NYSERDA Summer 2020 Offshore Wind Update and Informational Webinar

August 7, 2020

Agenda

- President's Remarks
- New York State's Nation-Leading Mandates
- 2020 Solicitation for Offshore Wind and Port Infrastructure Investments
- Project Updates: Empire Wind and Sunrise Wind
- Technical Working Groups and Stakeholder Engagement
- National Research and Development Consortium Solicitation

President's Remarks

Doreen Harris, Acting President and CEO

New York State's Nation Leading Clean Energy Mandates

Matt Vestal, Senior Advisor, Large-Scale Renewables

NEW YORK STATE OF OPPORTUNITY. | NYSERDA


New York is committed to
100% clean
carbon-free electricity
by 2040
most aggressive in the nation

9,000 MW of offshore wind by 2035

10,000 JOBS

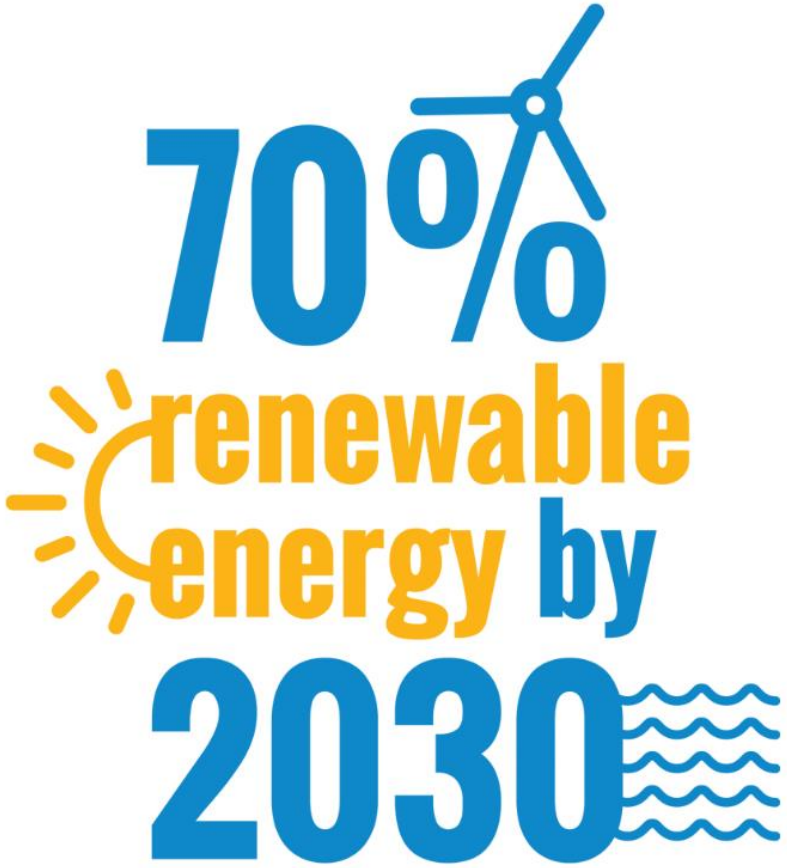
ENOUGH TO POWER 6 MILLION HOMES

BILLIONS IN INFRASTRUCTURE

30% OF NEW YORK'S ELECTRICITY LOAD

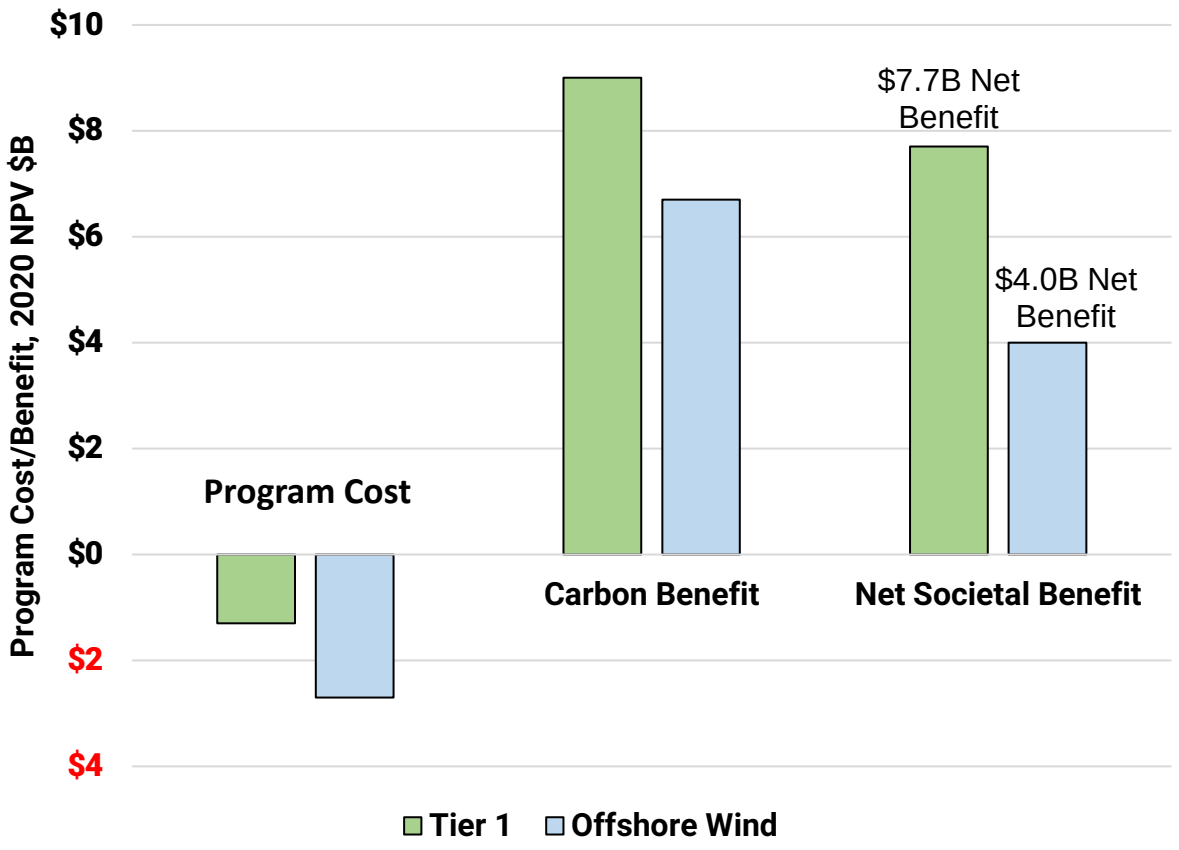
White Paper: Clean Energy Standard to Implement CLCPA

- **Alignment with the CLCPA**
  - Adopts 70 by 30 Goal
  - Definition of Renewable Energy
- **Procurement Targets**
  - Tier 1 Land Based Renewables
  - Offshore Wind
- **Costs and Benefits Analysis**
- **Tier 4 Proposal**
- **Repowering Proposal**
- **Competitive Tier 2 Petition**



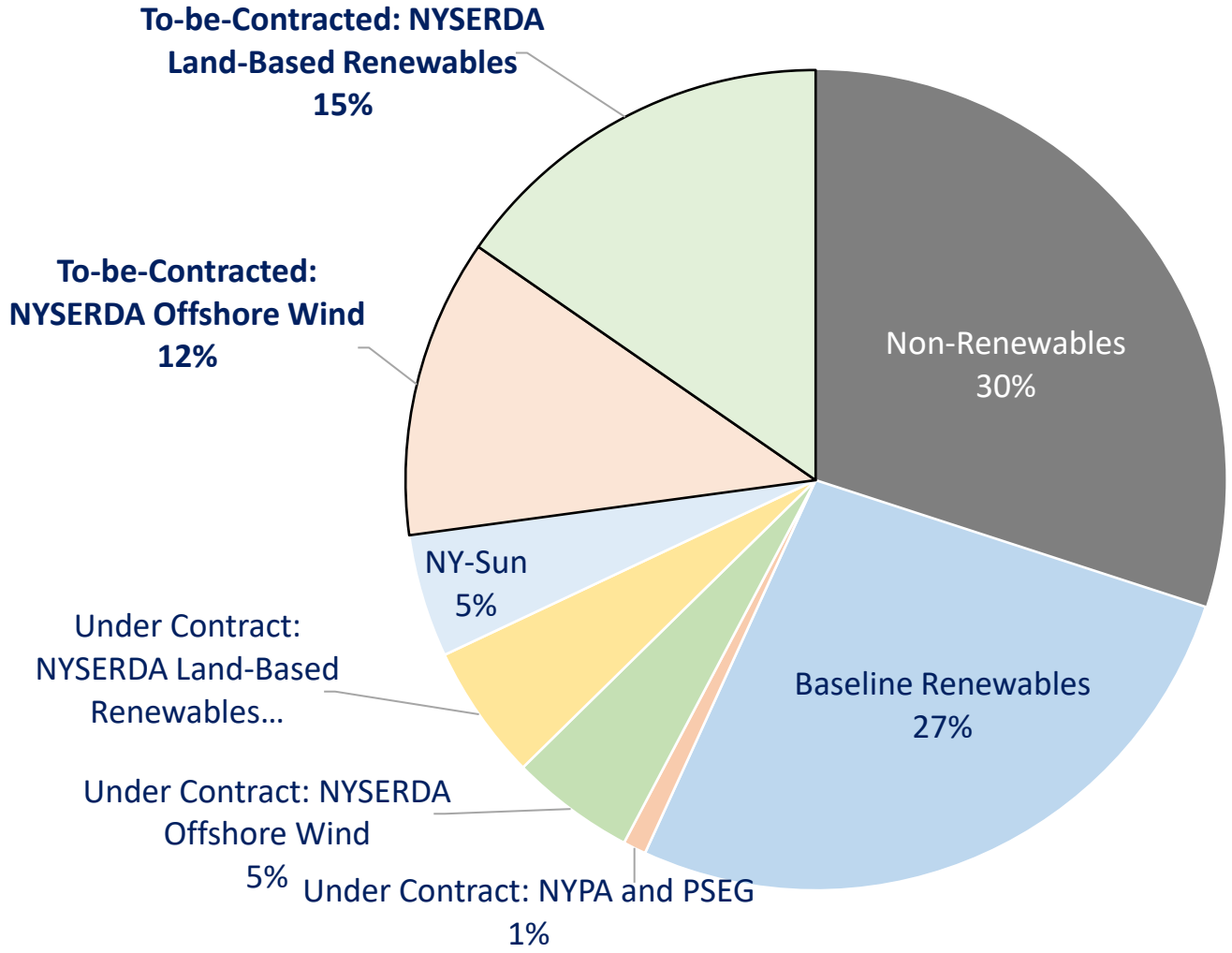
DPS Matter Master 15-E-0302 | Filed 06/18/20, Comments Due 8/31/20

Costs and Benefits Analysis to Reach 70 by 30



- Total (levelized) bill impact of the program cost for the proposed Tier 1 and Offshore Wind procurements is projected to be approximately **1.4%.**
- Both the Tier 1 and Offshore Wind programs are expected to accrue carbon benefits that far outweigh program costs, **delivering a combined net societal benefit of $11.7B over the life of the projects**.
- Extending the offshore wind program through 2035 (to capture the State's full 9 GW mandate) **increases these net societal benefits to $17.3B.**
- These net societal benefits capture only the value of avoided carbon emissions and do not include billions of dollars of other notable societal benefits, including PM2.5 reductions that would decrease premature deaths and hospitalizations.

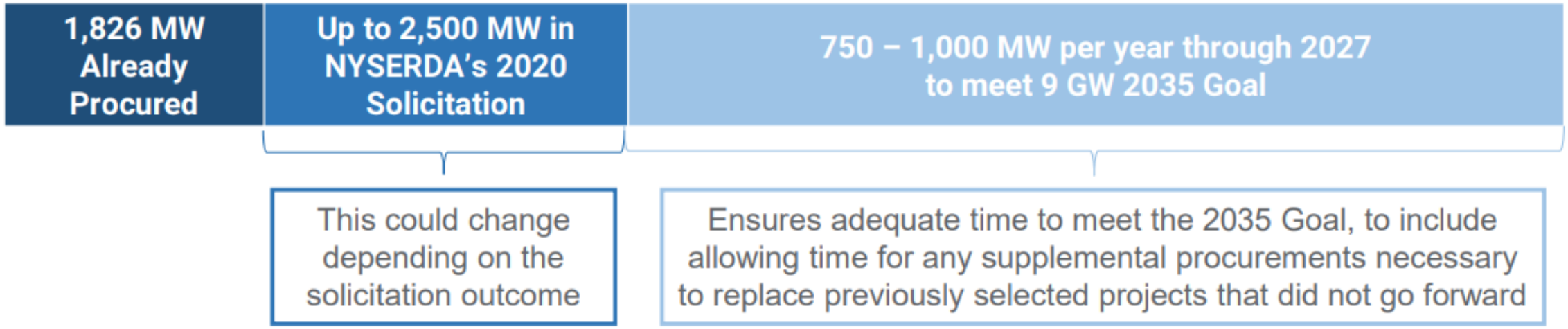
New York's Projected 2030 System Mix



White Paper Proposal: Adoption of the +9GW Goal

Proposal:

Formal adoption the CLCPA's minimum statewide goal of 9 GW of OSW by 2035 and the authority for NYSERDA to procure the remaining amount of ORECs necessary to achieve that goal, and the flexibility to do so in an effective manner.



Direct Procurement and Resale of ORECs

Offshore wind projects may be developed for delivery into the NYCA without NYSERDA's involvement by:

> **LSEs or other large buyers**, such as the city government.

> **Voluntary buyers**, such as private businesses.

Therefore, the white paper proposes that:

> LSEs are free to **procure ORECs directly** for compliance and need not obtain them from NYSERDA.

> NYSERDA have the authority to **re-sell ORECs** to any interested purchaser.

+White Paper: Clean Energy Standard to Implement CLCPA

Energy+Environmental Economics

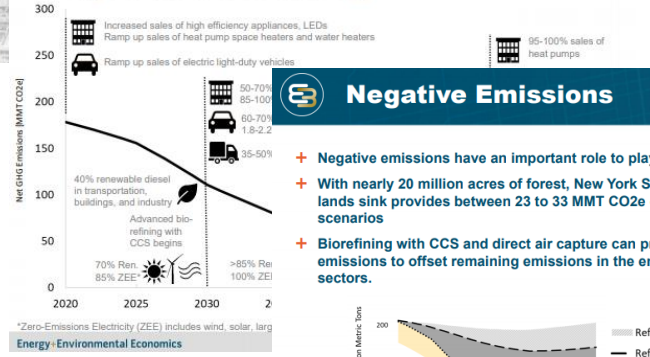
New York State Decarbonization Pathways Analysis

Summary of Draft Findings

June 24, 2020

Key Takeaways

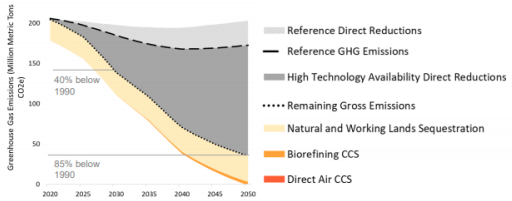
+ Achievement of emissions reductions to meet state law requires action in all sectors
+ A 30-year transition demands that action begin now



Energy+Environmental Economics

Negative Emissions

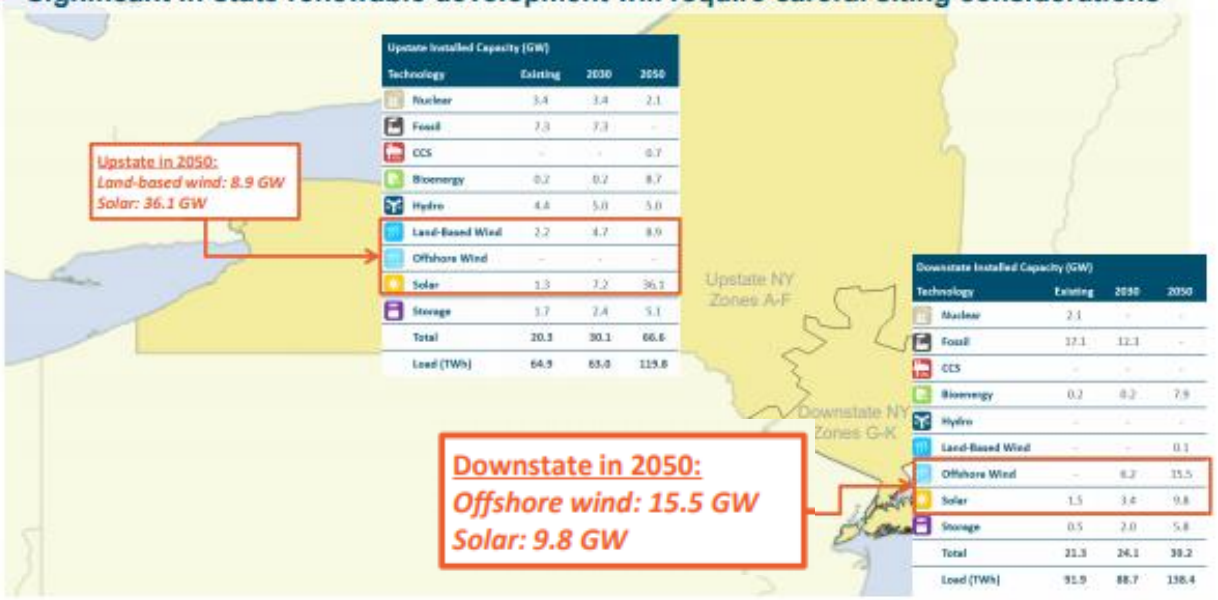
+ Negative emissions have an important role to play in carbon neutrality
+ With nearly 20 million acres of forest, New York State's natural and working lands sink provides between 23 to 33 MMT CO2e of negative emissions across scenarios
+ Biorefining with CCS and direct air capture can provide additional negative emissions to offset remaining emissions in the energy and non-combustion sectors.



Energy+Environmental Economics 18

Electricity Supply

+ New York State has significant potential renewable energy resources and zero-carbon technology options, as well as access to adjoining states, provinces, and regional transmission systems, which offer additional options for energy supply.
+ Significant in-state renewable development will require careful siting considerations



Energy+Environmental Economics 14

https://climate.ny.gov/Meetings-and-Materials

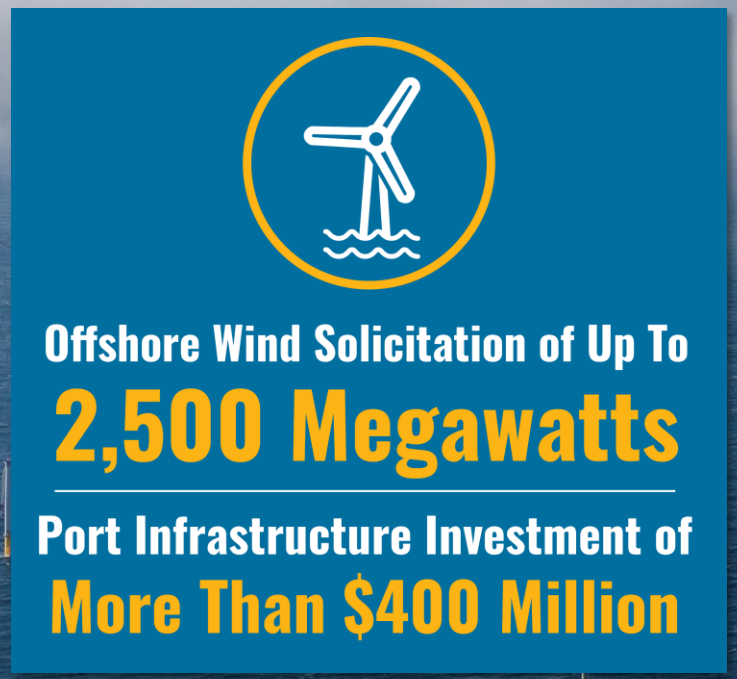
NEW YORK STATE OF OPPORTUNITY. | NYSERDA

NYSERDA's Second Offshore Wind Solicitation

Adrienne Downey, Principal Engineer, Offshore Wind

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

ORECRFP20-1 Now Live!
New York Launches Second OSW Solicitation



70% Price
20% Economic Benefits
10% Viability

https://www.nyserda.ny.gov/offshore-wind-2020-solicitation

$400 million in Complementary Port Infrastructure Investments

- The solicitation includes a **multi-port strategy** and requirement for offshore wind generators to partner with **any of the 11 prequalified New York ports** to stage, construct, manufacture key components, or coordinate operations and maintenance activities.

- To support New York's position as the hub for the offshore wind industry, NYSERDA, with the assistance of NY Green Bank, Empire State Development and the New York State Department of Transportation, will all support this combined solicitation for investing in and upgrading the state's port infrastructure. **The $400 million in private and public funding is comprised of:**

  - $100 million in Empire State Development grant funding,
  - $100 million in low-interest financing,
  - $200 million in private-sector matching funds, for a 1:1 public/private match.

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

New York Forward: Building Back Better

Notable **Economic Development & Equity** provisions in this comprehensive solicitation include:

- Provisions requiring payment of the **prevailing wage**, a standard set by the New York State Department of Labor, and good-faith negotiations towards the use of **Project Labor Agreements** for workers associated with the construction of any awarded facility and continuing to prioritize opportunities for **New York State Minority- and Woman-Owned Business Enterprises and Service-Disabled Veteran-Owned Businesses** to support these projects;
- Incentivizing associated jobs, project spending, and infrastructure investments in New York State by requiring awardees to provide an economic benefits plan for evaluation, backed by independent audit and verification of the realization of these claims;
- **Prioritizing low-income census tracts and Environmental Justice Areas** to contribute to delivering the overall job creation and benefits to **Disadvantaged Communities**, consistent with the State's Climate Leadership and Community Protection Act;
- (…)

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

New York Forward: Building Back Better

Notable **Environmental Leadership** provisions in this comprehensive solicitation include (Cont'd):

- Sending a clear **buy-clean demand signal** to the market to encourage the **consideration of the project's carbon footprint** in design, sourcing and construction and spur use of advanced materials;
- Actively addressing the interests of ocean users such as commercial and recreational fishing and environmental stakeholders as reflected in **standardized and expanded mitigation plans** which are informed by New York's Offshore Wind Technical Working Groups as established by New York's Offshore Wind Master Plan; and
- The obligation to provide **financial and technical support to regional monitoring of wildlife and key commercial fish stocks** through a minimum contribution of $10,000 per megawatt, which includes:
  - **$5,000 per megawatt** must be used to support **regional monitoring of wildlife** to better understand how offshore wind energy development effects distribution and abundance of sensitive species.
  - **$5,000 per megawatt** to support **regional monitoring of key commercial fish stocks** to better understand how offshore wind energy development is potentially altering the biomass and/or distribution of these stocks.

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

Schedule and Milestones

RFP Release Date	July 21, 2020
Proposers' Conference (password OREC)	August 12, 2020, 10:00 a.m.
Deadline for Submission of Written Questions	August 19, 2020, 3:00 p.m.
Responses to Written Questions Posted	August 26, 2020
Deadline for Notice of Intent to Propose	September 23, 2020, 3:00 p.m.
Deadline for NYSERDA Portal Registration	**October 13, 2020, 3:00 p.m.**
Deadline for Submission of Proposals	**October 20, 2020, 3:00 p.m.**
NYSERDA Award Notification Date	Q4 2020
Contract(s) Executed	Q4 2020

Next week!

- Notification of any changes to the RFP process or documents will be posted on the **NYSERDA Offshore Wind 2020 Solicitation website** and sent via email to those parties who have submitted a Notice of Intent to Propose.

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

Offshore Wind Solicitation of Up To

2,500 Megawatts

Port Infrastructure Investment of

More Than $400 Million

Combined, these Clean Energy Projects will

$7 BILLION

in Investments and More than

4,500 JOBS

New York has issued the LARGEST Combined Solicitations for RENEWABLE ENERGY ever by a U.S. State

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

Solicitations for Land-Based Renewable Energy Projects of

1,500+ Megawatts

Which is Equivalent to Powering

500,000 Homes for 20 Years

CLEAN ENERGY PROJECTS WILL

- ✓ Jumpstart New York's economy and accelerate climate goals
- ✓ Prioritize hiring in Environmental Justice Areas
- ✓ Benefit disadvantaged communities
- ✓ Require project labor agreements and/or prevailing wage for good paying jobs

NYSERDA's Project Updates

Adrienne Downey, Principal Engineer, Offshore Wind

CONTRACTS EXECUTED OCT. 2019

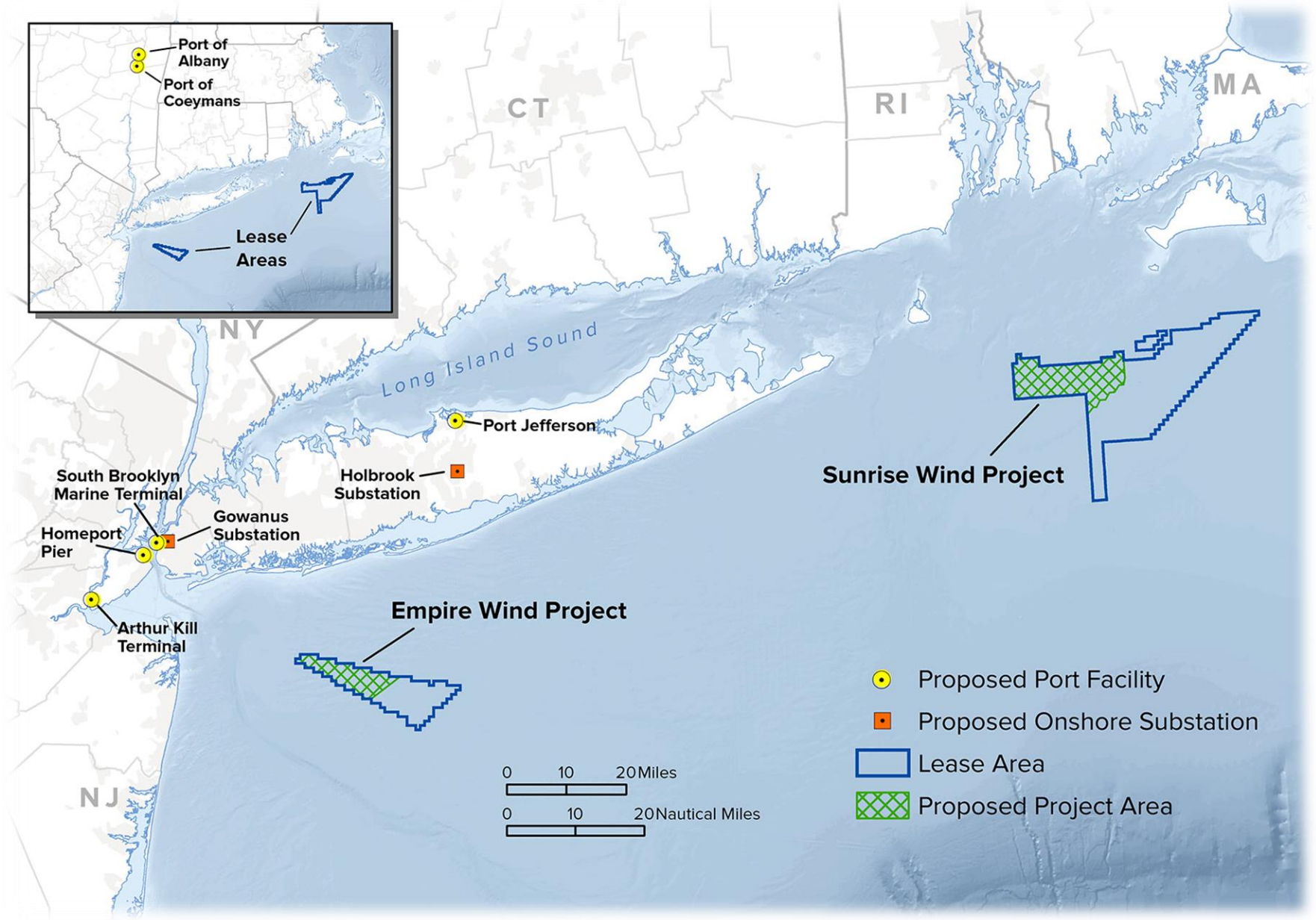
Total: 1,696 MW

Empire Wind

816 MW

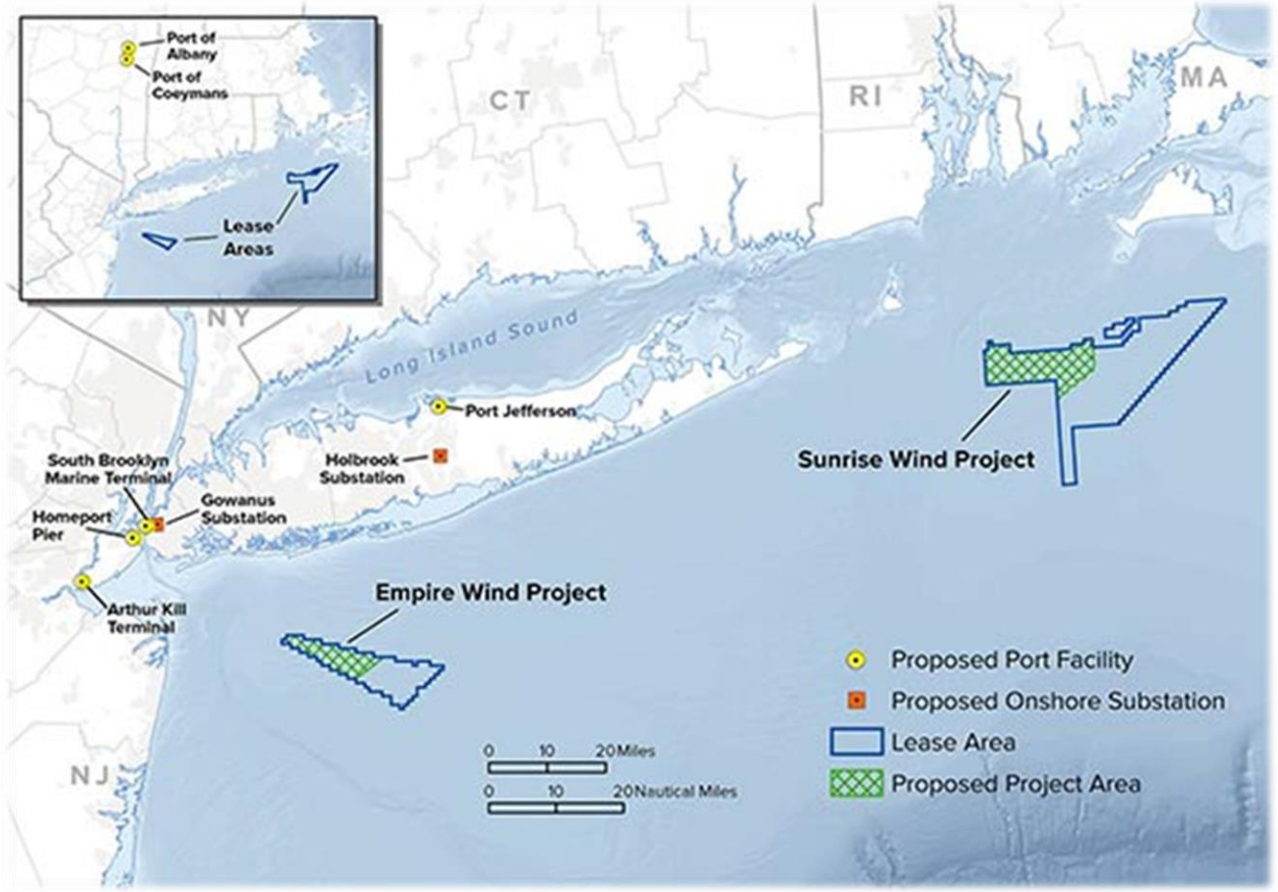
Sunrise Wind

880 MW



1,696MW by 2024: Sunrise Wind and Empire Wind

- Together, they will power more than 1 million New York homes
- Bring a combined economic impact of $3.2 billion to upstate, downstate, and Long Island
- Invest more than $85 million in long-term port facilities and cutting-edge technologies
- Support more than 1,600 jobs in project development, component manufacturing, installation, and operations and maintenance
- Directly offer well-paying careers with salaries of $100,000 per year
- Both projects are proceeding on-track



Research & Stakeholder Engagement

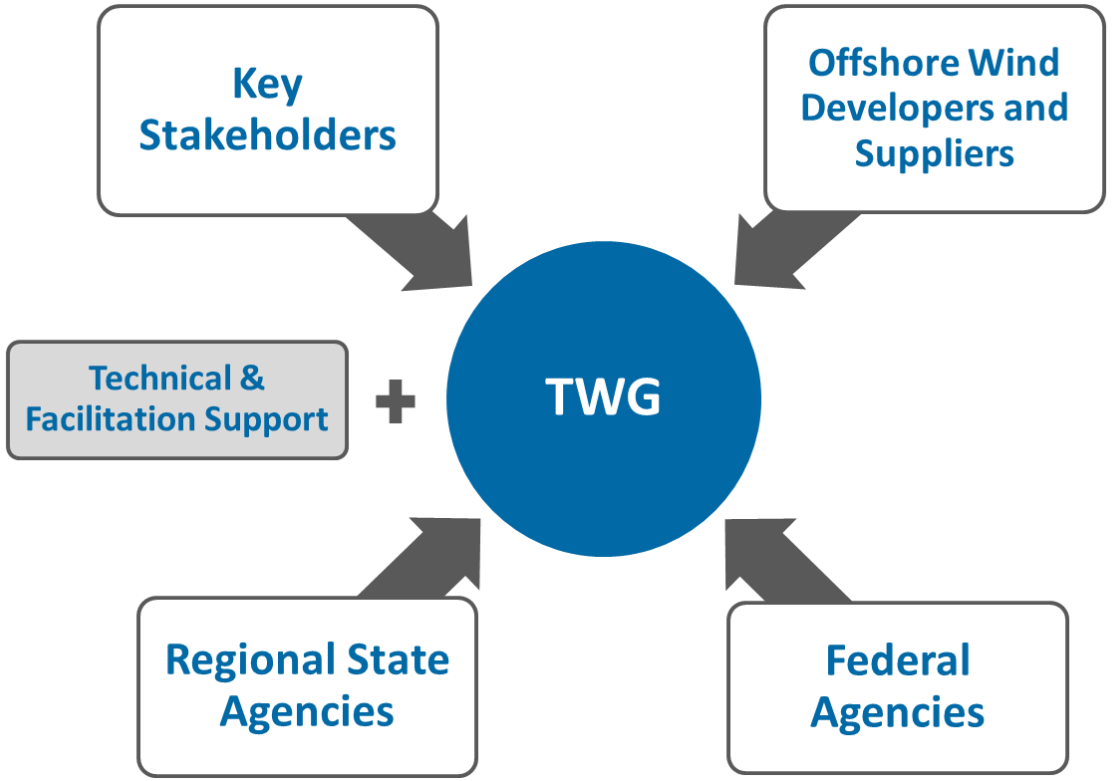
Greg Lampman
Program Manager, Environmental Research

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

OSW Technical Working Groups

Collaborative Engagement with Key Stakeholders

- Unique points of view and targeted interests
- Cross-borders and geographies
- Powerful representative voices
- Active problem-solving roles in NYS policy and program development



Environmental
Commercial Fishing
Maritime
Jobs and Supply Chain

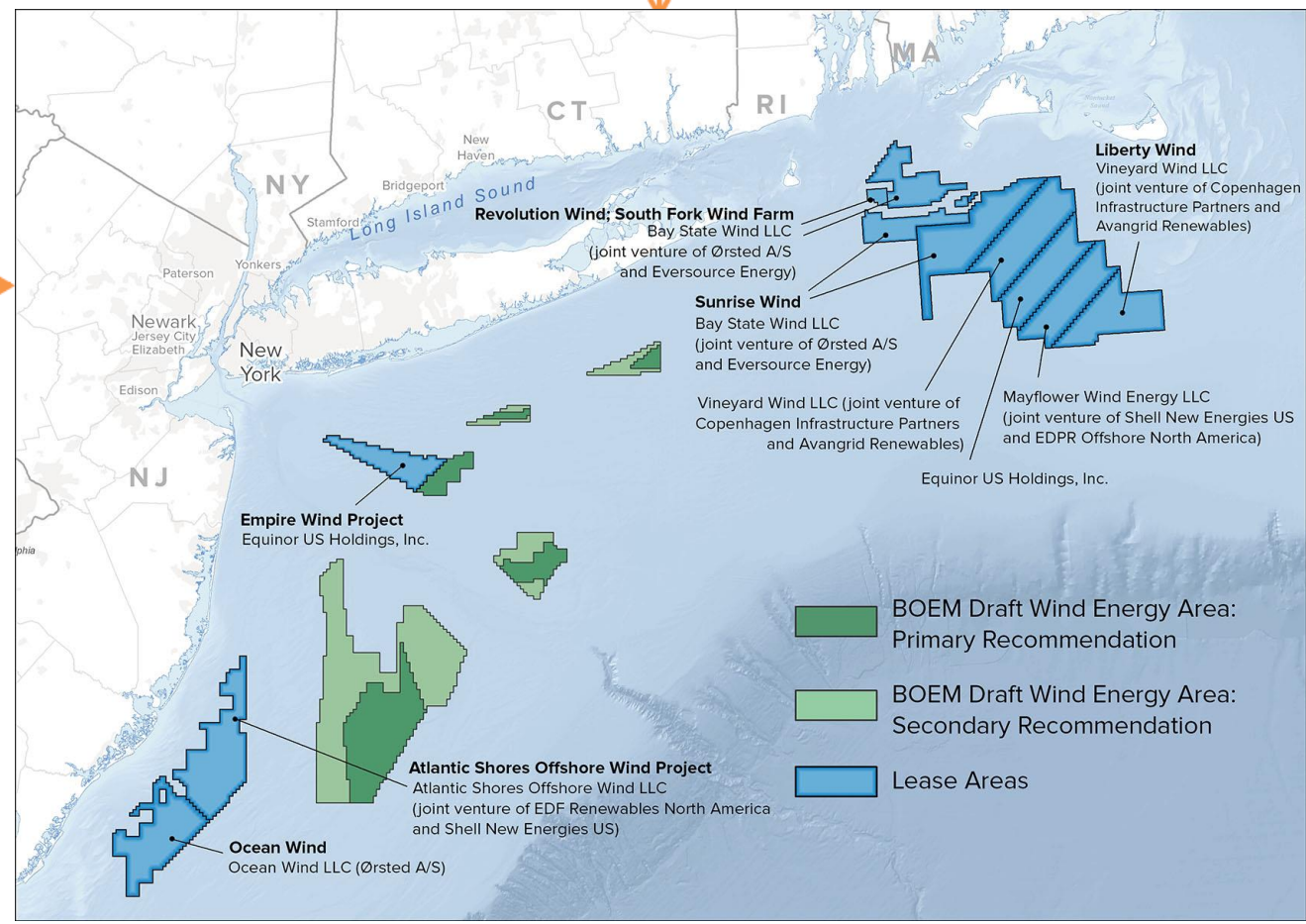
New York State

Ad Hoc Specialist Committees

Provide advice and recommendations to inform decision-making at multiple geographic scales

Broader stakeholder community

Provide expertise and develop guidance to inform projects and actions



Use outreach mechanisms to encourage two-way information flow

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

New York State

Ad Hoc Specialist Committees

Provide advice and recommendations to inform decision-making at multiple geographic scales

Broader stakeholder community

Fishing/Environmental Technical Working Groups

Offshore Wind Developers	Topical Experts	Regional State Agencies	Federal Agencies
advisory members		observers	

Provide expertise and develop guidance to inform projects and actions

Use outreach mechanisms to encourage two-way information flow

Discuss project-specific Fishing and Environmental Mitigation Plans

- **Selected Developer A**
- **Selected Developer B**
- **Selected Developer C**

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

E-TWG Updates

- E-TWG website: nyetwg.com
- Environmental Mitigation Plans
- Bird and Bat Scientific Research Framework
  - Stakeholder Workshop held March 2020
- Best Management Practices for birds, bats, and marine mammals
  - Specialist Committee products posted April 2020

2020 State of the Science Workshop on Offshore Wind and Wildlife

- Cumulative effects to populations and ecosystems
- ALL VIRTUAL MEETING
  - Registration will reopen this summer
- Plenary presentations November 16-20, 2020
- Working meetings to identify key research needs in late 2020/early 2021
- Final webinar in spring 2021
- To receive updates, sign up for our mailing list: nyetwg.com/2020-workshop

F-TWG Updates

- Updates on F-TWG Website: https://www.nyftwg.com/ Announcements, Meeting Summaries, Lease Mapper, BMP Tool, Topic Specific pages (Transit, Mitigation Plans)
- Continuation of the Transit Lane work for the Mid-Atlantic Bight
  - Held an initial transit lane workshop for the Mid-Atlantic in Spring of 2019, Second Survey Fall 2019
  - Final Report with recommendations and general guiding principles published early in 2020
- Continued coordination with other State efforts (e.g. development of ROSA)
- Developing a synthesis of knowledge around cables

F-TWG Updates

Morgan Brunbauer
NYS Offshore Wind Marine Fisheries Manager

Captain Anthony (Tony) DiLernia
NYS Offshore Wind Recreational Fisheries Liaison

NYS Fisheries Liaisons

Contact info at: https://www.nyftwg.com/

Mitigation Plans & Best Management Practices

NYSERDA-funded Research

5 Contracted Studies

- Wildlife Distribution Modeling in the New York Bight; Ecology and Environment
- Multi-Scale Relationships Between Marine Predators and Forage Fish; Biodiversity Research Institute
- Development of Monitoring Protocols for Nanotag Studies at Offshore Wind Farms; US Fish and Wildlife Service
- Strategies and Tools to Address Commercial Fishing Access in Offshore Wind Farms; National Renewable Energy Laboratory (NREL)
- Creation of a Fishermen's Data Trust for effective inclusion of fishermen's knowledge in OSW decision making; Responsible Offshore Development Alliance (RODA)

NYSERDA-funded Research

Predevelopment Updates

> Metocean Buoys have completed 1 full-year of data collection and deployment! Go to: oswbuoysny.resourcepanorama.dnvgl.com

> The Ocean Endeavor has started NYSERDA's geophysical surveys in the New York Bight! http://nyserdageosurvey.ene.com/

OSW Opportunities for Mariners Study Update

> NYSERDA is working on a new study, entitled "Offshore Wind Opportunities for Experienced Mariners" to link mariners with jobs in the OSW Industry

Regional Wildlife Science Entity Update

> Organizational Vision can be found: https://www.nyetwg.com/regional-wildlife-science-entity

> RFQL out summer 2020

Maritime & Jobs & Supply Chain

Maritime TWG

> Hosting two roundtables with maritime experts and the OSW industry in August

> Working toward publication of a report on the Maritime industry and offshore wind in the Fall 2020 to help inform future approach and dialogue between stakeholders and industry

Jobs and Supply Chain TWG

> Public/private port infrastructure and workforce development investments are rapidly advancing

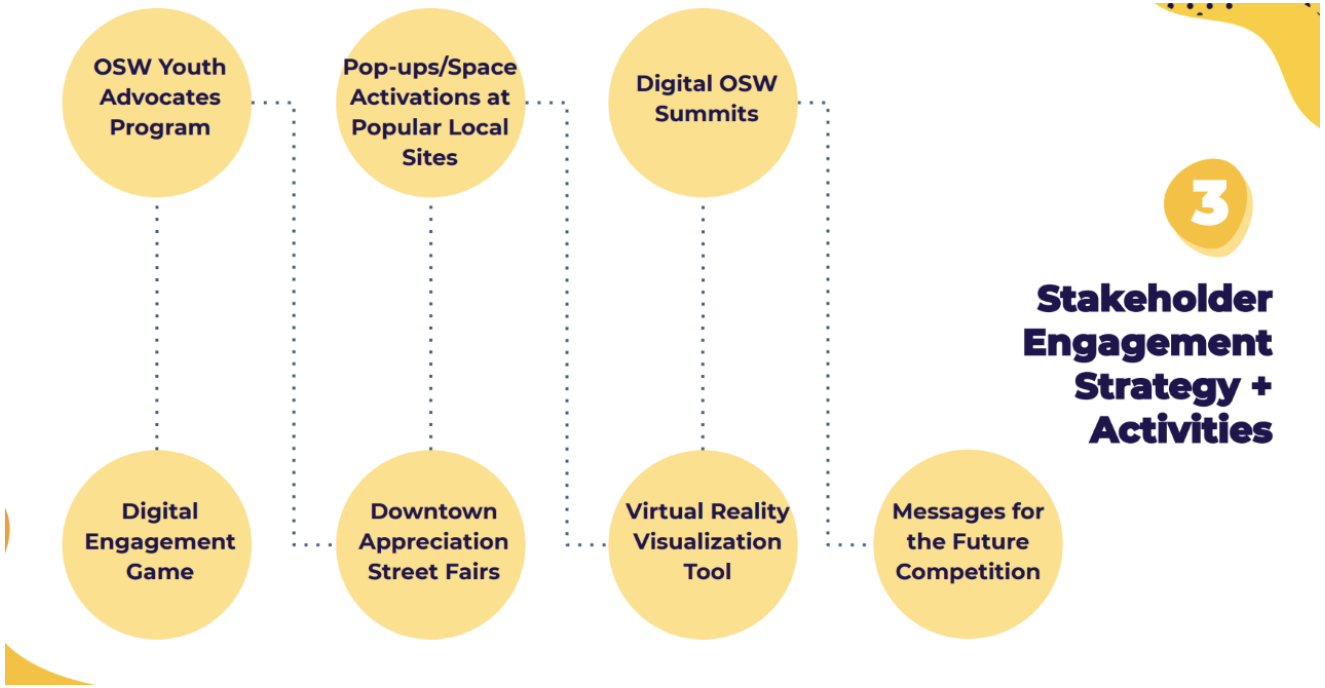
> Surveying members in Q3 2020 to support development of near- and long-term priorities

Stakeholder Engagement

>We are excited to announce a new stream of work with Karp Strategies to support creative stakeholder engagement activities

>The KStrat team will also be working with NYSERDA to support an Industry Report to:

- >amplify the importance of stakeholder engagement to New York's OSW program to the industry, and
- > support meaningful engagement from project inception through operations



KARP STRATEGIES
URBAN PLANNING ADVISORS

National Offshore Wind R&D Consortium

Haiyan Sun, Senior Project Manager

NATIONAL OFFSHORE WIND
RESEARCH & DEVELOPMENT CONSORTIUM

NEW YORK STATE OF OPPORTUNITY. NYSERDA

National OSW Research & Development Consortium (NOWRDC)

Goal:

Facilitate a nationally-focused, not-for-profit organization collaborating with industry on prioritized R&D activities to reduce levelized cost of energy (LCOE) of offshore wind in the U.S. and maximize other economic and social benefits

Desired Impacts:

- Innovations directly responsive to the technical and supply chain barriers faced by offshore wind project developers in the U.S.
- Build strong networks connecting technology innovators, investors, and industry
- Increase U.S. content and job opportunities

Consortium Funding:

$41 M ($20.5 DOE funds, matched by NYSERDA) – plus state (MA, VA, MD) and member contributions

National OSW Research & Development Consortium (NOWRDC)

Progress

- March 29, 2019: 1st round solicitation launched
- December 31, 2019: 59 proposals received
- To date: 20 awards announced
- Total funding: Over 17.3 million

Webinars & Events

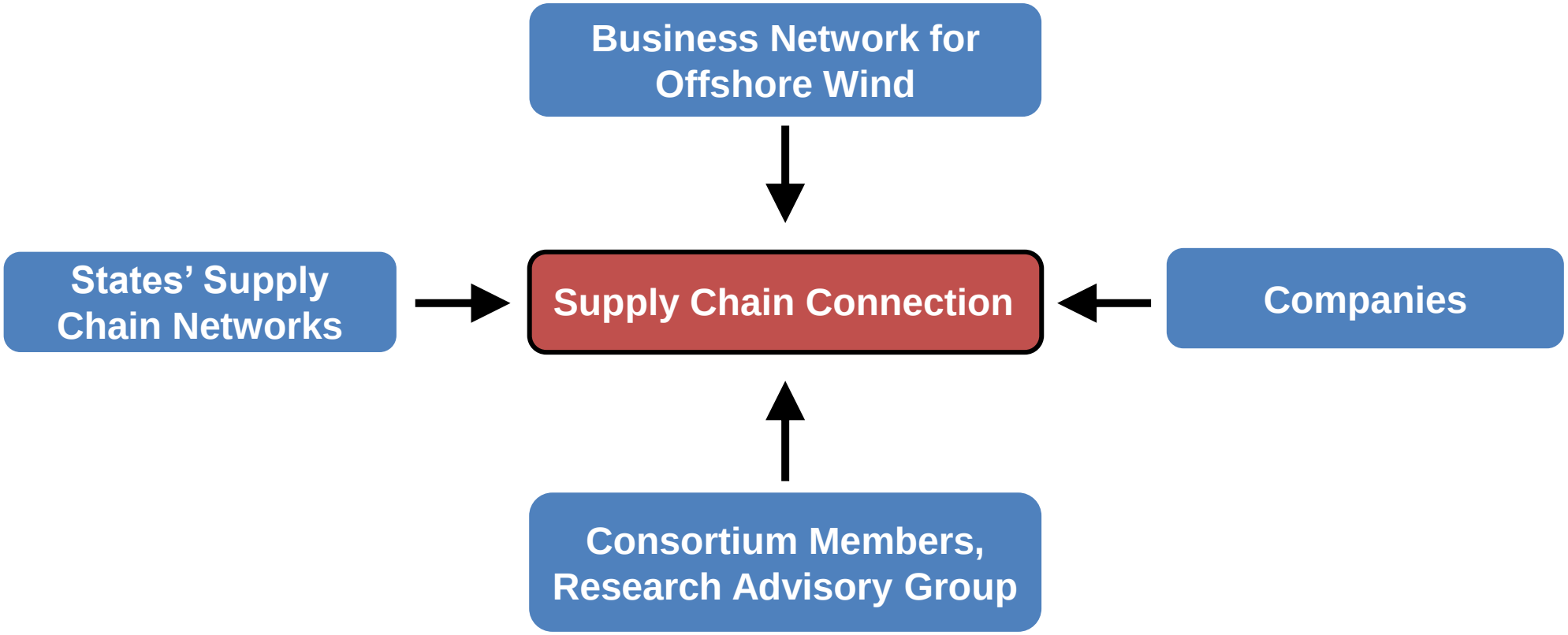
- Mar 23, 2020: Manufacturing, Services, and Supply Chain Advisory Group
- Mar 31, 2020: OSW Energy and Future Power Systems
- June 4, 2020: OSW Port Readiness - Supply Chain Solutions in the State of Virginia
- June 23, 2020: Oil & Gas Crossover
- July 14, 2020: Gulf of Mexico
- Nov 9, 2020: R&D Consortium's First Annual Technical Conference (Virtual)

R&D Awards To-Date: 20 Projects, Valued at $17 million

Pillar	Technical Challenge Area	Proposal Title	Lead Proposer
Pillar 1: OSW Plant Technology Advancement	1.1: Array Performance and Control Optimization	Computational Control Co-design Approach for Offshore Wind Farm Optimization	Stony Brook University
		Impact of Low-Level Jets on Atlantic Coast Offshore Wind Farm Performance	General Electric (GE)
		Reducing LCoE from Offshore Wind by Multiscale Wake Modeling	Cornell University
		Wind Farm Control and Layout Optimization for U.S. Offshore Wind Farms	NREL
	1.2: Cost-Reducing Turbine Support Structures for the U.S. Market	A Low-Cost Modular Concrete Support Structure and Heavy Left Vessel Alternative	RCAM Technologies
	1.3: Floating Structure Mooring Concepts for Shallow and Deep Waters	Demonstration of Shallow-Water Mooring Components for FOWTs (ShallowFloat)	Principle Power, Inc.
		Design and Certification of Taut-synthetic Moorings for Floating Wind Turbines	University of Maine
		Dual-Functional Tuned Inerter Damper for Enhanced Semi-Sub Offshore Wind Turbine	Virginia Tech
		Innovative Anchoring System for Floating Offshore Wind	Triton Systems, Inc.
		Innovative Deepwater Mooring Systems for Floating Wind Farms (DeepFarm)	Principle Power, Inc.
		Shared Mooring Systems for Deep-Water Floating Wind Farms	NREL
		Techno-Economic Mooring Configuration and Design for Floating Offshore Wind	UMass Amherst
	1.4: Power System Design and Innovation Challenge Statement	Development of Advanced Methods for Evaluating Grid Stability Impacts	NREL
Pillar 2: OSW Power Resource and Physical Site Characterization	2.1: Comprehensive Wind Resource Assessment	A Validated National Offshore Wind Resource Dataset with Uncertainty Quantification	NREL
	2.2: Development of a Metocean Reference Site	Development of a Metocean Reference Site near the MA & RI Wind Energy Areas	WHOI
Pillar 3: Installation, O&M and Supply Chain Solutions	3.2: Offshore Wind Digitization Through Advanced Analytics	Enabling Condition Based Maintenance for Offshore Wind	GE
		Physics Based Digital Twins for Optimal Asset Management	Tufts Univers
		Radar Based Wake Optimization of Offshore Wind Farms	GE
		Survival Modeling for Offshore Wind Prognostics	Tagup, In
	3.3: Technology Solutions to Accelerate U.S. Supply Chain	20GW by 2035: Supply Chain Roadmap for Offshore Wind in the US	NREL

Manufacturing, Services & Supply Chain Group Launched!

R&D Consortium and Business Network for OSW Collaboration



OSW R&D Solicitation Now Open!

New!
Solicitation launched
08/03/2020

NOWRDC Program Opportunity Notice (via NYSERDA PON 4476)
Round 1: 9/21/2020
Round 2: 10/5/2020
Round 3: 10/19/2020

$9 million

3 Technical Challenge Areas

Pillar 1: Plant Technology Advancement

Pillar 2: Power Resource and Physical Site Characterization

Pillar 3: Installation, O&M and Supply Chain Solutions

https://nationaloffshorewind.org/news

LIVE! Technical Challenge Areas for Second R&D Solicitation

Challenge Area	Round 1 9/21/2020 Enabling Large Scale Wind Turbines	Round 2 10/5/2020 Support Structure Innovation; Supply Chain Development	Round 3 10/19/2020 Electrical systems and Innovation; Mitigation of Use Conflicts
1	Enabling Fabrication and Installation of Future Foundations	Support Structure Solutions to Reduce Impact and Cost of Fixed and Floating Arrays (anchor and mooring designs)	Cable Innovation to Reduce Cable Failure, Electrical Losses and Costs
2	Port and Marine Systems Innovation to Support Onshore Logistics	U.S. Supply Chain Development Through Innovation	Innovation in Transmission Hardware Or Transmission Options to Reduce Interconnection Costs
3	Port Gaps Assessment and Strategies	Solutions to O&M Challenges	Innovation or Strategies to Mitigate Grid System Impacts
4	N/A	Safety System Innovation	Technology Solutions to Mitigate Use Conflicts

Questions?

www.nyserda.ny.gov/offshorewind
Offshorewind@nyserda.ny.gov