Offshore Wind Supply Chain
Virginia Coastal Energy Research Consortium (VCERC)
- Identify and develop new coastal energy resources through research
- 9 universities, plus state agencies and industry partners

Virginia Offshore Wind Task Force (VOWTF)
- Federal, State, and local officials to represent and coordinate offshore interests

Virginia Offshore Wind Coalition (VOWC)
- Developers, manufacturers, utilities, localities, business and environmental groups, and other organizations and individuals with offshore wind interests

Virginia Offshore Wind Development Authority (VOWDA)
- Appointed by the Governor to facilitate and support the development of wind-powered energy facilities located off Virginia’s coast

Outreach to North Carolina / Maryland
- State Economic Development Partnerships
- Universities
- Utilities
Marinization

- Commercial R & D
- University focused research

- Corrosion
  - Cathodic protection
  - Coatings
- Waves and currents
- Scouring of foundations
- Lubrications
  - Leaks and spills
  - Salt water mix
- Marine fouling
  - Above waterline
  - Sub-sea foundation
- Salt water and fresh water solutions
Maritime Requirements

- Green / brown field availability
- Marine heavy lift capability
- Vessel maintenance capability
- Deep draft / air draft access
- Manufacturing capability
- Convenient land transportation
- Qualified worker pool
- Intermodal transport for assembly and staging
- Maritime legal and finance
- Naval architecture and marine engineering

Hampton Roads Maritime and Ports Capacity Report
www.vcerc.org
Installation Vessels

- Purpose-built jack-up rigs
- Vessel conversion
- Barges / tugs
- Cable vessels
- Maintenance
  - Install response
  - Post-install

**Seawaymax**

- Mammoet Van Oord’s *Jumping Jack*
- MPI Offshore’s *TIV MPI Resolution*
- Global Marine System’s *Cable Retriever*
Maintenance

- Requires special lifting equipment
- Access via boat can be limited by sea state
- Access via helicopter can be limited by visibility and wind
- Purpose-built vessel concept
  - Can one vessel design do it all?
  - How much ‘territory’ can a maintenance effort cover? (Regional maintenance similar to telecom)
- Regional maintenance solution

Can we innovate to reduce O&M?
Sustainable Industry

■ Optimized inputs
  - Innovation in design
    - Foundations
    - Blades
    - Generators
    - Control systems
    - Power conditioning
  - Facilities
  - Materials used
  - Efficient installation
  - Innovation in maintenance

■ Fixed inputs
  - Labor
  - Costs of materials

Can we find cost reductions here?
Regional Solutions

- Manufacturing
- Shipping
- Assembly
- Installation
- Maintenance

Norfolk Southern’s Heartland Corridor

Large project in federal waters
Small project in federal waters
Project in state waters
Boom-Bust Installation Cycle

Ocean Energy Industry (Theoretical)

Submarine Telecommunications Industry Construction Spending
Conclusion

- **Project Economics**
  - We need to find ways to level load the industry to avoid economic turmoil

- **Regional Solutions**
  - Regional solutions require cooperation between states, companies, and regulators

- **Maritime Environment**
  - The maritime infrastructure must be developed to reduce cost and increase efficiency across projects