Engineering Solutions for Australian Port Infrastructure

Feeder Logistics vs. Traditional HLJV Logistics

Transport & Installation Operations from Theory to Practice

- Port Compatibility
- Risk Considerations
- Operational Efficiency
- Port CAPEX Implications

ONP Management

energy estate

Renewable Resources International

1. EXECUTIVE SUMMARY

The Australian offshore wind sector is entering a pioneering deployment phase, characterized by ambitious targets but severely constrained port infrastructure. In addition, traditional Transport & Installation (T&I) methodologies utilizing Heavy Lift Jack-up Vessels (HLJVs) to commute between port and offshore installation site face a critical bottleneck: next-generation wind turbine generator (WTG) components (20 MW+) have outgrown conventional harbor capacities.

This Information Memorandum addresses a fundamental divergence in logistics reality. While the traditional HLJV approach imposes extreme spatial constraints, operational conflicts, and tremendous commercial risks on ports, innovative feeder concepts, such as e.g. FEEDERDOCK, enable compatibility with existing and multi-purpose infrastructure. By shifting the installation vessel permanently offshore and utilizing specialized feeder vessels for component transport, feeder concepts minimize berth footprints, reduce the need for extensive harbor dredging and quay wall reinforcements, while safeguarding parallel commercial port operations.

In light of a recent multi-million-euro port incident in Europe, this memorandum outlines why adopting feeder concepts is not merely an operationally beneficial choice, but a structural risk-mitigation imperative for Australia.

2. THE OFFSHORE WIND LOGISTICS CHALLENGE

As the global wind industry scales, Australia faces an immediate logistics hurdle:

- **Exponential Component Growth:** Next-generation turbine blades now exceed lengths of 130 meters.
- **Severe Port Constraints:** Existing Australian maritime hubs feature limited spatial footprints, mostly shallow drafts, and quay wall load-bearing capacities not designed for offshore wind.
- **Operational Disruption:** Standard T&I methods frequently block fairways and harbor basins during port calls, disrupting established commercial operations such as container, bulk, and project cargo shipping.
- **Escalating CAPEX:** Upgrading entire harbor facilities to accommodate massive conventional installation vessels requires immense capital expenditure and protracted environmental approval processes.

Key Industry Questions:

1. *What T&I concepts can support next-generation offshore wind logistics without disrupting regular, daily port businesses?*
2. *How can developers and port authorities mitigate skyrocketing port development CAPEX?*
3. *How to recover port infrastructure investments that will not pay off with single offshore wind projects?*

3. REAL-WORLD EVIDENCE: THE STRUCTURAL RISK OF TRADITIONAL HLJV OPERATIONS

The financial and operational dangers of bringing massive HLJVs into constrained port environments are no longer theoretical.

On June 10, 2026, a severe collision occurred at the Port of Esbjerg (Denmark). During a harbor maneuver in challenging weather conditions, a traditional HLJV (Brave Tern) drifted, colliding with another vessel (Wind Keeper), the quay wall, and a harbor crane.

The Implications:

- **Catastrophic Asset Damage:** A batch of 15-MW rotor blades was heavily damaged.
- **Immense Financial Impact:** Total damage and cleanup costs are estimated to exceed **EUR 134 million (DKK 1 billion)**.
- **Severe Project Delays:** Component replacements and vessel detainment, triggering severe supply chain disruptions.

This incident proves that traditional HLJV port maneuvers represent a **structural risk** that traditional insurance structures and project timelines can no longer easily absorb.

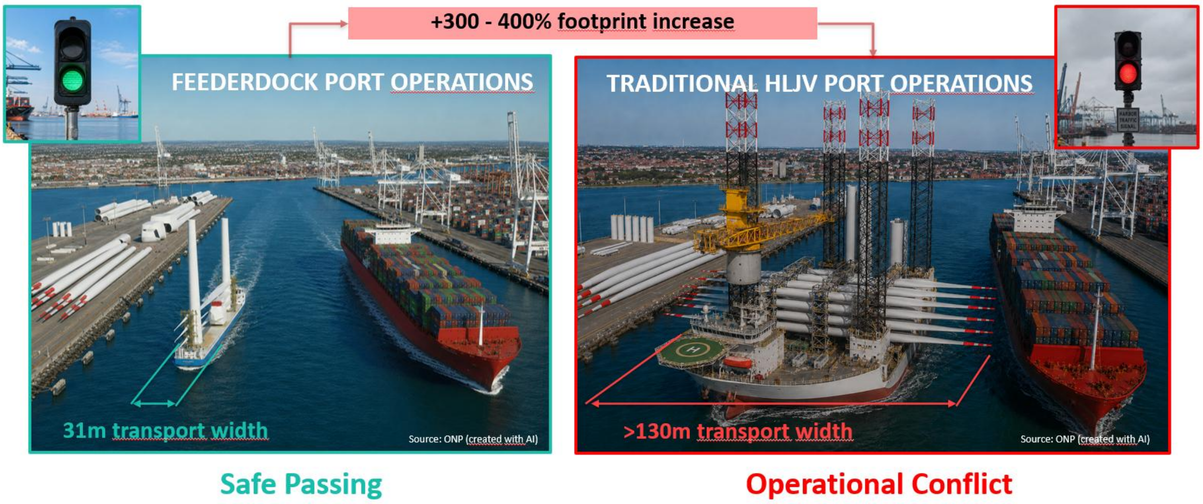
Esbjerg Port Incident 10.06.2026:

- Contact with vessel, quay and crane
- Rotor blades heavily damaged

This incident highlights a significant structural risk.

4. PHYSICAL REALITY IN PORTS: FEEDER VS. TRADITIONAL HLJV

The core operational conflict stems from how components are oriented and transported during transit.



4.1. Traditional HLJV: Structural Limitations

The conventional approach dictates loading WTG components directly onto an expensive HLJV inside the port, which then commutes to the offshore site. Typically, such vessels have a length of 180-200m and a width of 55-60m. This methodology features:

- **Transverse Blade Transport:** Rotor blades are transported at a 90-degree angle to the vessel axis. With 130m+ blades, this creates an effective transport width exceeding 130 meters.
- **Massive Footprint (+300% to 400%):** The resulting spatial requirement exceeds typical port capacities, creating an acute risk of crane, vessel, or infrastructure collision. This is accompanied by an overhanging cargo of 70-75m.
- **Extreme Port Requirements:** Requires an uninterrupted quay length of ~450m to accommodate two vessels in parallel, water depths of 12-14m, costly dredging, and heavily reinforced seabed areas to support jacking-up operations directly in front of the quay wall. This is associated with a high environmental impact and its inherent permitting risks.

4.2. Innovative FEEDERDOCK Concept: Adaptability & Flexibility

The FEEDERDOCK concept completely redefines these operational methodologies. It completely decouples port logistics from offshore installation. The HLJV (FEEDERDOCK Main Vessel) remains permanently offshore, while cost-effective, highly maneuverable Feeder Vessels shuttle components from the port to the offshore installation site. The key innovative elements are:

- **Longitudinal Blade Transport:** Rotor blades are aligned parallel to the vessel axis. There is no overhanging cargo beyond the vessel beam.
- **Minimal Footprint:** Net lateral vessel clearance is kept to a compact 31 meters, ensuring "Safe Passing" of standard commercial traffic (e.g. container ships).
- **Reduced Infrastructure Requirements:** Feeder vessels require only a ~200m quay length and feature a shallow full-load draft of only ~6.5m. Wind turbine components are loaded onto the feeder vessels via port cranes. Jacking operations along the quay wall are avoided.

5. STRATEGIC IMPLICATIONS FOR THE AUSTRALIAN MARKET

I. Development of a Hybrid Port Strategy

Instead of executing full-scale, cost-prohibitive harbor buildouts, Australian port authorities can deploy a hybrid infrastructure strategy enabled by feeder concepts:

1. **Zoned Logistics:** Combine medium-draft inbound logistics (9-10m) for heavy transport vessels bringing components to Australia, with shallow-draft feeder outbound logistics (6.5-7m).
2. **Targeted CAPEX:** Deep-water access is only necessary for a small fraction of port and project logistics. By implementing feeder concepts, extensive quay operations can be sustained with significantly reduced, cost optimized technical specifications.
3. **Minimized Intervention:** Drastically reduces the scope of environmentally challenging dredging and ground improvement works.

II. Value Proposition & Risk Mitigation

- **CAPEX Protection:** Saves hundreds of millions in public and private port infrastructure funding.
- **Uninterrupted Port Revenue:** Commercial port business operations (container shipping, bulk carriers, tankers) can continue in parallel without impediments by heavy lift vessels and fairway blockages due to transverse transport of wind turbine components.
- **De-risked Insurance Profiles:** Eliminating cargo overhang (rotor blades or monopiles) and harbor jacking maneuvers directly lowers exposure to vessel-to-vessel and vessel-to-infrastructure contact, creating a highly favorable risk profile for global underwriters.
- **Future-Proofing:** Scalable for wind turbine components exceeding 25 MW and rotor blades far beyond 130m length without requiring additional port expansions.
- **Flexibility:** Maintains the option to revert to conventional HLJV-based T&I operations at any stage, providing a reliable fallback solution and ensuring maximum operational flexibility, schedule certainty, and risk mitigation.

6. CONCLUSION & CALL TO ACTION

The FEEDERDOCK concept acts as the ultimate enabler for the Australian offshore wind market. It bridges the gap between next-generation turbine technology and existing harbor realities, offering a cost-efficient, safe, and immediate pathway to project execution.

We invite developers, port operators, and marine underwriters to review the technical specifications of the FEEDERDOCK logistics setup to integrate its advantages and inherent risk-mitigation into upcoming project designs, chartering strategies and investment decisions.

7. CONTRIBUTORS & CONTACT INFORMATION

Prepared and Authenticated by:

The considerations and observations presented in this memorandum have been developed by a team of industry experts and practitioners, including **ONP Management GmbH**, **Renewable Resources Int'l LLC**, and **Energy Estate Pty Limited**, combining expertise in offshore wind logistics, port infrastructure and marine operations, together with extensive experience in renewable energy project development, industry collaboration, stakeholder engagement, supply chain development, and investment attraction for emerging energy markets.

For questions, comments, or further discussion regarding the topics addressed in this memorandum, please contact:

Frank Witte
Project Director
ONP Management GmbH
Hamburg, Germany
✉ frank.witte@onp-management.de

Mark Richards
Commercial Director
Energy Estate Pty Limited
Sydney, Australia
✉ mark.richards@energyestate.com

The authors welcome the opportunity to engage with developers, port authorities, investors, contractors, and other stakeholders interested in advancing practical and cost-effective offshore wind logistics solutions for the Australian market.