ISO will advise the NYISO Business Committee and the NYISO Operating Committee it has determined that a new Peak Load Window must be set. The new Peak Load Window must be approved by the NYISO Operating Committee and posted to the NYISO Installed Capacity Market web page by March 1 preceding the upcoming Capability Year.
- The final PLWs for the upcoming Capability Year will be posted to the NYISO Installed Capacity Market web page by March 1st

New York ISO

Energy Duration Limitation Proposal

New York ISO

EDL Proposal for Capacity Accreditation

- The existing EDL options currently detailed in MST 5.12.14 sunset with the Capability Year that begins in May 2024
- The NYISO is proposing to continue to allow Resources with a limited daily run-time less than 24 hours to elect a 2-, 4-, 6-, or 8-hour EDL, as described in Section 4.1.1 of the ICAP Manual
  - If the NYISO observes reliability needs extending past 8 hours, the NYISO will consider adding a 10-hour EDL election option
- Because the annually determined PLW may be shorter than the maximum allowable EDL, the NYISO is proposing corresponding bidding, scheduling, and notification requirements and initial DMNC testing requirements for Resources with EDLs longer than the PLW
  - Revisions to MST 5.12.7 are necessary to incorporate the bidding, scheduling, and notification requirements for Resources with EDLs longer than the PLW. The corresponding revisions to MST 5.12.7 are included with today's meeting materials for recommendation to the Management Committee for approval
- Derating factors for Resources with EDLs will continue to be calculated over the hours corresponding to each Resource's bidding, scheduling, and notification requirements

New York ISO

CAF Interaction with ICAP Demand Curves

New York ISO

CAF Interaction with ICAP Demand Curves

- Section 5.5 of the ICAP Manual details the current calculation of the ICAP Demand Curve reference point prices as follows:

$$RP_z = \frac{ARV_z * AssmdCap_z}{6 * DAF_z * [SDMNC_z * \left(1 - \frac{LOE_z - 1}{ZCPR_z - 1}\right) + WDMNC_z * \left(1 - \frac{LOE_z - 1 + WSR_z - 1}{ZCPR_z - 1}\right)]}$$

- The NYISO is proposing to remove the applicable DAF from the ICAP Demand Curve reference point price calculation formula in the ICAP Manual
  - With implementation of Capacity Accreditation in Capability Year 2024-2025, DAFs will no longer apply. Additionally, the applicable DAF for the current ICAP Demand Curves is 1. Therefore, removing the DAF will not impact the current ICAP Demand Curve reference point prices
- Given that Capacity Accreditation Factors (CAFs) will not be determined until March for the upcoming Capability Year and ICAP Demand Curves are required to be posted by (or, in the case of the first year of each reset, filed by) November 30th prior to the start of each Capability Year, the NYISO does not propose to include use of the applicable CAF in determining the ICAP Demand Curve reference point prices
  - For example, the CAFs for Capability Year 2024-2025 will be determined in March 2024
- Instead, the NYISO proposes to account for the applicable CAF as part of translating the ICAP Demand Curves to UCAP terms
  - Incorporating the CAF into the ICAP to UCAP translation will produce the same UCAP reference point prices that would result if the CAF had been incorporated into the ICAP Demand Curve reference point prices but avoids any potential for adverse impacts to the November 30th deadline to post (or file) updated (or new) curves

New York ISO

Translation Factors for IRM/LCR Studies and Deliverability Testing

New York ISO

Translation Factors

- Translation factors are currently used as part of the ICAP-to-UCAP translation for 1) the shifting methodology carried out in the IRM/LCR studies and 2) modeling resources for deliverability studies
- The NYISO calculates translation factors for both Intermittent Power Resources and non-Intermittent Power Resources following ISO procedure and NYSRC Policy
- The current ISO procedure to calculate translation factors for Intermittent Power Resources utilizes the existing market UCAP calculation (detailed in Section 4.5 of the ICAP Manual) applied to the 5-year-historical production of the resource
- With the implementation of Capacity Accreditation, the market UCAP calculation for all Resources will reflect the use of marginal CAFs
  - Therefore, a separate ISO procedure will be required to calculate the translation factors for Intermittent Power Resources for use in the IRM/LCR and deliverability studies
    - The current ISO procedure for calculating translation factors for non-Intermittent Power Resources (i.e., using a blended average of the derating factors of non-Intermittent Power Resources) will not reflect the use of marginal CAFs. Therefore, the current ISO procedure for non-Intermittent Power Resources will be maintained

New York ISO

Translation Factors

- The NYISO has proposed revisions to OATT Attachment S to clarify the translation factor methodology used in deliverability studies for different resource classes
  - The revisions to OATT Attachment S were approved by the NYISO Management Committee as part of the interconnection changes for the Internal Controllable Lines project. The approved revisions will be filed with FERC early next year
- The proposed ISO procedure to calculate the translation factors for IPRs and LCROR Hydro is detailed in a new Attachment N to the ICAP Manual
  - Attachment N is included with today's meeting materials for reference. Attachment N will be included in the ICAP Manual Appendix following the FERC approval of the associated revisions to OATT Attachment S, described above

New York ISO

Next Steps

New York ISO

Next Steps

- December 21st - Management Committee
  - Vote on the proposed revisions to MST 5.12.7
- File the informational filing, summarizing the final implementation details for Capacity Accreditation, with FERC within 90-days

New York ISO

Questions?

New York ISO

Our Mission & Vision

Mission

Ensure power system reliability and competitive markets for New York in a clean energy future

Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation

New York ISO

Appendix

Definitions

- CAF – Capacity Accreditation Factor
- CARC – Capacity Accreditation Resource Class
- EDL – Energy Duration Limitation
- LCROR – Limited Control Run of River
- IPR – Intermittent Power Resource
- LOLE – Loss of Load Expectation
- PLW – Peak Load Window

New York ISO

ICAP Manual and Tariff Revisions

New York ISO

ICAP Manual and Tariff Revisions - Summary

- Comprehensive list of existing sections revised, and new sections proposed:

Document	Section	Section Title
ICAP Manual	2.5	The NYCA Minimum Unforced Capacity Requirement
	2.6	Locational Minimum Installed Capacity Requirements
	4.1.1	Energy Duration Limitations and Duration Adjustment Factors for Installed Capacity Suppliers
	4.1.3	Provisions Applicable to Installed Capacity Suppliers that Participate as Co-located Storage Resources (CSR)
	4.2.1	DMNC Test Periods
	4.2.2.2	Installed Capacity Suppliers with an Energy Duration Limitation
	4.5	Calculation of the Amount of Unforced Capacity each Resource may Supply to the NYCA
	4.8.1	Generators and System Resources
	4.8.2	Energy Limited and Capacity Limited Resources
	4.12	Special Case Resources
	4.15.3	Net-UCAP Calculation
	5.5	Demand Curve and Adjustments
	7	Annual Process to Establish Capacity Accreditation Resource Classes, Capacity Accreditation Factors, and Peak Load Windows

Document	Section	Section Title
ICAP Manual Appendix	Attachment M	Procedure to Apply for a Capacity Limited Resource (CLR), Energy Limited Resource (ELR), Ambient Condition-Dependent Classification and/or for an Energy Duration Limitation
	Attachment J	Unforced Capacity for Installed Capacity Suppliers
MST	5.12.7	Availability Requirements
For future addition to the ICAP Manual Appendix	Attachment N	Procedure to Calculate Translation Factors for an Intermittent Power Resource or Limited Control Run of River Hydro Resource

- The following slides summarize the revisions in each section and the new proposed sections

New York ISO

ICAP Manual and Tariff Revisions

- **ICAP Manual - Section 2.5-2.6**
  - Revised for clarity and to reflect the replacement of “Adjusted Installed Capacity” with “Installed Capacity” in the translation of ICAP requirements to UCAP, beginning with the 2024 Capability Year
    - This revision reflects the updates to MST 5.10 and MST 5.11 accepted by FERC on August 10th, 2022
  - Sunsets the current calculation of Adjusted Installed Capacity with the 2024 Capability Year
    - The new calculation of Adjusted Installed Capacity is included in the revisions to Section 4.5 of the ICAP Manual

New York ISO

ICAP Manual and Tariff Revisions

- **ICAP Manual - Section 4.1.1**
  - Revised to reflect the sunsetting of the Duration Adjustment Factors for ICAP Suppliers with Energy Duration Limitations and existing Peak Load Windows with the 2024 Capability Year
    - The annual review process for establishing the Peak Load Windows beginning with the 2024 Capability Year is included in the new Section 7.3 of the ICAP Manual
- **ICAP Manual - Section 4.1.3**
  - Removed empty bullet

New York ISO

ICAP Manual and Tariff Revisions

- **ICAP Manual - Section 4.2.1 and Section 4.2.2.2**
  - Revised to reflect the DMNC test period requirements for ICAP Suppliers with Energy Duration Limitations longer than the Peak Load Window
- **MST 5.12.7, Sections 4.8.1 - 4.8.2 of the ICAP Manual, and ICAP Manual Attachment M**
  - Revised to reflect the bidding, scheduling, and notification requirements for ICAP Suppliers with Energy Duration Limitations longer than the Peak Load Window

New York ISO

ICAP Manual and Tariff Revisions

- **ICAP Manual - Section 4.5**
  - Revised to:
    - Include the new calculation of Adjusted Installed Capacity beginning with the 2024 Capability Year
      - A Resource's Adjusted ICAP will be equal to the Resource's ICAP multiplied by its assigned CAF (as detailed in MST 5.12.14.2)
    - Update the calculation of UCAP for IPRs and LCROR Hydro to reflect the new resource specific derating factor methodology beginning with the 2024 Capability Year
    - Update the initial UCAP calculation for new generating Resources to reflect the use of CAFs
    - Remove empty table on page 63
- **ICAP Manual - Section 4.12**
  - Revised to replace the Duration Adjustment Factor with the applicable Capacity Accreditation Factor for SCRs beginning with the 2024 Capability Year
- **ICAP Manual - Section 4.15.3**
  - Specified that a BTM:NG Resource's assigned CAF would be applied to the BTM:NG Resource's Gen UCAP

New York ISO

ICAP Manual and Tariff Revisions

- **ICAP Manual - Section 5.5**
  - Revised to:
    - Remove the Duration Adjustment Factor of the peaking plant from the calculation of the monthly reference point prices for the ICAP Demand Curves
    - Clarify the translation of the quantities on the ICAP Demand Curve to UCAP terms
    - Update the translation of the ICAP Demand Curve prices to UCAP terms to include the Capacity Accreditation Factor and applicable derating factor of the peaking plant for the respective ICAP Demand Curve beginning with the 2024 Capability Year

New York ISO

ICAP Manual and Tariff Revisions

ICAP Manual – Section 7

- This is a new section describing the annual process for establishing CARCs, calculating CAFs, assigning CARCs and CAFs to ICAP Suppliers, and the annual PLW review process
  - Section 7.1 covers the annual process for establishing CARCs and assigning each ICAP Supplier to the appropriate CARC
  - Section 7.2 covers the annual process for calculating CAFs and assigning the appropriate CAF to each ICAP Supplier
    - Section 7.2.1 details the MRI technique for calculating CAFs and the representative unit modeling for each type of CARC
  - Section 7.3 covers the annual PLW review process
- All processes in this section will be implemented beginning with the 2024 Capability Year

New York ISO

ICAP Manual and Tariff Revisions

- **ICAP Manual – Attachment J**
  - Sunsets the existing UCAP calculations with the 2024 Capability Year
    - Small ministerial edits to Sections 3.1.1(a), Sections 3.1.2(a), 3.2.2(a), and 3.7.2(a) of the existing UCAP calculations added for clarification
  - Beginning with the 2024 Capability Year:
    - The Duration Adjustment Factor term in each UCAP formula is replaced with the Installed Capacity Supplier's assigned CAF
    - The UCAP calculation for IPRs and LCRORs is revised to reflect the new resource specific derating factor methodology
    - The Peak Load Window term is replaced with the newly defined ICAP Obligation Hours term for use in measuring the availability of resources with Energy Duration Limitations
      - ICAP Obligation Hours: "The hours that an Installed Capacity Supplier must bid their ICAP obligation (ICAP Equivalent of UCAP Sold or Certified in the most recent ICAP Spot Market Auction) into the DAM. The ICAP obligation hours for Installed Capacity Suppliers with Energy Duration Limitations are described in Sections 4.8.1 and 4.8.2 of this ICAP Manual."
  - Since most components of the existing UCAP calculations remain the same beginning with the 2024 Capability Year, changes from the existing UCAP calculations are highlighted in yellow in today's meeting materials

New York ISO

ICAP Manual and Tariff Revisions

- **ICAP Manual – Attachment N**
  - This is a new Attachment describing the procedure for calculating translation factors for IPRs and LCROR Hydro for use in the shifting methodology in the IRM and LCR studies and for studying resources in deliverability testing
  - Attachment N will be added to the ICAP Manual Appendix following the FERC approval of the associated revisions to OATT Attachment S, as described on slide 23

New York ISO

Previous Discussions

New York ISO

Previous Discussions

Date	Working Group	Discussion Points and Links to Materials
August 5, 2021	ICAPWG	Review of Existing Capacity Accreditation Rules: https://www.nyiso.com/documents/20142/23590734/20210805%20NYISO%20-%20Capacity%20Accreditation%20Current%20Rules%20Final.pdf
August 9, 2021	ICAPWG	Capacity Accreditation Proposal: https://www.nyiso.com/documents/20142/23645207/20210809%20NYISO%20-%20Capacity%20Accreditation%20Straw%20Proposal.pdf
August 30, 2021 & August 31, 2021	ICAPWG	Capacity Accreditation Proposal: https://www.nyiso.com/documents/20142/24172725/20210830%20NYISO%20-%20Capacity%20Accreditation_v10%20(002).pdf
September 28, 2021	ICAPWG	Comprehensive Mitigation Review Proposal and Tariff: https://www.nyiso.com/documents/20142/24925244/20210928 NYISO - CMR Final.pdf/769828a1-f224-0140-240b-0762ec18efec
October 18, 2021	ICAPWG	Comprehensive Mitigation Review Proposal and Tariff Updates: https://www.nyiso.com/documents/20142/25440628/20211018%20NYISO%20-%20CMR%20v9.pdf/4475e775-159c-75c7-9cf8-7050dad9a363
October 29, 2021	ICAPWG	Comprehensive Mitigation Review Proposal and Tariff Updates: https://www.nyiso.com/documents/20142/25780701/20211029%20NYISO%20-%20CMR.pdf/ea8494b0-0860-b260-89b6-0c418d28a91d

New York ISO

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
November 2, 2021	ICAPWG	NYISO CMR Consumer Impact Analysis: https://www.nyiso.com/documents/20142/25835955/CIA%20-%20Comprehensive%20Mitigation%20Review.pdf/36d447d4-5b33-8ab1-2654-90a529ff1dfe Potomac CMR Consumer Impact Analysis: https://www.nyiso.com/documents/20142/25835955/MMU%20ICAP%20Accreditation%20Consumer%20Impact%20Analysis%2011-02-2021.pdf/637ba21e-db75-a4c1-5b41-f770dd26e529
November 9, 2021	BIC	Comprehensive Mitigation Review Proposal and Tariff: https://www.nyiso.com/documents/20142/25928340/5%2020211109%20NYISO%20-%20CMR%20v3.pdf/84d8b429-126c-68dd-0308-caa50886de92 Comprehensive Mitigation Review Approved Motion: https://www.nyiso.com/documents/20142/25928340/110921%20bic%20final%20motions.pdf/785d5869-1e04-9f97-e330-e2e632ae7a9c
November 17, 2021	MC	Comprehensive Mitigation Review Proposal and Tariff: https://www.nyiso.com/documents/20142/26119798/05%20CMR.pdf/11217ade-152a-74a2-d478-6b5ae5e21207 Comprehensive Mitigation Review Approved Motion: https://www.nyiso.com/documents/20142/26119798/111821%20MC_Final_Motions.pdf/bbf15d66-4108-7173-1596-9b20677914e6
January 20, 2022	ICAPWG	2022 Market Projects: https://www.nyiso.com/documents/20142/27799605/2022%20Projects%20Presentation.pdf/4553eb95-177d-7cbc-f2fe-7754b7c66644

New York ISO

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
February 3, 2022	ICAPWG	Improving Capacity Accreditation Plan: https://www.nyiso.com/documents/20142/28227906/Improving%20Capacity%20Accreditation%20Plan.pdf/92560e95-5703-4c57-45cb-7706c36f4656
February 24, 2022	ICAPWG	Improving Capacity Accreditation Project Kick Off: https://www.nyiso.com/documents/20142/28687884/Capacity%20Accreditation%20Kick%20Off%2002-24-22%20v7.pdf/5ab742c4-650b-5094-6a22-d41a2f29da6f MARS Review (GE Consulting): https://www.nyiso.com/documents/20142/28687884/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0224-v4.pdf/d302df1c-5607-16a8-ba01-fba700d5bbd1
March 3, 2022	ICAPWG	CMR Draft Deficiency Response: https://www.nyiso.com/documents/20142/28897222/CMR%20Deficiency%20Draft%20Responses%2003-03%20ICAPWG.pdf/0a3c8303-515e-7725-dee5-a9dda1398672
March 16, 2022	ICAPWG	Capacity Accreditation Resource Class Criteria, Resource-Specific Derating Factors, and Areas of Needed Change: https://www.nyiso.com/documents/20142/29177064/Capacity%20Accreditation%2003-16-22%20v7.pdf/b26e6a99-5f4e-29cc-c60c-47608c78c983
March 31, 2022	ICAPWG	Capacity Accreditation Representative Unit Modeling: https://www.nyiso.com/documents/20142/29607069/2%20CA%20Representative%20Unit%20Modeling%2003-31-22%20ICAPWG.pdf/1c3af8ac-625a-5066-3977-8c3d9ae0ddda ELCC and MRI Overview (GE): https://www.nyiso.com/documents/20142/29607069/3%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0331.pdf/08355c9a-d104-e1b6-6b8a-8266c61b74a3

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
April 19, 2022	ICAPWG	Capacity Accreditation Adjusted Resource Specific Derating Factors and External Resources: https://www.nyiso.com/documents/20142/30025560/04-19-22%20CA%20Adjusted%20Derating%20Factors%20and%20External%20Resources.pdf/5dd1f4b2-092d-6a6a-3b99-4d768ea6c5eb
April 28, 2022	ICAPWG	Preliminary Capacity Accreditation Resource Classes: https://www.nyiso.com/documents/20142/30276257/04-28-22%20Capacity%20Accreditation%20-%20Preliminary%20CARCs.pdf/c82c47c5-28c2-cf19-c602-16bf3cfc4aca Preliminary ELCC and MRI Results (GE): https://www.nyiso.com/documents/20142/30276257/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0428.pdf/3c761f16-7bc0-b469-b1e8-c2a69feb58ef
May 24, 2022	ICAPWG	Updated Preliminary CARCs and Annual Process to Establish CARCs: https://www.nyiso.com/documents/20142/30888946/3%2005-24-22%20Capacity%20Accreditation.pdf/cd61d855-f634-0fe8-6109-7d8c0547beda Additional Preliminary ELCC and MRI Results (GE): https://www.nyiso.com/documents/20142/30888946/2%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0524.pdf/0976330d-f4eb-4db3-2613-c8be9bafe452
June 16, 2022	ICAPWG	Sensitivity Scenarios and Seasonal CAFs: https://www.nyiso.com/documents/20142/31532822/2%20Capacity%20Accreditation%20v6.pdf/4ffe4fa9-bdaf-2c23-77be-d49ed04c5ea5

New York ISO

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
June 28, 2022	ICAPWG	Annual Peak Load Window (PLW) Review and Energy Duration Limitation Proposals: https://www.nyiso.com/documents/20142/31790818/06-28-22%20PLW%20and%20EDL%20Proposal.pdf/ffca7c8a-767e-3de1-9b46-404f661351b3 Revised Shape-based Resource Results and ELR Modeling Functionality in MARS (GE): https://www.nyiso.com/documents/20142/31790818/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0628.pdf/999c7dfa-0b5d-a6bc-a57a-b35a1cda5aa4
July 21, 2022	ICAPWG	Capacity Accreditation: Project Schedule Update: https://www.nyiso.com/documents/20142/32356084/7-21-2022%20ICAPWG%20Project%20Schedule.pdf/958ef86a-12de-32a1-c115-5c1af39abb54
July 28, 2022	ICAPWG	Capacity Accreditation: SCR CAF Results and Proposal: https://www.nyiso.com/documents/20142/32491922/2%207282022%20ICAPWG%20Capacity%20Accreditation.pdf/3f991228-5011-7cc2-cfd3-a7762fa8c8f6 Sensitivity Scenario Methodologies (GE): https://www.nyiso.com/documents/20142/32491922/3%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0728.pdf/9fd89cbc-2baa-3c54-dc74-17c2e8cf588a
August 9, 2022	ICAPWG	Modeling Discussion and ICAP Manual Revision Process Options: https://www.nyiso.com/documents/20142/32687686/08-09-22%20Capacity%20Accreditation.pdf/1009a4dc-bb9f-17f3-bb34-908fd8d5704d

New York ISO

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
August 29, 2022	ICAPWG	Annual CAF Proposal, Winter PLW Assessment, and CAF Interaction with the ICAP Demand Curves: https://www.nyiso.com/documents/20142/32977661/Capacity%20Accreditation%2008292022%20ICAPWG.pdf/13c04d12-f77f-3184-15c4-8f0b22897f3d Compiled Preliminary CAF Results: https://www.nyiso.com/documents/20142/32977661/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_LCR-results.pdf/e9fdeb01-1ee0-7651-6a3f-0823aedcef1d
September 30, 2022	ICAPWG	Resource Specific Derating Factor Proposal for Performance-based Resources, CAF Interaction with ICAP Demand Curves, ISO Review of Peak Load Windows, and Modeling CAFs At Criteria vs Level of Excess: https://www.nyiso.com/documents/20142/33520089/9-30-2022%20ICAPWG%20Capacity%20Accreditation%20v3.pdf/0178b3b4-4398-ce4a-3197-224e24086c51 Capacity Value Results for 2022 LCR at LOE and 2022 RNA 2030 Base Case (GE): https://www.nyiso.com/documents/20142/33520089/GEEC-CapacityAccreditation-LOEandBaseRNA-results%20v5%20-%20clean.pdf/4e05032a-91c3-ff78-08a2-9202efead08a Consumer Impact Analysis Methodology: https://www.nyiso.com/documents/20142/33520089/CIA%20Methodology%20-%20Capacity%20Accreditation_Final.pdf/37c9b5f5-ab29-8eb0-afd2-fdc369f097f5
October 19, 2022	ICAPWG	Translation Factors for IRM/LCR Studies and Deliverability Testing, Sensitivity Scenario Update, and ICAP Market Resource Adequacy 5 Year Plan: https://www.nyiso.com/documents/20142/33857891/02a_10-19-22%20ICAPWG%20Capacity%20Accreditation.pdf/cae2063d-76d6-b4d3-25d5-fadd0c5e1f50 Compiled CAF Results (Excel file): https://www.nyiso.com/documents/20142/33857891/02b_10-19-22%20ICAPWG%20Compiled%20CAF%20Results.xlsx/cf5ad8f9-b4fb-9f44-9df2-672f9a190331 Capacity Accreditation - Consumer Impact Analysis: https://www.nyiso.com/documents/20142/33857891/03_Consumer%20Impact%20-%20Capacity%20Accreditation.pdf/1e9097c6-c0ae-b137-dd44-15ce1f5a7841

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
October 27, 2022	ICAPWG	Proposed Modeling Technique for Calculating CAFs and Summary of Initial ICAP Manual and Tariff Revisions - Reposted: https://www.nyiso.com/documents/20142/34087499/10-27-22%20ICAPWG%20Capacity%20Accreditation%20v2%20-%20repost.pdf/23474d78-642b-c476-8f4d-26953fe57bd5 ICAP Manual Revisions – First Set: https://www.nyiso.com/documents/20142/34087499/ICAP%20Manual%20Revisions%20for%20Discussion%20v3.pdf/f69334aa-da69-54dd-a805-9f2148439561 ICAP Manual Attachment Revisions – First Set: https://www.nyiso.com/documents/20142/34087499/ICAP%20Manual%20Attachments%20v2.pdf/e1e2ec96-4cfc-fb78-01de-c8a97e2ed449 Updated Compiled CAF Results (Excel file): https://www.nyiso.com/documents/20142/34087499/10-27-22%20ICAPWG%20Compiled%20CAF%20Results%20v3.xlsx/46982a75-2fac-fcc6-01a8-ae9161edb742 Capacity Value Results for 2022 RNA 2030 Cases and IRM 2023 PBC Cases – Reposted (GE): https://www.nyiso.com/documents/20142/34087499/GEEC-CapacityAccreditation-RNA-and-2023-PBC-results%20v4%20-%20repost.pdf/2ecbb723-7a84-cd0f-b8a5-ae385a80214b

New York ISO

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
November 8, 2022	ICAPWG	Capacity Accreditation ICAP Manual & Tariff Revisions: https://www.nyiso.com/documents/20142/34285499/7b%20ICAPWG%20Capacity%20Accreditation%20-%20ICAP%20Manual%20and%20Tariff%20Revisions.pdf/4591f7ee-d6a6-8559-01ca-a066bcc559a1 ICAP Manual Revisions - Full Set: https://www.nyiso.com/documents/20142/34285499/7d%20ICAP%20Manual%20Revisions%20-%20Full%20Set%20v2.pdf/aaeb115e-de81-0411-76b3-9a4f0c0302fc ICAP Manual Attachments - Full Set: https://www.nyiso.com/documents/20142/34285499/7c%20ICAP%20Manual%20Attachments%20-%20Full%20Set%20v2.pdf/3cb7f313-1064-dfc7-1da5-88eb152865eb Tariff Revisions to MST 5.12.7: https://www.nyiso.com/documents/20142/34285499/7e%20MST%205.12.pdf/b030d99a-54b4-f52a-9b61-e51c585065a2 Capacity Accreditation - Updated CIA – Reposted: https://www.nyiso.com/documents/20142/34285499/11-08-22%20ICAPWG%20Capacity%20Accreditation%20-%20Updated%20CIA%20-%20repost.pdf/0e08be26-8bd5-76da-92a3-45867136f3d0 Capacity Accreditation Market Design Summary: https://www.nyiso.com/documents/20142/34285499/7%20ICAPWG%20Capacity%20Accreditation%20-%20Market%20Design%20Summary.pdf/aa364bb3-766b-19fd-d5b3-dfc6af730e89

New York ISO

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
November 21, 2022	ICAPWG	Capacity Accreditation: Updated ICAP Manual & Tariff Revisions and 2023 IRM PBC CAF Results Overview: https://www.nyiso.com/documents/20142/34549258/11-21-22%20ICAPWG%20Capacity%20Accreditation%20Presentation.pdf/5abfd875-d76e-27e9-d7a3-3b73393d2c13 ICAP Manual Revisions - Updated: https://www.nyiso.com/documents/20142/34549258/ICAP%20Manual%20Revisions%20-%2011-21-22%20ICAPWG%20v3.pdf/abe07efd-5b64-8285-7d9e-a85e5de2e858 ICAP Manual Attachments - Updated: https://www.nyiso.com/documents/20142/34549258/ICAP%20Manual%20Appendix%20-%2011-21-22%20ICAPWG.pdf/95c84259-6ceb-522a-da00-79441f8422a1 Updated Tariff Revisions to MST 5.12.7: https://www.nyiso.com/documents/20142/34549258/MST%205.12%2011-21-22%20ICAPWG%20v2.pdf/f538e679-2af3-c007-cf72-1700e14df542 ICAP Manual Attachment N: https://www.nyiso.com/documents/20142/34549258/ICAP%20Manual%20Attachment%20N.pdf/4299055a-0d2c-a0c3-b423-50d555e46baf
December 6, 2021	ICAPWG	Capacity Accreditation: Updated ICAP Manual & Tariff Revisions: https://www.nyiso.com/documents/20142/34833356/2%2012-06-22%20ICAPWG%20Capacity%20Accreditation%20-%20ICAP%20Manual%20Revision%20Updates%20v2%20clean.pdf/b3affad0-a8cf-842b-f451-99c86ab010b3 ICAP Manual Revisions - Updated: https://www.nyiso.com/documents/20142/34833356/2a%20ICAP%20Manual%20Revisions%20-%2012-06-22%20ICAPWG%20v2%20-%20clean.pdf/7cd896a2-e59c-ce12-d33e-ba5bb0cefdf0 ICAP Manual Attachments - Updated: https://www.nyiso.com/documents/20142/34833356/2b%20ICAP%20Manual%20Appendix%20-%2012-06-22%20ICAPWG%20v1.pdf/a45b8b27-96bd-571a-5497-f70e908a648b