

NC's Potential Offshore Wind Occupations

NC TOWERS Workforce Subcommittee

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NC DEPARTMENT
of COMMERCE
LABOR & ECONOMIC
ANALYSIS

What types of OSW Occupations?

- Based on review of state- and national-level reports including:
 - BVG Associates, [Building North Carolina's Offshore Wind Supply Chain \(2021\)](#)
 - BW Research, [Offshore Wind Workforce Training & Development in Massachusetts \(2021\)](#)
 - Workforce Development Institute, [New York State and the Jobs of Offshore Wind Energy \(2017\)](#)
 - BVG Associates, [New York State Offshore Wind Master Plan: The Workforce Opportunity of Offshore Wind in New York \(2017\)](#)
 - National Renewable Energy Laboratory (NREL), [U.S. Offshore Wind Workforce Assessment \(2022\)](#)



Our Charge



March 2021

Recommendation 34: Conduct a job skills analysis

- In consultation with the OSW industry, lead a job skills analysis for **construction, operation and maintenance needs** faced by the OSW industry.
- This analysis should include a literature review of any previous studies conducted in the U.S. or overseas. Coordinate with industry, trade organizations, and accrediting bodies like the Interstate Renewable Energy Council (IREC) to support development of job task analyses (JTA) for specific OSW-focused jobs.



- **Manufacturing for Supply Chain**

- North Carolina is **well positioned to**
 - work with individual companies to **identify skill needs**
 - help recruit and train the needed employees through **existing programs** in the state's community colleges and other traditional training providers
- Skills for manufacturing OSW components will **vary significantly** depending on the item in question; NC has strong manufacturing base (e.g. auto parts)

- **Construction, Operation and Maintenance for Windfarms**

- NC has established history in workforce development for the **maritime industry** (commercial fishing, shipping and transport, tourism and recreation, defense industries)
- Many **specific OSW requirements** (safety protocols, welding, maritime, composites, general manufacturing, CNC machining and six sigma/lean manufacturing) **are already available** through workforce development agencies and community colleges, but these **requirements need to be better understood** and the providers need to be surveyed to **match their offerings and to identify any gaps**



- The core workforce skills required for the direct jobs created by an OSW project are primarily associated with **trade workers and assemblers (85% of direct jobs)**
- Skillsets suited for manufacturing, fabrication, assembly, staging, mechanical and electrical fit-out and maintenance.

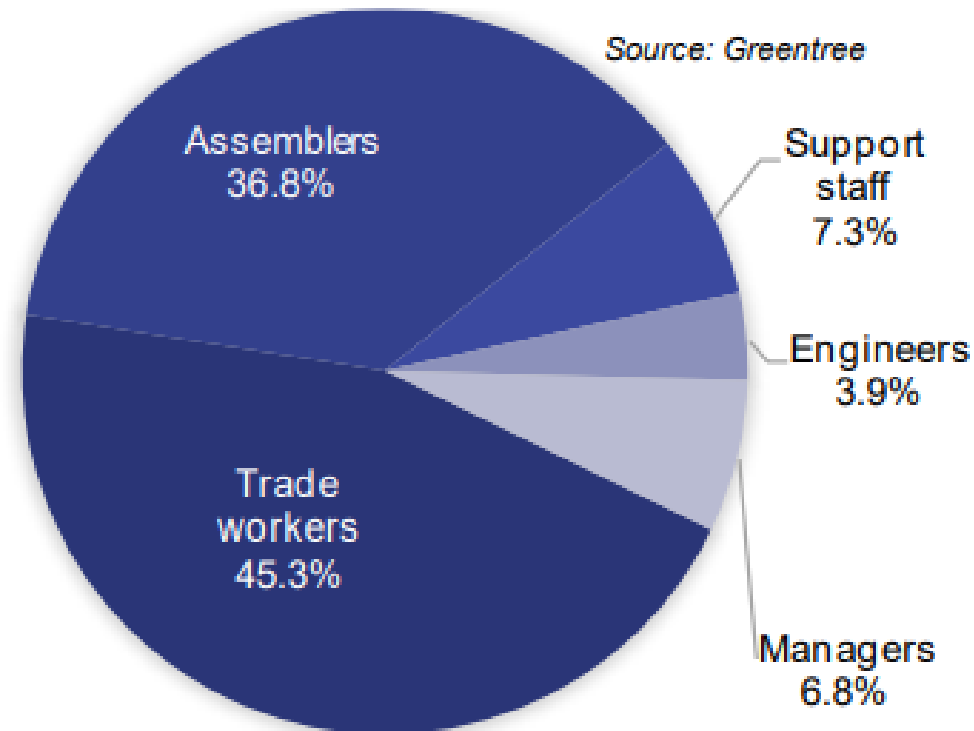


Figure 45 Breakdown of directly employed workers by job type in OSW.



- NC's coastal workforce is likely **well equipped to accommodate the OSW industry needs**.
- Many skills of North Carolina's trade workers and assemblers are **directly transferrable to the OSW industry**, though some industry-specific training will be required.
- Much of this training will be **product-specific and delivered by the suppliers**.
- **Safety Training** may also be required
 - OSHA, Standards of Training, Certification and Watchkeeping for Seafarers (STCW), Global Wind Organization (GWO) safety training
- **Technical Training** including
 - Certified welders, cutters, solderers and brazers for marine and nonmarine settings
 - CNC machinists, CCT (Certified Composites Technician), and Quality Control
 - Maritime training, including deck hands, operators, or ship masters



Occupational Workforce Needs (MA and NY)

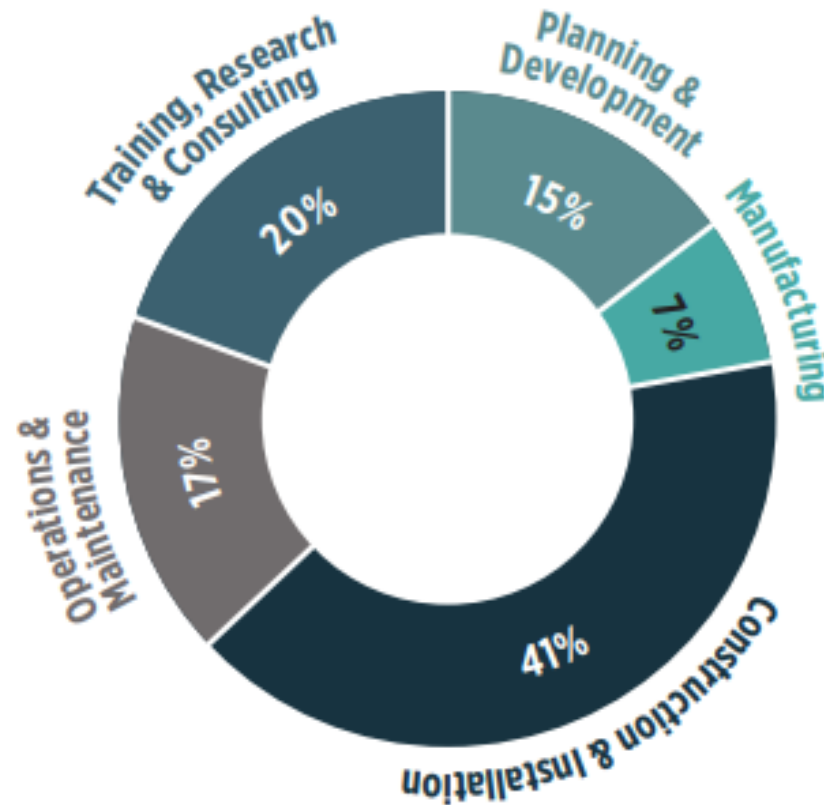
- **Planning and Development**
 - Takes at least two years, typically longer, depending on the project
 - 15% of the direct workforce
 - **47 occupations** within this phase, including engineers, financial analysts, and lawyers.
- **Manufacturing and Assembly**
 - Takes years, although OEMs will supply multiple projects/orders at once
 - 7 percent of direct workforce
 - **75 occupations** including engineers, metal workers, assemblers, and administrative staff.
- **Construction and Installation**
 - Takes 2 to 5 years
 - 41% of direct workforce
 - **68 occupations** within this phase, including crane operators, electricians, line workers, and welders.
- **Operations and Maintenance**
 - Can be 20 years or more depending on lease and energy agreements
 - 17% of direct workforce
 - **59 occupations** within this phase, including administrative staff, wind turbine technicians, marine operators, and plant managers.



- Support Services (Transportation, Training, Research, and Consulting)
 - Occurs during all phases
 - 20% of the direct workforce
 - **39 occupations** within this phase, including meteorologists, vessel mechanics, lawyers, and policy experts.

OFFSHORE WIND POWER PLANTS

Estimated Share of Direct US Workforce by Phase



TRAINING, RESEARCH AND CONSULTING

Occurs during all phases; involvement can be months long or last years, depending on project, funding and other factors.

PLANNING AND DEVELOPMENT

At least 2 years on average, typically longer depending on project; can last upwards of 10 years.

MANUFACTURING

Ongoing, takes years, Original Equipment Manufacturers (OEMs) can be involved in multiple projects or orders at once.

CONSTRUCTION AND INSTALLATION

Typically 3-5 years; technological advancements aim to shorten this period.

OPERATIONS AND MAINTENANCE

20 years or more, depending on lease and energy agreements.



NREL Industry Segments

- **Development:** site assessment, plant design, permitting, financing, project management, and other preconstruction activities.
- **Manufacturing and supply chain:** various components produced at multiple tiers of the manufacturing process, from engineering and design of components to production
- **Ports and staging:** terminal crews and logistics and management roles located portside
- **Maritime construction:** operating at sea to install projects, including the marine crew, engineers, and installation crews
- **Operations and maintenance (O&M):** operating and maintaining a project during its lifetime, including wind technicians and plant managers.



NREL Findings

- To meet target of 30 GW of U.S. installed offshore wind capacity by 2030, average annual employment levels (FTE/year) are estimated at **15,000** and **58,000** based on 25% and 100% domestic content scenarios
- Development: 800 and 3,200 FTE/year
- Manufacturing and Supply Chain: 12,300 and 49,000 FTE/year
- Ports and staging: 400 to 1,600 FTE/year.
- Maritime construction: 500 to 2,100 FTE/year.
- Operations and Maintenance: 100 and 500 in 2024, could grow to between 600 and 2,300 in 2030.



NREL Roles and Competency Requirements

- OSW industry has a **wide range of roles**: 113 distinct roles, from finance and engineering to maritime and trades (but awareness of roles is low)
- Most offshore wind energy industry roles require **specialized training** and **relevant experience** in a **skilled trade** (only some require BA+)
- Job roles requiring basic and skilled trades in construction and manufacturing are the **largest contribution of workers** across industry segments
- These skilled construction jobs are in **high demand** across renewable and other industries, which may increase the hiring difficulty for the offshore wind industry



NREL Key Gaps & Strengths

- **Additional community college and union-led training programs** such as apprenticeships may be needed to meet the workforce need for manufacturing factory-level workers, port terminal crews, and vessel construction crews
- The **standardization of safety certifications** for people working at sea to build and operate projects is required to ensure training programs meet desired industry requirements for vessel crews, port terminal crews, and O&M crews
- **Community colleges are already establishing offshore wind energy programs** focused primarily on offshore wind technician and safety training
- US has a **robust network of university programs** to educate students in professional, engineering, and management roles



NREL Education and Training Recommendations

- Workforce development **coordination** should continue and be expanded
- Aligning and standardizing **safety training**
- Aligning **training requirements** and times with **expected demand** will be a challenge
- Many **existing education and training programs** could be adapted or **expanded** to address offshore-specific topics.
- U.S. and global entities should **collaborate to structure trainings**
- Engage students in renewable energy **from an early age** and including offshore wind, particularly in coastal communities



NREL Recommendations for Workforce Initiatives

- Focus on the **local workforce** to offer an opportunity to ensure communities impacted by offshore wind development are benefiting economically
- Continuing and expanding partnerships with **unions**
- Support **apprenticeship** programs for individuals to gain necessary skills for trade careers
- Recruit and upskill members of **marine industries** could help fill peaks in installation requirements
- **Diversity and inclusion** initiatives as a high priority
- Assess and **track requirements** for diversity and local labor, as they are increasingly becoming part of project agreements and state offshore wind requirements



Industry Segment	Full-Time Equivalents (FTEs)		Workforce Programs					
Workforce Requirements	Average Annual Jobs, 100% Domestic Workforce		Safety Training					
	Average Annual Jobs, 25% Domestic Workforce		Community Colleges					
			Union-Led Training		Maritime Academies			
						University Programs		
Development	800	3,200						
Manufacturing and Supply Chain	12,300	49,000						
<i>Regional professionals</i>								
<i>Factory-level management</i>								
<i>Design and engineering</i>								
<i>Quality and safety</i>								
<i>Factory-level worker</i>	*	*						
<i>Facilities maintenance</i>								
Ports and Staging	400	1,600						
<i>Marine crew</i>								
<i>Terminal crew</i>	*	*						
<i>Logistics management</i>								
<i>Facilities management</i>								
Vessels	500	2,100						
<i>Marine crew</i>								
<i>Project crew</i>								
<i>Construction crew</i>	*	*						
Operations and Maintenance	600	2,300						
<i>O&M crew</i>	*	*						
<i>Plant operations</i>								

Meeting Workforce Requirements:

■ No gaps or gaps being addressed

■ Some potential gaps

■ One or more key gaps

□ Program has limited contribution to workforce development

* Largest worker contribution

NREL

Appendices

offer detailed Occupational Descriptions and Requirements

Table B-8. Port Marine Crew Role Descriptions and Requirements, Including Shipping Vessel, Tugboat, and Pilot Boat Crew

	Role	Description	Education and Experience Requirements
Shipping Vessel Crew	Captain/master	<ul style="list-style-type: none"> Responsible for every aspect of the voyage and vessel 	<ul style="list-style-type: none"> Associate degree (or vocational training) Significant experience leading a crew and navigating a vessel License issued by the U.S. Coast Guard
	Mate (chief/first, second, third)	<ul style="list-style-type: none"> Manages and trains the deck crew Inspects and maintains equipment inventory Orders needed repairs Aids in captain duties when necessary 	<ul style="list-style-type: none"> Associate degree or vocational training License issued by the U.S. Coast Guard
	Boatswain/bosun	<ul style="list-style-type: none"> Oversees the deck crew 	<ul style="list-style-type: none"> High school diploma/GED Relevant vessel crew leadership experience 6–12 months training on a U.S.-flagged Jones-Act-compliant vessel (6 months for small vessels, 12 months for large or construction vessels) U.S. Coast Guard license
	Seamen (able-bodied and ordinary)	<ul style="list-style-type: none"> Watches for obstructions, measures water depth, turns wheel on bridge, or uses emergency equipment as directed Maintains and operates ship 	<ul style="list-style-type: none"> High school diploma/GED 6–12 months training on a U.S.-flagged Jones-Act-compliant vessel (6 months for small vessels, 12 months for large or construction vessels) U.S. Coast Guard license
	Ship engineer	<ul style="list-style-type: none"> Operates and maintains engines, boilers, deck machinery, and electrical, sanitary, and refrigeration equipment aboard the ship 	<ul style="list-style-type: none"> Associate degree or vocational training Licensing for specific responsibilities (e.g., electrical engineering license)

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Appendices

offer detailed

Occupational

Descriptions

and

Requirements

Table B-9. Port Terminal Crew Role Descriptions and Requirements

Role	Description	Education and Experience Requirements
Laborer	<ul style="list-style-type: none"> Supports material handling activities, performs assigned tasks, and monitors and maintains equipment, building, and grounds 	<ul style="list-style-type: none"> None
Rigger/roustabout	<ul style="list-style-type: none"> Assists with lifting operations, handles ropes and cables, port side 	<ul style="list-style-type: none"> High school diploma/GED Offshore Petroleum Industry Training Organization (OPITO) rigging and lifting certification
Longshoreman	<ul style="list-style-type: none"> Prepares cargo for transport, which may include engaging and disengaging locks, placing or removing dunnage, and using lashing materials 	<ul style="list-style-type: none"> Transporter worker ID card 2 years general laborer experience (required)
Main/auxiliary crane operator	<ul style="list-style-type: none"> Operates mechanical boom and cable or tower and cable equipment to lift and move materials, machines, or products 	<ul style="list-style-type: none"> High school diploma/GED NCCCO training
Foreman, heavy-lift supervisor	<ul style="list-style-type: none"> Oversees receiving, lifting, and transport crew Directs and monitors terminal activity to ensure it is consistent with environmental safety and health, port, and customer standards 	<ul style="list-style-type: none"> Associate degree or vocational training Heavy-lift operator certifications (if applicable)
Truck driver	<ul style="list-style-type: none"> Offloads containers at port and transports within port to marshalling areas directly 	<ul style="list-style-type: none"> Must possess a valid Class A commercial driver's license and have minimum 2 years commercial driver's license-A driving experience Must be 23 years old (minimum for insurance) Must have a good driving record Drug test and background check required U.S. Department of Transportation physical required Transportation Worker Identification Credential card preferred, not required Port experience preferred

Select OWS- related Occupations In NC

Occupation Title	Employment Estimate 2021	Avg. Annual Openings 2020 - 2030	Location Quotient 2021
Heavy and Tractor-Trailer Truck Drivers	66,830	8,401	1.12
Maintenance and Repair Workers, General	44,390	5,098	1.11
Construction Laborers	28,360	4,168	0.93
Inspectors, Testers, Sorters, Samplers, and Weighers	19,850	2,079	1.15
Electricians	17,530	2,741	0.86
Operating Engineers and Other Construction Equip.Ops.	13,610	1,723	1.07
Welders, Cutters, Solderers, and Brazers	11,690	1,499	0.94
Logisticians	5,990	765	1.01
Cement Masons and Concrete Finishers	5,990	504	1.02
Electrical Power-Line Installers and Repairers	4,640	373	1.19
Transportation, Storage, and Distribution Managers	3,240	301	0.71
Helpers--Installation, Maintenance, and Repair Workers	3,080	552	1.11
Structural Metal Fabricators and Fitters	1,660	140	0.86
Structural Iron and Steel Workers	1,330	197	0.62
Commercial Pilots	1,170	210	0.87
Electrical Repair, Powerhouse, Substation, Relay	1,000	64	1.41
Crane and Tower Operators	980	118	0.72
Captains, Mates, and Pilots of Water Vessels	380	47	0.37
Riggers	290	59	0.51
Reinforcing Iron and Rebar Workers	280	53	0.55
Sailors and Marine Oilers	200	31	0.24
Wind Turbine Service Technicians	100	n/a	0.32
Plant and System Operators, All Other	60	13	0.13
Marine Engineers and Naval Architects	30	2	n/a

Related Occupations for Marine Engineers and Naval Architects (O*Net)

Occupation	Employment Estimate 2021
Aerospace Engineering and Operations Technologists and Technicians	40
Aerospace Engineers	520
Civil Engineering Technologists and Technicians	2,580
Civil Engineers	10,890
Electrical and Electronic Engineering Technologists and Technicians	2,500
Electrical Engineers	5,230
Industrial Engineers	8,670
Mechanical Engineering Technologists and Technicians	650
Mechanical Engineers	8,030
Ship Engineers	60

Occupation Title	2021 Median Annual Wage	Minimum Education Level Required for Entry	Work Experience Required	Job Training Required
Heavy and Tractor-Trailer Truck Drivers	\$47,020	Postsecondary non-degree award	None	Short-term on-the-job training
Maintenance and Repair Workers, General	\$38,200	High school diploma or equivalent	None	Moderate-term on-the-job training
Construction Laborers	\$35,530	No formal educational credential	None	Short-term on-the-job training
Inspectors, Testers, Sorters, Samplers, and Weighers	\$37,400	High school diploma or equivalent	None	Moderate-term on-the-job training
Electricians	\$47,310	High school diploma or equivalent	None	Apprenticeship
Operating Engineers and Other Construction Equip.Ops.	\$39,330	High school diploma or equivalent	None	Moderate-term on-the-job training
Welders, Cutters, Solderers, and Brazers	\$46,450	High school diploma or equivalent	None	Moderate-term on-the-job training
Logisticians	\$63,640	Bachelor's degree	None	None
Cement Masons and Concrete Finishers	\$39,190	No formal educational credential	None	Moderate-term on-the-job training
Electrical Power-Line Installers and Repairers	\$63,420	High school diploma or equivalent	None	Long-term on-the-job training
Transportation, Storage, and Distribution Managers	\$98,160	High school diploma or equivalent	5 years +	None
Helpers--Installation, Maintenance, and Repair Workers	\$29,620	High school diploma or equivalent	None	Short-term on-the-job training

Occupation Title	2021 Median Annual Wage	Minimum Education Level Required for Entry	Work Experience Required	Job Training Required
Structural Metal Fabricators and Fitters	\$37,880	High school diploma or equivalent	None	Moderate-term on-the-job training
Structural Iron and Steel Workers	\$46,740	High school diploma or equivalent	None	Apprenticeship
Commercial Pilots	\$101,730	High school diploma or equivalent	None	Moderate-term on-the-job training
Electrical Repair, Powerhouse, Substation, Relay	\$96,500	Postsecondary non-degree award	< 5 years	Moderate-term on-the-job training
Crane and Tower Operators	\$60,250	High school diploma or equivalent	< 5 years	Moderate-term on-the-job training
Captains, Mates, and Pilots of Water Vessels	\$49,860	Postsecondary non-degree award	< 5 years	None
Riggers	\$47,860	High school diploma or equivalent	None	Moderate-term on-the-job training
Reinforcing Iron and Rebar Workers	\$47,590	High school diploma or equivalent	None	Apprenticeship
Sailors and Marine Oilers	\$38,300	No formal educational credential	None	Moderate-term on-the-job training
Wind Turbine Service Technicians	\$59,190	Postsecondary nondegree award	None	Long-term on-the-job training
Plant and System Operators, All Other	\$64,710	High school diploma or equivalent	None	Moderate-term on-the-job training
Marine Engineers and Naval Architects	\$79,300	Bachelor's degree	None	None

Online Job Postings In NC (Burning Glass)

Occupation	Job Postings (past 365 days)	Demand	Time to Fill	Effort (compared to US)
Tractor-Trailer Truck Driver	23,336	Very High	44 days	Similar
Building and General Maintenance Tech.	13,787	Very High	34 days	Similar
Construction Helper / Worker	6,227	High	38 days	Similar
Repair / Service Technician	5,796	High	38 days	Similar
Quality Inspector / Technician	4,243	Medium	31 days	Similar
Electrician	2,134	Medium	34 days	Easier
Field Service Technician	1,975	Medium	46 days	Similar
Logistician / Supply Chain Specialist	1,692	Medium	36 days	Easier
Storage / Distribution Manager	1,679	Medium	34 days	Similar
Logistics / Supply Chain Analyst	1,481	Medium	39 days	Similar
Welder / Solderer	1,310	Medium	29 days	Easier
Operating Engineer / Heavy Equipment Op.	1,299	Medium	40 days	Similar
Utility Line Locator / Technician	784	Medium	32 days	Similar
Maintenance Helper / Assistant	770	Medium	36 days	Similar
Transportation Manager	741	Medium	38 days	Similar
Supply Chain / Logistics Manager	739	Medium	38 days	Similar

Online Job Postings In NC (Burning Glass)

Occupation	Job Postings (past 365 days)	Demand	Time to Fill	Effort (compared to US)
Crane Operator	539	Low	27 days	Easier
Concrete Finisher	481	Low	34 days	Similar
Pilot	284	Low	34 days	Much Easier
Ship / Boat Captain	230	Low	41 days	Similar
Sailor / Deckhand / Marine Oiler	200	Low	37 days	Similar
Iron / Steel Worker	157	Low	37 days	Similar
Rigger	135	Low	47 days	Similar
Electrical Substation / Relay Repairer	85	Low	50 days	Much Harder
Plant Operator	47	Low	39 days	Similar
Wind Turbine Technician	20	Low	46 days	Much Harder
Marine Engineer / Architect	18	Low	42 days	Easier

Education and Training linked to Occupation

Campus	Institution Type	Degree Level	Degree Code	CIP2020Code	CIP2020Title	CIP Description	Program Title
Asheville-Buncombe TCC	NCCCS	Associate	2	46.0302	Electrician	A program tha	Electrical Systems Technology
Asheville-Buncombe TCC	NCCCS	Certificate	1	46.0302	Electrician	A program tha	Electrical Systems Technology
Asheville-Buncombe TCC	NCCCS	Diploma	1	46.0302	Electrician	A program tha	Electrical Systems Technology
Bladen CC	NCCCS	Associate	2	46.0302	Electrician	A program tha	Electrical Systems Technology
Bladen CC	NCCCS	Certificate	1	46.0302	Electrician	A program tha	Electrical Systems Technology
Bladen CC	NCCCS	Diploma	1	46.0302	Electrician	A program tha	Electrical Systems Technology
Caldwell CC and TI	NCCCS	Associate	2	46.0302	Electrician	A program tha	Electrical Systems Technology
Caldwell CC and TI	NCCCS	Certificate	1	46.0302	Electrician	A program tha	Electrical Systems Technology
Caldwell CC and TI	NCCCS	Diploma	1	46.0302	Electrician	A program tha	Electrical Systems Technology
Cape Fear CC	NCCCS	Associate	2	46.0302	Electrician	A program tha	Electrical Systems Technology
Cape Fear CC	NCCCS	Certificate	1	46.0302	Electrician	A program tha	Electrical Systems Technology
Cape Fear CC	NCCCS	Diploma	1	46.0302	Electrician	A program tha	Electrical Systems Technology
Carteret CC	NCCCS	Associate	2	46.0499	Building/Construction	Any instructio	Building Construction Technology
Carteret CC	NCCCS	Certificate	1	46.0499	Building/Construction	Any instructio	Building Construction Technology
Carteret CC	NCCCS	Diploma	1	46.0499	Building/Construction	Any instructio	Building Construction Technology
Catawba Valley CC	NCCCS	Associate	2	46.0302	Electrician	A program tha	Electrical Systems Technology
Catawba Valley CC	NCCCS	Certificate	1	46.0302	Electrician	A program tha	Electrical Systems Technology
Catawba Valley CC	NCCCS	Diploma	1	46.0302	Electrician	A program tha	Electrical Systems Technology
Central Carolina CC	NCCCS	Associate	2	46.0302	Electrician	A program tha	Electrical Systems Technology
Central Carolina CC	NCCCS	Certificate	1	46.0302	Electrician	A program tha	Electrical Systems Technology
Central Carolina CC	NCCCS	Diploma	1	46.0302	Electrician	A program tha	Electrical Systems Technology
Central Carolina CC	NCCCS	Associate	2	46.0499	Building/Construction	Any instructio	Building Construction Technology
Central Carolina CC	NCCCS	Certificate	1	46.0499	Building/Construction	Any instructio	Building Construction Technology
Central Carolina CC	NCCCS	Diploma	1	46.0499	Building/Construction	Any instructio	Building Construction Technology
Central Piedmont CC	NCCCS	Associate	2	46.0302	Electrician	A program tha	Electrical Systems Technology
Central Piedmont CC	NCCCS	Certificate	1	46.0302	Electrician	A program tha	Electrical Systems Technology
Central Piedmont CC	NCCCS	Diploma	1	46.0302	Electrician	A program tha	Electrical Systems Technology

Graduates and Outcomes for Education Programs

<https://tower.nc.gov/>

School/Program Outcomes ?

Hide/Show



Graduates



Enrollment Outcomes



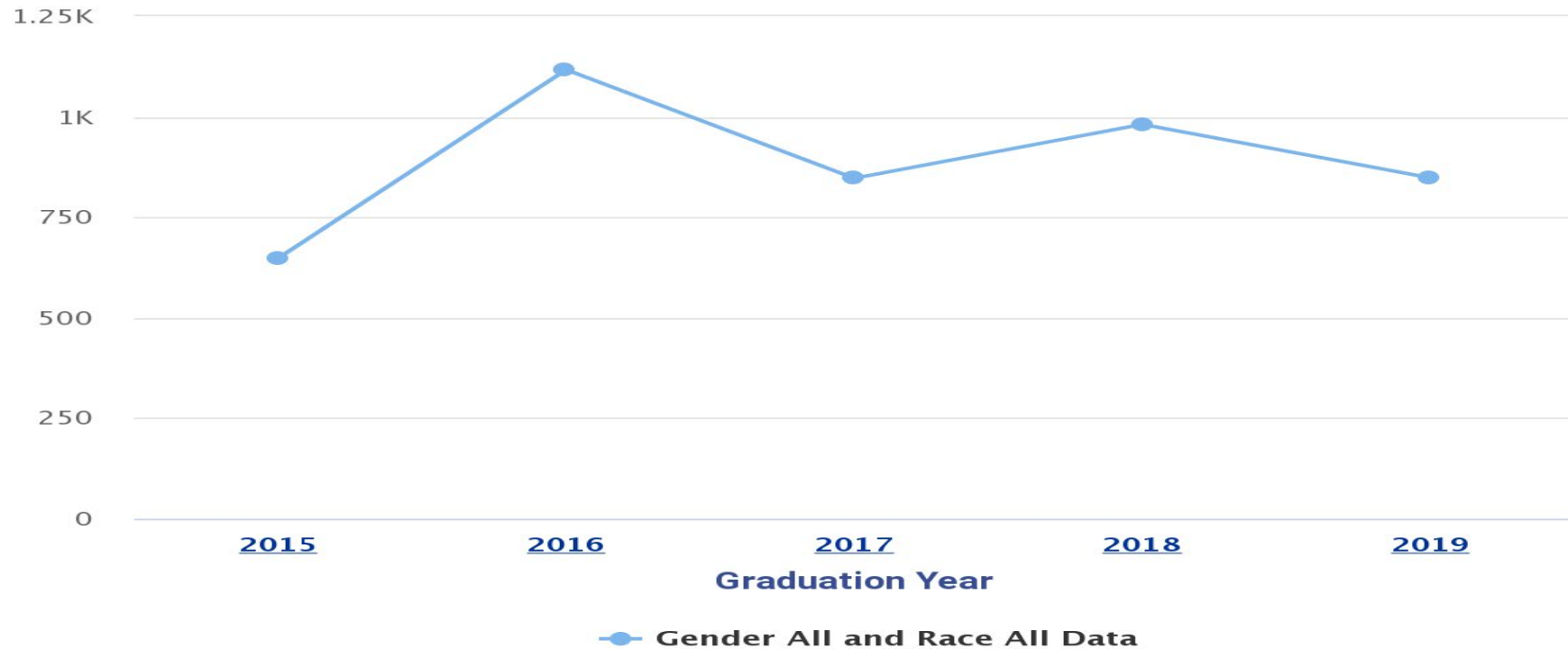
Employment Outcomes



Wages

Students Graduated ?

All Community Colleges, Welding Technology, Certificate

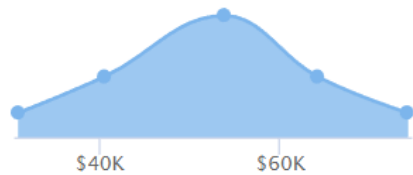


Crane and Tower Operators ★★★★★

North Carolina

Architecture and Construction

Annual Salary (Wages)



Lower End Wage (10th Percentile)

\$30,980(\$14.89/hr)

Middle Wage (50th Percentile)

\$53,810(\$25.87/hr)

Higher End Wage (90th Percentile)

\$74,150(\$35.65/hr)

Ratings

Annual Median Wage

\$53,810

\$30,980 ————— \$74,150

Annual NC Wage Range

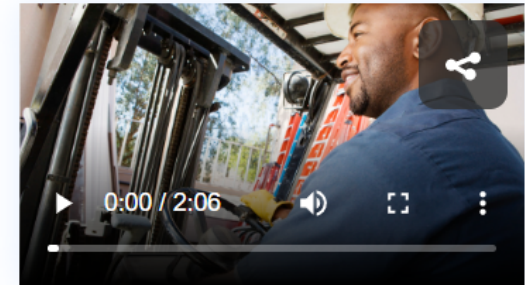
Growth Rate



Crane and tower operators operate mechanical boom and cable or tower and cable equipment to lift and move materials, machines, or products in many directions.

What do they typically do

- ✓ Inspect and adjust crane mechanisms or lifting accessories to prevent malfunctions or damage
- ✓ Determine load weights and check them against lifting capacities to prevent overload
- ✓ Weigh bundles using floor scales, and record weights for company records
- ✓ Clean, lubricate, and maintain mechanisms such as cables, pulleys, or grappling devices, making repairs as necessary
- ✓ Load or unload bundles from trucks or move containers to storage bins



Video provided by CareerOneStop. CareerOneStop is sponsored by the U.S. Department of Labour, Employment and Training Administration and the Minnesota Department of Employment & Economic Development.

Interests

R **C** **I**
Realistic Conventional Investigative

Work Place

Crane and tower operators typically work in a variety of

Conclusions

- **Increase existing levels of workers in skilled trades**
 - **Current demand from other industries; transferrable skills**
- **Develop/Expand OSW-specific capacity**
 - **Partner with industry and other states/countries to build NC capacity**
- **Develop/Expand safety training capacity**
 - **Partner with industry and other states/countries to build NC capacity**

