

# **Assumptions Matrix for 2021-2040 System & Resource Outlook**

## **Draft for Discussion at Nov. 19, 2021 ESPWG**

## Preliminary Assumptions in Capacity Expansion Model for Policy Case

<b>Existing Generation</b>	Consistent with Policy Case production cost simulation database
<b>Existing Generation Costs</b>	Fixed O&M costs for existing generators assumed per 2018 documentation for <a href="#">EPA Platform, Chapter 4: Generating Resources</a>
<b>Existing Generation Properties</b>	Firm capacity (i.e., UCAP) values based on 2016-2020 historic values, as used in <a href="#">2020 RNA</a> base case.
<b>Energy Demand &amp; Profile</b>	Energy Forecast based on 2021 Load & Capacity Data Report (“Gold Book”) Baseline Forecast of Annual Energy, including impacts of statewide Energy Efficiency programs. Each year is represented by 16 load blocks by slicing hours of the year by season (Spring, Summer, Fall, Winter) and time of day (overnight, morning, afternoon, evening). Blocks are based on <a href="#">2018 NREL ReEDS</a> documentation.
<b>Existing Transmission</b>	Nodal to zonal reduction performed by PLEXOS to create a pipe-and-bubble equivalent model, where intra-zonal lines are collapsed to a single “pipe”.  Voltage and stability limited interface limits consistent with Policy Case production cost simulation database. Thermally limited interface limits set to sum of thermal normal ratings of each interface line (N-0 normal limit). Applicable N-X contingencies modeled specifically in production cost simulation.
<b>New Generation Types</b>	Updated to include units with financial contracts, including state sponsored programs, per firm builds as noted in <a href="#">large-scale renewable projects reported by NYSERDA</a> .  Updated to include units to support achievement of state and federal policies, per <a href="#">2021 EIA Energy Outlook</a> . Capacity expansion is limited to the NYCA, where each zone assumes one candidate generator per technology.  Generation types from 2021 EIA Energy Outlook Table 3 assumed in model: Land based wind Offshore wind Utility PV 4-hour battery storage Combined Cycle Combined Cycle with 90% CCS Nuclear Internal combustion engine Combustion turbine

<b>New Generation Costs</b>	<p>Overnight costs, fixed O&amp;M, variable O&amp;M costs, and regional multipliers assumed per 2021 EIA Energy Outlook.</p> <p>Regional multipliers assumed for candidate generators by zone:</p> <table border="1" data-bbox="678 344 1252 646"> <thead> <tr> <th>Candidate Technology</th> <th>Zones A-I</th> <th>Zones J-K</th> </tr> </thead> <tbody> <tr> <td>Combined-cycle</td> <td>1.15</td> <td>1.61</td> </tr> <tr> <td>Combined-cycle with 90% CCS</td> <td>1.03</td> <td>1.2</td> </tr> <tr> <td>Internal combustion engine</td> <td>1.05</td> <td>1.37</td> </tr> <tr> <td>Combustion turbine—industrial frame</td> <td>1.06</td> <td>1.44</td> </tr> <tr> <td>Nuclear</td> <td>1.07</td> <td>1.47</td> </tr> <tr> <td>Utility PV</td> <td>1.03</td> <td>n/a</td> </tr> <tr> <td>Land based wind</td> <td>1.01</td> <td>n/a</td> </tr> <tr> <td>Offshore wind</td> <td>n/a</td> <td>1.01</td> </tr> <tr> <td>4-hour battery storage</td> <td>1</td> <td>1.03</td> </tr> </tbody> </table> <p>Technological optimism factors per NREL <a href="#">2020-ATB-data</a>.</p>	Candidate Technology	Zones A-I	Zones J-K	Combined-cycle	1.15	1.61	Combined-cycle with 90% CCS	1.03	1.2	Internal combustion engine	1.05	1.37	Combustion turbine—industrial frame	1.06	1.44	Nuclear	1.07	1.47	Utility PV	1.03	n/a	Land based wind	1.01	n/a	Offshore wind	n/a	1.01	4-hour battery storage	1	1.03
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<b>New Generation Properties</b>	<p>Unit heat rates per 2021 EIA Energy Outlook.</p> <p>Linear capacity expansion by technology-zone. Maximum allowable capacities are enforced for applicable generator types, per Table 7 of <a href="#">Climate Change Impact Phase II</a>.</p> <p>Firm capacity (i.e., UCAP) values based on default derating factor values. NERC GADS database and ICAP Manual, as applicable to generator type.</p>																														
<b>New Transmission</b>	<p>Transmission expansion not enabled.</p> <p>New policy based transmission projects included:</p> <ul style="list-style-type: none"> <li>-<a href="#">NYPA Northern New York Priority Transmission Project</a></li> <li>-<a href="#">Champlain Hudson Power Express</a></li> <li>-<a href="#">Clean Path New York</a></li> </ul>																														
<b>Capacity Reserve Margin</b>	<p>Capacity reserve margins (IRM and LCRs) for 2021-2022 Capability Year translated to UCAP equivalent for model years, per <a href="#">NYISO ICAP to UCAP translation</a>.</p> <p>Minimum UCAP requirements by capacity zone are as follows:</p> <ul style="list-style-type: none"> <li>• NYCA: 110.11%</li> <li>• Zones G-J: 84.43%</li> <li>• Zone J: 78.14%</li> <li>• Zone K: 97.85%</li> </ul>																														

<b>Policy Targets and Other Model Constraints</b>	<p>CLCPA targets modeled:</p> <ul style="list-style-type: none"><li>• 6 GW BTM-PV by 2025</li><li>• 70% renewable energy by 2030</li><li>• 3 GW energy storage by 2030</li><li>• 10 GW BTM-PV by 2030</li><li>• 9 GW offshore wind by 2035</li><li>• 100% - emission free by 2040</li></ul> <p>As noted above, maximum allowable capacities are enforced for applicable generator types by zone, per Table 7 of <a href="#">Climate Change Impact Phase II</a>.</p>
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