New Jersey: Strengths & Opportunities in Offshore Wind

Offshore Wind Supply Chain Study Summary

On behalf of NJ EDA ECONOMIC DEVELOPMENT AUTHORITY

October 2024

COVER LETTER

DELIVERING THE SUPPLY CHAIN TO REACH 11GW by 2040

Green Ducklings has been engaged to aid NJEDA in their vision to position New Jersey supply chain companies towards the offshore wind sector and establish a strong long-term foundation for local value creation.

Purpose

The State of New Jersey has ambitious targets of deploying 11,000 megawatts of offshore wind by 2040. This offshore wind target will secure the clean, renewable energy generation needed to meet the state's goal of 50% renewable energy by 2030 and 100% clean energy by 2050.

To better position the New Jersey supply chain for upcoming offshore wind opportunities and provide decision- and policy-makers with insights on necessary development potential, NJEDA has requested offshore wind consultancy Green Ducklings to perform an assessment of the current state of the New Jersey supply chain as of 2024 versus what is required to deliver long-term local jobs alongside the deployment of offshore wind projects.

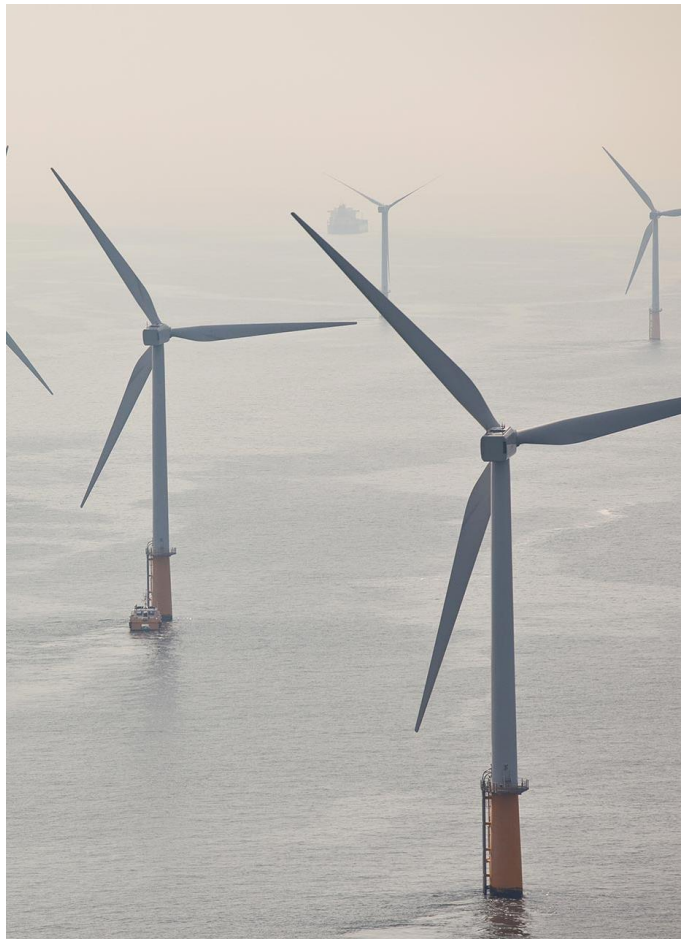
The supply chain assessment will provide NJEDA with a database of New Jersey companies with opportunities to deliver products and services for the offshore wind industry, as well as assess their capabilities in delivering to the industry.

Ultimately, the supply chain assessment aims to provide strategic recommendations on how the State of New Jersey can maximize local advantages, focus on key sectors, and position the local supply chain effectively.

Scope

To guide the supply chain assessment work and ensure the right outcomes of the study, the following scope was agreed upon:

- The study was performed by consolidating supplier lists provided by NJEDA, encompassing 2,100 individual suppliers.
- Suppliers were categorized based on Green Ducklings' supply chain categorization tree, with each supplier evaluated for their ability to successfully deliver to the offshore wind industry.
- The study highlighted exemplary suppliers within each category and included case studies of high-potential suppliers (excluded from the public version).
- The evaluation concluded with strategic recommendations on maximizing local value creation and aligning with state initiatives.



The study presents the New Jersey Supply Chain as of December 2024.

The New Jersey supply chain is benefiting from OSW development

With a strong manufacturing landscape, combined with an impressive service sector, the New Jersey supply chain stands to grow from increased offshore wind activities. However, the supply chain must adapt to the OSW-requirements.

1 Supply Chain Database

Supply Chain Assessment Methodology

6 supply chain databases, in different formats, integrated to create a single +2,100 New Jersey suppliers list, detailing company descriptions, size, NAICS, location, and capabilities.

The "Top 500" most relevant potential suppliers for offshore wind were identified, based on analysis of the companies' relevance for offshore wind Balance of Plant scope, size, services and products, etc.

2 Supply Chain Assessment

Strength of the local supply chain for each OSW category and subcategory was assessed, by categorizing the database (list of potential suppliers) into offshore wind supply chain categories and then evaluating each category.

The assessment highlights **NJ's strengths in material supply, foundations manufacturing, engineering, logistics, and permitting support. Significant potential in secondary steel**. Realizing this potential requires targeted improvements.

3 5 High Potential Suppliers

Five high-potential suppliers were identified, focusing on secondary steel, handling equipment, maritime operations. Other top candidates include opportunities in civil construction, surface treatment, and consultancy services.

Opportunities exist across the supply chain, particularly with high-potential suppliers, but knowledge-sharing and public support schemes are essential to support the local companies in gaining OSW traction.

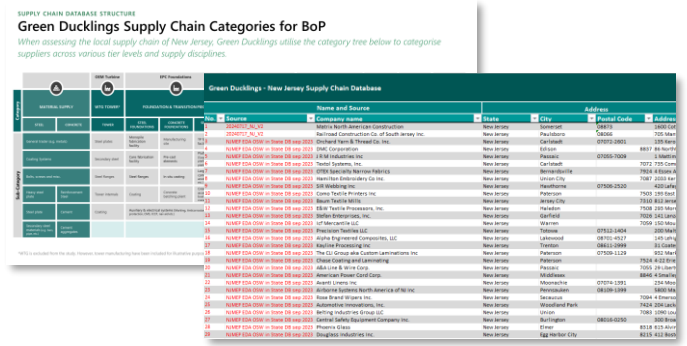
APPROACH

Green Ducklings approach to Supply Chain Assessment

Green Ducklings supply chain category tree for Offshore Wind Balance of Plant (BoP) components was leveraged to consolidate, categorize and assess NJ supplier databases.

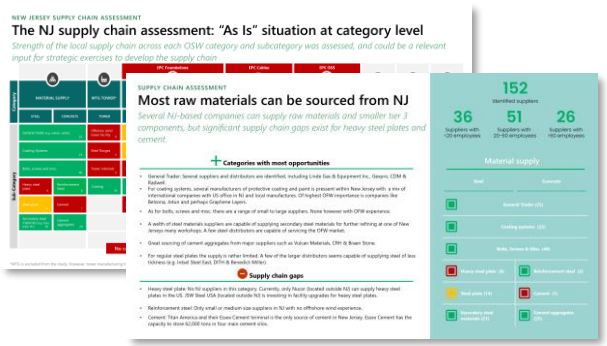
Key deliverables

1 Supply Chain Database



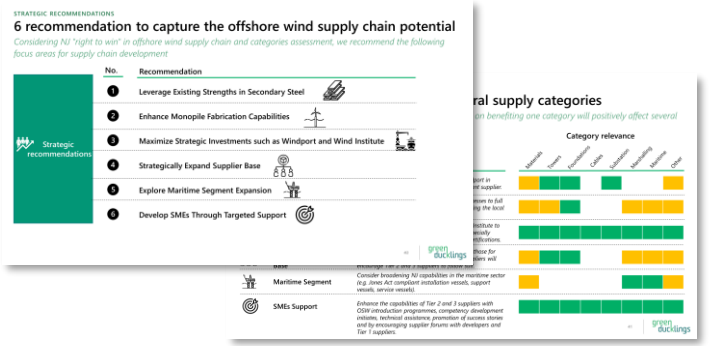
- Green Ducklings has established a supply chain database of New Jersey companies, presented in a consolidated Excel overview.
- The database has been built, using Green Ducklings balance of plant methodology and categorization tree.
- Green Ducklings matched industry NAICS codes to BoP categories to create a long list and rough segmentation before performing an individual assessment of the supply chain companies.

2 3 Supply Chain Assessment & High Potential Suppliers



- Using the information from the supply chain database, Green Ducklings assessed suppliers from New Jersey on their offshore wind fit.
- An assessment of each category/subcategory was visualized using a red-amber-green color coding.
- The local supply chain landscape was described and suppliers with the highest potential to satisfy offshore wind was highlighted

4 Strategic Recommendations



- The report includes strategic recommendations on how to benefit from local advantages, key focus sectors, and strategic suggestions on how to position the local supply chain landscape.

APPROACH HIGHLIGHT: CATEGORY TREE 1

GDs BoP category tree used to structure the industry assessment

By use of Green Ducklings category tree, it is possible to further investigate main supply of each Balance of Plant elements. The category tree investigates both EPC contractors as well as tier 1 and 2 component suppliers.

BoP* Supply Chain Category Tree

Category	MATERIAL SUPPLY		WTG TOWER*	EPC Foundations: FOUNDATION & TRANSITION PIECES			EPC Cables: CABLES		EPC OSS: SUBSTATION	STORAGE & MARSHAL SITE	MARITIME OPERATIONS	OTHER
Sub-Category	STEEL	CONCRETE	TOWER	STEEL FOUNDATIONS	CONCRETE FOUNDATIONS	SECONDARY STEEL	INTER-ARRAY CABLES FABRICATION	EXPORT CABLES FABRICATION	HVAC & HVDC			
	General trader (e.g. metals, cables)		Offshore wind tower facility	Monopile fabrication facility	Manufacturing site	TP fabrication facility	Inter-array	Export cable	Civil Works Onshore Substation	Heavy lift cranes	Wind turbine installation vessel	Consultancies (Studies, Permitting, Engineering etc.)
	Coating Systems		Steel flanges	Cans fabrication facility	Pre-cast elements	Platforms (Suspended internal platform & External platform)	Cable Protection System		Offshore Substation Foundation	Handling equipment	Foundation installation vessel	Other Service Providers
	Bolts, screws and misc.		Tower internals	Steel flanges	In situ casting	Large welded steel components (e.g. anode bracelet, J-tube etc.)	Landfall and Onshore Grid		Offshore Topside Structure	Other	Cable installation vessel	Other Solution Providers
	Heavy steel plate	Reinforcement Steel	Coating	Coating	Concrete batching plant	Crew / Materials access systems (e.g. boat landings, davit cranes etc.)			Electrical & Control Systems		OSS Installation vessel	
	Steel plate	Cement		Auxiliary & Electrical Systems (Marking, Anticorrosion, lighting, fire protection, CMS, ICCP, nav aid etc.)					Auxiliary Systems		Support vessels (Barges etc.)	
	Secondary steel materials (e.g. bars, pipe, etc.)	Cement aggregates									Heavy Transport Vessels	
											Other	

Development of Category Tree

- The category tree leans on the bottom fixed offshore wind value chain. It first identifies local sourcing of raw materials and semi-finished products sold through distributors and general traders.
- It then considers the manufacturing of each BoP element, from foundation to cables and substation.
- To illustrate potential synergies to the WTG segment, the assessment further showcases the processes in manufacturing the WTG towers.
- The assessment then considers component storage and installation e.g., marine activities.
- To further provide insights on the value chain a category has been added describing suppliers of services and other solutions.

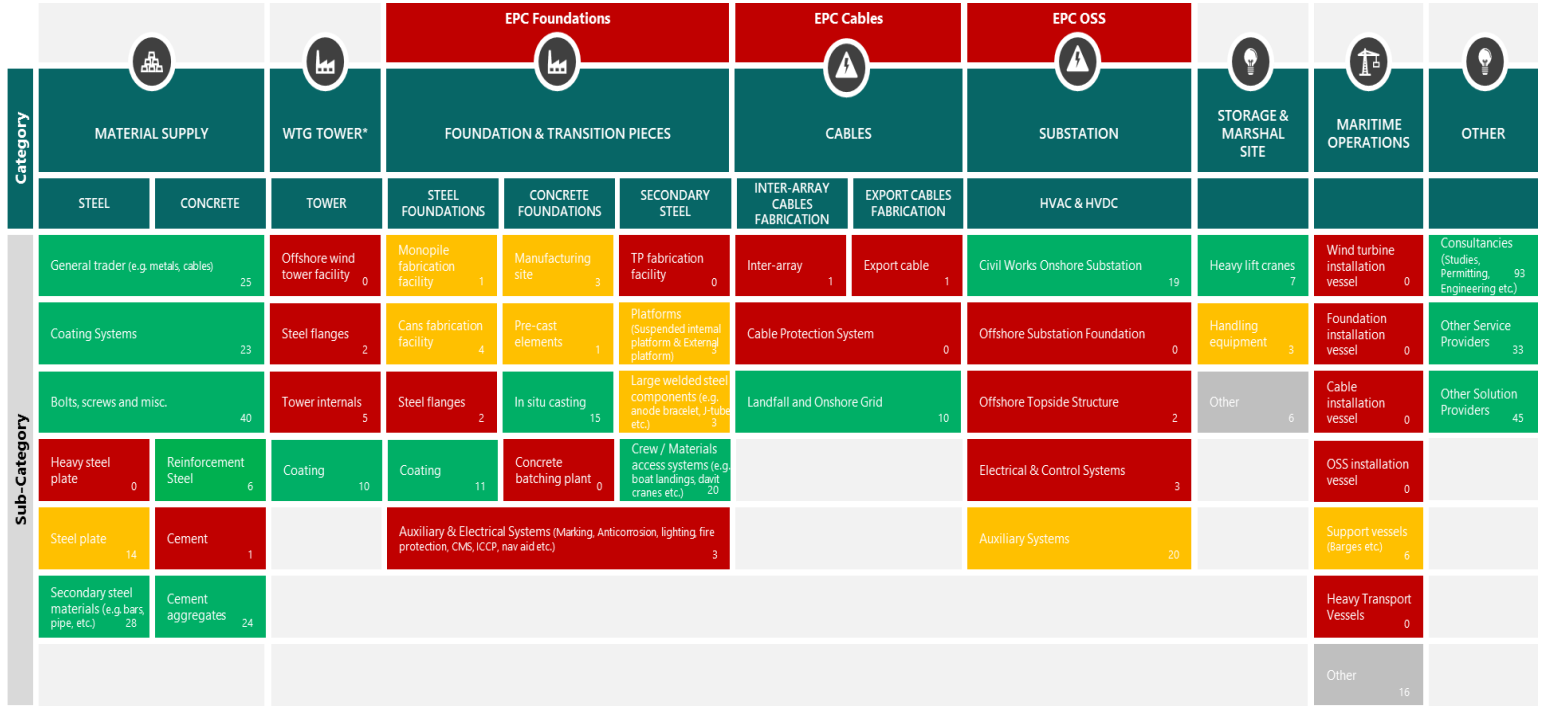
*As agreed in the scope, the assessment is focused on Balance of Plant components and excludes WTG, but as an addition it includes Towers manufacturing

APPROACH HIGHLIGHT: ASSESSMENT AT CATEGORY TREE LEVEL 2

Using the supply chain database, a qualitative assessment is performed

Based on the identified suppliers in the database, Green Ducklings performed a qualitative assessment of the local supply capabilities within each subcategory. The assessment is visually presented using RAG-color coding.

BoP Supply Chain Category Tree



Red-Amber-Green Assessment

- The RAG (Red-Amber-Green) assessment is a qualitative evaluation that indicates the local New Jersey supply chain's capabilities at category level
- **Green** segments indicate that there are sufficient, strong suppliers ready to supply the offshore wind industry.
- **Amber** segments indicate that there are some identified suppliers in the category considered capable of supplying the offshore wind industry, but the supply capacity is limited.
- **Red** segments suggest that there are no capable suppliers identified within the category, or that the identified suppliers are not capable of satisfying the requirements of the offshore wind industry.

SUPPLY CHAIN DATABASE: STATISTICS

2100+ companies have been considered as potential suppliers

By combining the 6 databases, a total of 2100+ New Jersey located companies have been assessed and more than 450 registered as potential New Jersey-based balance of plant suppliers

2183

Total companies in database

463

Companies considered OFW BoP relevant

92%

of registrered companies have associated e-mail contact info

1620

Companies with data on number of employees

399

Companies with >60 employees

639

Companies with 20-60 employees

582

Companies with <20 employees

Green Ducklings - New Jersey Supply Chain Database

	Name and Source		Address		
No.	Source	Company Name	State	City	Postal Code
1	20240717_NJ_V2	Riggs Distler & Company, Inc.	New Jersey	Cherry Hill	08003
2	20240717_NJ_V2	Matrix North American Construction / Matrix Service Company	New Jersey	Somerset	08873
3	20240717_NJ_V2	Railroad Construction Co. of South Jersey Inc.	New Jersey	Paulsboro	08066
4	NJMEP EDA OSW in State DB sep 2023	Orchard Yarn & Thread Co. Inc.	New Jersey	Carlstadt	07072-2601
5	NJMEP EDA OSW in State DB sep 2023	DMC Corporation	New Jersey	Edison	8
6	NJMEP EDA OSW in State DB sep 2023	J R M Industries Inc	New Jersey	Passaic	07055-7009
7	NJMEP EDA OSW in State DB sep 2023	Textol Systems, Inc.	New Jersey	Carlstadt	7
8	NJMEP EDA OSW in State DB sep 2023	OTEX Specialty Narrow Fabrics	New Jersey	Bernardsville	7
9	NJMEP EDA OSW in State DB sep 2023	Hamilton Embroidery Co Inc.	New Jersey	Union	7
10	NJMEP EDA OSW in State DB sep 2023	SIR Webbing Inc	New Jersey	Hawthorne	07506-2520
11	NJMEP EDA OSW in State DB sep 2023	Como Textile Printers Inc	New Jersey	Paterson	7
12	NJMEP EDA OSW in State DB sep 2023	Baum Textile Mills	New Jersey	Jersey City	7
13	NJMEP EDA OSW in State DB sep 2023	E&W Textile Processors, Inc.	New Jersey	Haledon	7
14	NJMEP EDA OSW in State DB sep 2023	Stefan Enterprises, Inc.	New Jersey	Garfield	7
15	NJMEP EDA OSW in State DB sep 2023	Icf Mercantile LLC	New Jersey	Warren	7
16	NJMEP EDA OSW in State DB sep 2023	Precision Textiles LLC	New Jersey	Totowa	07512-1404
17	NJMEP EDA OSW in State DB sep 2023	Alpha Engineered Composites, LLC	New Jersey	Lakewood	08701-4527
18	NJMEP EDA OSW in State DB sep 2023	Kayline Processing Inc	New Jersey	Trenton	08611-2999
19	NJMEP EDA OSW in State DB sep 2023	The CLI Group aka Custom Laminations Inc	New Jersey	Paterson	07509-1129
20	NJMEP EDA OSW in State DB sep 2023	Chase Coating and Laminating	New Jersey	Paterson	7
21	NJMEP EDA OSW in State DB sep 2023	A&A Line & Wire Corp.	New Jersey	Passaic	7
22	NJMEP EDA OSW in State DB sep 2023	American Power Cord Corp.	New Jersey	Middlesex	8
23	NJMEP EDA OSW in State DB sep 2023	Avanti Linens Inc	New Jersey	Moonachie	07074-1391
24	NJMEP EDA OSW in State DB sep 2023	Airborne Systems North America of NJ Inc	New Jersey	Pennsauken	08109-1399
25	NJMEP EDA OSW in State DB sep 2023	Rose Brand Wipers Inc.	New Jersey	Secaucus	7
26	NJMEP EDA OSW in State DB sep 2023	Automotive Innovations, Inc.	New Jersey	Woodland Park	7
27	NJMEP EDA OSW in State DB sep 2023	Belting Industries Group LLC	New Jersey	Union	7
28	NJMEP EDA OSW in State DB sep 2023	Central Safety Equipment Company Inc.	New Jersey	Burlington	08016-0250
29	NJMEP EDA OSW in State DB sep 2023	Phoenix Glass	New Jersey	Elmer	8
30	NJMEP EDA OSW in State DB sep 2023	Douglass Industries Inc.	New Jersey	Egg Harbor City	8
31	NJMEP EDA OSW in State DB sep 2023	Cox Stationers and Printers Inc	New Jersey	Linden	7
32	NJMEP EDA OSW in State DB sep 2023	Metro Flag Inc	New Jersey	Wharton	7
33	EP EDA OSW in State DB sep 2023	STAR EMBROIDERY CORP	New Jersey	Newark	7
34	EP EDA OSW in State DB sep 2023	American Fur Felt LLC	New Jersey	Newark	7

Legends & Filters | New Jersey Database | Procedure | NAICS Code Map | PIVOT Table Categories | +

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“Top 500” potential OSW suppliers identified by further analysis

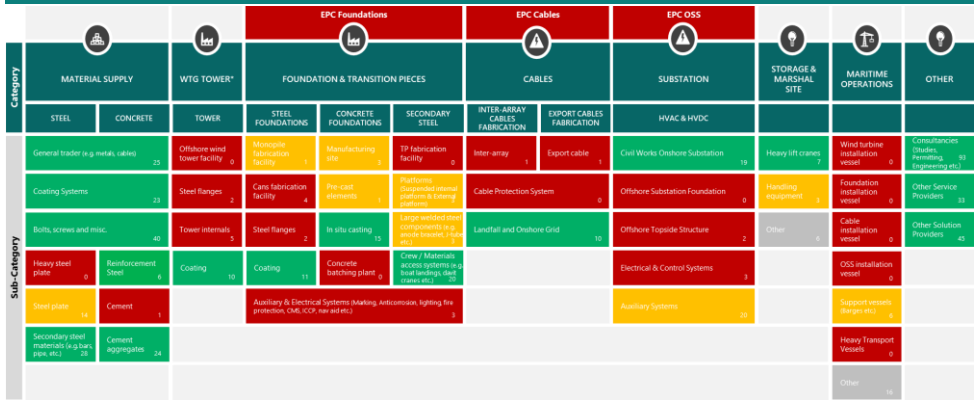
When assessing the list of suppliers in the integrated database, factors like the number of employees, facility size, and capabilities were considered. This approach aimed to provide a more OSW relevant analysis and categorization.

Integrated New Jersey Supplier Database

Analysis and categorization

- The database includes a column “Categories NJEDA”. Here companies self-indicate their potential OSW capabilities. However, several companies lack OSW experience and may not fully understand the requirements of OSW BoP scopes.
- When Green Ducklings analyzed the Integrated New Jersey Supplier Database, additional factors were considered to categorize the potential suppliers:
  - **Number of Employees:** Assessing if there are enough workers to meet the person-hours required for offshore wind projects.
  - **Capabilities:** Determining if companies possess the necessary technical skills, equipment, and knowledge for offshore wind specialized work.
  - **Facility Size:** Evaluating whether companies have sufficiently large fabrication sites and facilities for serial manufacturing of larger components.
  - **Current sector focus**: Identification of whether the companies were involved in sectors with potential knowledge spill-over to OSW
  - **Project track-record**: Assessment of the companies past project deliveries to identify whether past work was alike tasks from the OSW industry.

Supply Chain Category Tree Assessment



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SUPPLY CHAIN DATABASE: STATISTICS

“Top 500” supply chain spread across NJ

While the supply chain is spread across New Jersey, there are areas of intensified supply chain concentration.

Supply Chain Concentration			
Marker	**# of suppliers per city**	**# of Cities**	**City examples**
	+12	**1**	**Newark**
	9-12	**3**	**Edison, South Plainfield & Trenton**
	5-8	**13**	**Cherry Hill, Camden, Fairfield, Elizabeth, Linden, Mount Laurel, Somerset, Cape May, Fair Lawn, Paterson, Red Bank, Sayreville & Somerville**
	1-4	**214**	**Bridgewater, Hoboken, Kearny, Parsippany, Phillipsburg, Princeton, Rahway, Vineland, West Berlin, Woodbridge, Salem**

75

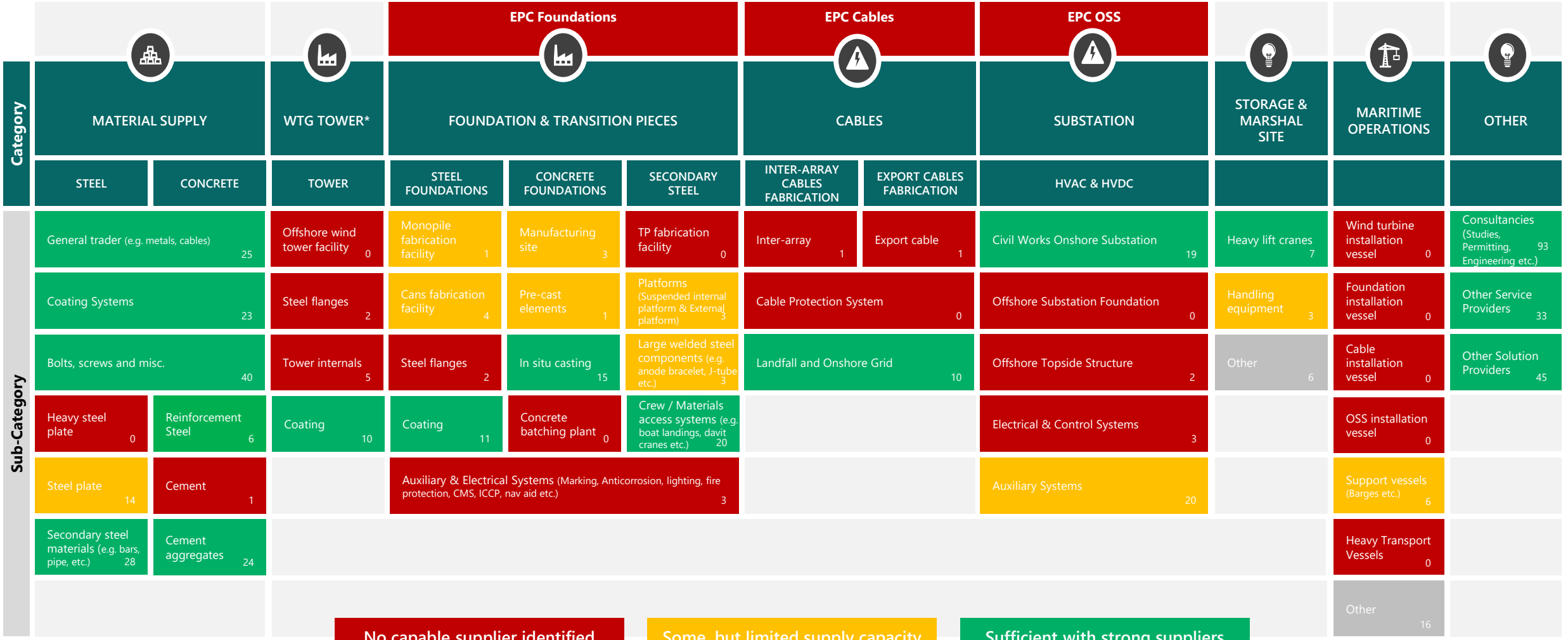
Suppliers in top 7 cities

20%

of relevant suppliers are located in just 10 cities

The NJ supply chain assessment: "As is" situation at category level

Strength of the local supply chain across each OSW category and subcategory was assessed and demonstrates areas of opportunity for further supply chain growth as of 2024.



*WTG is excluded from the study. However, tower manufacturing have been included as an addition to initial scope.

SUPPLY CHAIN ASSESSMENT

Most raw materials can be sourced from NJ

Several NJ-based companies can supply raw materials and smaller tier 3 components, but significant supply chain gaps exist for heavy steel plates and cement.

+ Categories with most opportunities

- General Trader: Several suppliers and distributors are identified, including Linde Gas & Equipment Inc., Gexpro, CDM & Radwell.
- Coating Systems: Several manufacturers of protective coatings and paint are present in New Jersey, with a mix of international companies with U.S. offices in NJ and local manufacturers. Of highest importance for OSW are companies like Belzona, Jotun, and perhaps Graphene Layers.
- Bolts, Screws, and Miscellaneous: There is a range of small to large suppliers. However, none were identified with OSW experience.
- Steel Materials: A wealth of steel materials suppliers are capable of supplying secondary steel materials for further refining at one of New Jersey's many workshops. A few steel distributors are further capable of servicing the OSW market.
- Cement Aggregates: Great sourcing of cement aggregates from major suppliers such as Vulcan Materials, CRH & Braen Stone.
- Regular Steel Plates: The supply is rather limited. A few of the larger distributors seem capable of supplying steel of lesser thickness (e.g., Intsel Steel East, DITH & Benedict-Miller).

− Supply chain gaps

- Heavy Steel Plate: Currently, no NJ suppliers in this category. As of now, only Nucor (located outside NJ) can supply heavy steel plates in the U.S. JSW Steel USA (located outside NJ) is investing in facility upgrades for heavy steel plates.
- Reinforcement Steel: Currently, only small or medium-sized suppliers in NJ with no offshore wind experience.
- Cement: Titan America and their Essex Cement terminal is the only source of cement in New Jersey. Essex Cement has the capacity to store 62,000 tons in four main cement silos.

*The number of unique suppliers in the category. The reason it does not correspond with the numbers of suppliers in each subcategory, is because the same supplier can be associated with more than one subcategory.

153*
Identified suppliers

39
Suppliers with <20 employees

44
Suppliers with 20-60 employees

25
Suppliers with >60 employees

Material supply

Steel	Concrete
General Trader (25)	
Coating systems (23)	
Bolts, Screws & Misc. (40)	
Heavy steel plate (0)	Reinforcement steel (6)
Steel plate (14)	Cement (1)
Secondary steel materials (28)	Cement aggregates (24)

SUPPLY CHAIN ASSESSMENT

Currently, local supply chain challenged with towers

A few New Jersey suppliers offer expertise in steel and aluminum plate work, as well as surface treatments. Although none have direct OSW industry experience, a promising commitment has been secured from two projects for local NJ tower manufacturing, signaling strong industry potential.

+ Categories with most opportunities

- Several companies were identified as capable of supplying industrial paint and coating services, including U.S. Tank Painting, MISTRAS, Champion Specialty Services, and Banks Industrial Group. These highlighted suppliers have experience working with large steel structures, primarily water and fuel tanks, as well as bridges. However, their coating activities have mainly been performed outdoors, and they have limited access to covered painting facilities.
- 2 projects (NJ3 solicitation) have commited to buy from a tower manufacturer in NJ.

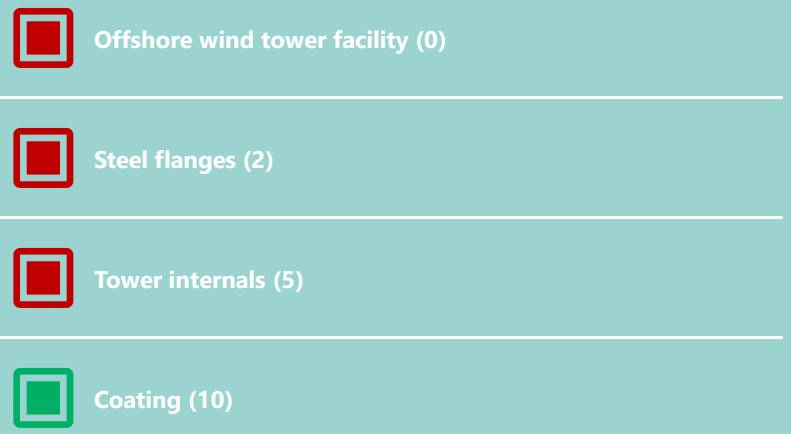
− Supply chain gaps

- Tower Internals: Tower internals cover several parts manufactured in aluminum or steel plates, such as lugs, platforms, plugs, fasteners, ladders, brackets, etc., as well as electric internals (light kits, cables, etc.). While several steel workshops could supply parts of the internals, none were identified as direct matches for the segment. A potential candidate identified to pursue tower internals could be the New Jersey company Unalext.
- Offshore Wind Tower Manufacturing: No local offshore wind tower manufacturing facility currently exists in New Jersey. The process requires cutting and rolling large steel plates, welded together to form tower modules. Towers for a 15 MW turbine have a base diameter of about 10 meters with a top diameter of about 6 meters.
- Steel Flanges: No companies in New Jersey have the capabilities to mill steel flanges for tower bases, monopiles, or transition pieces (TPs). These flanges need to be up to 12 meters in diameter and require significant manufacturing space and steelwork capabilities.

19
Identified suppliers

4	**4**	**9**
Suppliers with <20 employees	Suppliers with 20-60 employees	Suppliers with >60 employees

WTG Towers



SUPPLY CHAIN ASSESSMENT

Best opportunities are in secondary steel and transition pieces

While most of the local steel-working suppliers and manufacturers are too small for the OSW segment, there are great opportunities for developing the industry.

+ Categories with most opportunities

- The foundations and transition piece supply chain in New Jersey is developing. While EEW, Riggs Distler, and Selco Manufacturing have offshore wind experience, many other potential suppliers currently lack offshore wind experience.
- EEW is the only supplier equipped for full monopile delivery. Their Port of Paulsboro plant will manage all processes, from the fabrication of cans to surface treatment. They will procure heavy steel plates and flanges, but all remaining processes will be conducted in-house. Until full ramp-up, the monopile fabrication category is marked in amber, and then will turn into green. Same / similar facility could produce transition pieces (cans) with secondary steel and electrical outfitting in the same location or at another site
- For concrete foundations, some port sites are identified, but further study is needed on available land near the waterside. The strong NJ construction sector offers potential, though pre-cast options are currently limited.
- Secondary steel manufacturing for OSW in NJ is limited, particularly for complex components requiring the bending of tubular steel. Most suppliers are too small and lack a proper understanding of OSW standards and regulations. However, smaller workshops may develop capabilities for Tier 3 items like stairs, kickplates, and railings.

− Supply chain gaps

- Most NJ steel-working companies are small, with under 60 employees and limited manufacturing capacity, many of which are not relevant to OSW BoP.
- Significant gaps exist in the current supply chain, particularly for cans, steel flanges, transition piece fabrication and secondary steel. Despite the gaps, there are still significant opportunites requiring that the value chain needs to be strengthend to secure local manufacturing jobs.

67
Identified suppliers

12
Suppliers with <20 employees

21
Suppliers with 20-60 employees

25
Suppliers with >60 employees

Foundation & Transition Pieces

EPC Foundations

Steel foundations	Concrete foundations	Secondary steel
Monopile fabrication facility (1)	Manufacturing site (3)	TP fabrication facility (0)
Cans fabrication facility (4)	Pre-cast elements (1)	Platforms (3)
Steel flanges (2)	In situ casting (15)	Large welded steel components (3)
Coating (11)	Concrete batching plant (0)	Crew / Materials access systems (20)
Auxiliary & electrical systems (3)		

SUPPLY CHAIN ASSESSMENT

Limited supply chain for cables and cables' accessories

While the supply of the cables is limited, there is a strong group of companies with capabilities within landfall and onshore grid.

+ Categories with most opportunities

- Creamer-Jingoli joint venture has been selected by Atlantic Shores Offshore Wind to engineer and design the full onshore underground cable route for Atlantic Shores Project 1. The early works contract scope includes detailed design for the 12 miles of underground infrastructure running from the project's landfall in Atlantic City to the point of interconnection in Egg Harbor Township, Atlantic County. Southwire, a US company with a facility in NJ, has been identified in Landfall and Onshore Grid.
- Southwire was responsible for designing, manufacturing, and installing onshore cables for Vineyard Wind 1.
- Ultimately, quite a strong supply chain has been identified for onshore cables and landfall services.

− Supply chain gaps

- LS Cable America is the only identified supplier for inter-array and export cable within New Jersey, but presence is limited to an office (not manufacturing). As a subsidiary of South Korea's LS Cable and System, they are well-established in the offshore wind industry but do not have manufacturing facilities in the U.S. LS Cable and System recently announced plans to develop a production facility in Virginia, with construction set to begin in 2025.
- European suppliers of inter-array and export cables: Nexans has an operating US facility (in Charleston, South Carolina), Hellenic Cables announced FID for a factory in Maryland and Prysmian has a proposal for cable factory in Massachusetts. Other major suppliers, such as NKT, JDR, Taihan do not currently have US fabrication.
- As of now, no suppliers have been identified for cable protection.

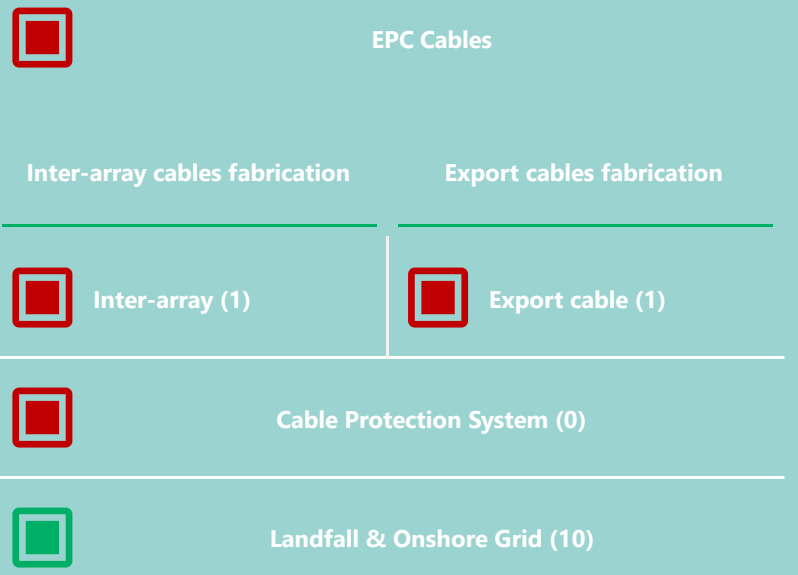
11
Identified suppliers

2
Suppliers with <20 employees

1
Suppliers with 20-60 employees

7
Suppliers with >60 employees

Cables



SUPPLY CHAIN ASSESSMENT

Narrow local supply of offshore substation elements

Although New Jersey has ample contractors for the onshore work, the supply chain for critical offshore substation components is limited.

+ Categories with most opportunities

- New Jersey has several civil contractors with experience in the construction of power plants. From large contractors such as JINGOLI, Conti Civil, Ferreira, Matrix Service Company, and Kiewit to smaller specialized contractors. While a few are capable of taking on a full EPC scope for an onshore substation, several of the smaller contractors could take on smaller deliveries.
- Kiewit, which is present in New Jersey through several subsidiaries (e.g., Kiewit Infrastructure, Mass Electric Construction, Kiewit Power Delivery, Weeks Marine, and North American Aggregates), has a track record with the EPC scope of a substation. Their fabrication yard in Texas built the South Fork Substation. Currently, no fabrication yards of significant size have been identified in New Jersey, thus, it is unlikely that the state will be producing offshore substation structures as of now.
- A few companies are capable of supplying smaller Tier 3 deliveries for the substation in the Electrical and Control Systems category e.g., Pepco Sheetmetal, which can supply enclosures and cabinets.
- Several local sourcing opportunities are identified for a range of substation-relevant auxiliary systems such as LED industrial lighting, cable assemblies and cable ways, HVAC, and fire alarm systems. Although none of the local suppliers have proven track records within the OSW industry, this subcategory show potential NJ local supply.

− Supply chain gaps

- Beyond civil contractors, several Tier 3 suppliers of electric and control systems were identified in New Jersey. However, upon further investigation, most of these were assessed to be of no relevance for the BoP scope, as they were either supplying components too small for the industry, or engaged with distribution rather than transmission electronics, e.g., ABB (as they sold their OSS business to Hitachi and as their NJ facility is focusing on distribution), TDK Lambda, and Synergy Microwave Corp.
- Currently, the state of New Jersey lacks local sourcing opportunities for the foundation and topside steel work. There are no local yards with the size and capabilities to manufacture either the foundation or the topside structure.
- Although there are currently no yards capable of delivering the full structures, the New Jersey Helideck Offshore are capable of supplying the helidecks. Their engineering takes place within New Jersey, while their manufacturing is located in South Carolina. Larger steel works specialists like Selsco Manufacturing could also take a minor role in the topside manufacturing.

41
Identified suppliers

8
Suppliers with <20 employees

9
Suppliers with 20-60 employees

16
Suppliers with >60 employees

Substation

HVAC & HVDC

- **Civil Works Onshore Substation (19)**
- **Offshore Substation Foundation (0)**
- **Offshore Topside Structure (2)**
- **Electrical & Control Systems (3)**
- **Auxiliary Systems (20)**

SUPPLY CHAIN ASSESSMENT

NJ Wind Port set to become key marshalling site; opportunities for heavy lift and handling

While only a few suppliers have OSW experience and gaps remain in heavy lifting, handling equipment, and related services, the NJWP is on track to create new opportunities for the local supply chain.

+ Categories with most opportunities

- **The New Jersey Wind Port (NJWP) project is the most obvious marshaling site in the state. The first marshalling parcel development phase is due to be completed by 2024.**
- Within heavy lifting, four potential suppliers have been identified, the largest two being Mammoet and Sarens, which are proven international suppliers of heavy lifting services and equipment. Beyond Mammoet and Sarens, Gartons Rigging, J. Supor & Son, and Lomma Crane and Rigging have been identified. However, Gartons Rigging and J. Supor have limited crane lifting capacity to service the offshore wind market. Lomma Crane & Rigging controls a range of crawler cranes, which could be OSW relevant.
- As for handling equipment, the NJ company Hilman has been identified. Hilman provides heavy load-moving solutions. Among their product lines are rollers and dollies. Hilman further promotes an offshore wind focus with products relevant for cable laying, offshore cranes, polegripper skidding systems, walk-to-work gangways, and carousel bearings. As for handling equipment, the NJ company Hilman has been identified. Hilman provides heavy load-moving solutions. Among their product lines are rollers and dollies. Hilman further promotes an offshore wind focus with products relevant for cable laying, offshore cranes, polegripper skidding systems, walk-to-work gangways, and carousel bearings.
- Within the "Other" category, several companies offering various services have been identified, including Red Hook Terminals (terminal service), Clean Energy Terminals (terminal developer focusing on OSW), Biehl Co. (port agency), Yank Marine (CTV builder), Sims Metal (metal brokerage and logistics), and Diverse Enterprise (workforce provider).

13
Identified suppliers

1
Suppliers with <20 employees

4
Suppliers with 20-60 employees

8
Suppliers with >60 employees

Storage & Marshalling site

- Heavy lift cranes (7)
- Handling equipment (3)
- Other (6)

SUPPLY CHAIN ASSESSMENT

Limited suppliers within maritime operations

New Jersey's value chain for marine operations includes a major ship broker, a few barge and support vessel owners, and two repair yards, with room for further development.

+ Categories with most opportunities

- A more mature part of the value chain includes companies like Hughes Marine and Northstar Marine, which offer support vessels and primarily own a fleet of smaller barges and Alpine Ocean, which offers a fleet of survey vessels.
- The study identifies a group of smaller support vessel providers within New Jersey. It features, among others, the Green Star Marine LLC joint venture between Liberty Green Logistics (NY) and Northstar Marine (NJ). Information on the JV, however, is not found on any of their websites.
- Besides Green Star Marine, Green Shipping Line has been identified within support vessels. They are offering a supply vessel named The Eleanor to support the offshore wind market (but limited info available on their website).
- Small presence of additional maritime operations companies such as vessel brokers, fuel suppliers, agency solutions, and marine support. Examples of other suppliers within Maritime Operations are KPI OceanConnect (a fuel supplier) and American Piledriving Equipment (a manufacturer of vibratory hammers that are used for monopile installation).

− Supply chain gaps

- Major gap with regard to the local presence of specialized maritime operations companies and vessel owners.
- No local presence of offshore wind marine contractors with capabilities within wind turbine installation, foundation installation, cable installation, or offshore substation installation. Furthermore, no identified heavy transport vessel owners.

22
Identified suppliers

2
Suppliers with <20 employees

5
Suppliers with 20-60 employees

4
Suppliers with >60 employees

Maritime Operations

- Wind turbine installation vessel (0)
- Foundation installation vessel (0)
- Cable installation vessel (0)
- OSS Installation vessel (0)
- Support vessels (6)
- Heavy transport vessels (0)
- Other (16)

SUPPLY CHAIN ASSESSMENT

Impressive service provider landscape

New Jersey has numerous consultancies and service providers with an appetite in offshore wind.

173
Identified suppliers

43
Suppliers with <20 employees

22
Suppliers with 20-60 employees

40
Suppliers with >60 employees

+ Categories with most opportunities

- The supply chain analysis presents numerous companies with capabilities within Project development, Consulting, Engineering, Administrative support and Environmental advisory. Examples are A.I.S. (did geophysical and geotechnical surveys and advisory at e.g., Empire Wind and Vineyard Wind) and Black & Veatch (did engineering and designing consulting for Block Island).

- The state of New Jersey also offers a wide range of other services relevant for the offshore wind sector, such as Human Resources, Staffing solutions, Legal services, Insurance, Public relations and Financing. Examples are Riker Danzig (law firm that has begun to work on offshore wind projects) and CW Solutions (doing services like GIS mapping, permitting, regulatory compliance in offshore wind).

- In other solution providers, multiple companies are offering solutions within logistics and freight forwarding. Examples are Ocean Tech Services (did metteorological and oceanographic data collection system at CVOW) and Moran Shipping Agencies (construction logistic solution provider with OSW experience in New England).

Other

- Consultancies (93)
- Other Service Providers (33)
- Other Solution Providers (45)

New Jersey has a “right to win” in offshore wind supply chain

11 GW Offshore wind targets by 2040. The strongest targets in the United States

200 acre of port space being developed in US’ first purpose-built wind port, creating up to 1500 manufacturing and operations jobs

Strong collaboration With local academia, developers, suppliers and other stakeholders in the Wind Institute.

Along with several support programs created to ensure local manufacturing of offshore wind components.

State of New Jersey have already attracted their first Tier 1 supplier with the EEW monopile facility.

~500 local companies identified as potential suppliers to offshore wind, but require further supplier development, engagement with developers and tiers 1 contractors, and guidance

New Jersey is home to some of the largest proven US offshore wind suppliers, like Riggs Distler, capable of promoting local opportunities.

Local supply chain development has been underway for many years.

Transferable capabilities and assets will create strong opportunities

An assessment and prioritization at category level of current strengths and capabilities reveals a strong development opportunity and strategic fit with NJ focus area.

Supply Chain Categories	Strength of current SC: *Current offshore wind track-record*	Strength of current SC: *Transferable capabilities and assets*	Development opportunities*	Fit w. NJ Tier 1 & 2 OSW assets**	Segment prioritization
Material supply	Some	High	High	Limited alignment	2nd priority
WTG Tower	Low	Limited	Some opportunities	Strong fit	1st priority
Foundation & Transition Piece	Some	Some	Strong opportunities	Strong fit	1st priority
Cables	Low	Some	Some opportunities	No alignment	Opportunistic
Substation	Low	Limited	Limited opportunities	No alignment	Opportunistic
Storage & Marshalling Site	Low	High	High	Strong fit	1st priority
Maritime Operations	Some	Limited	Medium	Strong fit	2nd priority
Other	Some	High	High	Limited alignment	1st priority

* With "Development Opportunities", we assess the potential in developing a strong offshore wind category if prioritized. E.g. Limited chance for a local value chain for OSS, as there are no local yards big enough to carry out fabrication. Strong marshalling site opportunities with the development of Wind Port, and so forth.

**e.g. Wind Port, Training institute, EEW monopile factory

6 recommendations to capture the offshore wind supply chain potential

Considering NJ's "right to win" in offshore wind supply chain and category assessment, we recommend the following focus areas for supply chain development

Strategic recommendations

No.	Recommendation
1	Leverage Existing Strengths in Secondary Steel
2	Enhance Monopile Fabrication Capabilities and link with transition piece value streams
3	Maximize Strategic Investments such as Windport and Wind Institute
4	Strategically Expand Tier 1 Supplier Base
5	Explore Maritime Segment Expansion
6	Develop SMEs Through Targeted Support

About Green Ducklings A/S

As a trusted advisor to decision-makers across the entire value chain of offshore wind, Green Ducklings understands most commercial, technical and legal aspects influencing the offshore wind industry. Our team of 15 experienced offshore wind specialists have supported more than 60 clients in efficient decision-making and go-to-market strategies within offshore wind.

Working with developers in structuring of their project supply chain, supporting bids, advising on strategic topics.

And working with supply chain companies to understand their opportunity space and qualify investment programs.

Green Ducklings is the market leader in providing commercial analyses and executive overviews, based on deep technical understanding of offshore wind aspects. We utilize inhouse expertise and our comprehensive network in the industry to understand or clarify uncertainties.

Webpage: www.greenducklings.com