Draft Supplemental Generic Environmental Impact Statement for the Climate Leadership and Community Protection Act

June 11, 2020

Prepared for:

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List of Exhibits

List of Abbreviations and Acronyms

2015 GEIS	Final Generic EIS (published by the Commission in February 2015)
2016 SEIS	Supplemental EIS (published by the Commission in May 2016)
2018 GEIS	Final Generic EIS (published by the Commission in June 2018)
BOEM	Bureau of Ocean Energy Management
CEF	Clean Energy Fund
CES	Clean Energy Standard
CLCPA	Climate Leadership and Community Protection Act
Commission	Public Service Commission
DPS	New York State Department of Public Service
EIS	Environmental Impact Statement
GHG	greenhouse gas
GWh	gigawatt hours
km^2	square kilometers
Master Plan	New York State Offshore Wind Master Plan
MW	megawatts
MWh	megawatt hours
NYCRR	New York Codes, Rules and Regulations
NYISO	New York Independent System Operator
NYPA	New York Power Authority
NYSDEC	New York State Department of Environmental Conservation
NYSERDA	New York State Energy Research and Development Authority
REV	Reforming the Energy Vision
SGEIS	Supplemental Generic Environmental Impact Statement
SEQRA	New York State Environmental Quality Review Act
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

Executive Summary

In May 2014, the Public Service Commission (Commission) established two major policy initiatives: Reforming the Energy Vision (REV) and the Clean Energy Fund (CEF). The Commission prepared a Generic Environmental Impact Statement (EIS), pursuant to the New York State Environmental Quality Review Act (SEQRA), to explore the potential environmental impacts associated with the initiatives. The Commission subsequently adopted the REV Framework Order on February 26, 2015, the CEF Order on January 21, 2016, and the REV Track Two Order on May 19, 2016.

In May 2016, the Commission published a Supplemental EIS (2016 SEIS) that analyzed the potential environmental impacts associated with a requirement that 50% of all electricity consumed in New York by 2030 be supplied by renewable resources (the 50 by 30 goal), and establishment of a support mechanism to sustain operations of eligible nuclear facilities. In August 2016, the Commission adopted the Clean Energy Standard (CES), and recognized the development of offshore wind generation as one of numerous avenues required to achieve the State's renewable energy goals.

In June 2018, the Commission published a Generic EIS in response to a New York State Energy Research and Development Authority (NYSERDA) report providing options to procure offshore wind energy (2018 GEIS). In July 2018, the Commission adopted an offshore wind procurement goal of 2,400 megawatts (MW) by 2030 (2018 OSW Order). NYSERDA's first offshore wind solicitation, issued in November 2018 (ORECRFP18-1), garnered a competitive market response.

The Climate Leadership and Community Protection Act (CLCPA), signed by Governor Andrew M. Cuomo in June 2019, increases the State's clean energy goal from 50% renewables to 70% renewables by 2030 (the 70 by 30 goal), increases the offshore wind procurement goal from 2,400 MW by 2030 to 9,000 MW by 2035, and increases the distributed solar energy goal from 3,000 MW by 2023 to 6,000 MW by 2025. The CLCPA complements a number of New York State policies over the past several years that have established goals aimed at substantially increasing the use of renewables and reducing greenhouse gas (GHG) emissions.

According to a NYSERDA petition filed on January 28, 2020, a second statewide solicitation in 2020 has the potential to result in a near-term total procurement of offshore wind capacity beyond the 2,400 MW analyzed in the 2018 GEIS. In January 2020, the New York State Department of Public Service (DPS) prepared a Supplemental Generic EIS (2020 SGEIS) in response to the petition. The SGEIS analyzed the potential environmental impacts associated with the State's

procurement of an additional 1,800 MW of offshore wind in the near term, in addition to the previously evaluated 2,400 MW evaluated in the 2018 GEIS. The Commission published the final 2020 SGEIS in April 2020.

This SGEIS evaluates the environmental impacts associated with the incremental resources needed to comply with the CLCPA. This SGEIS builds upon and incorporates by reference relevant material from the 2020 SGEIS, 2018 GEIS, 2016 SEIS, and 2015 GEIS (collectively, Prior SEQRA Analyses).

Consistent with 6 New York Codes, Rules and Regulations (NYCRR) §617.9(a)(7), an SGEIS is the appropriate mechanism for assessing environmental impacts in this matter. The proposed procurement of additional renewable energy capacity pursuant to the CLCPA represents a change in circumstances from the Prior SEQRA Analyses. This SGEIS, therefore, evaluates the potential effects of the additional procurement of resources required in the CLCPA.

Description of the Proposed Action

The Proposed Action is a continuation of previous initiatives analyzed in the Prior SEQRA Analyses, in addition to the increase in resources needed for implementation of the following CLCPA requirements:

- 70% of electricity from renewable energy by 2030
- 9,000 MW of offshore wind electricity by 2035
- 6,000 MW of distributed photovoltaic solar generation by 2025

The scope of this SGEIS addresses issues either not addressed in the Prior SEQRA Analyses or issues that need further analysis based on the expansion of the State's renewable energy goals pursuant to the CLCPA. Specifically, this SGEIS considered the following factors when determining which resource areas required new or further analysis: changes in the type of renewable resources, increases in scale of development, and new information (e.g., previously unknown impacts on a threatened or endangered species, or technology change of large-scale renewable resource and distributed solar generation). The renewable energy resources analyzed in the Prior SEQRA Analyses and that warrant further analysis in this SGEIS are described below.

Utility-scale solar projects include large commercial-scale solar power plants that feed electricity directly to the grid. The Prior SEQRA Analyses evaluated utility-scale solar and identified potential adverse impacts on land use, visual resources, and birds and bats. State and local communities have become increasingly sensitive to issues such as potential loss of habitat for grassland birds, as well as loss of agricultural land. This SGEIS analyzes the effects of additional utility-scale solar on these resources and considers potential impacts on grassland birds.

Great Lakes offshore wind is expected to contribute to the 70 by 30 goal in addition to oceanic offshore wind. The 2016 SEIS provided some general discussion of potential impacts of offshore wind in the Great Lakes; however, Great Lakes offshore wind was not addressed in the 2020 SGEIS. Consistent with 6 NYCRR §617.6(a), an initial review of the Proposed Action identified the following resource areas as warranting further analysis in this SGEIS: (1) visual resources; (2) sensory disturbance to fish; (3) conflict with use of space for commercial and recreational vessels; and (4) displacement, disturbance, or loss of habitat and mortality/injury to birds and bats.

Consistent with 6 NYCRR §617.6(a), an initial review of the Proposed Action determined the following renewable energy resources analyzed in the Prior SEQRA Analyses would not experience a change in type or scale of impacts: onshore wind, hydroelectric, geothermal energy, and ocean energy. These renewable resources continue to not result in potential significant adverse effect from the change in type or scale of impacts associated with the additional expected renewable resources, and therefore are not analyzed in this SGEIS.

Procurement of 9,000 MW of Offshore Wind Capacity
The 2020 SGEIS concluded that the resources for which potential unavoidable adverse impacts may occur and, therefore, potential cumulative impacts could occur, include: (1) displacement, disturbance, or loss of habitat for marine mammals and sea turtles; (2) sensory disturbance to fish; (3) conflict with use of space for commercial and recreational vessels; and (4) displacement, disturbance, or loss of habitat and mortality/injury to birds. Therefore, this SGEIS considers the effects of the additional development of approximately 4,800 MW of offshore wind on these resource areas.

Procurement of 6,000 MW of Distributed Solar
Distributed solar energy can be located on rooftops or ground-mounted, and is typically connected to the local utility distribution grid. Distributed solar was addressed in both the 2015 GEIS and 2016 SEIS, including impacts on land use, visual resources, and birds were considered. Therefore, this SGEIS considers the effects of the additional development of approximately 3,000 MW of distributed solar on land use, visual resources, and birds.

Large-scale Renewable Energy Resource Forecast
This SGEIS considers forecasted energy demand and existing renewable capacity as a foundation in analyzing the potential impacts of achieving the CLCPA goals. The mix and capacity of renewable energy resources needed to meet the 70 by 30 goal is based on preliminary modeling from NYSERDA.

This SGEIS evaluates a range of utility-scale solar that can maximize the competitive outcome, including up to an incremental 6,300 MW of utility-scale solar to meet the 70 by 30 goal. Procurement of 5,800 MW of offshore wind by 2030 represents a portion of the 9,000 MW by 2035 procurement goal. An additional 3,000 MW of distributed solar capacity is expected to be procured by 2030 beyond the 6,000 MW by 2025 procurement goal.

Environmental Impacts

This SGEIS identifies the types of impacts that could result from the approval and implementation of the Proposed Action. Chapter 5 provides a quantitative and qualitative discussion; however, as with the Prior SEQRA Analyses, these discussions do not substitute for project-specific environmental reviews, which may result in the identification of site-specific impacts. The deployment of large amounts of large-scale renewables and distributed solar energy may have adverse environmental impacts. Large-scale solar development may have significant land requirements and may permanently affect existing agricultural land and habitat for grassland birds. Development of new large-scale solar may increase potential impacts to visual resources compared to the Prior SEQRA Analyses. Development of new offshore wind may increase impacts on marine mammals, fish, commercial and recreational fisheries, and birds and bats beyond what was

analyzed in the Prior SEQRA Analysis. Impacts on visual resources could result from development of offshore wind in the Great Lakes.

Chapter 6 of this SGEIS, discusses the No Action alternative identified by the Commission as the reasonable alternative to the Proposed Action, wherein the State would not take actions needed to achieve the 70 by 30 goal, would not procure the additional approximately 4,800 MW of offshore wind capacity by 2035, and would not procure the additional 3,000 MW of distributed solar by 2025. In the No Action alternative scenario, the State still expects to take actions to achieve the 50 by 30 goal outlined in the CES by employing a variety of resources in the renewable generation portfolio; procure 4,200 MW of offshore wind in the near-term; and procure 3,000 MW of distributed solar by 2023. However, under the No Action alternative, additional development of renewable resources would still occur to meet the 50 by 30 mandate, and associated impacts on the onshore and offshore environment of any such development would still occur.

Chapter 7 of this SGEIS also considers the unavoidable impacts, irreversible and irretrievable commitment of resources, and effects on energy consumption due to the development of large-scale renewable resources and distributed solar generation. The future construction and operation of new large-scale renewable resource projects that may occur in response to the Proposed Action could result in irreversible and irretrievable commitment of resources. With respect to additional procurement of utility-scale solar, the 2016 SEIS identified the agricultural land as the principle commitment of resources. Responsibly sited utility-scale solar projects can provide long-term preservation of agricultural land as an alternative to commercial development and at the end of the operation life of a project, the land can be returned to its former use. With respect to additional procurement of offshore wind, the 2020 SGEIS identified the marine environment occupied by a project as the principal commitment of resources for construction and operation. In all of these cases, actual impacts and resource commitments are unknown until specific projects are proposed. These resource commitments would be identified in site-specific environmental analyses and avoided or minimized in accordance with applicable law and regulations, as discussed in the Prior SEQRA Analyses and Chapter 4 of this SGEIS.

The Proposed Action could result in direct benefits in the form of reduction in GHG emissions, additional economic development, workforce employment, the avoidance of adverse health outcomes, and improved transmission and distribution network relative to those described in the Prior SEQRA Analyses. The Proposed Action also has the potential to lead to additional secondary benefits described in the Prior SEQRA Analyses, including further development of new agricultural markets, coastal tourism, indirect jobs associated with construction and operation, purchases of local products and services, and new or increased tax payments by employees and facilities. These direct and secondary benefits are discussed in detail in Chapter 9 of this SGEIS.

1 SEQRA and Description of the Proposed Action

In May 2014, the Public Service Commission (Commission) established two major policy initiatives: Reforming the Energy Vision (REV) and the Clean Energy Fund (CEF). Among the goals of REV and the CEF is to achieve a cleaner economy through greater use of renewable energy and distributed energy resources. Under the CEF-funded NY-Sun program, for example, 3,000 megawatts (MW) of distributed solar is to be installed in the State by 2023.[1] The Commission prepared a Generic Environmental Impact Statement (EIS), pursuant to the New York State Environmental Quality Review Act (SEQRA), to explore the potential environmental impacts associated with the initiatives. The final Generic EIS was published by the Commission in February 2015 (2015 GEIS).[2] The Commission subsequently adopted the REV Framework Order on February 26, 2015,[3] the CEF Order on January 21, 2016,[4] and the REV Track Two Order on May 19, 2016.[5]

In May 2016, the Commission published a Supplemental EIS (2016 SEIS) that analyzed the potential environmental impacts associated with a requirement that 50% of all electricity consumed in New York by 2030 be supplied by renewable

[1] NYSERDA. 2019. NY-Sun Initiative Quarterly Performance Report to the Public Service Commission, Quarter Ending June 30, 2019. Accessed January 20, 2019. https://www.nyserda.ny.gov/-/media/Files/Programs/NYSun/2019-Q2.pdf.

[2] NYS Department of Public Service. 2015. Final Generic Environmental Impact Statement in CASE 14-M-0101- – Reforming the Energy Vision and CASE 14-M-0094- – Clean Energy Fund. Prepared by Industrial Economics, Incorporated and Optimal Energy, Incorporated. February 6, 2015.

[3] NYS Department of Public Service. 2015. CASE 14-M-0101, – Reforming the Energy Vision, Order Adopting Regulatory Policy Framework and Implementation Plan (issued February 26, 2015) (REV Framework Order)

[4] NYS Department of Public Service. 2016. CASE 14-M-0094 – Proceeding on Motion of the Commission to Consider a Clean Energy Fund et al, Order Authorizing the Clean Energy Fund Framework (issued January 21, 2016) (CEF Order).

[5] NYS Department of Public Service. 2016. CASE 14-M-0101, – Reforming the Energy Vision, Order Adopting a Ratemaking and Utility Revenue Model Policy Framework (issued May 19, 2016) (Track Two Order).

resources (the 50 by 30 goal), and establishment of a support mechanism to sustain operations of eligible nuclear facilities.[6] In August 2016, the Commission adopted the Clean Energy Standard (CES) and Zero-Emissions Credit programs, and recognized the development of offshore wind generation as one of numerous avenues required to achieve the State's renewable energy goals.[7]

In June 2018, the Commission published a Generic EIS in response to a New York State Energy Research and Development Authority (NYSERDA) report providing options to procure offshore wind energy (2018 GEIS).[8] In July 2018, the Commission adopted an offshore wind procurement goal of 2,400 MW by 2030 (2018 OSW Order).[9] NYSERDA's first offshore wind solicitation, issued in November 2018 (ORECRFP18-1), garnered a competitive market response.

The Climate Leadership and Community Protection Act (CLCPA), signed by Governor Andrew M. Cuomo in June 2019, increases the State's clean energy goal from 50% renewables to 70% renewables by 2030 (the 70 by 30 goal) increases the offshore wind procurement goal from 2,400 MW by 2030 to 9,000 MW by 2035, and increases the distributed solar energy goal from 3,000 MW by 2023 to 6,000 MW by 2025. The CLCPA complements a number of New York State policies over the past several years that have established goals aimed at substantially increasing the use of renewables and reducing greenhouse gas (GHG) emissions.

According to a NYSERDA petition filed on January 28, 2020, a second statewide solicitation in 2020 has the potential to result in a near-term total procurement of offshore wind capacity beyond the 2,400 MW analyzed in the 2018 GEIS, due to the rapid expansion of the offshore wind market and the successful inaugural solicitation.[10] In January 2020, the New York State Department of Public Service (DPS) prepared a Supplemental Generic EIS (2020 SGEIS) in response to the petition. The 2020 SGEIS analyzed the potential environmental impacts associated with the State's procurement of an additional 1,800 MW of offshore wind in the near term, in addition to the previously evaluated 2,400 MW of offshore wind by 2030 evaluated in the 2018 GEIS. The Commission published the final 2020 SGEIS in April 2020.[11]

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[6] NYS Department of Public Service. 2016. Final Supplemental Environmental Impact Statement CASE 15-E-0302 -– Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and a Clean Energy Standard, et al. Prepared by Industrial Economics, Incorporated and Optimal Energy, Incorporated. May 19, 2016.

[7] NYS Department of Public Service. 2016. CASE 15-E-0302 and CASE 16-E-0270, – Order Adopting a Clean Energy Standard.

[8] NYS Department of Public Service. 2018. Final Generic Environmental Impact Statement in Case 18-E-0071, – Order Establishing Offshore Wind Standard and Framework for Phase 1 Procurement. Prepared by Ecology and Environment, Inc. May 2018.

[9] NYS Department of Public Service. 2018. CASE 18-E-0071, Order Establishing Offshore Wind Standard and Framework for Phase 1 Procurement. July 12, 2018.

[10] NYS Department of Public Service. 2020. CASE 18-E-0071, – Petition Regarding Offshore Wind Procurement. January 28, 2020.

[11] NYS Department of Public Service. 2020. Final Supplemental Generic Environmental Impact Statement in Case 18-E-0071, Order Establishing Offshore Wind Standard and Framework for Phase 1 Procurement. Prepared by Ecology and Environment, Inc. April 2020.

This SGEIS evaluates the environmental impacts associated with the incremental resources needed to comply with the CLCPA. The SGEIS considers, in general and conceptual terms, the effects of increasing the State's renewable goal from 50% to 70% by 2030, increasing the offshore wind procurement goal from 2,400 MW by 2030 to 9,000 MW by 2035, and increasing the distributed solar goal of 3,000 MW by 2023 to 6,000 MW by 2025. This SGEIS builds upon and incorporates by reference relevant material from the 2020 SGEIS, 2018 GEIS, 2016 SEIS, and 2015 GEIS (collectively, Prior SEQRA Analyses) (see Exhibit 1-1).

Exhibit 1-1 Prior SEQRA Analyses

SEQRA Document	Proposed Action	Goals and Objectives
2015 GEIS CASE 14-M-0101 – Reforming the Energy Vision CASE 14-M-0094 – Clean Energy Fund	Implementation of REV and the CEF initiatives, including the NY-Sun distributed solar 3,000 MW program.	Transformation of the State's energy demand profile through the introduction of innovative technologies, distribution-level markets and resources, enhanced energy efficiency, and the expansion of clean energy resources on both the distribution and the bulk electric systems.
2016 SEIS CASE 15-E-0302 – Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and a Clean Energy Standard CASE 14-M-0101 – Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision CASE 14-M-0094 – Proceeding on Motion of the Commission to Consider a Clean Energy Fund CASE 13-M-0412 – Petition of New York State Energy Research and Development Authority to Provide Initial Capitalization for the New York Green Bank CASE 10-M-0457 – In the Matter of the System Benefits Charge IV	Adoption of the CES and establishment of a support mechanism to sustain the operations of eligible nuclear facilities.	Increase renewable electricity supply to achieve the 50 by 30 goal, support construction of new renewable generation in New York State, prevent premature closure of upstate nuclear facilities, and promote the progress of REV market objectives.

Exhibit 1-1 Prior SEQRA Analyses

SEQRA Document	Proposed Action	Goals and Objectives
CASE 07-M-0548 – Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard CASE 03-E-0188 – Proceeding on Motion of the Commission Regarding Retail Renewable Portfolio Standard		
2018 GEIS CASE 18-E-0071 – Order Establishing Offshore Wind Standard and Framework for Phase 1 Procurement	Procurement by 2030 of 2,400 MW of offshore wind energy with the ability to deliver energy into New York.	Jumpstart the offshore wind industry in New York to help achieve the State's 50 by 30 goal.
2020 SGEIS CASE 18-E-0071 – Order Authorizing Offshore Wind Solicitation in 2020	Near-term procurement of 1,000 MW or more of offshore wind.	Allow for the continued expansion of the offshore wind market in support of achieving the State's 50 by 30 goal.

Key:
CES = Clean Energy Standard
CEF = Clean Energy Fund
MW = megawatts
REV = Reforming the Energy Vision
SEQRA = New York State Environmental Quality Review Act

Purpose of the New York State Environmental Quality Review Act

SEQRA, as set forth in Article 8 of the Environmental Conservation Law, declares that it is the State's policy to:

"… encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and enhance human and community resources; and to enrich the understanding of ecological systems, natural, human and community resources important to the people of the state."

The purpose of SEQRA is to incorporate the consideration of environmental factors into the planning, review, and decision-making processes of State, regional, and local government agencies at the earliest possible time. Consistent with this intent, SEQRA requires agencies to identify the adverse impacts that could result from their actions and to consider how those impacts might be avoided or minimized. If an agency determines that an action may have a significant adverse impact, then the agency must prepare an EIS.

Preparation of a Supplemental Environmental Impact Statement

The Prior SEQRA Analyses were prepared in compliance with SEQRA to address the environmental impacts of previous proposed actions and goals outlined in Exhibit 1-1. SEQRA also addresses circumstances that may require a supplemental EIS, including changes proposed for the project, newly discovered information, or a change in circumstances. As a result of the passage of the CLCPA, an SGEIS is the appropriate mechanism for assessing environmental impacts, and is consistent with 6 New York Codes, Rules and Regulations (NYCRR) §617.9(a)(7). The proposed procurement of additional renewable energy capacity pursuant to the CLCPA represents a change in circumstances from the Prior SEQRA Analyses. This SGEIS therefore evaluates the potential effects of the additional procurement of resources required in the CLCPA.

1.1 Description of the Proposed Action

The Proposed Action is a continuation of previous initiatives analyzed in the Prior SEQRA Analyses, in addition to the increase in resources needed for implementation of the following CLCPA requirements:

- 70% of electricity from renewable energy by 2030;
- 9,000 MW of offshore wind electricity by 2035; and
- 6,000 MW of distributed photovoltaic solar generation by 2025.

The CLCPA is part of New York State's strategy to combat climate change through a modernized electric system that improves efficiency, affordability, resiliency, and sustainability. The CLCPA sets climate and clean energy goals by encompassing climate change impact adaptation, reductions in GHG emissions, and investments in technology, as well as job creation, energy worker transitions, and the protection of disadvantaged communities.

1.2 Purpose of this SGEIS

Consistent with 6 NYCRR §617.9(a)(7), this SGEIS evaluates the potential for significant adverse environmental impacts arising from expansion of the 50 by 30 goal to the 70 by 30 goal, additional procurement of offshore wind by 2035, and additional procurement of distributed solar by 2025. The scope of this SGEIS addresses issues either not addressed in the Prior SEQRA Analyses or issues that need further analysis based on the expansion of the State's renewable energy goals pursuant to the CLCPA. Exhibit 1-2 summarizes the renewable energy resources evaluated in the Prior SEQRA Analyses.

Exhibit 1-2 Summary of Environmental Resource Areas Analyzed in the Prior SEQRA Analyses

Resource System	2015 GEIS	2016 SEIS	2018 GEIS	2020 SGEIS	Resources Areas Analyzed in this SGEIS
Utility-Scale Solar	• Habitat Destruction and Fragmentation (birds and bats) • Visual Resources	• Land Use • Visual Resources	N/A	N/A	• Land Use • Visual Resources • Birds
Onshore Wind Energy	• Land Use • Birds and Bats • Habitat Destruction and Fragmentation • Noise Pollution • Visual Resources • Aesthetics and Cultural Resources • Air Resources	• Land Use • Birds and Bats • Habitat Destruction and Fragmentation • Noise Pollution • Visual Aesthetics	N/A	N/A	• Not Analyzed Further
Hydropower	• General Impact Overview	• General Impact Overview	N/A	N/A	Not Analyzed Further
Biomass Energy	• Land Use • Water Use • Air Emissions • Health Impacts	• Land Use • Water Use and Quality • Air Emissions • Health Impacts • Waste Impacts	N/A	N/A	Not Analyzed Further
Biogas Energy/Anerobic Digestion	• Air Emissions • Water Resources • Odors	General Impact Overview	N/A	N/A	Not Analyzed Further
Geothermal Energy Technologies	General Impact Overview	Not Analyzed Further	N/A	N/A	Not Analyzed Further

Exhibit 1-2 Summary of Environmental Resource Areas Analyzed in the Prior SEQRA Analyses

Resource System	2015 GEIS	2016 SEIS	2018 GEIS	2020 SGEIS	Resources Areas Analyzed in this SGEIS
Ocean Energy	General Impact Overview	Not Analyzed Further	N/A	N/A	Not Analyzed Further
Oceanic Offshore Wind Energy	• Birds and Bats • Marine Mammals • Fisheries • Noise Pollution • Visual Aesthetics and Cultural Resources • Air Resources	• Habitat Destruction and Fragmentation • Noise Pollution • Visual and Aesthetic Resources • Cultural and Historical Resources	• Benthic communities marine mammals and sea turtles, fish, and birds) • Commercial and Recreational Vessel • Cultural Resources • Socioeconomics • Visual and Aesthetic Resources • Air Quality and Climate Change	• Marine Mammals and Sea Turtles • Fish • Commercial and Recreational Vessels • Birds	• Marine Mammals and Sea Turtles • Fish • Commercial and Recreational Fishing • Birds
Great Lakes Offshore Wind Energy	• Not Analyzed	• General Impact Overview	• Not Analyzed Further	• Not Analyzed Further	• Visual Resources • Fish • Commercial and Recreational Fishing • Birds and Bats
Distributed Solar	• Habitat Destruction and Fragmentation (birds and bats) • Visual Resources	• Land Use • Visual Resources	N/A	N/A	• Land Use • Visual Resources • Birds

As previously noted, a supplemental EIS is required to address changes proposed for the project, newly discovered information, or a change in circumstances related to the project. This SGEIS considered the following factors when determining which resource areas required new or further analysis:

- **Change in Renewable Resources:** The CLCPA defines "qualified renewable energy systems" as photovoltaics, wind, hydroelectric, geothermal electric, geothermal ground source heat, solar thermal, tidal energy, wave energy, ocean thermal, or fuel cells which do not utilize a fossil fuel resource in the process of generating electricity. Other renewable resources analyzed in the Prior SEQRA Analyses but not included in the CLCPA definition (i.e., biomass energy and biogas energy) are not evaluated further in this SGEIS.
- **Increase in Scale of Development:** Based on the Prior SEQRA Analyses, expected market trends, and CLCPA technology-specific mandates, it is anticipated that a greater amount of solar resources, distributed solar, and offshore wind at a larger scale will need to be developed to meet the more aggressive CLCPA requirements.
- **Previously Identified Impacts:** The Prior SEQRA Analyses addressed potential impacts associated with specific renewable energy resources. Exhibit 1-2 lists the renewable energy resources and related impact areas analyzed in detail in the Prior SEQRA Analyses. For environmental resource impact areas not listed in Exhibit 1-2, the Prior SEQRA Analyses did not identify potential significant adverse impacts, and, therefore, those are not considered in this SGEIS, except as noted in Section 1.3.1.
- **New Information on Potential Impacts:** This SGEIS considers potential impacts not addressed in the Prior SEQRA Analyses, or impacts where new knowledge warrants additional analysis of potential impacts (e.g., changes in renewable resource technology). Due to the large scale required to meet the more stringent CLCPA goals, potential impacts of previously evaluated resources that were not previously apparent will be evaluated.

The following subsections describe the renewable energy resources analyzed in the Prior SEQRA Analyses and that warrant further analysis in this SGEIS.

1.2.1 Renewable Energy Resources Eligible under the 70 by 30 Goal

The potential impacts from a number of renewable energy resources were analyzed in the Prior SEQRA Analyses, and are discussed below in relation to the 70 by 30 goal. Oceanic offshore wind is expected to be a significant contributor to the 70 by 30 goal, and is discussed in Section 1.3.2 in relation to the 9,000 MW offshore wind goal. Distributed solar is discussed in Section 1.3.3 and is expected to contribute to the 70 by 30 goal.

Utility-scale solar projects include large commercial-scale solar power plants that feed electricity directly to the grid, and is expected to be a significant contributor to meeting the requirement so of the CLCPA. Solar energy (including distributed solar, utility-scale solar, and thermal solar) was generally addressed in both the 2015 GEIS and 2016 SEIS. Habitat destruction and fragmentation were identified

as a potentially significant impact in the 2015 GEIS. Similarly, impacts on land use were addressed in the 2016 SEIS. State and local communities have become increasingly sensitive to issues such as potential loss of habitat for grassland birds, as well as loss of agricultural land. Impacts on visual resources were also considered potentially significant in both the 2015 GEIS and 2016 SEIS. Therefore, this SGEIS considers the effects of additional utility-scale solar related to the 70 by 30 goal on land use, visual resources, and grassland birds.

Utility-scale onshore wind was addressed in the Prior SEQRA Analyses, which considered impacts on land use, birds and bats, visual resources, noise, cultural resources, and air quality. The 2016 SEIS anticipated approximately 6,000 MW of onshore wind would be developed to meet the 50 by 30 goal. Modeling for the 70 by 30 goal anticipates 1,900 MW of onshore wind would be developed due to changes in market conditions and increased development of offshore wind. Given the scale of potential onshore wind under the Proposed Action would not increase beyond what was analyzed in the Prior SEQRA Analyses, and no new concerns have been identified, utility-scale onshore wind is not analyzed further in this SGEIS.

Hydropower is a significant contributor to the State's renewable supply, but implementation of the Proposed Action is not expected to result in a large increase in new hydropower sources. Additional hydropower supplies could result from optimizing and/or upgrading infrastructure at existing hydroelectric projects and converting non-powered dams into energy producing dams. The amount of hydropower imported from sources in Canada is not anticipated to increase significantly under the Proposed Action. Resource areas impacted by hydropower are not anticipated to experience a potentially significant adverse effect from the change in type or scale of impacts associated with the 70 by 30 goal and, therefore, are not analyzed further in this SGEIS.

Great Lakes offshore wind is expected to contribute to the 70 by 30 goal in addition to oceanic offshore wind. The 2016 SEIS provided some general discussion of potential impacts of offshore wind in the Great Lakes; however, Great Lakes offshore wind was not addressed in the 2020 SGEIS. Consistent with 6 NYCRR §617.6(a), an initial review of the Proposed Action identified the following resource areas as warranting further analysis in this SGEIS: (1) visual resources; (2) sensory disturbance to fish; (3) conflict with use of space for commercial and recreational vessels; and (4) displacement, disturbance, or loss of habitat and mortality/injury to birds and bats.

Geothermal energy, including geothermal heat pumps, were addressed in the 2015 GEIS. Impacts discussed in the 2015 GEIS were not considered potentially significant. Chapter 2 discusses the potential for additional development of geothermal. Geothermal is not expected to be implemented at a large scale under the Proposed Action, and an increase in capacity would not be expected to result in a change in impacts from the Prior SEQRA Analyses. Given no significant impacts or new concerns have been identified, geothermal is not analyzed further in this SGEIS.

Ocean energy was evaluated in the 2015 GEIS, including potential impacts from six distinct ocean energy sources: (1) waves; (2) tidal range; (3) tidal currents; (4) ocean currents; (5) ocean thermal energy conversion; and (6) salinity gradients. Ocean energy technology continues to remain at the research and development stage. As ocean energy technology is developed for commercial use, further analysis may be warranted. However, given the lack of market and uncertainty around the technology, ocean energy is not expected to be implemented at a large scale under the Proposed Action and, therefore, is not analyzed further in this SGEIS.

1.2.2 Procurement of 9,000 MW of Offshore Wind Capacity

The 2020 SGEIS concluded that the resources for which potential unavoidable adverse impacts may occur and, therefore, potential cumulative impacts could occur, include: (1) displacement, disturbance, or loss of habitat for marine mammals and sea turtles; (2) sensory disturbance to fish; (3) conflict with use of space for commercial and recreational vessels; and (4) displacement, disturbance, or loss of habitat and mortality/injury to birds. Therefore, this SGEIS considers the effects of the additional development of approximately 4,800 MW of offshore wind on these resource areas.

1.2.3 Procurement of 6,000 MW of Distributed Solar

Distributed solar energy can be located on rooftops or ground-mounted, and is typically connected to the local utility distribution grid. Distributed solar resources and other behind-the-meter resources are expected to contribute to the CLCPA goal by reducing demand for power from the bulk electric system through the installation of on-site systems to meet local electricity needs. Community solar are projects approximately 1 to 2 MW that share similar characteristics with larger utility-scale solar development. In addition to the procurement of 6,000 MW of distributed solar by 2025, additional distributed solar energy could be developed by 2030 to meet the 70 by 30 goal. Distributed solar was addressed in both the 2015 GEIS and 2016 SEIS, including impacts on land use, visual resources, and birds were considered. Therefore, this SGEIS considers the effects of the additional development of approximately 3,000 MW of distributed solar on land use, visual resources, and birds.

1.3 Relationship to Other Plans and Programs

The additional renewable energy resources needed to fulfill the CLCPA goals will occur in the context of a number of additional energy-related programs and plans in New York. Many of these programs are described in the New York State Energy Plan and include, for example, initiatives contemplated under REV, the New York State Offshore Wind Master Plan (Master Plan), CEF, New York Green Bank, and Regional Greenhouse Gas Initiative. Under the "No Action" alternative scenario (see Chapter 6), these current programs are maintained and continue working towards achievement of New York's clean energy goals and directives. Exhibit 1-3 summarizes other potentially related energy initiatives in New York.

Exhibit 1-3 Other Related Energy Initiatives

Program or Plan	Description
Clean Energy Communities Program	Recognizes and rewards municipalities for implementing clean energy actions to save taxpayer dollars, create jobs, and improve the environment.[12]
Clean Energy Workforce Development	Supports a broad range of renewable energy and energy efficiency education and training programs for new and existing staff, aimed at creating an experienced workforce to support New York State's growing clean energy economy.[13]
Commercial and Industrial (C&I) Carbon Challenge	Supports capital investments by large energy customers to reduce carbon through energy efficiency, distributed energy, and other clean energy actions.[14]
Commercial Property Assessed Clean Energy (PACE)	Offers guidance to municipalities adopting Commercial PACE financing.[15]
Energy Storage	Offers funding and technical support to building owners, municipalities, energy storage developers, contractors, and integrators for installing energy storage technologies.[16]
Ground Source Heat Pump Rebate	Offers support for the installation of ground source heat pump systems at residential, commercial, institutional, and industrial buildings. Funding is available only to eligible designers and installers of clean heating and cooling systems that have been approved by NYSERDA.[17]
K-Solar	New York Power Authority (NYPA) and NYSERDA, in collaboration with the New York State Education Department, and closely tied to Community Solar NY, provide tools, technical expertise (including free solar feasibility assessments), and access to financing to help K-12 schools cost-effectively go solar.[18]
NY Energy Highway	A precursor and complement to the REV initiative, The NY Energy Highway is a far-reaching initiative to modernize New York's statewide energy system, including electric transmission and generation construction, development of

[12] NYSERDA. 2019a. Clean Energy Communities Program. Accessed April 14, 2020. https://www.nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Communities

[13] NYSERDA. 2019b. Clean Energy Workforce Development. Accessed April 14, 2020. https://www.nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Workforce-Development

[14] NYSERDA. 2019c. Commercial & Industrial (C&I) Carbon Challenge. Accessed April 14, 2020. https://www.nyserda.ny.gov/All-Programs/Programs/CI-Carbon-Challenge

[15] NYSERDA. 2019d. Commercial Property Assessed Clean Energy (PACE) Financing Guidelines. Accessed April 14, 2020. https://www.nyserda.ny.gov/All-Programs/Programs/Commercial-Property-Assessed-Clean-Energy

[16] NYSERDA. 2019e. Energy Storage. Accessed April 14, 2020. https://www.nyserda.ny.gov/All-Programs/Programs/Energy-Storage

[17] NYSERDA. 2019f. Ground Source Heat Pump Rebate. Accessed April 14, 2020. https://www.nyserda.ny.gov/All-Programs/Programs/Ground-Source-Heat-Pump-Rebate

[18] NYPA. 2020a. K-Solar. Accessed April 14, 2020. https://www.nypa.gov/innovation/programs/k-solar

Exhibit 1-3 Other Related Energy Initiatives

Program or Plan	Description
	renewable energy sources, and upgrades to electric and natural gas infrastructure.[19]
NY Green Bank	NY Green Bank is a state-sponsored, specialized financial entity working in partnership with the private sector to increase investments into New York's clean energy markets, creating a more efficient, reliable and sustainable energy system.[20]
P-12 Schools: Green and Clean Energy Solutions	Provides cost-sharing and direct incentives to help reduce energy loads and assist in the conversion to carbon free fuels. Available to publicly or privately-owned pre-kindergarten through 12th grade schools.[21]
ReCharge NY	Qualifying businesses and nonprofits statewide can potentially lower their energy costs by using specially allocated NYPA power that is set aside by the State government and the NYPA board for economic support. [22]
Renewable Heat NY	Supports the installation of high-efficiency, low emission wood heating technology for residential, municipal, and commercial buildings.[23]
Residential Financing Options	Residential Financing offers two loan options for energy efficiency and renewable energy improvements to New York State homeowners.[24]
REV Campus Challenge	Recognizes and supports colleges and universities in New York State that implement clean energy projects and principles on campus, in the classroom, and in surrounding communities.[25]
REVitalize	Supports community-based organizations, that represent low- to moderate-income communities or environmental justice areas, to plan for, develop, and implement community-scale clean energy projects.[26]

[19] NYPA.2020b. NY Energy Highway. Accessed April 14, 2020. https://www.nypa.gov/innovation/initiatives/ny-energy-highway

[20] NY Green Bank. No date. About NY Green Bank. Accessed April 14, 2020. https://greenbank.ny.gov/

[21] NYSERDA. 2019h. P-12 Schools: Green and Clean Energy Solutions. Accessed April 14, 2020. https://www.nyserda.ny.gov/All-Programs/Programs/P-12-Green-and-Clean-Energy-Solutions

[22] NYPA. 2020c. ReCharge NY. Accessed April 14, 2020. https://www.nypa.gov/innovation/programs/recharge-ny

[23] NYSERDA. 2019i. Renewable Heat NY. Accessed April 14, 2020. https://www.nyserda.ny.gov/All-Programs/Programs/Renewable-Heat-NY

[24] NYSERDA. 2019j. Residential Financing Options. Accessed April 14, 2020. https://www.nyserda.ny.gov/All-Programs/Programs/Residential-Financing-Options

[25] NYSERDA. 2019k. REV Campus Challenge. Accessed April 14, 2020. https://www.nyserda.ny.gov/All-Programs/Programs/REV-Campus-Challenge

[26] NYSERDA. 2019l. REVitalize. Accessed April 14, 2020. https://www.nyserda.ny.gov/All-Programs/Programs/REVitalize

Exhibit 1-3 Other Related Energy Initiatives

Program or Plan	Description
Smart Grid Program	Supports the modernization of New York State's electric grid through innovative technology and distributed energy resources.[27]

[27] NYSERDA. 2019m. Smart Grid Program. Accessed April 14, 2020. https://www.nyserda.ny.gov/All-Programs/Programs/Smart-Grid-Program

2 Description of Changes

Consistent with 6 NYCRR § 617.9(b)(5)(ii), this chapter provides information on changes to the State energy industry as it relates to the implementation of the CLCPA. The background information presented in this chapter and in Chapter 3 provides the baseline condition for assessing the potential impacts of the Proposed Action (Chapters 5 through 10). The information presented in this Chapter becomes part of the No Action alternative scenario (see Chapter 6), and may assist in understanding the likely impacts of the Proposed Action.

The Prior SEQRA Analyses provided detailed information on the State's electric industry, which demonstrated a consistent trend of diversifying energy capacity and decreasing net electric usage. This chapter builds upon and incorporates reference material from Chapter 2 of the 2016 SEIS, which focused primarily on trends in electricity demand and the electric system in New York. This SGEIS provides a description of the changes in those conditions relevant to evaluating the potential environmental impacts of the Proposed Action:

- Section 2.1: Current Electricity Demand and Capacity
- Section 2.2: Energy Forecasts
- Section 2.3: Potential Design Changes in Renewable Energy Projects

The information presented in the following subsections is limited and focused on specific factors that may assist in understanding the potential impacts of the Proposed Action. The information presented in Chapter 2 of the 2020 SGEIS regarding changes in the offshore wind market, changes in potential offshore wind projects, and potential design changes in offshore wind projects are largely unchanged and are, therefore, incorporated by reference in its entirety.

2.1 Current Electricity Demand and Capacity

Annual electric use and forecasted future electric demand have generally declined since the 2016 SEIS, in part due to energy efficiency gains currently being implemented as part of the REV and CEF initiatives.[28] As shown in Exhibit 2-1, peak

[28] NYISO. 2019. Power Trends 2019 Reliability and a Greener Grid. Accessed February 6, 2020. https://www.nyiso.com/documents/20142/6386402/Power-Trends-2019-Media-Briefing-FINAL.pdf/bc903ee2-d571-190e-e2d0-831a16b425a5?t=1556738785048

electrical demand reached 31,861 MW in 2018. Forecasts generally show a decline in peak electrical demand through 2030.[29] According to the New York Independent System Operator (NYISO) as shown in Exhibit 2-2, power resources available to serve New York State totaled 39,294 MW for the summer of 2019, providing ample margin compared to the 2018 peak summer demand.[30]

As discussed in the 2016 SEIS, and illustrated in Exhibit 2-1 and 2-2, the majority of the state's electric demand is located in the downstate areas, while most of the state's power supply is located in upstate areas.[31,32] Since 2016, 1,294 MW of nameplate capacity has been added to the state, of which 1,120 MW was added in upstate New York.[33] The geographical distribution of electricity demand and generation is similar to the distribution presented in the 2016 SEIS and is forecasted to remain consistent through 2030.

Exhibit 2-1 2018 Peak Electricity Demand, by New York Control Area Load Zone

State Sub-Area	New York Control Area Load Zone	2018 Annual Energy Usage (GWh)	Peak Demand (MW)	
			Summer	Winter
Upstate	A (West)	15,900	2,400	2,100
	B (Genesee)	10,100	2,000	1,600
	C (Central)	16, 600	2,700	2,700
	D (North	4,700	600	700
	E (Mohawk Valley)	8,000	1,300	1,400
	F (Capital)	12,400	2,400	2,100
	G (Hudson Valley)	10,000	2,200	1,600
Down-state	H (Milwood)	2,800	600	500
	I (Dunwoodie)	6,100	1,400	900
	J (New York City)	53,400	10,900	7,700
	K (Long Island)	21,300	5,400	3,400
Upstate Subtotal		**77,600**	**13,600**	**12,200**
Downstate Subtotal		**83,600**	**18,300**	**12,500**
Total		**161,100**	**31,900**	**24,700**

Source: NYISO. *2019 Load & Capacity Data Gold Book*; Table I-2: Baseline Annual Energy Historical and Forecast.

Note: Totals do not sum due to rounding.

Key: GWh = gigawatt hours
MW = megawatts

[29] NYISO. 2019. Load & Capacity Data Gold Book; Table I-1a: NYCA Baseline Energy and Demand forecasts.
[30] NYISO. 2019. Power Trends 2019: Reliability and a Greener Grid.
[31] NYISO. 2019. Load & Capacity Data Gold Book; Table III-3a: Capability by Zone and Type – Summer 2019; Table III-3b: Capability by Zone and Type – Winter 2019-20
[32] NYISO. 2019. Load & Capacity Data Gold Book; Table I-2: Baseline Annual Energy Historical and Forecast.
[33] NYISO. 2019. Power Trends 2019: Reliability and a Greener Grid; NYISO. 2016. Power Trends 2016: The Changing Energy Landscape.

Exhibit 2-2 2019 Installed Generation Capacity by New York Control Area Load Zone

State Sub-Area	New York Control Area Load Zone	Installed Capacity (MW)[1] Summer	Winter	Nameplate Capacity Added Since 2016[2,3]
Upstate	A (West)	4,000	4,100	<100
	B (Genesee)	800	800	0
	C (Central)	6,600	6,800	100
	D (North	1,900	1,900	<100
	E (Mohawk Valley)	1,000	1,000	<100
	F (Capital)	4,500	5,000	0
	G (Hudson Valley)	3,600	3,800	800
Downstate	H (Milwood)	2,100	2,100	0
	I (Dunwoodie)	0	0	0
	J (New York City)	9,600	10,500	100
	K (Long Island)	5,200	5,700	<100
Upstate Subtotal		**22,400**	**23,400**	**1,100**
Downstate Subtotal		**16,900**	**18,400**	**200**
Total		**39,300**	**41,800**	**1,300**

Notes:
[1] NYISO. 2019. Load & Capacity Data Gold Book; Table III-3a: Capability by Zone and Type – Summer 2019; Table III-3b: Capability by Zone and Type – Winter 2019-20.
[2] NYISO. 2019. Power Trends 2019: Reliability and a Greener Grid.
[3] NYISO. 2016. Power Trends 2016: The Changing Energy Landscape.
Totals do not sum due to rounding.

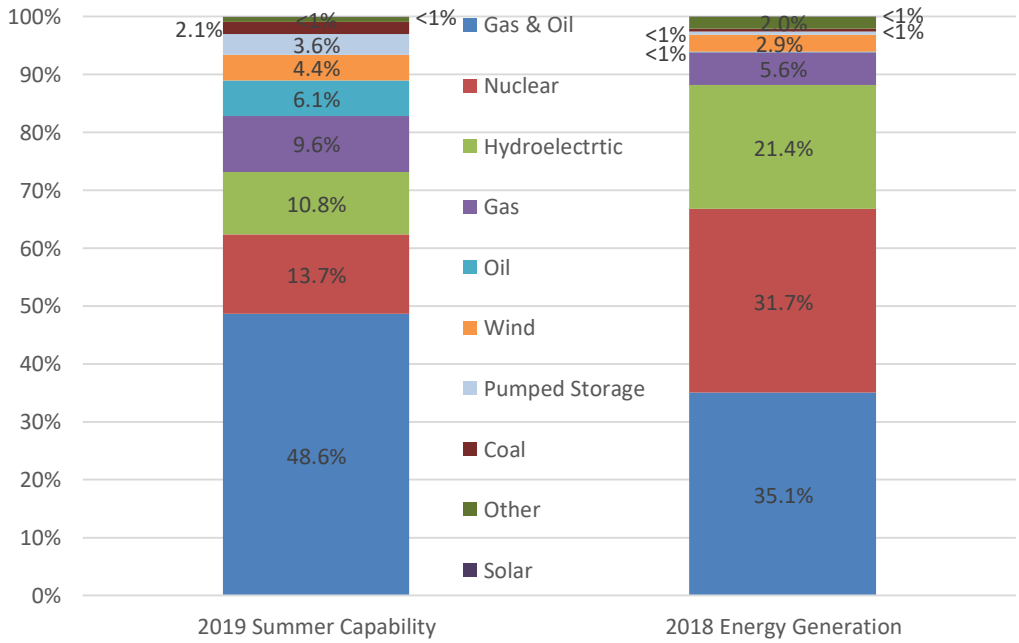
Key:
MW = megawatts

Exhibit 2-3 details New York State's power generation and capacity by fuel type. The majority of the state's total capacity (based on 2019 summer capability) and electric generation continues to come from three fuel types: dual-fuel (gas and oil) facilities, nuclear, and hydropower. Since the 2016 SEIS, the percentage of capacity and generation of solar and wind energy increased modestly while coal and oil capacity decreased. Renewable energy generating capacity accounted for over 6,000 MW in 2019, including 32 MW of utility-scale solar.[34] Distributed solar and other behind-the-meter resources reduce demand for power from the bulk electric system because consumers install on-site systems to meet their electricity needs. Over 454 MW of distributed solar resources contributed to the summer generating capacity at the end of 2019.[35]

[34] NYISO. 2019. Load & Capacity Data Gold Book; Table I-1a: NYCA Baseline Energy and Demand forecasts.
[35] NYISO. 2019. Load & Capacity Data Gold Book; Table I-1c: Summary of NYCA Summer Coincident Peak Demand Forecasts -– MW.

New York State continues to import a portion of its electricity from neighboring control areas to meet demand. New York imported an average 3,200 MW during peak hours in 2017 and 2018, with over 1,300 MW from hydroelectric sources.[36]

Exhibit 2-3 New York Capability and Generation by Fuel Type



Source: NYISO. 2019 Load & Capacity Data Gold Book; Figure III-2: 2019 NYCA Summer Capability by Fuel Type; Figure III-3: 2018 NYCA Energy Production by Fuel Type.

2.2 Energy Forecasts

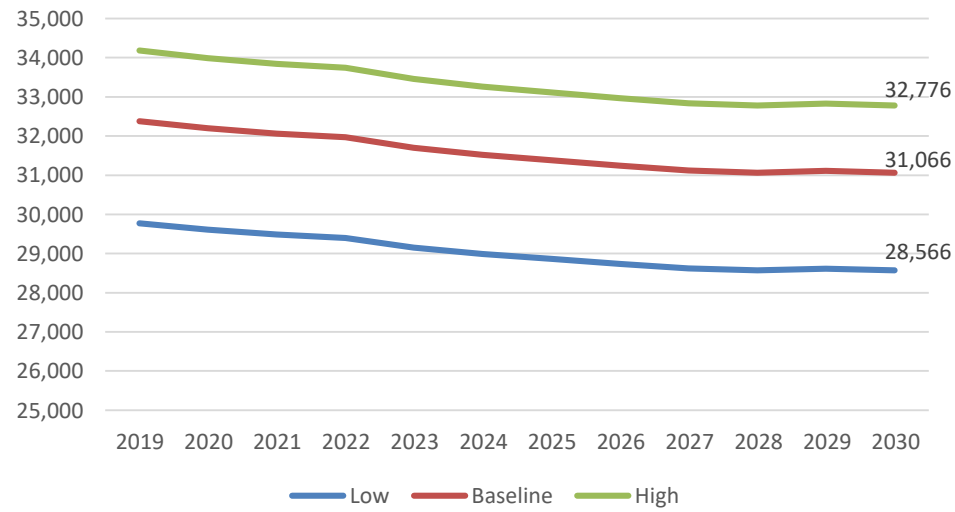
This SGEIS considers forecasted energy demand and existing renewable capacity as a foundation in analyzing the potential impacts of achieving the CLCPA goals. The mix and capacity of renewable energy resources needed to meet the 70 by 30 goal is based on preliminary modeling from NYSERDA.

Exhibit 2-4 presents the forecast for peak energy demand through 2030, including the impacts from electric vehicles, distributed sources (including solar), energy storage units, and energy efficiency and codes and standards. The forecast includes baseline and high and low forecasts that reflect extreme weather conditions. In 2030, the forecasted energy demand is 153,449 megawatt hours (MWh) and the peak energy demand under the high scenario is 32,776 MW.[37]

[36] Potomac Economics. 2018. State of the Market Report for the New York ISO Markets, Table 11: Average Net Imports from Neighboring Areas, Peak Hours, 2017-2018.

[37] NYISO. 2019. Load & Capacity Data Gold Book; Table I-1a: NYCA Baseline Energy and Demand forecasts.

Exhibit 2-4 New York Peak Energy Demand Forecast (MW) - 2019-2030



Source: NYISO. 2019 Load & Capacity Data Gold Book; Table I-1a: NYCA Baseline Energy and Demand forecasts.

Exhibit 2-5 summarizes the current renewable energy generation in New York, in addition to the offshore wind and distributed solar procurement goals, and the estimate of utility-scale solar capacity required to meet the meet the 70 by 30 goal. This SGEIS is evaluating a range of utility-scale solar that can maximize the competitive outcome, including up to an incremental 6,300 MW of utility-scale solar. Procurement of 5,800 MW of offshore wind by 2030 represents a portion of the 9,000 MW by 2035 procurement goal. Distributed solar capacity by 2030 is expected to exceed the 6,000 MW by 2025 procurement goal by an additional 3,000 MW.

Exhibit 2-5 Expected Renewable Energy Generation and Capacity

Renewable Energy Source	Contribution to 70 by 30 Capacity (MW)	Total New Capacity Under Proposed Action	Capacity Analyzed in Prior SEQRA Analyses (MW)	Incremental Increase Analyzed in this SGEIS
Existing and Contracted[1]	8,000	N/A	N/A	N/A
Utility-Scale Solar	11,100	9,000 – 13,200[2]	6,865	2,100 – 6,300
Utility-Scale Onshore Wind	1,900	1,900	5,905	N/A
Offshore Wind	5,800	9,000	4,200	4,800
Distributed Solar	6,000[3]	6,000	3,000	6,000
Total CLCPA-Eligible Renewables	**32,800**	**25,900 - 30,100**	**19,970**	**12,900 - 17,100**

Sources: NYSERDA.
NYSERDA. 2019. Clean Energy Standard Annual Progress Report: 2018 Compliance Year Final. December 2019. Accessed April 24, 2020. https://www.nyserda.ny.gov/-/media/Files/Programs/Clean-Energy-Standard/2019/Case-15-E00302-CES-2018-Annual-Progress-Report.pdf

Notes:
1 Includes constructed and contracted utility-scale solar, distributed solar, onshore wind, hydroelectric, and imported renewable energy.
2 The 2016 SEIS analyzed approximately 2,700 to 6,900 MW of utility-scale solar capacity that could meet the 50 by 30 goal based on varying market conditions. This SGEIS assumes a similar range for utility-scale solar applied to the preliminary modeling from NYSERDA.
3 An additional 3,000 MW of distributed solar is included under Existing and Contracted.

Key:
CLCPA = Climate Leadership and Community Protection Act
GWh = gigawatt hour
MW = megawatt

2.3 Potential Design Changes in Renewable Energy

2.3.1 Solar Energy

The additional utility-scale solar and distributed solar could occur through several types of changes, including an increase in number of solar panels at a proposed project, an increase in the number of proposed projects, and an increase in the capacity of individual solar panels. The design and size of panels may also increase the number of homeowners and businesses interested in distributed solar.

The efficiency of solar photovoltaic energy generation has increased substantially over the last several decades and is expected to continue, consistent with assumptions from the Prior SEQRA Analyses. The efficiency of solar energy in New York State is currently 14%, and efficiency is expected to increase in the future.[38] If solar efficiency increases at a rate faster than expected, this may increase the

[38] NYISO. 2019. Power Trends 2019: Reliability and a Greener Grid.

state's overall solar capacity, and would likely have a reduced impact on the footprint of individual solar facilities proportional to the increase in efficiency.

2.3.2 Offshore Wind Energy

This subsection incorporates by reference the discussion of changes in offshore wind energy from Chapter 2 of the 2020 SGEIS. As discussed there, the additional capacity of offshore wind energy could occur through several types of changes, including an increase in the number of turbines at a proposed project, an increase in the number of proposed projects, and an increase in the size of wind turbines.

Offshore wind development may also occur in the Great Lakes. Costs and market conditions over the last decade limited the development of offshore wind there, which was only generally discussed in the 2016 SEIS and not considered in the 2020 SGEIS. The proposed Icebreaker Wind Project located in Lake Erie near Cleveland, Ohio, is on track to be the first offshore wind facility developed in the Great Lakes. The 21 MW project will include six turbines with a nameplate capacity of 3.45 MW each and a tower height of 479 feet (146 meters).[39] Completion of the Icebreaker Wind Project is expected to renew interest in offshore wind in the Great Lakes to support the 70 by 30 goal, and, therefore, warrant additional analysis in this SGEIS.

Accessibility to the Great Lakes may also be a limiting factor for the development of offshore wind. Moderately sized heavy-lift vessels that are typically used to install offshore wind foundations and turbines in the ocean are generally too large to safely navigate locks and some inland waterways connecting to the Great Lakes.[40] This could limit the size of turbines in the Great Lakes to less than 4 MW, or require development of a new or adapted fleet of construction vessels.[41]

Suitable locations for offshore wind in the Great Lakes are currently limited by a number of factors, including international boundaries, obstructions, wind speed, and lake depth. It is estimated that 954 square kilometers (km^2) (66%) of New York's Lake Erie waters would be suitable for offshore wind development, and 1,536 km^2 (17.6%) of New York's Lake Ontario waters would be suitable.[42] Currently available monopile, jacket, and gravity foundations could be used for offshore wind projects in the Great Lakes at depths shallower than approximately 197 feet (60 meters). Floating foundation technologies are being developed for use at greater depths in the ocean. However, freshwater ice poses a unique threat to offshore wind turbines due to freezing of the substructure and lateral forces caused by moving ice. Current floating wind turbine technologies have not

[39] U.S. Department of Energy. 2018. Final Environmental Assessment LEEDCo Project Icebreaker Lake Erie, City of Cleveland, Cuyahoga County, Ohio.

[40] National Offshore Wind Research and Development Consortium. 2019. Research and Development Roadmap Version 2.0. October 2019.

[41] Ibid.

[42] NYSERDA. 2010. New York's Offshore Wind Energy Development Potential in the Great Lakes: Feasibility Study. Accessed March 16, 2020. https://www.nyserda.ny.gov/About/Publications/Research-and-Development-Technical-Reports/Wind-Reports.

demonstrated an ability to adequately withstand freshwater ice.[43] This is anticipated to prevent the use of floating turbines and limit development of offshore wind in the Great Lakes to lake depths of 197 feet (60 meters) or less until new technologies emerge. This would still allow for offshore wind development throughout much of New York's Lake Erie waters (up to approximately 10 miles or 16 kilometers from shore), but limit development to within a couple miles of shore within New York's Lake Ontario waters.

2.3.3 Hydroelectric

Construction of traditional dammed hydroelectric facilities in New York State is not likely, in part due to the environmental impacts resulting from alterations to river and streams. As discussed in the 2016 SEIS, new hydroelectric capacity in the state is expected to come from increased capacity from optimizing and/or upgrading infrastructure at existing hydroelectric facilities. The NYPA launched a $1.1 billion 15-year modernization and digitization program in 2019 to extend the operating life of the Niagara Power Project. The improvements will include replacing aging equipment with the latest machinery reflecting advanced digital technologies for optimizing the hydroelectric project's performance.[44] As discussed in Section 1.3 of the SGEIS, an increase in hydropower under the Proposed Action is not anticipated beyond what was analyzed in the 2016 SEIS and, therefore, is not discussed further in this SGEIS.

[43] Ibid.

[44] The Office of Governor Andrew M. Cuomo. 2019. "Governor Cuomo Announces $1.1 Billion, 15-Year Project to Extend Operating Life of State's Largest Power Plant: The Niagara Power Project." Accessed April 15, 2020. https://www.governor.ny.gov/news/governor-cuomo-announces-11-billion-15-year-project-extend-operating-life-states-largest-power

3 Environmental Setting

Consistent with 6 NYCRR §617.9(b)(5)(ii), this chapter provides a "concise description of the environmental setting of the areas to be affected, sufficient to understand the impacts of the proposed action and alternatives." This SGEIS incorporates by reference material from the Prior SEQRA Analyses and provides relevant updates to utility-scale solar and offshore wind located in the Great Lakes.

These updates provide information on the environmental setting pertaining to the resources for which the Prior SEQRA Analyses indicated potential unavoidable adverse impacts, including additional acreage or areas needed to meet new alternative energy needs. Based on a review of recent literature, relevant environmental changes since the Prior SEQRA Analyses are discussed below.

3.1 Onshore Setting

3.1.1 Land Cover and Land Use

The 2016 SEIS defined land use as "the management and/or modification of the natural environment (or land) to support human uses." For purposes of this discussion, land cover indicates the physical land type (e.g., forest, cropland, and open space), while land use states how people are using the land.[45] The phrase "land use regulation" means an ordinance or local law enacted by the city, town, village, or municipality for the regulation of any aspect of land use and community resource protection (e.g., zoning), which advises the appropriate use of property or the scale, location, and intensity of development.[46]

The distribution of land cover types changed slightly since the 2016 SEIS. In comparison, 2019 data indicates that land cover types like Shrubland, Open Water, and Wetlands, have decreased while the remaining general land cover types of Cropland/Pasture, Forest and Woodland, Developed Land, and Barren have increased in acreage. Exhibit 3-1 summarizes the 2019 land cover categories and acreages. As shown, the largest land cover type is Forest and Woodland, which represents 60% of the land cover in the state.

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[45] National Oceanic and Atmospheric Administration. 2020. Difference between land cover and land use. Accessed on February 20, 2020. https://oceanservice.noaa.gov/facts/lclu.html

[46] New York State Department of State (DOS). 2011. Guide to Planning and Zoning Laws of New York State. Reprinted 2015. Accessed on February 21, 2020. https://www.dos.ny.gov/lg/publications/Guide_to_planning_and_zoning_laws.pdf

Exhibit 3-1 New York State Land Cover Summary (2019)

Land Type	Acres	Percent of State Total
Cropland/Pasture	6,118,300	19
Forest and Woodland	18,548,200	60
Developed Land	3,106,700	10
Open Water	971,900	3
Wetlands	2,189,400	7
Barren	74,700	<0
Shrubland	105,500	<0
Total	**31,114,600**	**100**

Note: Totals do not sum due to rounding.

Many land-based renewable energy projects need open land, which often leads to use of cropland and pastures on the state's farmland. As shown in Exhibit 3-1, over 6.1 million acres of cropland and pasture are present within the state. The characteristics of the state's agriculture have not changed significantly since the Prior SEQRA Analyses. Farmland accounts for nearly one-quarter of the state's total land area.[47] Of this total farmland, approximately 60% is used for crops, and the remainder is in woodland, pastureland, conservation, and other uses. The number of farms in New York declined from 35,000 to 33,438 between 2017 and 2019. Although the number of farms and farm acreage declined, the economic impact from farming increased. Net farm income rose by 21% over the decade, including income from agritourism, which doubled over that time. [48]

New York's Agricultural Districts Law, Article 25-AA, allows counties to set up agricultural districts to protect and promote the availability of land for farming purposes through a combination of landowner incentives and protections that discourage the conversion of farmland to non-agricultural uses. As of 2019, the state had 174 agricultural districts composed of over 9 million acres.[49] Agricultural districts may include residential and commercial land in addition to land that is actively farmed, idle, or forested.

3.1.2 Sensitive Biological Resources

Exhibit 3-7 of the 2016 SEIS lists the federal and State endangered and threatened animal and plant species believed or known to occur in New York, which included 22 federally listed plant species and 88 state-listed animal species. Exhibit 3-2 lists the relevant New York State endangered and threatened bird species believed or known to occur in New York that were not identified in Exhibit 3-7 in

[47] Office of the New York State Comptroller. 2019. A Profile of Agriculture in New York State. August 2019. Accessed at: https://www.osc.state.ny.us/reports/economic/agriculture-report-2019.pdf

[48] Office of the New York State Comptroller. 2019. A Profile of Agriculture in New York State. August 2019. Accessed at: https://www.osc.state.ny.us/reports/economic/agriculture-report-2019.pdf

[49] NYS Department of Agriculture and Markets. No date. Frequently Asked Questions Regarding Agricultural Districts. Accessed at: https://agriculture.ny.gov/system/files/documents/2020/01/agricultural_districts_faq.pdf

the 2016 SEIS. Additionally, the New York State Department of Environmental Conservation (NYSDEC) is proposing to revise the State's endangered, threatened, and species of concern list; bird species from the revised list are also included in Exhibit 3-2. The draft list is available for review on NYSDEC's website. The public comment period closed on January 24, 2020.[50]

Exhibit 3-2 Proposed Changes in New York State-Listed and Federally Listed Bird Species Believed or Known to Occur in New York

Species	Federal Status	Current New York State Status	Proposed Change to New York State Status
American three-toed woodpecker (*Picoides tridactylus*)	-	-	T
Bald eagle (*Haliaeetus leucocephalus*)	-	T	SC
Black rail (*Laterallus jamaicensis*)	-	E	No change
Black skimmer (*Rynchops niger*)	-	SC	T
Black tern (*Chlidonias niger*)	-	E	No change
Common nighthawk (*Chordeiles minor*)	-	SC	T
Common tern (*Sterna hirundo*)	-	T	No Change
Eskimo curlew (*Numenius borealis*)	E	E	Off List (Extinct)
Golden eagle (*Aquila chrysaetos*)	-	E	No change
Henslow's sparrow (*Ammodramus henslowii*)*	-	T	No change
Kentucky warbler (*Geothlypis formosa*)	-	-	T
King rail (*Rallus elegans*)	-	T	No change
Least bittern (*Ixobrychus exilis*)	-	T	No change
Least tern (*Sterna antillarum*)	E	T	No change
Loggerhead shrike (*Lanius ludovicianus mearnsi*)	E	E	No change

[50] NYSDEC. 2019. "Current and Proposed Status of All Species on Proposed List." Accessed December 10, 2019. https://www.dec.ny.gov/animals/7494.html.

Exhibit 3-2 Proposed Changes in New York State-Listed and Federally Listed Bird Species Believed or Known to Occur in New York

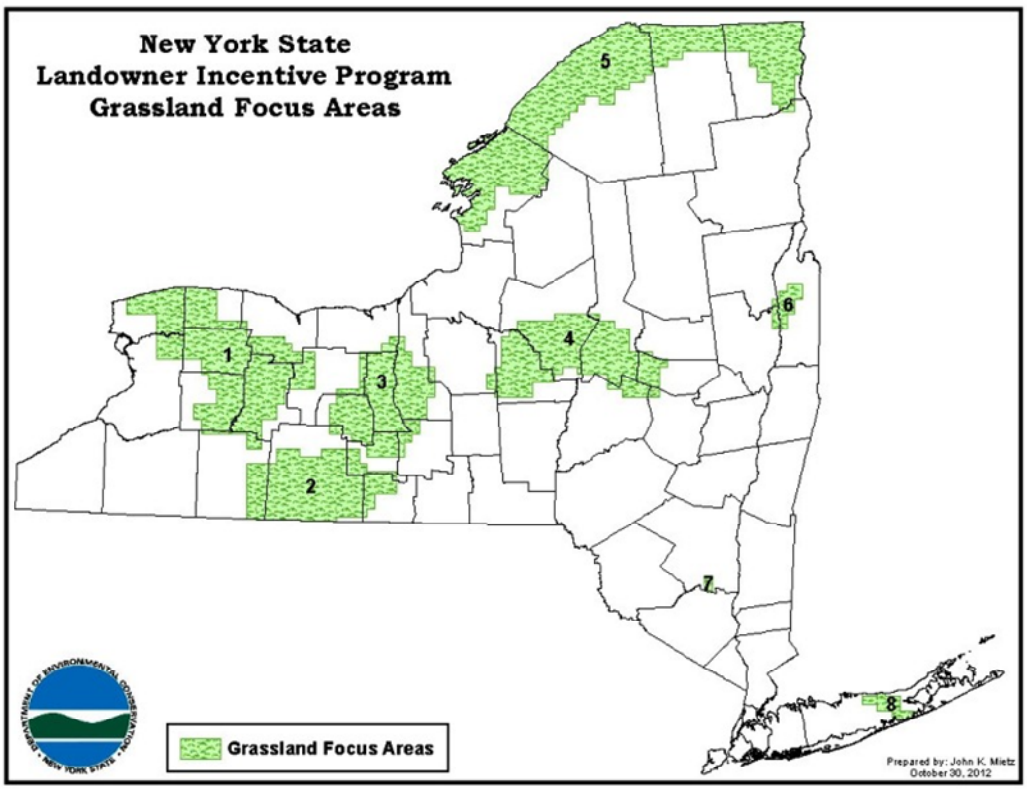
Species	Federal Status	Current New York State Status	Proposed Change to New York State Status
Northern harrier (*Circus cyaneus*)*	-	T	SC
Peregrine falcon (*Falco peregrinus*)	-	E	SC
Pied-billed grebe (*Podilymbus podiceps*)	-	T	SC
Piping plover (*Charadrius melodus*)	E	E	No change
Red knot (*Calidris canutus rufa*)	T	T	No change
Roseate tern (*Sterna dougallii dougallii*)	E	E	No change
Sedge wren (*Cistothorus platensis*)*	-	T	No change
Short-eared owl (*Asio flammeus*)*	-	E	No change
Spruce grouse (*Falcipennis canadensis*)	-	E	No change
Upland sandpiper (*Bartramia longicauda*)*	-	T	No change
Yellow-breasted chat (*Icteria virens*)	-	SC	T
Horned lark (*Eremophila alpestris*)*	-	SC	No change
Vesper sparrow (*Pooecetes gramineus*)*	-	SC	No change
Grasshopper sparrow (*Ammodramus savannarum*)*	-	SC	No change

Key:
E = Endangered
T = Threatened
SC = Species of Special Concern
* = Grassland bird species

Grassland bird habitat includes large, open grasslands, which provide treeless spaces needed to forage, nest, and reproduce. Grassland bird populations are currently declining due to habitat loss and fragmentation from development, re-forestation, and agricultural intensification. According to the National Land Cover Database, 4.1 million acres (13%) of land cover in New York State is considered

suitable nesting habitat, including grasslands and hayfields.[51] Using land cover data and statewide bird surveys, NYSDEC identified grassland focus areas that have the highest likelihood of sustaining grassland bird populations on a long-term basis and should be targeted for conservation (see Exhibit 3-3). Approximately 1.4 million acres of grasslands and hayfields are present within these grassland focus areas.[52] These grassland focus areas are intended to facilitate land-use planning and decision making for conservation priorities.

Exhibit 3-3 New York State Grassland Focus Areas



3.2 Offshore Setting

The description of the offshore setting focuses primarily on the marine environment, which includes the submerged lands, subsoil, seabed, and water under states' jurisdiction and federal jurisdiction as well as the Great Lakes region of New York. For the Great Lakes region, after consideration of water depth from shore and the presence of canal locks and sea ice, only Lake Erie and Lake Ontario were considered in the analysis as suitable areas for wind energy development.

[51] U.S. Geological Survey (USGS). 2019. NLCD 2016 Land Cover Conterminous United States, Updated: May 2019. Accessed May 18, 2019. https://www.mrlc.gov/data

[52] New York State Department of Environmental Conservation (NYSDEC). 2005. Grassland Focus Areas [Raster & vector geospatial data] Updated: 2005, Accessed February 5, 2020. https://www.dec.ny.gov/pubs/32975.html

The following subsections incorporate by reference in its entirety material from Chapter 3 of the 2020 SGEIS with respect to the marine environment under federal jurisdiction, defined by the Bureau of Ocean Energy Management (BOEM) as the North Atlantic Outer Continental Shelf and Mid-Atlantic Outer Continental Shelf, including the associated waters offshore of New York. These subsections also provide relevant environmental setting information for the Great Lakes.

3.2.1 Physical Resources

The Great Lakes Basin, including Lake Erie and Lake Ontario, consist of glacial deposits and sediment material deposited after the retreat of the last glaciers from the area. The type and thickness of the sediment is dependent on its location within the lake. Generally, deeper waters consist of finer sediment (e.g., lake clay and silt), while the coastline consists of coarser sediment (e.g., sand and gravel). Wave and current activity within each of the Great Lakes drives the movement of sediment throughout.[53]

Lake Erie is the fourth largest lake of the five Great Lakes in North America. It is the southernmost, shallowest, and smallest (by volume) of the Great Lakes.[54] At its deepest point, Lake Erie is 210 feet (64 meters) deep, with an average depth of 84 feet (26 meters). In contrast to Lake Erie, Lake Ontario is the smallest (by circumference) of the Great Lakes and is much deeper with a significantly steeper lake depth gradient.[55] Average water depth in Lake Ontario is 363 feet (111 meters) with a maximum depth of 790 feet (241 meters). Lake Ontario's physical characteristics define the areas that are most feasible for development, and significantly affect the selected technology and installation procedures. Bathymetry, waves, and lake ice affect foundation design in particular. Site access and installation schedules would be affected by seasonal and extreme lake conditions.

The Great Lakes have developmental challenges related to the presence of lake ice. The formation of ice during winter plays a critical role in determining turbine siting and distance from shore for an offshore wind energy project. The amount of ice coverage in each of the lakes is dependent on the severity of the winter. Generally, ice in Lake Erie can stop all vessel traffic for months, which would limit access to an offshore wind project area. Ice forms on Lake Erie in the west and slowly progresses east throughout the early winter. Areas of deeper water are usually the last portions of the lake to freeze. The maximum thickness of ice occurs in mid-February with ice ranging from 16 to 20 inches (40 to 51 centimeters) thick. Ice can last until April and cause significant navigational issues.

Unlike Lake Erie, Lake Ontario is significantly deeper, and largely remains ice-free except during periods when an extreme drop in temperature occurs causing small areas of thin, slushy ice to form within 3 to 9 miles (5 to 15 kilometers)

[53] NYSERDA. 2010. New York's Offshore Wind Energy Development Potential in the Great Lakes: Feasibility Study. Accessed March 16, 2020. https://www.nyserda.ny.gov/About/Publications/Research-and-Development-Technical-Reports/Wind-Reports.

[54] International Lake Environment Committee Foundation. 2020a. World Lake Database-Lake Erie. Accessed March 17, 2020. http://wldb.ilec.or.jp/Details/Lake/NAM-06.

[55] International Lake Environment Committee Foundation. 2020b. World Lake Database-Lake Ontario. Accessed March 17, 2020. http://wldb.ilec.or.jp/Details/Lake/NAM-07.

from the coast. Most ice that forms in Lake Ontario occurs in the northeastern section. The maximum thickness of ice occurs during February with ice ranging from 20 to 25 inches (50 to 60 centimeters) thick. The average duration of ice cover ranges from 10 days in the open lake waters to approximately 40 days in the northeast bays.

3.2.2 Sensitive Biological Resources

The biodiversity of New York and the Great Lakes includes many different species of animals, plants, fungi, benthic organisms, and microorganisms. Several changes to status of state and federal listed species occurred since the 2016 SEIS. Two species of fish believed or known to occur in New York have been federally listed as threatened in the marine environment. They are the giant manta ray (*Manta birostris*) and the oceanic whitetip shark (*Carcharhinus logimanus*). There is no critical habitat designated for these species and they are not state-listed in New York. Additionally, numerous fish species are now regularly stocked in the Great Lakes from artificial propagation. These species are managed by the Great Lakes Fishery Commission and include lake trout (*Salvelinus namaycush*), rainbow trout (*Corhynchus mykiss*), brown trout (*Salmo trutta*), and Atlantic salmon (*Salmo salar).*[56]

The coastlines have a significant population of local and migratory birds. Exhibit 3-2 in the 2018 GEIS lists migratory birds included on the U.S. Fish and Wildlife Service (USFWS) 2008 Birds of Conservation Concern list and other migratory birds that potentially occur in the area of the Great Lakes region and could be affected by offshore wind energy.[57] Numerous other migratory bird species protected under the Migratory Bird Treaty Act may be present in the Great Lakes region; however, as discussed in the 2018 GEIS, those species are not expected to be particularly susceptible to the effects of offshore wind development activities.

Since the Prior SEQRA Analyses, the federally endangered piping plover (*Charadrius melodus*), belonging to the Great Lakes watershed DPS, has had several successful nesting pairs breeding along the eastern shoreline of Lake Ontario.[58,59,60] This is the first time this species has been recorded along the shoreline of Lake Ontario in over 30 years.

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[56] Great Lakes Fishery Commission. 2018. Great Lakes Fish Stocking Database. Accessed March 17, 2020. http://www.glfc.org/fishstocking/.

[57] U.S. Fish and Wildlife Service. 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp. Accessed January 21, 2020. https://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php

[58] U.S. Fish and Wildlife Service. 2020. ECOS Species Profile – Piping Plover (*Charadrius melodus*). Accessed March 16, 2020. https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=6039.

[59] Audubon. 2016. "Endangered Piping Plover Birds Return to Lake Ontario for First Time in 30 Years". Published January 11, 2016. Accessed March 17, 2020. https://ny.audubon.org/news/endangered-piping-plover-birds-return-lake-ontario-first-time-30-years.

[60] Mazzocchi, I. and E. Truskowski. 2015. Piping Plovers nest successfully on the eastern shores of Lake Ontario. *The Kingbird, New York Ornithological Association, Inc.* 65(4): 285-286.

[23] NYSDEC. 2019. "Current and Proposed Status of All Species on Proposed List." Accessed March 18, 2020. https://www.dec.ny.gov/animals/7494.html.

Bat species are generally terrestrial animals and are not frequently observed more than a few miles from shore. The federally and stated endangered Indiana bat (*Indiana myotis*), and the federally and state threatened northern long-eared bat (*Myotis septentrionalis*) are typically located in forested habitat; however, these species may migrate along portions of the Great Lakes.[61]

Exhibit 3-3 below represents a comprehensive and current list of federally and New York state-listed species believed or known to occur in the Great Lakes or marine environment. Additionally, as noted previously, NYSDEC is proposing to revise the state's endangered, threatened, and species of concern list.[23] Exhibit 3-4 includes the proposed changes to the status of New York species.

Exhibit 3-4 New York State-Listed and Federally Listed Animal Species Believed or Known to Occur in the Great Lakes and Marine Environment[62,63]

Species	New York Region[1]	Federal Status	Current New York State Status	Proposed Change to New York State Status
Fish				
American eel (*Anguilla rostrata*)	Marine, Great Lakes	-	-	SC
Atlantic sturgeon (*Acipenser oxyrhynchus*)	Marine	E	-	E
Banded sunfish (*Enneacanthus obesus*)	Marine	-	T	No change
Bigeye chub (*Hybopsis amblops*)	Great Lakes	-	-	T
Black redhorse (*Moxostoma duquesnei*)	Great Lakes	-	SC	Off List
Bloater (*Coregonus hoyi*)	Great Lakes	-	-	SC
Comely shiner (*Notropis amoenus*)	Marine, Great Lakes	-	-	SC
Deepwater sculpin (*Myoxocephalus thompsoni*)	Great Lakes	-	E	SC
Eastern sand darter (*Ammocrypta pellucida*)	Great Lakes	-	T	SC
Giant manta ray (*Manta birostris*)	Marine	T	-	-
Gravel chub (*Erimystax x-punctata*)	Great Lakes	-	T	Off List

[61] U.S. Department of Energy. 2018. *Final Environmental Assessment LEEDCo Project* Icebreaker *Lake Erie, City of Cleveland, Cuyahoga County, Ohio*.
[62] 83 FR 2916.
[63] 83 FR 4153.

Exhibit 3-4 New York State-Listed and Federally Listed Animal Species Believed or Known to Occur in the Great Lakes and Marine Environment[62,63]

Species	New York Region[1]	Federal Status	Current New York State Status	Proposed Change to New York State Status
Ironcolor shiner (*Notropis chalybaeus*)	Marine	-	SC	T
Lake chubsucker (*Erimyzon sucetta*)	Great Lakes	-	T	Off List
Lake sturgeon (*Acipenser fulvescens*)	Great Lakes	-	T	No change
Mooneye (*Hiodon tergisus*)	Great Lakes	-	T	No change
Northern sunfish (*Lepomis peltastes*)[2]	Great Lakes	-	T	E
Oceanic whitetip shark (*Carcharhinus logimanus*)	Marine	T	-	-
Pugnose shiner (*Notropis anogenus*)	Great Lakes	-	E	SC
Redfin shiner (*Lythrurus umbratilis*)	Great Lakes	-	SC	Off List
Round whitefish (*Prosopium cylin-draceum*)	Great Lakes	-	E	T
Sauger (*Sander canadensis*)	Great Lakes	-	-	SC
Scalloped hammerhead shark (*Sphyrna lewini*)	Marine	T	-	-
Shortnose sturgeon (*Acipenser brevirostrum*)	Marine	E	E	No change
Silver chub (*Macrhybopsis store-riana*)	Great Lakes	-	E	Off List
Spoonhead sculpin (*Cottus ricei*)	Great Lakes	-	E	Off List
Streamline chub (*Erymystax dissimilis*)	Great Lakes	-	SC	Off List
Swallowtail shiner (*Notropis procne*)	Great Lakes	-	-	T
Western pirate perch (*Aphredoderus sayanus gibbosus)*	Great Lakes	-	-	T
Marine Mammals				
Blue whale (*Balaenoptera musculus*)	Marine	E	E	No change
Fin whale (*Balaenoptera physalus*)	Marine	E	E	No change

Exhibit 3-4 New York State-Listed and Federally Listed Animal Species Believed or Known to Occur in the Great Lakes and Marine Environment[62,63]

Species	New York Region[1]	Federal Status	Current New York State Status	Proposed Change to New York State Status
Harbor porpoise (*Phocoena phocoena*)	Marine	-	SC	No change
Humpback whale (*Megaptera novaeangliae*)	Marine	-	E	Off List
North Atlantic right whale (*Eubalaena glacialis*)	Marine	E	E	No change
Sei whale (*Balaenoptera borealis*)	Marine	E	E	No change
Sperm whale (*Physeter microcephalus*)	Marine	E	E	No change
Sea Turtles				
Green sea turtle (*Chelonia mydas*)	Marine	T	T	No change
Loggerhead sea turtle (*Caretta caretta*)	Marine	T	T	No change
Kemp's Ridley sea turtle (*Lepidochelys kempii*)	Marine	E	E	No change
Leatherback sea turtle (*Dermochelys coriacea*)	Marine	E	E	No change
Atlantic hawksbill sea turtle (*Eretmochelys imbricata*)	Marine	E	E	Off List

Notes:

[1] The New York region designation for each species is not representative of their entire range of distribution, but only representative of the waters for which offshore wind is being analyzed within the state (i.e., marine environment [to include nearshore and offshore Atlantic ocean] and the Great Lakes [Lake Erie and/or Lake Ontario]).

[2] Formally called longear sunfish.

Key:
E = Endangered
T = Threatened
SC= Species of Special Concern

3.2.3 Commercial and Recreational Uses

The Great Lakes environment provides a variety of commercial and recreational uses including fishing and infrastructure. Commercial and recreational fishing are some of the main activities within the Great Lakes. Fish caught in the lakes include walleye (*Sander vitreus*) and yellow perch (*Perca flavescens*) and almost

4.8 billion pounds of fish were harvested from Lake Erie in 2012.[64,65] Commercial and recreational fishing in Lake Ontario is far less prevalent. Fishing in Lake Ontario occurs along the New York shoreline. Higher concentrations of fishing occurs in Lake Ontario along the eastern shore from Alcan Point to Montario Point.

Infrastructure in the form of submarine cables (telecommunication and power cables), natural gas pipelines, and other infrastructure (e.g., buoys) is either present or planned throughout the Great Lakes environment. Numerous marine cables and submerged pipelines extend from the shoreline with connections between the various islands. Buoys that measure a range of environmental parameters or serve as aids to navigation, mark navigation channels and shipping lane approaches are present in both Lake Erie and Lake Ontario.[66] In addition to cables and buoys, there are anchorage areas, dumping grounds of various sizes for dredged material, and military practice areas. The U.S. Army Corps of Engineers (USACE) is considering updating local dredged material management plans and restricting the dumping of dredged material into Lake Erie. For Ohio, dumping dredged material will no longer be an option as of July 1, 2020.[67] The state of New York may follow suit.

Underwater activities in the Great Lakes environment consist of shore- and boat-based scuba diving, free diving, and snorkeling. Scuba diving occurs near shipwrecks, artificial reefs, and other distinct areas of the Great Lakes environment. Surface water activities can consist of swimming, windsurfing, surfing, and kayaking/paddling. These aquatic recreational uses predominantly occur near the coast and are correlated with beach activities.

3.2.4 Vessel Traffic

Existing marine transportation includes a variety of commercial vessel uses, including the operation of vessels for import and export services, construction work, fishing, and cruise ship tourism, as well as recreational vessels. Established vessel traffic routes exist within Lake Erie and Lake Ontario. Transportation routes in Lake Erie tend to follow parallel to the shoreline at varying distances from shore and converge near the Port of Buffalo.[68] Lake Ontario is the primary link between the upper Great Lakes and the Atlantic Ocean as part of the St. Lawrence Seaway and is used extensively by commercial shipping traffic. Major ports in Lake Ontario include Rochester, Alexandria, Oswego, and Niagara-on-the-Lake. The Ports of Rochester and Oswego have deep-draft vessel facilities and are equipped to

[64] Great Lakes Fishery Commission. 2015. Lake Erie Walleye Management Plan 2015-2019. October 2015. Accessed March 17, 2020. www.glfc.org/pubs/lake_committees/erie/LEC_docs/position_statements/walleye_managment_plan.pdf.

[65] The Nature Conservancy. 2018. Commercial Fishing Map. Accessed March 17, 2020. https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/wholesystems/greatlakes/coasts/wle/Pages/Commercial-Fishing.aspx.

[66] National Oceanic and Atmospheric Administration, National Weather Service. 2020. National Data Buoy Center. Accessed March 17, 2020. https://www.ndbc.noaa.gov/.

[67] Ohio Environmental Protection Agency. 2020. Lake Erie Dredged Material Program. Accessed March 20, 2020. https://epa.ohio.gov/dir/dredge.

[68] NYSERDA. 2010. New York's Offshore Wind Energy Development Potential in the Great Lakes: Feasibility Study. Accessed March 16, 2020. https://www.nyserda.ny.gov/About/Publications/Research-and-Development-Technical-Reports/Wind-Reports.

handle bulk cargo. Recreational vessels may include charter boats used for general boating, fishing, birding, and/or scuba diving. Recreational boating and commercial tour groups (e.g., Niagara Falls on Lake Ontario) are common during the summer months.

4 Regulatory Framework and Mitigation of Potential Impacts

Consistent with 6 NYCRR §§617.9(b)(5)(iv) and 617.11(d)(5) of SEQRA, Prior SEQRA Analyses identified federal and state regulations that help ensure, to the maximum extent practicable, avoidance, minimization, or mitigation of adverse environmental impacts that may occur from the Proposed Action. This SGEIS incorporates by reference material from Prior SEQRA Analyses and provides relevant updates to federal and state regulations and guidance concerning renewable energy development activities, as well as updates related to avoidance, minimization, and mitigation strategies. In addition, this SGEIS provides relevant updates to federal and state regulations and guidance concerning offshore wind located in the Great Lakes.

4.1 Federal and State Regulations and Guidance

As described in the Prior SEQRA Analyses, large-scale renewable energy projects are subject to review and decision-making by federal and state agencies. Renewable energy developers will be expected to adhere to these project-specific and site-specific regulations and permitting processes. Regulations and guidance applicable to offshore wind in the marine environment were discussed in the 2020 SGEIS. Site-specific characteristics and project-specific details will ultimately determine the regulations that will apply to each potential development.

4.1.1 Onshore Resources

The regulations identified in the Prior SEQRA Analyses remain in effect without substantive changes for utility-scale solar. The Accelerated Renewable Energy Growth and Community Benefit Act was passed as part of the fiscal year 2020-2021 state budget and will create a first in the nation Office of Renewable Energy Siting to improve and streamline the process for environmentally responsible siting of large-scale renewable energy projects. Renewable energy projects greater than 25 kilowatts will continue to be sited through the Article 10 process until the Office of Renewable Energy Siting establishes the new siting standards.[69] Regulatory requirements for distributed solar energy projects generally vary by the size

[69] NYSERDA. 2020. New York State Announces Passage of Accelerated Renewable Energy Growth and Community Benefit Act as Part of 2020-2021 Enacted State Budget. Accessed April 17, 2020. https://www.nyserda.ny.gov/About/Newsroom/

and type of project. Many communities permit rooftop installations and residential solar projects by right and often a building permit may be the only approval required. NYSERDA has developed a unified solar permit that has been adopted by nearly 350 communities to streamline the permitting process for solar systems that are 25 kilowatts or less.[70] Community solar projects are typically around 2 MW and allow individuals (including renters and others who cannot install a system on their own roof) to purchase individual panels or some fraction of the electricity the entire system generates.[71] Community solar projects are generally assessed in accordance with SEQRA and are potentially subject to the same federal and state regulations as the utility-scale solar projects identified in Exhibit 6-3 of the 2015 GEIS.

4.1.2 Offshore Resources

The requirements identified in Exhibit 4-1 in the 2020 SGEIS remain in effect without substantive changes and will continue to help ensure, to the maximum extent practicable, avoidance, minimization, or mitigation of adverse environmental impacts that may occur from the procurement of offshore wind capacity. As discussed in the 2020 SGEIS, most offshore wind projects located in the marine environment are subject to review and decision-making by BOEM and other federal agencies. However, offshore wind projects located in New York State jurisdictional waters, including Lake Erie and Lake Ontario, would be subject to SEQRA or Article 10 of the Public Services Law, which provides for siting review of major electric generating facilities of 25 MW.[72] In addition to requirements identified in Exhibit 4-1 in the 2020 SGEIS, offshore wind in the Great Lakes could also be subject to Boundary Water Treaty approval from the International Joint Commission and USACE permits under Section 408 as well as Section 401 of the Clean Water Act.

4.2 Avoiding, Minimizing, and Mitigating Potential Impacts

As described in the Prior SEQRA Analyses, the required avoidance, minimization, and mitigation of potential environmental impacts from future renewable energy development would occur on a project-specific basis as part of the permitting process for each project.

Since the Prior SEQRA Analyses, local, state, regional, and federal agencies continue to identify and develop additional measures to avoid, minimize, and mitigate potential adverse impacts from development of renewable energy. These efforts inform current and future guidance, regulations, contracts, and agreements to implement additional suitable measures, as described below.

Under the Proposed Action, the new and previously identified measures would be suitably implemented on a project-specific basis, as required by the necessary

[70] NYSERDA . 2019. Designated Clean Energy Communities Map. https://www.nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Communities/CEC-Map

[71] NYSERDA. 2019. *New York Solar Guidebook for Local Governments*. https://www.nyserda.ny.gov/All-Programs/Programs/NY-Sun/Communities-and-Local-Governments/Solar-Guidebook-for-Local-Governments

[72] New siting standards for projects greater than 25 kW will be developed as part of the Accelerated Renewable Energy Growth and Community Benefit Act.

state and federal permits and authorizations, in accordance with federal and state laws and regulations. Such measures may be supplemented by non-regulatory initiatives aimed at enhancing developer and stakeholder collaboration to identify and incorporate less impactful approaches to offshore wind facility design, construction, and operation.

4.2.1 Onshore Resources

Since the 2016 SEIS, the New York State Department of Agriculture and Markets has developed guidelines for mitigating construction impacts of solar projects on agricultural land during construction, post-construction restoration, monitoring and remediation, and decommissioning. Similarly, NYSDEC provides best management practices to guide habitat management for grassland birds. Exhibit 4-1 summarizes pertinent aspects of these guidelines designed to minimize and avoid impacts.

4.2.2 Offshore Resources

Many of the guidelines discussed in the Prior SEQRA Analyses related to offshore wind and avoiding and minimizing impacts on, for example, birds and bats, fish, and recreational and commercial fishing, would likely be applicable to Great Lakes offshore wind. Several avoidance and minimization measures were proposed in the U.S. Department of Energy's Environmental Assessment for the Icebreaker Wind Project and are also summarized in Exhibit 4-1.

Exhibit 4-1 New Potential Avoidance, Minimization, and Mitigation Measures for Solar Energy and Great Lakes Wind Development

Resource(s)	Potential Avoidance, Minimization, and Mitigation Measures	References
Solar Energy		
Agricultural Land	Siting - avoiding installation of solar arrays on the most valuable or productive farmland, especially lands containing prime farmland soils or soils of statewide importance. Construction Requirements - ensuring the surface of access roads is level with the adjacent agricultural field surface; installing culverts and water bars to maintain natural drainage patterns; stripping all topsoil from agricultural areas used for vehicle and equipment traffic, parking, and equipment laydown and storage areas; stockpiling topsoil stripped from work areas; burying interconnected cables at a specified depth; removing excess subsoil and rock from the site; constructing temporary or permanent fences around work areas to prevent livestock access; and picking up and properly disposing of pieces of wire, bolts, and other unused metal objects. Restoration Requirements - decompacting disturbed agricultural areas; regrading access roads to allow for farm equipment crossing and to restore original surface drainage patterns; seeding restored agricultural areas with the seed mix specified by the landowner; repairing all surface or subsurface drainage structures damaged during construction; and, following restoration, removing all construction debris from the site. Two-Year Monitoring and Remediation Immediately Following Restoration - mitigation of topsoil deficiency and trench settling with imported topsoil consistent with the quality of topsoil on the affected site; and determination of the appropriate rehabilitation measures if the subsequent crop	New York State Department of Agriculture and Markets. 2019. *Guidelines for Solar Energy Projects - Construction Mitigation for Agricultural Lands.* Revised 10/18/2019. Accessed online at: https://agriculture.ny.gov/system/files/documents/2019/10/solar_energy_guidelines.pdf NYSERDA. 2019. New York Solar Guidebook for Local Governments. Accessed on March 31, 2020 at: https://www.nyserda.ny.gov/-/media/NYSun/files/solar-guidebook.pdf

Exhibit 4-1 New Potential Avoidance, Minimization, and Mitigation Measures for Solar Energy and Great Lakes Wind Development

Resource(s)	Potential Avoidance, Minimization, and Mitigation Measures	References
	productivity within affected areas is less than that of the adjacent unaffected agricultural land. Decommissioning - removal of all above-ground structures and restoration of areas previously used for agricultural production.	
Grassland Birds	The management goal of these best management practices is to maintain the open, grassy conditions necessary for successful breeding by grassland birds and to avoid disturbance to nesting birds. Techniques to be used may include seeding, mowing, and removal of trees and shrubs. Typically, land should be managed for a minimum of 5 years to begin showing benefits for grassland birds: Nesting Restrictions: Grasslands should not be disturbed by mowing, planting, harvesting, driving, or by any other mechanized means from 23 April to 15 August, inclusive (the nesting season) of every contract year. Wintering Restrictions: Excessive disturbance such as frequent high-speed snowmobile, ATV, motorized vehicle operation, or loud noises such as fireworks should be avoided from 1 November to 1 March, inclusive for the protection of wintering raptors. Mowing Window: All mowing must be done between 16 August and 1 October.	New York State Department of Environmental Conservation, *Best Management Practices for Grassland Birds*. Available at https://www.dec.ny.gov/pubs/86582.html

Exhibit 4-1 New Potential Avoidance, Minimization, and Mitigation Measures for Solar Energy and Great Lakes Wind Development

Resource(s)	Potential Avoidance, Minimization, and Mitigation Measures	References
	Between 16 August and 1 November of the first year of management, reduce fragmentation of the grassland by eliminating hedgerows, shrubs, and trees within the boundaries of the Landowner Incentive Program field. Between 16 August and 1 November and to the extent possible, eliminate woody vegetation, especially hedgerows within and bordering the field. Hedgerows split up habitat and function as predator corridors for coyote, foxes, cats, raccoons, etc; thereby degrading the overall quality of the site for breeding.	
Visual Resources	General guidance regarding appropriate considerations to address visual effects for development projects of all types, such as relocation, camouflage/disguise, low profile, downsizing, use of alternative technology, non-specular material, lighting, and screening. Visual Impact Assessment addressing visibility, appearance, lighting, visual change, glare, proposed mitigation including landscaping.	New York State Department of Environmental Conservation. *Program Policy: Assessing and Mitigating Visual Impacts*, DEP-00-2, Division of Environmental Permits, Albany NY. 2018. Public Service Law Article 10. 16 New York Codes, Rules, and Regulations 1000.24(a).

Exhibit 4-1 New Potential Avoidance, Minimization, and Mitigation Measures for Solar Energy and Great Lakes Wind Development

Resource(s)	Potential Avoidance, Minimization, and Mitigation Measures	References
Great Lakes Wind Energy		
Birds and Bats	Develop a Bird and Bat Conservation Strategy to conduct thorough post-construction monitoring of Proposed Project impacts, and undertake adaptive management measures, if necessary. Adjust the pitch of turbine blades up to the manufacturer's cut in speed during late summer when migrating and swarming bats are most active. Use flashing red lights on turbines for bird safety. Where lights on the platforms or bases of the turbines are illuminated and face upward, use bird-safe designs, such as hooded or "smart" lighting, consistent with other pertinent safety guidance on facility lighting.	U.S. Department of Energy. 2018. Final Environmental Assessment LEEDCo Project Icebreaker Lake Erie, City of Cleveland, Cuyahoga County, Ohio. Accessed online at: https://www.energy.gov/sites/prod/files/2018/09/f55/EA-2045-LEEDCo-Final%20EA-2018.pdf. Accessed on March 9, 2020. Federal Aviation Administration. 2018. AC No. 70/7460-1L , Obstruction Marking and Lighting. August 17, 2018. Accessed online at: https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_70_7460-1L_-_Obstuction_Marking_and_Lighting_-_Change_2.pdf. Accessed on March 9, 2020.
Fish	Develop an aquatic and fish sampling plan that lays out testing and analyses that will be conducted before, during, and post-construction.	U.S. Department of Energy. 2018. Final Environmental Assessment LEEDCo Project Icebreaker Lake Erie, City of Cleveland, Cuyahoga County, Ohio. Accessed online at: https://www.energy.gov/sites/prod/files/2018/09/f55/EA-2045-LEEDCo-Final%20EA-2018.pdf. Accessed on March 9, 2020.

Exhibit 4-1 New Potential Avoidance, Minimization, and Mitigation Measures for Solar Energy and Great Lakes Wind Development

Resource(s)	Potential Avoidance, Minimization, and Mitigation Measures	References
Commercial and Recreational Uses	Notify all applicable agencies (e.g., U.S. Coast Guard [USCG] and USACE) prior to construction that a construction vessel (or vessels) will be moored and/or traveling within navigable channels. Provide the USCG with the information necessary for the USCG to issue a Notice to Mariners. Follow any navigation restrictions imposed by the USCG. Notify appropriate authorities to include the wind turbines on navigation charts.	U.S. Department of Energy. 2018. Final Environmental Assessment LEEDCo Project Icebreaker Lake Erie, City of Cleveland, Cuyahoga County, Ohio. Accessed online at: https://www.energy.gov/sites/prod/files/2018/09/f55/EA-2045-LEEDCo-Final%20EA-2018.pdf. Accessed on March 9, 2020.

5 Areas of Potential Environmental Impact

5.1 Introduction

Consistent with 6 NYCRR §617.10(a), the Prior SEQRA Analyses reviewed potential impacts from an increase in large-scale renewable resources and distributed solar generation. Potential impacts were considered in the context of regulatory requirements for avoidance, minimization, and mitigation strategies. This SGEIS incorporates by reference material from the Prior SEQRA Analyses and analyzes the potential for significant adverse environmental impacts from the Proposed Action.

As described in Chapter 1, this SGEIS considered the following factors when determining which resource areas required new or further analysis: changes in the type of renewable resources, increases in scale of development, and new information (e.g., previously unknown, impacts on a threatened or endangered species, or technology change of large-scale renewable resource and distributed solar generation). Exhibit 1-2 in Chapter 1 provides a summary of the potential significant adverse impacts that the Prior SEQRA Analyses concluded would occur, therefore, these impacts are considered further with respect to changes that may affect conclusions regarding impacts. Chapter 2 discusses changes in technology or design for large-scale renewable resources and distributed solar generation, as well as the estimated increase in the scale of development. As Exhibit 2-5 explains, the Proposed Action would result in approximately 2,100 to 6,300 MW of incremental utility-scale solar, 4,800 MW of incremental offshore wind, and 6,000 MW of incremental distributed solar. Each subsection in this chapter evaluates these changes and the potential for significant adverse effects.

As with the Prior SEQRA Analyses, these quantitative and qualitative discussions do not substitute for project-specific environmental reviews, which may result in the identification of site-specific impacts not set forth below.

5.2 Utility-Scale Solar Energy

As summarized in Exhibit 1-2, the Prior SEQRA Analyses evaluated utility-scale solar and identified potential adverse impacts on land use, visual resources, and birds. This SGEIS analyzes the effects of additional utility-scale solar on these resources and considers potential impacts on grassland birds.

5.2.1 Land Use

Impacts on land use and land cover would occur from the temporary and permanent conversion of existing land use and land cover for development of utility-scale solar energy. The estimated increase in the development of utility-scale solar required to meet the 70 by 30 goal would result in an increase in the temporary and permanent conversion of land area beyond what was considered in the Prior SEQRA Analyses.

Land cover, as described in Section 3.1.1, has not changed significantly since the Prior SEQRA Analyses. However, the Prior SEQRA Analyses assumed a land use requirement of 2 acres per MW capacity, while current land requirement assumptions from NYSERDA estimate an average requirement of 5 acres per MW capacity is required for utility-scale solar projects.[73]

The additional development of utility-scale solar would result in some minor impacts on land use, including conversion of farmland. As described in Chapter 3, approximately 6.1 million acres in New York are cultivated crop and pastureland. Assuming 5 acres per MW of utility-scale solar capacity, land requirements for the expansion of the 50 by 30 goal to 70 by 30 using additional utility-scale solar represent approximately 0.2 to 0.5% of the state's cropland and pastureland.

As described in the Prior SEQRA Analyses and Chapter 4 of this SGEIS, policies for agricultural land protection, including agricultural districts, and guidelines for mitigation of construction impacts on agricultural land, would avoid, minimize, and mitigate some potential impacts associated with construction and operation of utility-scale solar development. In addition, utility-scale solar projects can provide long-term preservation of agricultural land as an alternative to commercial development, and at the end of the operation life of a project the land can be returned to its former use.[74] Given the minor conversion of land compared to available crop and pastureland, project-specific agency guidelines, and restoration following decommissioning, significant adverse impacts on land use and land cover would not be expected from incremental utility-scale solar development.

5.2.2 Visual Resources

Potential impacts on visual resources from the equipment of utility-scale solar facilities occur primarily from the contrast with surrounding landscape and glare from solar panels. The Prior SEQRA Analyses concluded that best practices including proper siting, screening, and using non-reflective support structures, would avoid or minimize impacts, including glare. The estimated increase in the scale of development of utility-scale solar required to meet the 70 by 30 goal would increase the spatial area in which impacts on visual resources would occur.

As described in Section 3.2, land use and land cover, which make up components of the visual landscape, have not changed significantly since the Prior SEQRA

[73] NYSERDA. 2019. *New York Solar Guidebook for Local Governments*. Accessed March 31, 2020. https://www.nyserda.ny.gov/-/media/NYSun/files/solar-guidebook.pdf

[74] Ibid.

Analyses. As described in Section 2.3, the efficiency of solar could increase from 14% to 20%, which may result in a reduction in the size or number of solar panels at individual utility-scale solar projects.

The additional utility-scale solar would result in some additional spatial area in which a contrast between solar facilities and the surrounding landscape occurs depending on the selected design, topography, existing vegetation, screening, and individual sensitivity. Some large utility-scale solar projects would overlap with a greater portion of the viewshed from a viewing location or be seen from longer distances.[75,76] Use of safety lighting at substations and operations infrastructure would be visible nearby. Siting of utility-scale solar would generally avoid or minimize visual impacts on high density population centers, and screening provided by vegetation and topography would limit visibility to nearby areas. Photovoltaic modules are specifically designed to reduce reflection to maximize the amount of light converted into electricity and visual impacts from glare would be negligible.[77]

As described in Section 4.2 and the Prior SEQRA Analyses, permitting of utility-scale solar requires consideration of visual impacts and measures, such as landscaping or non-reflective materials, to avoid, minimize, and mitigate impacts on visual resources. Given the project-specific agency consultations, the Proposed Action would not be expected to result in significant adverse impacts on visual resources from additional utility-scale solar projects.

5.2.3 Birds

Potential impacts on birds that may result from utility-scale solar development include the loss or fragmenting of habitat, disrupting natural behaviors such as foraging, hunting, and migration patterns; and introducing barriers to the movement of species. The Prior SEQRA Analyses concluded that impacts depend on the size and type of utility-scale solar projects as well as proximity to sensitive species. In addition, development of utility-scale solar under the Proposed Action may result in impacts on grassland birds that were not analyzed in detail in the Prior SEQRA Analyses.

The increase in utility-scale solar developed under the Proposed Action would result in impacts on some bird species from increased noise, human presence, habitat loss and disturbance of vegetation communities due to site preparation including clearing and tree removal. The increase in vegetation removal from construction of utility-scale solar projects would result in conversion from agricultural

[75] Sullivan, R.G., L. Kirchler, C. McCoy, J. McCarty, K. Beckman, and P. Richmond. 2012. Visual Impacts of Utility-scale Solar Energy Facilities on Southwestern Desert Landscapes. Presented at the National Association of Environmental Professionals 37th Annual Conference, May 21–24, Portland, OR.

[76] Sullivan, Robert and Jennifer Abplanalp. 2014. *Utility-Scale Solar Energy Facility Visual Impact Characterization and Mitigation Study Project Report*.

[77] Federal Aviation Administration. 2018. *Technical Guidance for Evaluating Selected Solar Technologies on Airports*. Accessed March 28, 2020. https://www.faa.gov/airports/environmental/policy_guidance/media/FAA-Airport-Solar-Guide-2018.pdf

land that may be considered grassland habitat to maintained vegetation, displacing individuals from some avian species from migrating, breeding, foraging, and nesting areas. Loss of habitat would displace individuals of some species to other nearby areas with suitable habitat, resulting in increased competition in the nearby habitat. Construction would also result in some partial removal of forested area, removing areas of cover from predators, foraging opportunities, and shelter.[78]

Most grassland bird species are present throughout the state; however, suitable habitat is concentrated in focus areas shown in Exhibit 3-3. Land requirements of additional utility-scale solar, assuming 5 acres per MW capacity, would represent only 0.8 to 2.3% of the approximately 1.4 million acres of suitable nesting habitat within the state's grassland focus areas even if all additional utility-scale solar were conservatively assumed to be constructed there.

Potential effects of construction noise on birds include changes in physiology (e.g., stress, reproductive hormone levels) and behavior (e.g., avoidance, foraging, vocalization, attention).[79,80] However, bird populations can rebound very shortly after even large-scale, extremely noisy events.[81] Given the short-term noise exposure; the potential impacts due to construction noise from utility-scale solar projects would be temporary and negligible.

Impacts on birds would occur at an individual level, however, population level impacts would not be expected to occur for any species. Given the minor conversion of land compared to available grassland areas, the available habitat for relocation, and project-specific agency consultations, significant adverse impacts on grassland birds would not be expected.

5.3 Great Lakes Offshore Wind Energy

As summarized in Exhibit 1-2, the Prior SEQRA Analyses did not consider in detail offshore wind in the Great Lakes and resources for which potential adverse impacts would occur. This SGEIS considers the effects of development of offshore wind in the Great Lakes on visual resources, fish, commercial and recreational fishing, and birds and bats.

[78] U.S. Department of the Navy. 2016. Final Environmental Assessment for the Lease of Property to Support the Construction and Operation of a Solar Photovoltaic System at Naval Air Station Oceana, Virginia Beach, Virginia.

[79] Sanyal, T., V. Kumar, T.C. Nag, S. Jain, V. Sreenivas, S. Wadhwa. 2013. Prenatal Loud Music and Noise: Differential Impact on Physiological Arousal, Hippocampal Synaptogenesis and Spatial Behavior in One Day-Old Chicks. PLoS ONE 8(7): e67347. https://doi.org/10.1371/journal.pone.0067347.

[80] Bowles, A.E. 1995. Responses of Wildlife to Noise. Pages 109–156 in R.L. Knight and K.J. Gutzwiller, editors. Wildlife Recreationists: Coexistence Through Management and Research. Island Press, Washington, D.C., USA.

[81] Payne, C.J., T.S. Jessop, P-J Guay, M. Johnstone, M. Feore, and R. A. Mulder. 2012. Population, Behavioural and Physiological Responses of an Urban Population of Black Swans to an Intense Annual Noise Event. PLoS ONE 7(9): e45014. https://doi.org/10.1371/journal.pone.0045014.

5.3.1 Visual Resources

Offshore wind energy would affect visual resources along the coast of Lake Erie and Lake Ontario; however, impacts would be dependent on the viewshed and individual sensitivity to changes in the viewshed, and could be minimized with careful siting.

As discussed in Section 2.3.3, offshore wind turbines in New York's Great Lakes waters are expected to be similar in height and capacity to onshore turbines, and offshore turbines would generally be within 10 miles (16 kilometers) of the Lake Erie shore and within 1 to 2 miles (2 to 3 kilometers) of the Lake Ontario shore. The Prior SEQRA Analyses indicated that offshore wind energy would be difficult to see starting at 20 miles (32 kilometers) from shore due to the curvature of the earth and atmospheric conditions. Small offshore wind facilities less than 9 miles (14 kilometers) from shore in a range of weather conditions would generally be a focus of visual attention.[82,83]

Given the limited spatial area for development of offshore wind in the Great Lakes, particularly in Lake Ontario where turbines would be within a few miles of shore, and number of sensitive viewsheds along the lakes, wind development would likely be a major focus of visual attention of individuals on and offshore. Avoidance of sensitive viewsheds and considerations on the number and height of turbines would minimize impacts on visual resources. However, the potential for visual impacts may not be entirely unavoidable.

5.3.2 Fish

Impacts on fish in the Great Lakes would occur from the temporary increase of suspended sediments, noise, and other sensory disturbances from pile driving, excavating, and increased vessel traffic associated with construction. The development of offshore wind capacity in the Great Lakes would result in minor temporary increase of noise and other sensory disturbances from pile driving, excavating, and increased vessel traffic associated with construction, or no additional impacts depending on the selected wind facility design (e.g., turbine size and spacing).[84]

Freshwater fish species in the Great Lakes have higher tolerances to suspension rates of sediment than marine pelagic fish species.[85] Most fish species would be expected to temporarily relocate to surrounding areas and experience disturbances

[82] Maslova, N., C. Claramunt, T. Wanga, and T. Tang. 2017. Evaluating the Visual Impact of an Offshore Wind Farm. The 8th International Conference on Applied Energy – ICAE2016.

[83] Sullivan, R. G., L. B. Kirchler, J. Cothren, and S. L. Winters. 2013. Offshore wind turbine visibility and visual impact threshold distances. *Environmental Practice* 15(1): 33–49.

[84] U.S. Department of Energy. 2018. *Final Environmental Assessment LEEDCo Project Icebreaker Lake Erie, City of Cleveland, Cuyahoga County, Ohio*.

[85] Ewert, D.N., J.B. Cole, and E. Grman. 2011. Wind energy: Great Lakes regional guidelines. Unpublished report. The Nature Conservancy. Accessed April 1, 2020. https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/michigan/Documents/Ewert_WindEnergy2011.pdf.

less frequently or of lower magnitude. If egg and larval fish are present at proposed turbine sites they may not be able to avoid noise impacts or direct impacts on the lake bed.[86] After turbine installation, displaced fish species are likely to return to the area, but the rate of recolonization is poorly understood.[87] Monitoring studies in the Great Lakes have shown that recolonization rates can range from months to years. [88] The spatial distribution of offshore wind projects in the Great Lakes and time of year restrictions would avoid or minimize impacts on fish. Alternative turbine anchoring systems, specifically gravity-based foundations, may substantially reduce the amount of pile driving and associated noise-related disturbance during turbine installation.[89] Given available habitat, potential reductions in pile driving, and project-specific agency consultations, significant adverse impacts on fish in the Great Lakes would not be expected.

5.3.3 Commercial and Recreational Fishing

Potential impacts on commercial and recreational fishing in the Great Lakes would result from area-use conflicts that would result in the displacement of commercial and recreational vessels from fishing grounds, and/or displacement of fish from fishing grounds. Offshore wind energy may limit certain fishing practices, restrict access to fish, or displace fish from traditional fishing areas. To avoid the potential risks associated with fishing within or near offshore wind energy, commercial and recreational fishers may choose to travel farther than they would otherwise, which would increase fuel costs, and potentially reduce the number of landings and catch due to a more limited fishing timeframe. Fish may also temporarily avoid construction areas, which may temporarily alter typical fish catch.[90,91]

Sufficient spacing of turbines would allow vessels to navigate around turbines while also maintaining safe distance from other vessels and commercial shipping lanes.[92] Offshore wind energy development may also lead to the conversion of open water to an artificial reef-like habitat. Added structures (i.e. turbine foundations) would create a new hard-bottom habitat similar to an artificial reef, which

[86] U.S. Department of Energy. 2018. *Final Environmental Assessment LEEDCo Project Icebreaker Lake Erie, City of Cleveland, Cuyahoga County, Ohio.*
[87] Ibid.
[88] Gill, A. B. 2005. Offshore renewable energy: ecological implications of generating electricity in the coastal zone. *Journal of Applied Ecology*. 42:605-615.
[89] U.S. Department of Energy. 2018. *Final Environmental Assessment LEEDCo Project Icebreaker Lake Erie, City of Cleveland, Cuyahoga County, Ohio*.
[90] VanderMolen, J., and E. Nordman. 2014. Offshore Wind Development and the Environment: Potential Impacts for Birds, Fish, and the Coastal Environment. West Michigan Wind Assessment Issue Brief #10. Accessed April 1, 2020. https://www.michiganseagrant.org/wp-content/uploads/2018/08/Wind-Brief-10-Offshore-Wind-and-Environment.pdf.
[91] U.S. Department of Energy. 2018. *Final Environmental Assessment LEEDCo Project Icebreaker Lake Erie, City of Cleveland, Cuyahoga County, Ohio*.
[92] Ibid.

could cause a shift in species presence and diversity.[93,94] The development of new wind capacity would minimize significant adverse impacts on commercial and recreational fisheries in the Great Lakes environment. However, the potential for impacts on commercial and recreational fisheries may not be entirely unavoidable.

5.3.4 Birds and Bats

Development of offshore wind in the Great Lakes would result in potential offshore impacts on birds and bats from construction and operation of offshore wind including disturbance and displacement due to noise, human presence, vessel traffic, and the presence of newly introduced large structures. Development of wind turbines in the Great Lakes under the Proposed Action would result in direct impacts on birds and bats through collisions with turbines. Many species of birds migrate through the Great Lakes region during spring and fall migrations. Many of those species avoid flying over large bodies of water, and those that do typically fly at higher altitudes, often above the height of turbine blades.[95,96] However, because of the tendency of many bird species to avoid flying over large bodies of water, there are several areas along the eastern shores of Lake Erie and Lake Ontario that are important stopover sites for migratory birds; many of these areas are designated as Audubon Important Bird Areas. Birds and bats may also be attracted to wind turbines and platforms as potential structures to perch or roost, and upward facing lighting could attract nocturnally migrating birds; this would potentially result in collisions with turbines. Minimization of lighting and use of colors in lighting that is less attractive to birds would potentially reduce the number of bird collisions. Adjusting the pitch of turbine blades and slowing the rotation of turbines at lower wind speeds during summer months would reduce the number of bat collisions.[97, 98]

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[93] Bergstrom, L., et al. 2014. Effects of offshore wind farms on marine wildlife-a generalized impact assessment. Environmental Research Letters 9. Accessed April 17, 2020. https://iopscience.iop.org/article/10.1088/1748-9326/9/3/034012/pdf.

[94] NYSERDA. 2010. New York's Offshore Wind Energy Development Potential in the Great Lakes: Feasibility Study. Accessed March 16, 2020. https://www.nyserda.ny.gov/About/Publications/Research-and-Development-Technical-Reports/Wind-Reports.

[95] Heist, K.W., N.A. Rathbun, M.T. Wells, E. Olson, and J. C. Gosse. 2018. *Great Lakes Avian Radar Technical Report Lake Ontario Shoreline, Jefferson County, Niagara County, and Wayne County, New York, Fall 2016*. U.S. Department of Interior, Fish and Wildlife Service, Biological Technical Publication FWS/BTP-BTP-R3017-2018

[96] Goodale, Wing, Iain Stenhouse, PhD, and Kate Williams. 2014. Reducing the Adverse Effects of Offshore Wind Development on Waterbirds in the Great Lakes: A Proposed Four-Step Approach. BRI Report 2014-23. Accessed April 6, 2020. https://www.glc.org/wp-content/uploads/2016/10/Great-Lakes-waterbird-vulnerability-to-offshore-wind-FINAL.pdf

[97] U.S. Department of Energy. 2018. *Final Environmental Assessment LEEDCo Project Icebreaker Lake Erie, City of Cleveland, Cuyahoga County, Ohio*.

[98] Goodale, W., I. Stenhouse, PhD, and K. Williams. 2014. Reducing the Adverse Effects of Offshore Wind Development on Waterbirds in the Great Lakes: A Proposed Four-Step Approach. BRI Report 2014-23. Accessed April 6, 2020. https://www.glc.org/wp-content/uploads/2016/10/Great-Lakes-waterbird-vulnerability-to-offshore-wind-FINAL.pdf

The potential for new offshore wind development in the Great Lakes, could result in an increase in displacement of birds, essentially resulting in habitat loss. [99,100] As discussed in Chapter 4, regulatory consultations and preconstruction siting studies would ensure that projects avoid areas of known dense avian use. Impacts on birds would occur at an individual level, however, population-level impacts would not be expected to occur for any species. Given the limited spatial area for development of offshore wind in the Great Lakes, siting of specific projects would require careful avoidance, minimization, and mitigation measures.

5.4 North Atlantic and Mid-Atlantic Offshore Wind Energy

As summarized in Exhibit 1-2, the Prior SEQRA Analyses considered offshore wind in the marine environment and identified resources for which potential adverse impacts would occur. The 2020 SGEIS evaluated impacts of 4,200 MW of offshore wind and concluded that significant adverse impacts the resources evaluated would not be expected. This analysis considers the effects of the procurement of an additional 4,800 MW of offshore wind on marine mammals and sea turtles, fish, commercial and recreational fishing, and birds.

As described in Prior SEQRA Analyses for the marine environment, impacts resulting from offshore wind would occur on marine mammals and sea turtles from increased vessel traffic and sensory disturbance activities, specifically, pile-driving, excavation activities, and vessel traffic during construction. The procurement of an additional 4,800 MW of offshore wind under the Proposed Action would result in additional spatial coverage, sensory disturbance activities, and associated temporary displacement of marine mammals and sea turtles depending on the selected wind facility design, including turbine size and spacing.

Impacts on fish would occur from the temporary increase of suspended sediments, noise, and other sensory disturbances from pile driving, excavating, and increased vessel traffic associated with construction. The additional 4,800 MW of offshore wind would result in an additional temporary increase of noise and other sensory disturbances from pile driving, excavating, and increased vessel traffic associated with construction, depending on the selected wind facility design. Pile driving for additional foundations would occur in isolated areas during a temporary timeframe. As discussed in the Prior SEQRA Analyses, anticipated advancements in turbine anchoring systems would substantially reduce the amount of pile driving and associated noise impacts.

Potential impacts on commercial and recreational fishing would result from area-use conflicts that would result in the displacement of commercial and recreational vessels from fishing grounds, or displacement of fish from fishing grounds. The procurement of an additional 4,800 MW of offshore wind would result in additional impacts on commercial and recreational fishing. Assuming all of the additional 4,800 MW of offshore wind is sited within the geographic scope of analysis of the Master Plan, the scale-up would represent a total of approximately 3% of

[99] Ibid.
[100] U.S. Department of Energy. 2018. *Final Environmental Assessment LEEDCo Project* Icebreaker *Lake Erie, City of Cleveland, Cuyahoga County, Ohio*.

the area offshore of New York, leaving the area largely available without conflicts for fishing.

Potential impacts on birds from construction and operation of offshore wind include disturbance and displacement due to noise, human presence, vessel traffic, and the presence of newly introduced large structures. Impacts would also occur to individual birds and bats from direct collision with construction cranes and turbines. The procurement of an additional 4,800 MW of offshore wind would result in an increase in displacement of birds, essentially resulting in habitat loss. The overall spatial coverage of an additional 4,800 MW of offshore wind energy development relative to the potential impact area distributed across the marine environment would not significantly reduce or modify avian habitat.

All potential impacts on marine mammals and sea turtles, fish, commercial and recreational fisheries, and birds as discussed in the Prior SEQRA Analyses would occur under the Proposed Action, as would the avoidance, minimization, and mitigation measures previously described. Given the spatial distribution of offshore wind projects, the available habitat in the marine environment, and agency consultations; significant adverse impacts on marine mammals and sea turtles, fish, commercial and recreational fisheries, and birds would not be expected.

5.5 Distributed Solar Energy

As summarized in Exhibit 1-2, the Prior SEQRA Analyses considered distributed solar energy and identified resources for which potential adverse impacts would occur. This analysis considers the effects of an additional 6,000 MW of distributed solar under the Proposed Action on land use and visual resources. In addition, this analysis considers potential impacts on avian species, particularly grassland birds.

5.5.1 Land Use

The estimated increase in the development of distributed solar would result in an increase in the temporary and permanent conversion of land area beyond what was considered in the Prior SEQRA Analyses. Distributed rooftop solar would be located on existing structures and would not result in a temporary or permanent conversion of land use or land cover. Community solar projects, which are between 1-2 MW, share physical characteristics with large scale utility solar; they are commonly developed in rural areas, including agricultural land, and are typically ground mounted.[101] Each megawatt of a distributed solar facility is estimated to require 6 acres of land.[102] Based on projections from NYSERDA, approxi-

[101] NYSERDA. 2019. *New York Solar Guidebook for Local Governments- Using Special Use Permits and Site Plan Regulations.* January 2019. Accessed March 31, 2020. https://www.nyserda.ny.gov/All%20Programs/Programs/Clean%20Energy%20Siting/Solar%20Guidebook

[102] Ibid.

mately half of the 6,000 MW of distributed solar in 2030 is expected to be community solar.[103] Assuming 6 acres per MW are needed for a typical 1 MW community solar facility, the land area needed for 3,000 MW of community-distributed solar would represent 0.3% of the state's cropland, assuming only cropland and pastureland was used for community solar.[104]

As described in the Prior SEQRA Analyses and Chapter 4 of this SGEIS, policies for agricultural land protection, including agricultural districts and guidelines for mitigation of construction impacts on agricultural land, would avoid, minimize, and mitigate some potential impacts associated with construction and operation of community solar development. With the availability of suitable land for development of distributed solar in New York, project-specific agency guidelines, and the potential to restore land to its previous land use following decommissioning, significant adverse impacts on land use and land cover would not be expected from the additional procurement of distributed solar under the Proposed Action.

5.5.2 Visual Resources

Distributed solar would result in impacts on visual resources from mechanical equipment that contrasts with surrounding landscape. These impacts on visual resources would vary depending on the type of distributed solar developed.

Rooftop solar projects would generally blend in with existing landscapes and not result in significantly new contrasts. Design considerations, such as symmetrical layouts, can minimize visual impacts of rooftop solar when viewed from nearby.[105,106] Alternatives to traditional rack-mounted solar panels, such as those that resemble roof shingles, are becoming more readily available and would further minimize visual contrasts.[107,108] Community solar projects may be built on undeveloped land or open space which would result in a contrast with the existing landscape. Glare from rooftop solar or community solar projects may occur, but as discussed in Section 5.2.1, photovoltaic modules are designed to reduce reflection to maximize the amount of light converted into electricity.[109] Given the varia-

[103] DPS. 2020. Personal communication. Emails between Peter Sheehan (DPS) and Carl Sadowski of Ecology and Environment, Inc., member of WSP, regarding NEM and CDG/VDR estimates through 2030. March 17, 2020.

[104] NYSERDA. 2019. *New York Solar Guidebook for Local Governments*. Accessed March 31, 2020. https://www.nyserda.ny.gov/-/media/NYSun/files/solar-guidebook.pdf

[105] Lu, M.L., A.L. Lin and J. Sun. 2018. The Impact of Photovoltaic Applications on Urban Landscapes Based on Visual Q Methodology. *Sustainability* 2018, 10, 1051; doi:10.3390/su10041051.

[106] BRE National Solar Centre. 2016. Ensuring Place-Responsive Design For Solar Photovoltaics On Buildings. Accessed April 1, 2020. https://www.solar-trade.org.uk/wp-content/uploads/2016/10/CPRE-BRE-Solar-Report-high-res.pdf.

[107] Ibid.

[108] Pickerel, K. 2019. "The latest on solar shingles, solar roofs and solar tiles.." Solar Power World. April 16, 2019. Accessed April 1, 2020. https://www.solarpowerworldonline.com/2019/04/the-latest-on-solar-roofs-solar-shingles-and-solar-tiles/

[109] Federal Aviation Administration. 2018. *Technical Guidance for Evaluating Selected Solar Technologies on Airports*. Accessed March 28, 2020. https://www.faa.gov/airports/environmental/policy_guidance/media/FAA-Airport-Solar-Guide-2018.pdf

tion in site-specific conditions and avoidance and minimization measures, the procurement of additional distributed solar energy would not be expected to result in significant adverse impacts on visual resources.

5.5.3 Birds

Rooftop solar has negligible impacts on wildlife because solar panels are affixed to existing structures and would not result in a loss of bird habitat. Community solar projects may result in similar potential impacts on birds from utility-scale solar development including the loss or fragmenting of habitat, disrupting natural behaviors such as foraging, hunting, and migration patterns; and introducing barriers to the movement of species. These impacts depend on the size and type of the solar projects as well as proximity to sensitive species. In addition, development of community solar under the Proposed Action may result in impacts on grassland birds.

The impacts on birds from community solar would be similar to utility-scale solar as discussed in Section 5.2.3 and smaller in scale. Land requirements of additional community solar represents approximately 1.3% of the approximately 1.7 million acres of suitable nesting habitat, such as grasslands and hayfields, within the state's grassland focus areas, assuming 6 acres per MW of capacity. Impacts on birds would occur at an individual level; however, population level impacts would not be expected to occur for any species. Given the minor conversion of land compared to available grassland areas, the available habitat for relocation, and project-specific agency consultations, significant adverse impacts on grassland birds would not be expected.

5.6 Cumulative Impacts

This SGEIS identifies potential cumulative impacts where such impacts may be "applicable and significant." Cumulative impacts are two or more individual environmental effects that, when taken together, become environmentally significant or may compound or increase other environmental effects. Cumulative impacts can result from individually minor but collectively significant actions that take place over time. For cumulative impacts to occur, incremental impacts must be greater than negligible. Based on the prior analysis, potential unavoidable adverse impacts may occur and, therefore, potential cumulative impacts may occur for land use, visual, and grassland birds.

5.6.1 Land Use

Cumulative impacts may occur on land use and land cover from the temporary and permanent conversion of existing land use and land cover from development of utility-scale solar energy and distributed solar. Exhibit 5-1 provides a summary of the land use requirements of the potential utility-scale solar energy, utility-scale wind energy, and distributed solar in comparison to the available crop and pastureland.

Exhibit 5-1 Cumulative Land Use Requirements

Renewable Energy Source	Acres per MW	Estimated New Capacity (MW)	Total Land Area Requirements	Percent of Cropland/ Pasture-land Cover
Utility-Scale Solar	5	2,100 – 6,300	10,500 - 31,500	0.2 – 0.5
Distributed Community Solar	6	3,000	18,000	0.3
	Total	**5,100 - 9,300**	**28,500 – 49,500**	**0.5 – 0.8**

The cumulative effect of development of the utility-scale solar energy and distributed solar resources under the Proposed Action would require between approximately 28,500 and 49,500 acres of land. This would represent a cumulative use of approximately 0.5 to 0.8% of the state's cropland and pastureland cover. Given the availability of land area within the state, measures to avoid or minimize permanent impacts on agricultural land, and agency consultations, significant adverse cumulative impacts on land use would not be expected.

5.6.2 Visual

Cumulative impacts may occur on visual resources from mechanical equipment that contrasts with surrounding landscape from development of offshore wind. Cumulative impacts on visual resources would depend on the selected design, topography, existing vegetation, screening, and individual sensitivity. Communities hosting multiple offshore wind projects could experience cumulative visual impacts due to the long distance at which these projects may be seen. Given the limited spatial area suitable for development of offshore wind in the Great Lakes, and the long distances at which wind turbines can be seen, careful consideration of siting, including avoidance of sensitive viewsheds and considerations on the number and height of turbines, would be needed to avoid cumulative impacts on visual resources. With implementation of measures to avoid or minimize permanent impacts on visual resources, and agency consultations, significant adverse cumulative impacts on visual resources would not be expected.

5.6.3 Grassland Birds

Cumulative impacts may occur on grassland birds from the removal or fragmentation of habitat, or collision from development of utility-scale solar energy and distributed solar. The cumulative effect of development of the large-scale renewable energy and distributed solar resources under the Proposed Action would require approximately 28,500 and 49,500 acres of land. This would represent approximately 2.1 to 3.6% of the suitable habitat for grassland birds within the state's grassland focus areas assuming all solar energy projects locate in grassland bird habitat. As noted in Chapter 4, BMPs would generally minimize impacts in areas of grassland habitat in general. Impacts on birds would occur at an individual level, and are not expected to occur at a population level. With implementation of measures to avoid or minimize permanent impacts on grassland birds, and agency consultations, significant adverse cumulative impacts on grassland birds would not be expected.

6 Alternatives Considered

Consistent with 6 NYCRR §617.9(b)(5)(v) of the SEQRA regulations, this chapter provides a description and evaluation of the range of reasonable alternatives to the Proposed Action that are feasible. This chapter builds upon and incorporates reference material from the Prior SEQRA Analyses.

The Commission has identified the No Action alternative as the reasonable alternative to the Proposed Action. The No Action alternative evaluates the adverse or beneficial changes that are likely to occur in the reasonably foreseeable future, in the absence of the Proposed Action.

In the No Action alternative scenario, the State would still take actions to achieve the 50 by 30 goal outlined in the CES by employing a variety of resources in the renewable generation portfolio; procure 4,200 MW of offshore wind in the near-term; and procure 3,000 MW of distributed solar by 2023. However, under the No Action alternative, the State would not take actions needed to achieve the 70 by 30 goal, would not procure the additional approximately 4,800 MW of offshore wind capacity by 2035, and would not procure the additional 3,000 MW of distributed solar by 2025 and 6,000 MW of distributed solar by 2030. Instead, the State would continue to pursue its 50 by 30 goal and procurement would be limited in the near term.

The No Action alternative may result in less potential development of renewable resources, including offshore wind and distributed solar projects, and perhaps less diversity in generation type, in the State's renewable generation portfolio.

Under the No Action alternative, environmental conditions would not change from the current baseline described in Chapter 3. The impacts on the onshore and offshore environment described in Chapter 5 may be less likely to occur under the No Action alternative, or may occur to a lesser degree. For example, the No Action alternative could result in fewer potential impacts on agricultural land if fewer large-scale renewable resources are developed, or fewer impacts on marine mammals and sea turtles if development of less offshore wind infrastructure (e.g., wind turbines and offshore transmission cables) occurs. Alternatively, more agricultural land may be permanently lost to commercial and industrial development, whereas large-scale renewable development preserves the agricultural use of the land.

However, it should be noted that under the No Action alternative, additional development of renewable resources would still occur to meet the 50 by 30 mandate, and associated impacts on the onshore and offshore environment of any such development would still occur. Under the No Action alternative, additional wind facility development could occur offshore of New York State and its electricity would be procured by other states. As outlined in Chapter 2 of the 2020 SGEIS, offshore wind is a regional resource, and several states throughout the region are taking actions to procure offshore wind, as well as setting aggressive goals and implementing directives for the future procurement of offshore wind. Under the No Action alternative, the increased competition in the offshore wind market introduced by other states in the region may lead to fewer purchase options for the State in the future. Some amount of offshore wind could still be obtained from other states indirectly, although how much is obtained and when the associated offshore wind facility development would occur remains less certain.

The socioeconomic impacts associated with the Proposed Action may be reduced under the No Action alternative. Chapter 9 of this SGEIS discusses these socioeconomic benefits of the Proposed Action, including air quality benefits and job creation. Regarding air quality, the No Action alternative would change or reduce the corresponding health benefits of reduced emissions. Similarly, the No Action alternative would change or reduce the anticipated increase in workforce, including new jobs in manufacturing, installation, and operation of renewable energy facilities under the Proposed Action.

7 Unavoidable Adverse Impacts

Consistent with 6 NYCRR §617.9(b)(5)(iii)(b), the Prior SEQRA Analyses analyzed unavoidable adverse impacts from the Proposed Action. Unavoidable adverse impacts are impacts that, if an action is implemented, cannot be avoided or adequately mitigated. The Prior SEQRA Analyses concluded that, at a generic level, there were no unavoidable adverse impacts that could not be mitigated.

As discussed, this SGEIS incorporates by reference material from the Prior SEQRA Analyses and analyzes the potential for unavoidable adverse environmental impacts from the increase in the State's clean energy goal from 50% renewables to 70% renewables by 2030, procurement of an additional 4,800 MW of offshore wind by 2035, and procurement of an additional 3,000 MW of distributed solar energy by 2025. This SGEIS is not intended to evaluate specific renewable resource projects and their potential site-specific environmental impacts; rather it identifies whether the Proposed Action or alternatives could pose unavoidable adverse impacts at a generic level. As set forth in Chapter 5, there are no unavoidable adverse impacts that could not be mitigated through one or more of the mechanisms discussed in Chapter 4. Similarly, as discussed in Chapter 6, the No Action alternative or an alternative mix of renewable resource present no such unavoidable adverse impacts.

Biomass and biogas energy were previously eligible technologies under the CES; however, these technologies would no longer be eligible to contribute to the 70 by 30 goal under the Proposed Action. While biomass and biogas energy projects could be installed without subsidies under the Proposed Action, the absence of subsidies may result in a decrease in development of biomass and biogas energy compared to what was analyzed in the 2016 SEIS. As discussed in the Prior SEQRA Analyses, biogas energy projects can significantly reduce emissions of methane and CO_2, emanating from landfill sites, wastewater treatment facilities, and farms. A decrease in development in biogas energy could result in an increase in methane and CO_2 compared to what was discussed in the Prior SEQRA Analyses.

8 Irreversible and Irretrievable Commitment of Resources

Pursuant to 6 NYCRR §617.9(b)(5)(iii)(c), the Prior SEQRA Analyses assessed the irreversible and irretrievable commitments of environmental resources associated with the Proposed Action. An irreversible commitment of resources occurs when an action's impacts would limit future use options if the change cannot be reversed, reclaimed, or repaired. An irretrievable commitment of resources occurs when the used or consumed resource is neither renewable nor recoverable for use by future generations without reclamation. Irretrievable commitments are not necessarily irreversible and can include the loss of production or harvest of natural resources. This SGEIS incorporates by reference material from Prior SEQRA Analyses and provides an assessment of the irreversible and irretrievable commitment of environmental resources from the development of new renewable energy sources.

The Proposed Action would help the state achieve the CLCPA mandate and will increase the development of large-scale renewable resources and distributed solar generation. As described in Prior SEQRA Analyses, the future construction and operation of new large-scale renewable resource projects that may occur in response to the Proposed Action could result in irreversible and irretrievable commitment of resources. With respect to additional procurement of utility-scale solar, the 2016 SEIS identified the agricultural land as the principle commitment of resources. The New York State Department of Agriculture and Markets has developed a number of guidelines for developing utility-scale solar in agricultural areas summarized in Exhibit 4-1. Responsibly sited utility-scale solar projects can provide long-term preservation of agricultural land as an alternative to commercial development and at the end of the operation life of a project, the land can be returned to its former use.

With respect to additional procurement of offshore wind, the 2020 SGEIS identified the marine environment occupied by a project as the principal commitment of resources for construction and operation. The NYSERDA "Offshore Wind Policy Options Paper" (Options Paper) notes that activities to drive market scale are interrelated with scale economies; construction, operating and financing experience;

development of local supply chain; and offshore wind prices.[110] Further, the Options Paper notes that initially, the global supply chain will support development of offshore wind in the Northeast United States. However, as the market is established, development of ports and vessels would occur locally, requiring resource commitments. Existing vessels used for offshore wind construction may be too large to access the Great Lakes; therefore, committing local resources to adapt or create new vessels suitable for construction in the Great Lakes may be necessary.[111] The materials used for construction for large-scale renewable resources and additional distributed solar generation would be consumed and is neither renewable nor recoverable for use at this time, although reclamation techniques may become available. In all of these cases, actual impacts, and resource commitments are unknown until specific projects are proposed. These resource commitments would be identified in site-specific environmental analyses and avoided or minimized in accordance with applicable law and regulations, as discussed in the Prior SEQRA Analyses and Chapter 4 of this SGEIS.

[110] NYSERDA. 2018. "Offshore Wind Policy Options Paper." Accessed March 30, 2020. https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Biomass-Solar-Wind/Master-Plan/Offshore-Wind-Policy-Options-Paper.pdf.

[111] NYSERDA. 2010. *New York's Offshore Wind Energy Development Potential In The Great Lakes: Feasibility Study.* Available at: https://www.nyserda.ny.gov/About/Publications/Research-and-Development-Technical-Reports/Wind-Reports

9 Growth-Inducing Aspects and Socioeconomic Impacts

Consistent with 6 NYCRR §617.9(b)(5)(iii)(d), the Prior SEQRA Analyses identified and discussed the potential growth-inducing impacts, including potential program costs and benefits, as part of the socioeconomic impacts of the respective proposed actions. Growth-inducing generally refers to "secondary" impacts, or the potential for an action to trigger further development. This SGEIS incorporates by reference material from Prior SEQRA Analyses and provides an assessment of the potential growth-inducing impacts from the Proposed Action.

The CLCPA requires investment of clean energy program resources to benefit disadvantaged communities, and is designed to ensure that individuals working in conventional energy industries are provided with training and opportunities in the growing clean energy economy. The Proposed Action will increase the development of large-scale renewable energy and distributed solar generation, as well as inducing growth in the communities where projects are located.

9.1 Impacts on Growth and Community Character

9.1.1 Onshore Renewable Energy Resources

As noted in the Prior SEQRA Analyses, the potential indirect impacts of large-scale renewable energy and distributed generation are reflected in economic indicators, including the creation of jobs in construction and operation of new facilities, payments to the State and localities, payments for fuel and land leases, and in-state purchase of materials and services. Additional indirect impacts under the Proposed Action are reflected in advancement in renewable technologies and changes in community character.

The Proposed Action would result in increased spending at local businesses and increased use in public services by workers in construction and operation. The increase in construction and operation workers typically results in an increase in demand for goods and services, such as local food and hotel industries, that supply and support developers engaged in construction and operation. Additional induced impacts could result from reinvestment of earned wages from construction and operation workers as well as the businesses that supply them. This reinvestment can occur anywhere within the economy: on household goods, entertainment, food, clothing, transportation, etc. The increases in indirect impacts from the Proposed Action are not anticipated to vary substantially from what was described in

the Prior SEQRA Analyses. However, the Proposed Action would result in a greater number of large-scale renewable energy and distributed generation projects, and some communities may host a greater number of these projects. Depending on the timing of projects within a single community, this could result in greater demand for supporting industries, including hotels, restaurants, and public services. This may also result in an increase in the number of jobs at local businesses. The potential increase in tax revenue to local communities cannot be reasonably quantified; however, the overall increase is anticipated to be greater compared to the Prior SEQRA Analyses in proportion to the increase in the number of renewable energy projects. Communities hosting multiple renewable energy projects would likely see a greater impact on their tax base.

The Proposed Action would be expected to continue to facilitate the advancement of technologies for solar energy. As a result, the region could experience the development of economies of scale for regional solar energy, which would have the effect of advancing applicable technologies, increasing local knowledge, and reducing the cost of renewable energy development and ratepayers' energy costs.

The Prior SEQRA Analyses discussed impacts on community character in terms of the visual and physical impacts from new renewable energy development. These impacts would be site specific, and the increase in renewable energy projects under the Proposed Action would not be expected to result in substantially different impacts from those described in the Prior SEQRA Analyses.

Agriculture remains an important characteristic of many communities and their economies.[112] Communities may be concerned that solar development could result in a loss of valuable and productive agricultural land that could potentially decrease the economic feasibility of agricultural activity in the future.[113] Agricultural land generally provides flat clear terrain with minimal contamination that is ideally suited for renewable energy projects and, therefore, agricultural communities are more likely to host many of the new utility-scale solar projects. As discussed in Section 3.1.1 of this SGEIS, the economic impact of agritourism in the state has grown over the last several years. Conversion of agricultural land to renewable resources could impact the agricultural character of some communities and affect growth of this industry. As discussed in Section 4.2 of this SGEIS, a number of avoidance and minimization measures could be implemented that may minimize changes to a community's character. Utility-scale solar sited on agricultural land may limit agricultural opportunities during operation of the solar facility; however, agricultural activities on nearby land would generally not be affected.

Co-location of solar panels and active agricultural uses is a common practice across the country. Solar developers can work with communities to develop com-

[112] New York State Comptroller. 2019. Profile of Agriculture in New York State, August 2019. Accessed February 21, 2020. https://www.osc.state.ny.us/reports/economic/agriculture-report-2019.pdf.

[113] NYSERDA. 2019. New York Solar Guidebook for Local Governments. Accessed March 31, 2020. https://www.nyserda.ny.gov/-/media/NYSun/files/solar-guidebook.pdf

plementary agricultural uses, such as grazing animals, pollinators, or shade-resistant crops. Sheep, for example, can be used for vegetation management on solar sites, providing a low-cost way to prevent overgrowth around panels. The addition of sheep pastureland on solar sites could potentially expand the production of locally produced lamb, sheep dairy products, and wool.

9.1.2 Offshore Wind

Consistent with the growth-inducing effects identified in the 2018 GEIS and 2020 SGEIS, an increase of 4,800 MW of offshore wind generation capacity by 2035 is expected to lead to a proportional increase in development of emerging technologies, coastal tourism, employment associated with construction and operation, purchases of local products and services, and tax payments by employees and facility owners. The Proposed Action would likely result in the state realizing economies of scale at an accelerated rate compared to that described in the 2020 SGEIS.

9.2 Potential Program Costs

The development of additional large-scale renewable resources and distributed generation under the Proposed Action would result in an increase in potential program costs compared to the Prior SEQRA Analyses. The increase in potential program costs would depend on the mix of renewable energy sources, as well as market conditions. Generally, the cost of large-scale renewable resource and distributed generation is expected to decrease.

The Prior SEQRA Analyses estimated the gross program cost for development of tier 1 renewables (i.e., new renewable energy projects) to meet the 50 by 30 goal would be $2.4 billion. The potential benefits was estimated at $4.3 billion, which would result in a net program benefit of $1.9 billion through 2030.[114] Program costs for NYSERDA's Phase 1 Procurement of offshore wind contracts were estimated between a net cost of approximately $0.4 billion and a net benefit of approximately $1.9 billion.

As discussed in Section 2.3.1 of this SGEIS, the efficiency of solar photovoltaic is expected to continue to increase, which is expected to result in lower costs for solar energy. The cost of residential solar declined 36% between 2012 and 2019 while the cost per watt of non-residential solar decreased by 35% during the same period.[115] Average wind energy project costs decreased by approximately 40% between 2009 and 2010. However, this decline followed an increase in average costs between 2000 and 2008 due to a decline in the value of the U.S. dollar and increased materials, energy, and labor costs.[116]

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[114] NYSERDA. 2016. Clean Energy Standard White Paper Cost Study. April 8, 2016. Accessed April 8, 2020. http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=15-e-0302

[115] NYSERDA. 2019. NYSolar Map, Local Cost of Solar ($/Watt) by Sector. Accessed April 16, 2020. https://nysolarmap.com/.

[116] U.S. Department of Energy. 2018. 2018 Wind Technologies Market Report. Accessed February 7, 2020. https://www.energy.gov/sites/prod/files/2019/08/f65/2018%20Wind%20Technologies%20Market%20Report%20FINAL.pdf

Estimates of net costs for offshore wind declined nearly 40% between the Options Paper and NYSERDA's Phase 1 Procurement. It is likely that net costs for offshore wind will continue to decline through 2035. The projected levelized cost of energy for offshore wind is currently projected to decrease by 35% between 2018 and 2030.[117]

9.3 Potential Program Benefits

The development of additional large-scale renewable energy and distributed generation under the Proposed Action would result in an increase in potential program benefits. As described in the Prior SEQRA Analyses, renewable energy development is expected to provide significant beneficial impacts from a reduction in GHG emissions and related beneficial impacts on public health and employment in the renewable energy sector.

Greenhouse Gas Emissions

As part of the 2016 SGEIS, NYSERDA prepared a cost study analysis to estimate the potential benefits of implementation of the CES. The cost study analysis estimated the potential benefit of the reduction in GHG from development of new renewable energy sources to meet the 50 by 30 goal would equal approximately $1.8 billion in carbon benefits.[118] The carbon benefits represent an avoidance of costs related to climate change, such as changes in net agricultural productivity, human health, property damages from increased flood risk, and changes in energy system costs. Additional renewable energy generation capacity to meet the 70 by 30 mandate would be expected to increase expected net carbon benefits beyond the estimates in NYSERDA's cost study analysis.

The development of large-scale renewable resources and distributed solar generation would support the objectives of the CLCPA and the State to combat climate change which would benefit sensitive species. An emerging threat to grassland bird species is the warming of global temperatures.[119] The National Audubon Society's North American Grasslands and Birds Report stated that solutions to carbon emissions are needed to protect grassland birds.[120] As discussed in Section 3.1.2, several grassland species are on the New York State threatened and endangered species list (see Exhibit 3-2).

[117] U.S. Department of Energy. 2018. 2018 Offshore Wind Technologies Market Report. Accessed April 16, 2020. https://www.energy.gov/sites/prod/files/2019/08/f65/2018%20Offshore%20Wind%20Market%20Report.pdf

[118] NYSERDA. 2016. Clean Energy Standard White Paper Cost Study. April 8, 2016. Accessed March 17, 2020. http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=15-e-0302

[119] National Audubon Society. 2019. Survival by Degrees: 389 Bird Species on the Brink. Accessed April 16, 2020. https://www.audubon.org/sites/default/files/climatereport-2019-english-lowres.pdf

[120] Wilsey, C.B., J. Grand, J. Wu, N. Michel, J. Grogan-Brown, B. Trusty. 2019. North American Grasslands and Birds Report. National Audubon Society, New York, New York, USA.

Public Health Benefits

An increase in the development of renewable energy under the Proposed Action is anticipated to result in improved air quality beyond what was expected in the Prior SEQRA Analyses. This increase in air quality would in turn result in increased health benefits.

Employment

In 2018, the state employed 22,023 people in renewable energy generation. Projections for 2019 predicted an increase to 24,410 people employed in the renewable energy generation. Of these, 11,603 were employed in the solar energy, and 3,491 were employed in wind energy.[121]

The National Solar Jobs Census indicates utility-scale solar projects in the United States have an average capacity of 19.5 MW and require an average of 3.3 jobs per MW for solar installation and project development. Residential solar and non-residential solar projects require more jobs per MW (38.7 and 21.9 jobs per MW, respectively) than utility-scale solar due to their smaller size.[122]

The Proposed Action would increase the anticipated need for renewable energy support services (primarily repair and maintenance, administrative support, and facilities management), sales and distribution, and professional support services. Renewable energy support services have had the highest growth rates across the clean energy value chain in New York in recent years, with an increase in employment in 2017 and 2018 of 11.0% and 7.7%, respectively. Professional services, which include consulting, engineering, finance, legal, and other professional support services, accounted for the second-largest number of jobs in the clean energy value chain.

As noted in the Prior SEQRA Analyses, studies have generally found that renewable energy deployment increases gross jobs in and related to the renewable energy sector. The 2019 U.S. Energy and Employment Report for New York projects a 8.3% increase in electric power generation job growth in the state over a 12-month period.[123] New York has one of the fastest growing solar markets in the country and 2019 was New York's most productive year for solar installations with 460 MW of solar installed.[124] The additional utility-scale and distributed solar associated with achieving the 70 by 30 goal will likely continue to drive additional job growth and economic growth beyond these projections.

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[121] NYSERDA. 2019. New York Clean Energy Industry Report. Accessed April 16, 2020. https://www.nyserda.ny.gov/About/Publications/New-York-Clean-Energy-Industry-Report

[122] The Solar Foundation. 2018. National Solar Jobs Census 2018. Accessed April 16, 2020. https://resources.solarbusinesshub.com/images/reports/206.pdf

[123] Energy Futures Initiative. 2019. U.S. Energy and Employment Report New York Energy and Employment 2019. Accessed March 4, 2020. https://static1.squarespace.com/static/5a98cf80ec4eb7c5cd928c61/t/5c7f41aeeef1a1d1dc9b005d/1551843758692/NewYork.pdf

[124] New York State Energy Research Development Authority (NYSERDA). "Statewide Solar Projects". Accessed March 4, 2020. https://www.nyserda.ny.gov/All-Programs/Programs/NY-Sun/Solar-Data-Maps/Statewide-Projects

Other Benefits

The Prior SEQRA Analyses identified a number of other program benefits from large-scale renewable resources and distributed generation, including:

- Reduced Transmission and Distribution Losses – An increase in distributed solar near the load is expected to result in a reduction in line losses.
- Optimized Electricity Network – Distributed solar could allow for better optimization of generation systems and the transmission and distribution network.
- Reduced or Avoided Transmission and Distribution Infrastructure – Decentralization of the state's electricity system could reduce the need for expanded grid capacity.
- Reduced Congestion Costs – Locating renewable energy generation near congested areas can alleviate the transmission and distribution constraints causing congestion and associated costs.
- Increased Reliability and Power Quality – Locating renewable energy generation near the load may result in more reliable transmission, distribution, and generation, fewer power interruption events, and faster facility repairs following extreme weather events.

10 Effects on Energy Consumption

Consistent with 6 NYCRR §617.9(b)(5)(iii)(e) of the SEQRA regulations, this chapter considers impacts of the Proposed Action on the use and conservation of energy. For electric generating facilities, SEQRA requires a demonstration that the facility will satisfy electric generating capacity needs or other electric systems needs in a manner reasonably consistent with the most recent State Energy Plan. This chapter builds upon and incorporates by reference material from the Prior SEQRA Analyses.

As described in Chapter 1, the CLCPA sets climate and clean energy goals, encompassing climate change impact adaptation, reductions in GHG emissions, and investments in technology, as well as job creation and energy worker transitions and the protection of disadvantaged communities. As a result, the use and conservation of energy in the state is undergoing a transition facilitated by the CLCPA and supported by the State Energy Plan. Achieving the mandate that renewable sources provide 70% of the electricity consumed in New York by 2030, the increased offshore wind procurement goal by 2035, and the increased distributed solar energy goal by 2025 would increase the supply of large-scale renewable resources and distributed generation as well as increase the resiliency of energy supplies.

As described in Prior SEQRA Analyses, increased use of large-scale renewable resources is expected to increase the proportion of renewable energy in the total generation mix, although it is not expected to influence the amount of energy consumed. The Proposed Action would affect the State's electric generation portfolio and foster development of large-scale renewable resources. The Proposed Action would expand renewable energy as a source of New York's overall electric generation mix and ensure at least 70% of the energy used in New York is sourced from renewables. The CLCPA is anticipated to spur innovation, allowing market participants to develop new strategies and solutions to continue to provide cost-effective renewable energy for consumption.

As described in the 2015 GEIS, additional distributed generation is likely to reduce consumption of grid-supplied power, and make electric load more dynamic and responsive to wholesale market price signals, potentially improving overall

system efficiencies.[125] Achieving the CLCPA target of additional distributed photovoltaic solar generation by 2025 would represent an increase of approximately 422% from 2019 distributed energy generation.

[125] New York Independent System Operator. 2017. "Distributed Energy Resources Roadmap for New York's Wholesale Electricity Markets," A Report by the New York Independent System Operator January 2017. Accessed March 19, 2020. https://www.nyiso.com/documents/20142/1391862/Distributed_Energy_Resources_Roadmap.pdf/ec0b3b64-4de2-73e0-ffef-49a4b8b1b3ca.

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