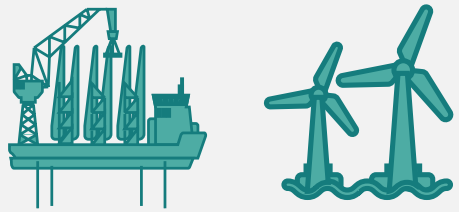
Sea Impact

2025 Market Report

Market Insight Report



@BASF Renewable Energy: Borkum Riffgrund 3

Content

Sea Impact

1. Planned Conferences & Exhibition in Q1 & Q2

If you are heading to any of the conferences or exhibitions, reach out so we can have a catch up

February 24th in Hamburg

April 21st to 23rd in Madrid

1. News From Sea Impact – Updated O&M Jack-Up Module

Loads of new dashboards have been added to the O&M Module

Nine New Dashboards

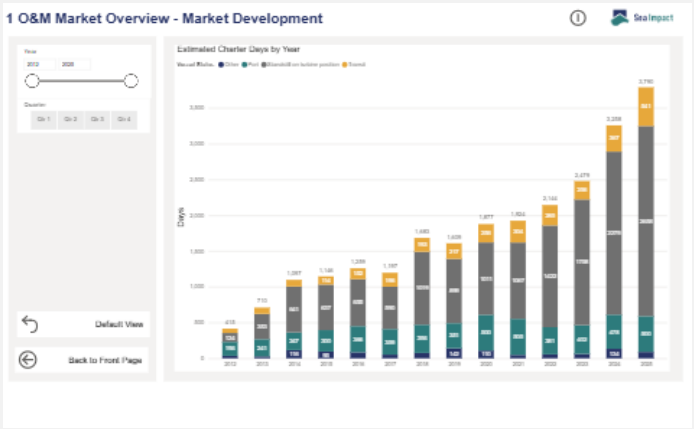
New Additions to the O&M Jack-Up Module

Wind Farm Operator Perspective
Industry-level view of O&M demand and contracting

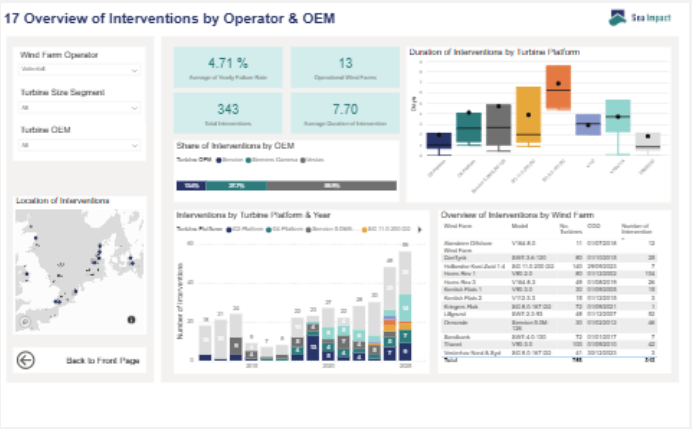
- ✓ Offshore wind farm portfolios across operators
- ✓ Number of O&M jack-up interventions by operator and year
- ✓ Turbine platforms driving O&M interventions across the market
- ✓ Contracting patterns between operators and vessel companies
- ✓ How operator-level O&M demand has developed over time

Vessel & Vessel Company Perspective
Market-wide view of capacity, activity, and utilization

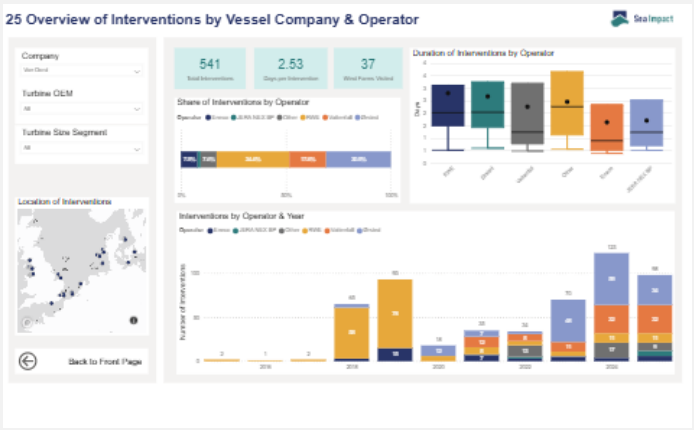
- ✓ Annual intervention activity per vessel vs. available capacity
- ✓ Intervention volumes by vessel company and individual vessels
- ✓ Turbine platforms serviced, split by size segment
- ✓ Which wind farm operators vessels are supporting
- ✓ Vessel company utilization and activity trends



Charter Day Estimate *Review how many hours have been spent for O&M jack-up activities*



Overview of Interventions by Operator & OEM *Understand what turbine platforms are driving interventions for the different operators*



Interventions by Vessel Company & Operator *Investigate which wind farm operators the difference vessel companies work for*

Fleet Overview *Review jack-up vessels operating in their market, check the specifications and share of work in O&M*

2025 Review

Sea Impact

2. Year In Review 2025

Key Developments, Challenges, and Outlook

2025 Highlights

The industry continued its shift toward **next-generation turbines above 13 MW**, which accounted for **67% of all turbines installed**, with **all three major OEMs installing turbines in this segment**

When measured by **installed MW capacity**, **2025 was a record year**, with **turbines installed equivalent to 6,773 MW**

2025 was a strong year for foundation installation, with **644 monopiles** and **145 jackets** installed. **DEME's Orion** and **Seaway7's Seaway Strashnov** led activity, installing **100** and **89 monopiles**, respectively

Eight new-built jack-up installation vessels entered service in **2025**, including **four for Cadeler**, one to **DEME**, APAC additions from **Shinfox Far East** and **Yi Hai Offshore**, and a **Jones Act–compliant vessel** for **Dominion Energy**.

Several **lower-specification installation vessels** transitioned into **O&M jack-up work** to meet continued **strong demand in the 6–10 MW turbine segment**

2025 Challenges

The trend of increasing **industry-average WTG installation durations** continued, reaching the **highest level observed across Sea Impact's 12-year data coverage**

All U.S. projects experienced **stop-work orders**, though the **most material impacts were seen at Revolution Wind and Empire Wind**

The **troubled drilling campaign at Calvados (Courseulles-sur-Mer)** finally saw progress in **2025**. However, **only 14 of 64 positions** had the **drilling scope completed** by year-end

A **record-high O&M jack-up intervention frequency of 8.2%** was recorded, indicating **elevated reliability challenges across the industry**.

The widely deployed **Siemens Gamesa G4 (3.6/4.0 MW) platform** shows **substantially increased failure rates beyond 10 years of operation**, peaking at **18% in year 12**, indicating **significant wear-and-tear–driven** interventions.

2026 Most Anticipated

Further **large-scale deployment of next-generation turbines above 13 MW** across the **major OEMs**.

Debut of Cadeler's *Wind Ally* at **Hornsea 3**, **DEME's *Norse Wind*** at **Windanker**, and **Maersk Offshore Wind's *Sturgeon*** at **Empire Wind 1**.

A **record year for WTG installations is expected in 2026**, with **around 900 turbines** planned based on announced installation campaigns.

Another **significant year for the growing Polish market** is expected, with **Baltic Power** reaching **commercial operation** and **foundation campaigns commencing at Baltica 2 and Bałtyk 2 & 3**.

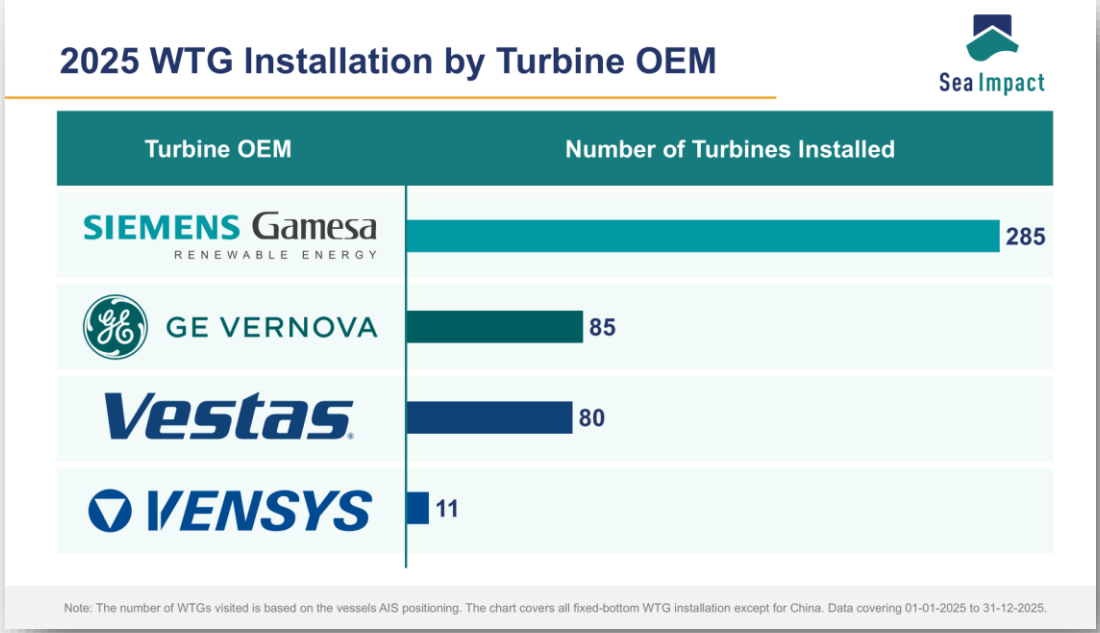
2026 is shaping up as a defining year for O&M intervention trends, testing whether the recent rise in failure rates and the **8.2% jack-up intervention level recorded in 2025** represent a **new baseline**.

2. Year In Review 2025 – Installation by Turbine OEM and Platform

Siemens Gamesa continued to dominated, and industry transitioned to next-gen turbines

Turbines Installed by Turbine OEM

- **Siemens Gamesa** dominated WTG installations in **2025**, accounting for **62% of all installed turbines**
- **GE Vernova** installed **85 Haliade-X 13 turbines**, deployed across **Vineyard Wind 1** and **Dogger Bank A**
- **Vestas** ranked third, with **80 turbines installed** during the year
- **VENSYS** installed **11 offshore wind turbines** in **South Korea**

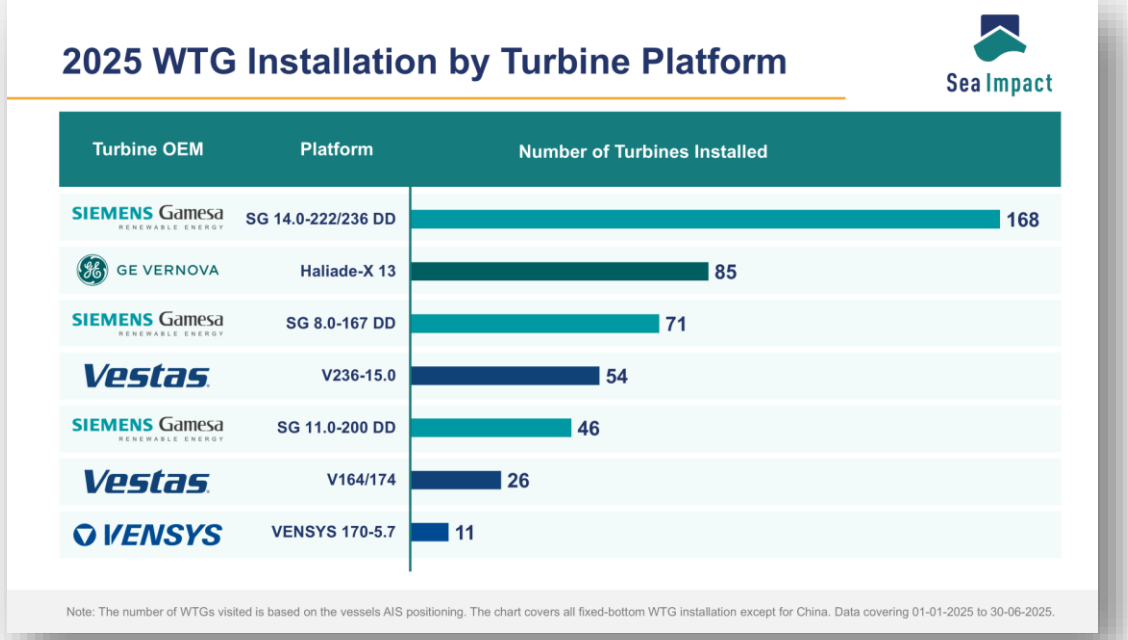


Turbines Installed by Turbine Platform

Siemens Gamesa installed **three different turbine platforms** in **2025**, led by deployment of the **SG 14 platform** with **168 turbines installed**.

Vestas installed the **first 54 units** of its **V236-15 platform** at **Baltic Power** and **EnBW He Dreiht**

GE Vernova installed **85 Haliade-X 13 turbines**, while VENSYS installed **11 VENSYS 170-5.7 turbines**

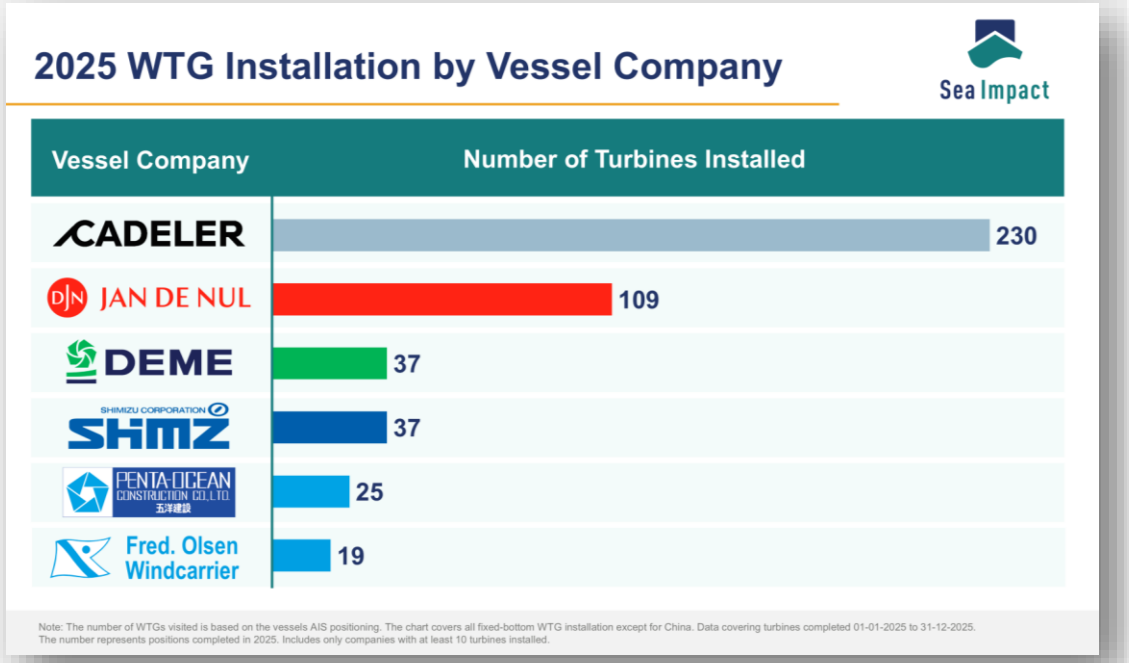


2. Year In Review 2025 – Installation Activity by Vessel Company

Cadeler dominates WTG installation, with BENELUX dredgers and Seaway7 leading foundation installation

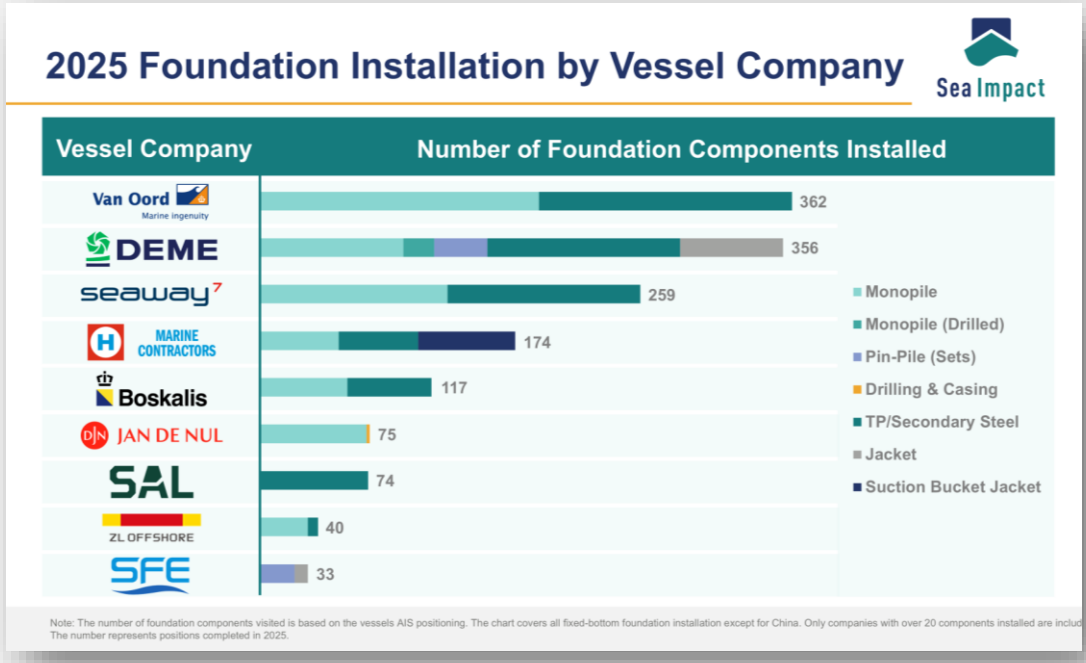
Turbines Installed by Vessel Company

- Cadeler once again led **WTG installation activity**, installing **230 turbines**, corresponding to a **49% market share**.
- Jan De Nul ranked second with **109 WTGs installed**, executed using the jack-up vessels **Vole Au Vent** and **Voltaire**.
- DEME installed turbines at **Vineyard Wind 1**, with **Sea Installer** completing **37 WTGs**.
- Shimizu Corporation installed **37 turbines** at **Hai Long 2** in **Taiwan**.



Foundations Installed by Vessel Company

- Van Oord emerged as the **leading foundation installer**, with a total of **362 components installed**. This was enabled by the delivery of the new jack-up **Boreas**, alongside continued activity from the upgraded **Svanen**, **Aeolus**, and **MPI Adventure**.
- In a close second, DEME installed **356 foundation components** across **Taiwan, Europe, and the United States**.
- Seaway7 also maintained high activity levels, with **Seaway Strashnov**, **Seaway Alfa Lift**, and **Seaway Ventus** active at **Dogger Bank C** and **East Anglia THREE**.

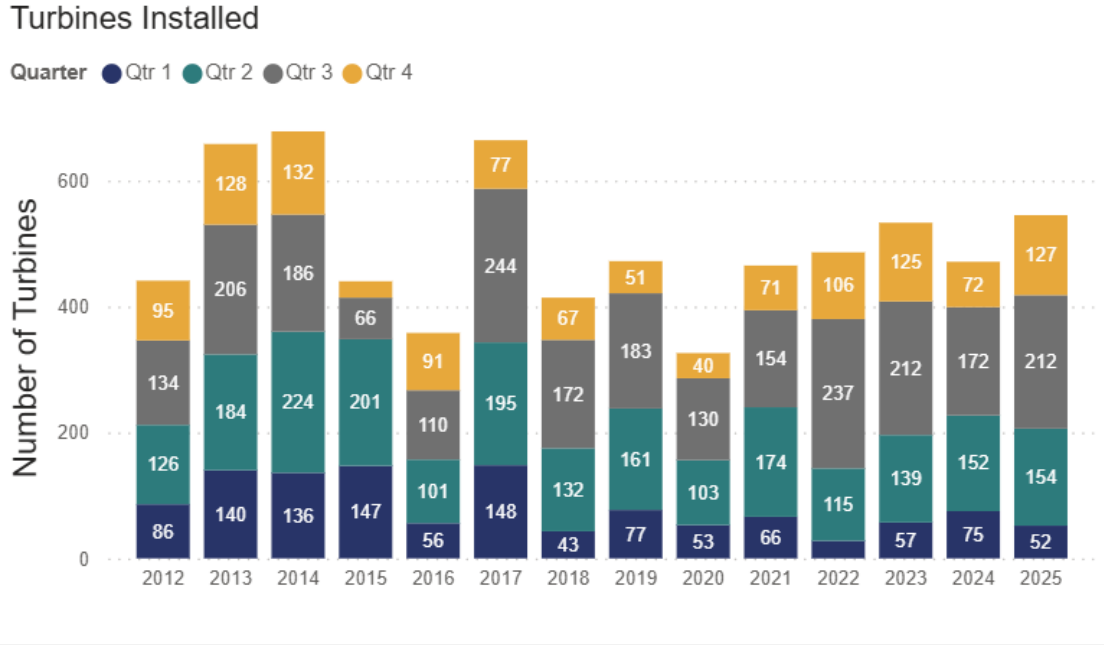


2. Year In Review 2025 – Installed Turbines by Number & MW

Industry growth driven by increasing turbine size rather than number of installed turbines

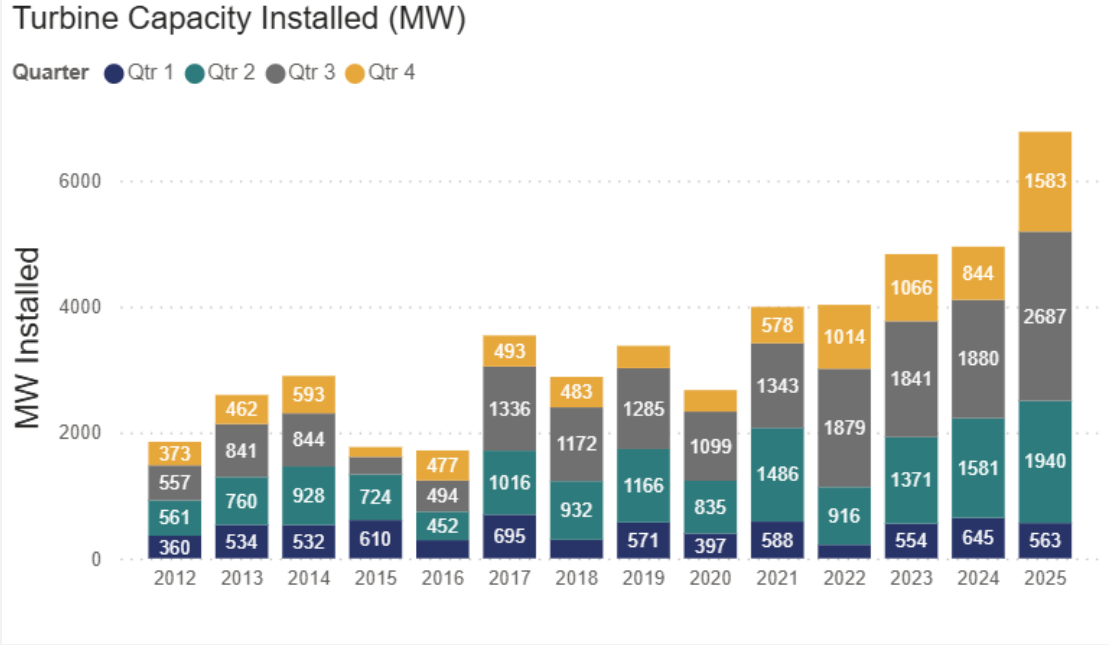
Number of WTG Installation by Year & Quarter

- Reviewing **WTG installation activity in 2025**, volumes remained **closely aligned with the five-year average**, at **around 500 turbines installed**.
- Following a **slow start in Q1**, activity **accelerated through Q2 and Q3** and **closed with a strong Q4**.
- Looking ahead, **2026 is expected to be a record year for WTG installations**, with **approximately 900 turbines** planned based on announced installation campaigns.



MW WTG Installation by Year & Quarter

- When reviewing installation activity from a **capacity (MW) perspective**, the impact of **increasing turbine sizes** becomes clear (note that figures reflect **installed**, not commissioned, capacity).
- A **new record was reached in 2025**, with installed turbines equivalent to **6,773 MW**.
- Looking ahead, **2026 is expected to be a record year for WTG installation capacity**, with **more than 10,000 MW** planned based on announced installation campaigns.



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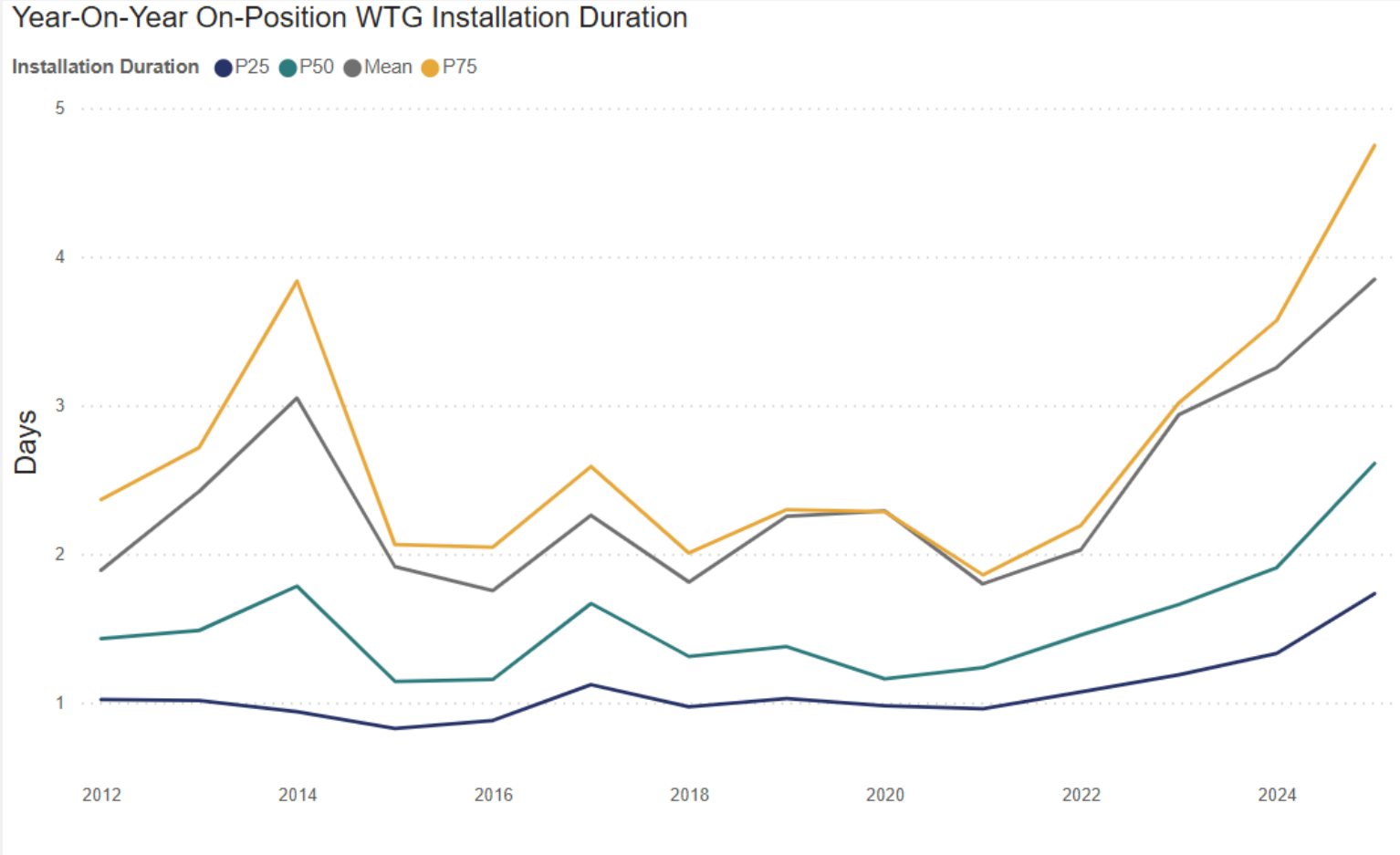
2. Year In Review 2025 – On-Position WTG Installation Duration

Industry high WTG installation duration, driven by longer durations for next-gen turbines and new markets

Year-On-Year On-Position WTG Installation Duration

- **2025 saw a significant rise in on-position installation duration** of WTGs.
- The graph shows industry P25, P50, mean and P75 durations.
- The **mean** on-position duration reached **3.85 days in 2025**, while the P50 (median) duration reached 2.61 days.
- For the mean duration this marks an **19% increased compared to 2024** while the P50 increase was 37%.
- This follows an upward trend seen since **2021,** where we saw an industry **low of just 1.80** days on average. This represents an **114% increase from 2021 to 2025**.
- Longer durations for the +12 MW segment has been one key driver.
- Another driver **of the increase** has been the new market projects, the **United States** in particular. Projects in the US saw and **mean duration of 6.20** days.



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2. Year In Review 2025 – WTG Installation Duration by Turbine Platform

Significant variation in installation duration between turbine platform and project

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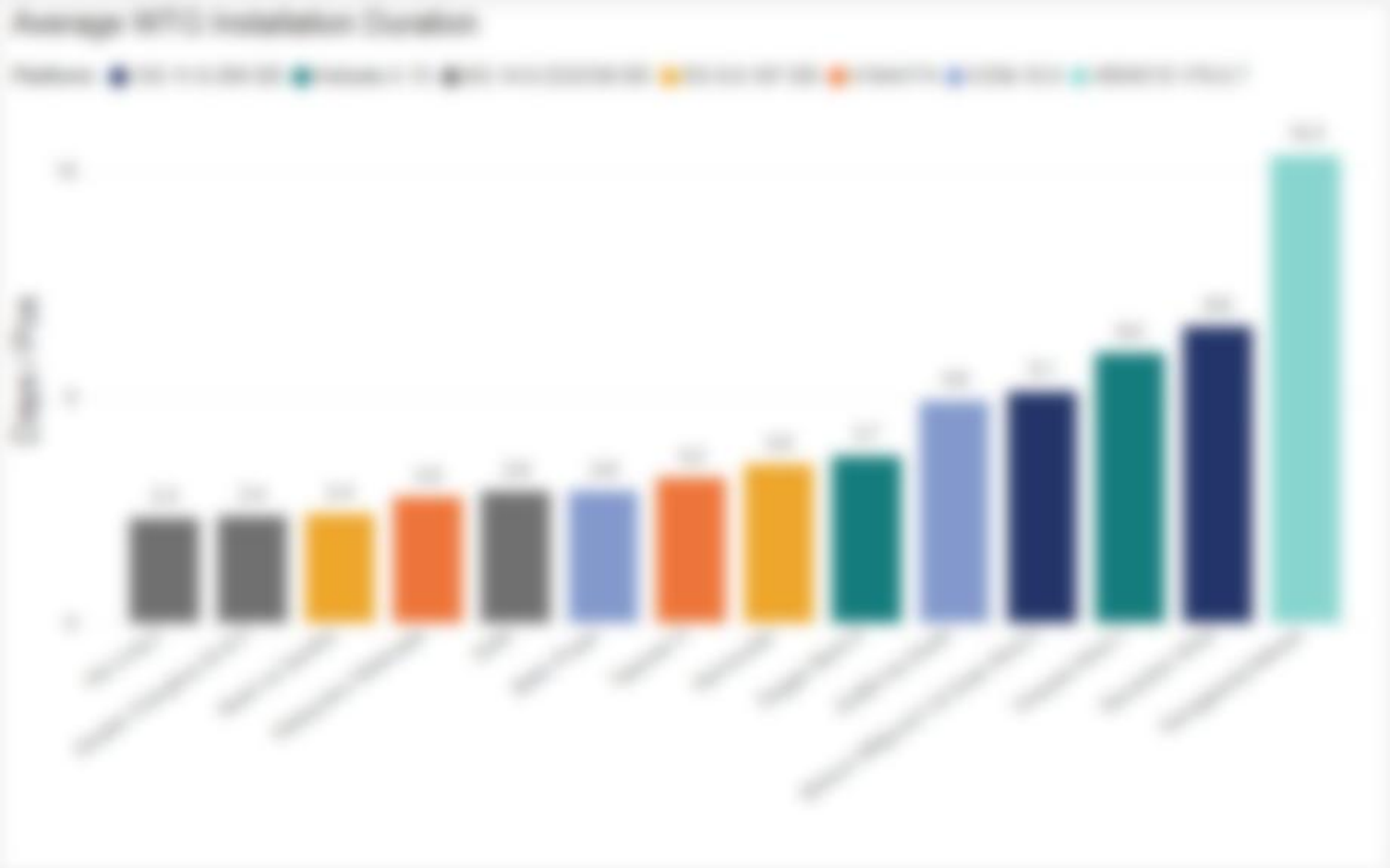

2. Year In Review 2025 – Comparison of SGRE Direct Drive Inst. Duration

SGRE showing overall stable and fast installation duration, while longer durations observed on recent platforms

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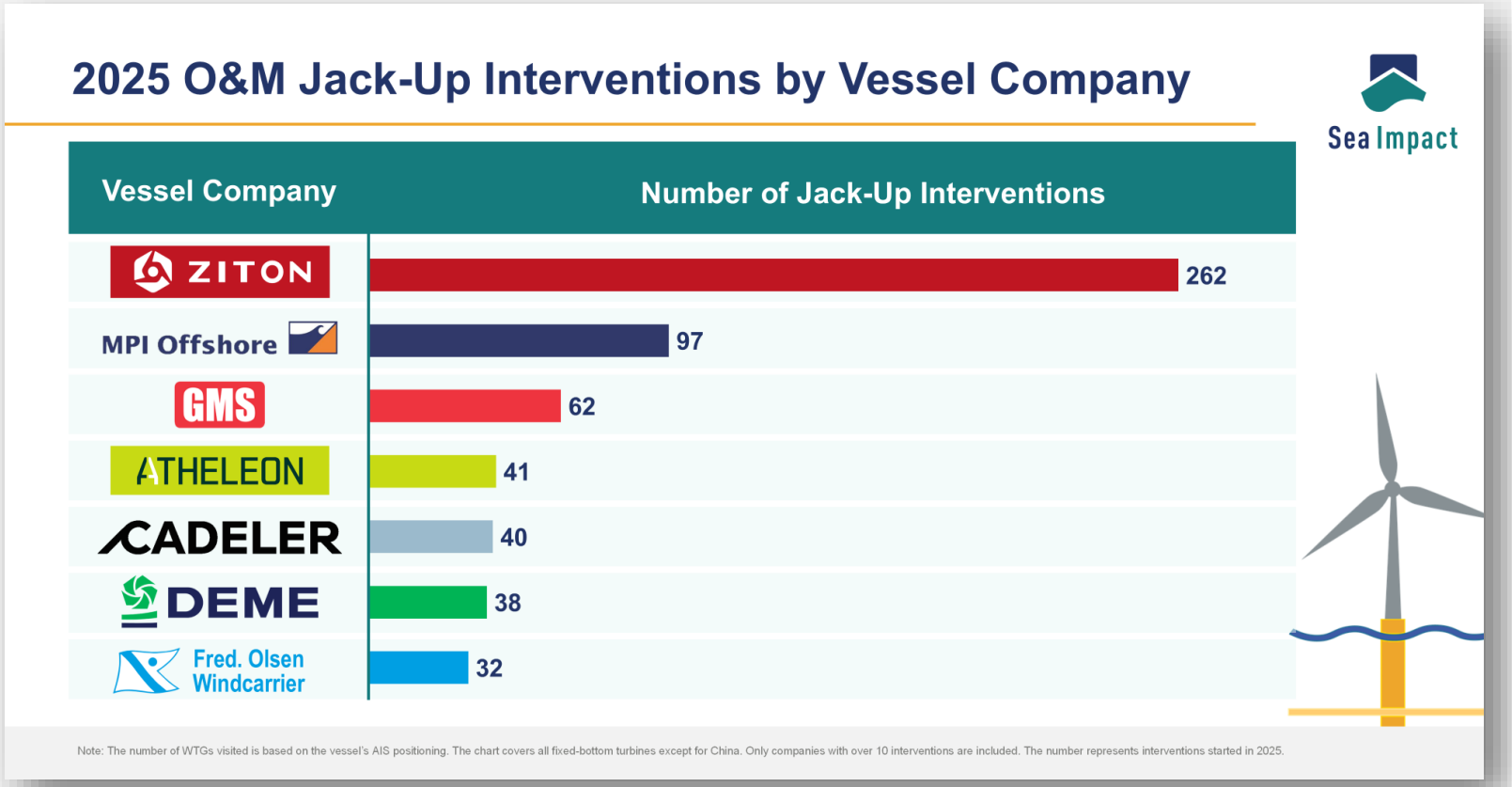
2. Year In Review 2025 – O&M Jack-Up Interventions by Vessel Company

ZITON remains the clear leader in the O&M jack-up market

O&M Jack-Up Interventions by Vessel Company

- ZITON remained the **market leader in the O&M jack-up intervention market** in 2025, completing **262 interventions**.
- The company expanded its fleet early in the year with the addition of **Wind Discovery**, bringing total fleet capacity to six vessels. Following several years of operation in **China**, the vessel was redeployed to **Europe**.
- This fleet expansion positions ZITON well to address **continued growth in O&M jack-up demand**, including activity in the **6–10 MW turbine segment**.
- Other notable players include **MPI Offshore**, owned by **Van Oord**, operating the two O&M-focused vessels **MPI Adventure** and **MPI Resolution**.
- GMS operated its single O&M-dedicated vessel **GMS Endeavour** under contract for **Ørsted**, completing **62 interventions**, all on Ørsted projects.
- ATHELEON operates two O&M jack-up vessels. Activity levels were lower in 2025, as **Wind Lift 1** underwent an **extended yard stay**.



2. Year In Review 2025 – Year-On-Year O&M Jack-Up Interventions

Record number of interventions and highest failure rate observed to date

O&M Jack-Up Interventions by Year

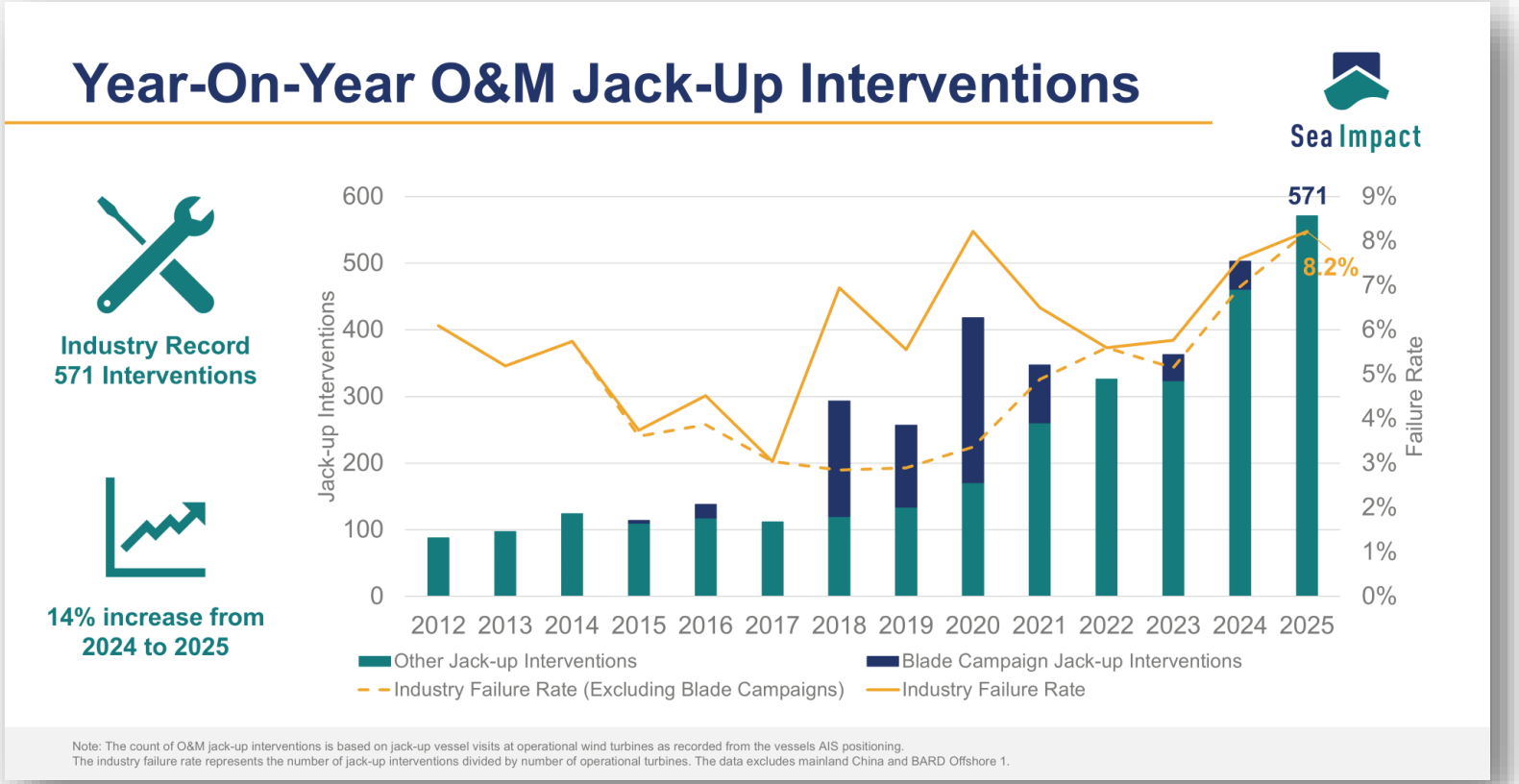
The O&M jack-up intervention market reached **record activity levels in 2025**, with a total of **571 interventions**, representing a **14% increase compared to 2024**. This surpasses the previous high of 503 interventions.

At the same time, **2025 recorded the highest industry-wide failure rate on record at 8.2%**, based on 14 years of tracked data. This indicates a continued increase in major component failures across the global offshore wind fleet.

The growth in intervention activity is primarily driven by the **ageing mid-life turbine fleet**, particularly the widely deployed **SGRE 3.6/4.0 MW platform**. A growing share of turbines on this platform have now exceeded **10 years of operation**, resulting in higher observed failure rates. Interventions on this turbine class accounted for **46% of all O&M jack-up interventions in 2025**.

In addition, intervention activity increased in the **6–10 MW turbine segment** across both major OEMs. This reflects a combination of **wear-related failures on older turbines** and **early-life issues at newer wind farms**, contributing to a broader distribution of intervention demand.

Overall, **2025 marks a structurally important year for the O&M jack-up intervention market**, underlining the need for robust failure trend monitoring and forward-looking O&M planning as the global offshore wind fleet continues to mature.



Note: The count of O&M jack-up interventions is based on jack-up vessel visits at operational wind turbines as recorded from the vessels AIS positioning.
The industry failure rate represents the number of jack-up interventions divided by number of operational turbines. The data excludes mainland China and BARD Offshore 1.

2. Year In Review 2025 – SGRE & Vestas Failure Rate Comparison

Significant difference between the two OEMs performance related to major component exchanges

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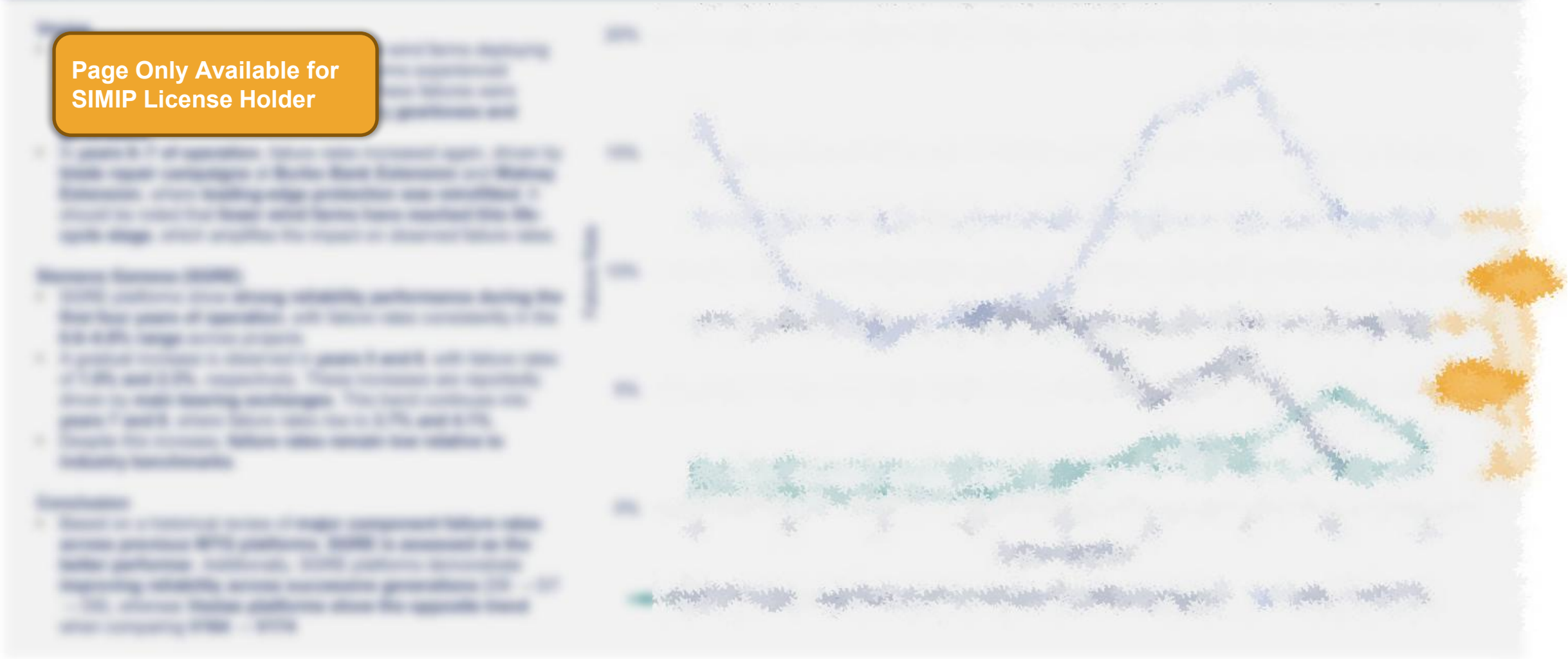


2025-Q4 Review

Sea Impact

@Vestas: He Dreiht

3. Installation Status – APAC

Installation Status as of 31-12-2025

Installation Status – APAC

Yeonggwang Nakwol
The monopile scope still stand at 52% completion, while 27% of transition pieces have been installed. Both are being installed by HANSAN1. Hyundai Frontier in collaboration with HANSAN1 has completed eleven positions of the VENSYS 170-5.7 turbines.

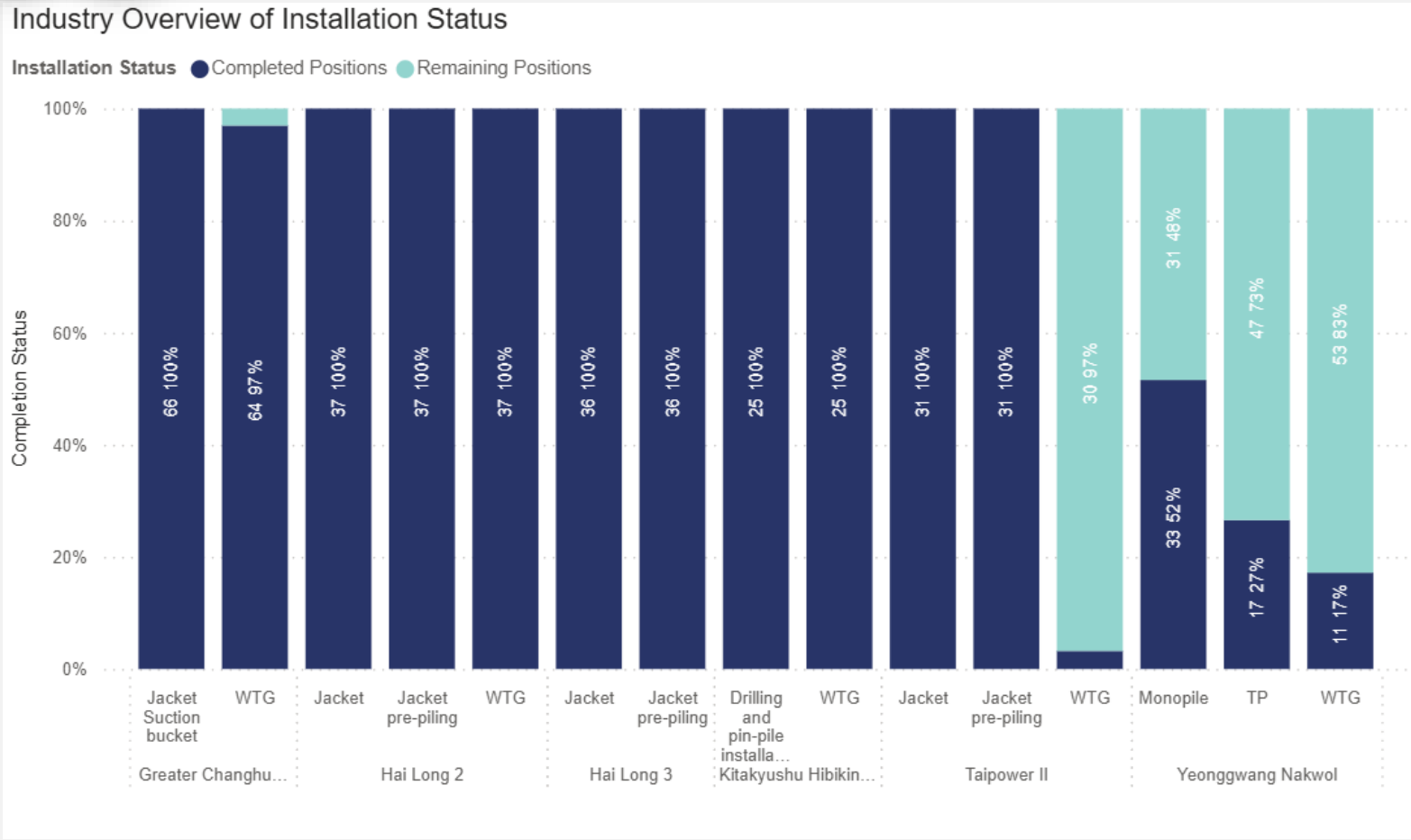
Taipower II
The foundation scope stands completed, and the first turbine has been installed by SFE Developer.

Kitakyushu Hibikinada
The offshore construction phase was completed in Q3-2025 and CoD is expected in Q1-2026

Hai Long 2
Turbine installation was completed in Q4-2025.

Hai Long 3
Foundation installation has been completed with the final jacket in place. Turbine installation is planned to start in 2026.

Greater Changhua 2b & 4
Just two turbines remain to be installed at the end of 2025 which have been completed in January 2026.



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3. Installation Status – Europe

Installation Status as of 31-12-2025

Installation Status – France, Germany & Poland

Windanker
Van Oord's Svanen completed the monopile scope, while MV Lone installed the TPs. WTG installation is planned for 2026.

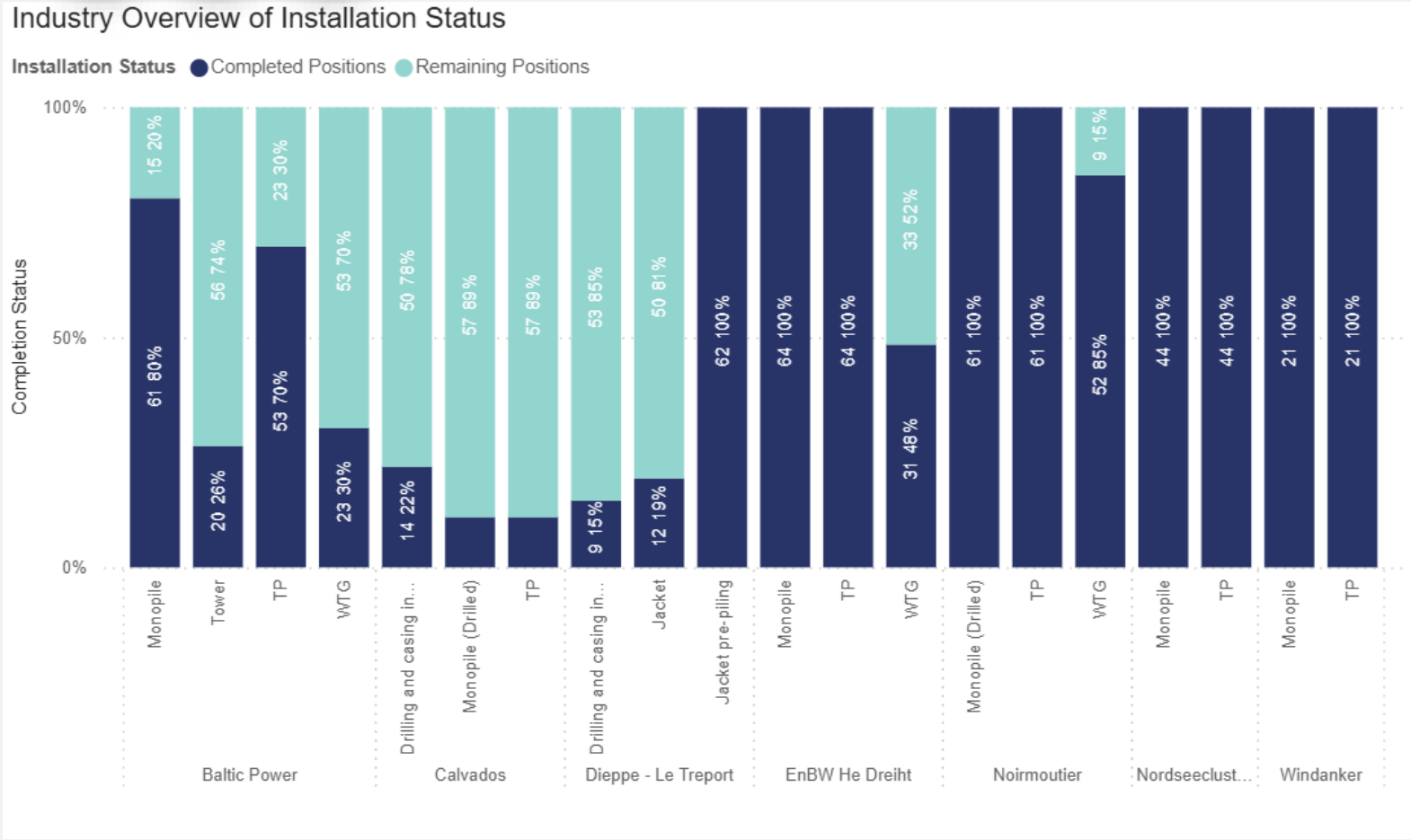
Nordseecluster A
Van Oord's new jack-up Boreas completed the monopile (and secondary steel for a few positions), while Aeolus installed the remaining secondary steel.

EnBW He Dreiht
Vestas' first project featuring the new V236-15 MW turbine has reached 48% completion, with 31 turbines installed.

Dieppe - Le Treport
The jacket campaign has started, with twelve jackets installed by DEME's Innovation. Drilling was required only at the nine completed positions.

Calvados
The drilling campaign has resumed following a vessel change over the summer, with 14 positions completed.

Baltic Power
Svanen returned and was supported by Bokalift 2 on the MP scope reaching 80%. Turbine installation has reached 30%, with an additional 26% standing with just towers installed. The project features the V236.



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3. Installation Status – Europe

Installation Status as of 31-12-2025

Installation Status – Denmark & United Kingdom

Thor
The foundation scopes stands fully completed, with WTG installation expected to start in early 2026.

Sofia
Foundation installation is complete, and turbine installation has reached 66%.

Inch Cape
The monopile scope was kicked off by Les Alizes.

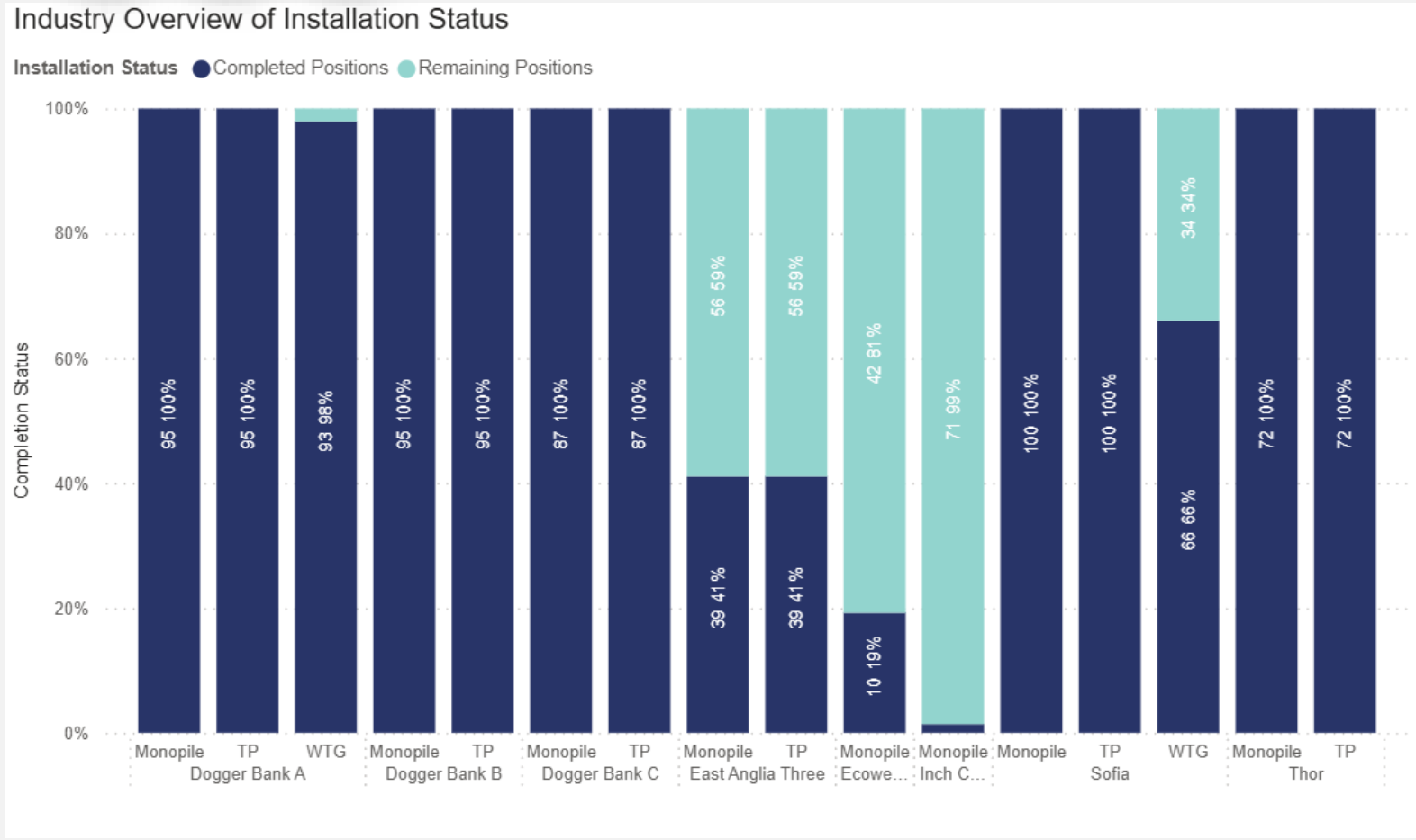
Ecowende
Van Oord's new vessel Boreas has installed the first 10 monopiles.

East Anglia Three
Seaway Ventus has installed 41% of monopile and transition piece sets.

Dogger Bank A
Turbine installation is in its final phase with just two turbines remaining.

Dogger Bank B
Turbine installation expected to start in early 2026, following the completion of phase A.

Dogger Bank C
Foundation scope stands completed, with turbine installation coming next after Dogger Bank B.



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3. Installation Status – United States

Installation Status as of 31-12-2025

Installation Status – United States

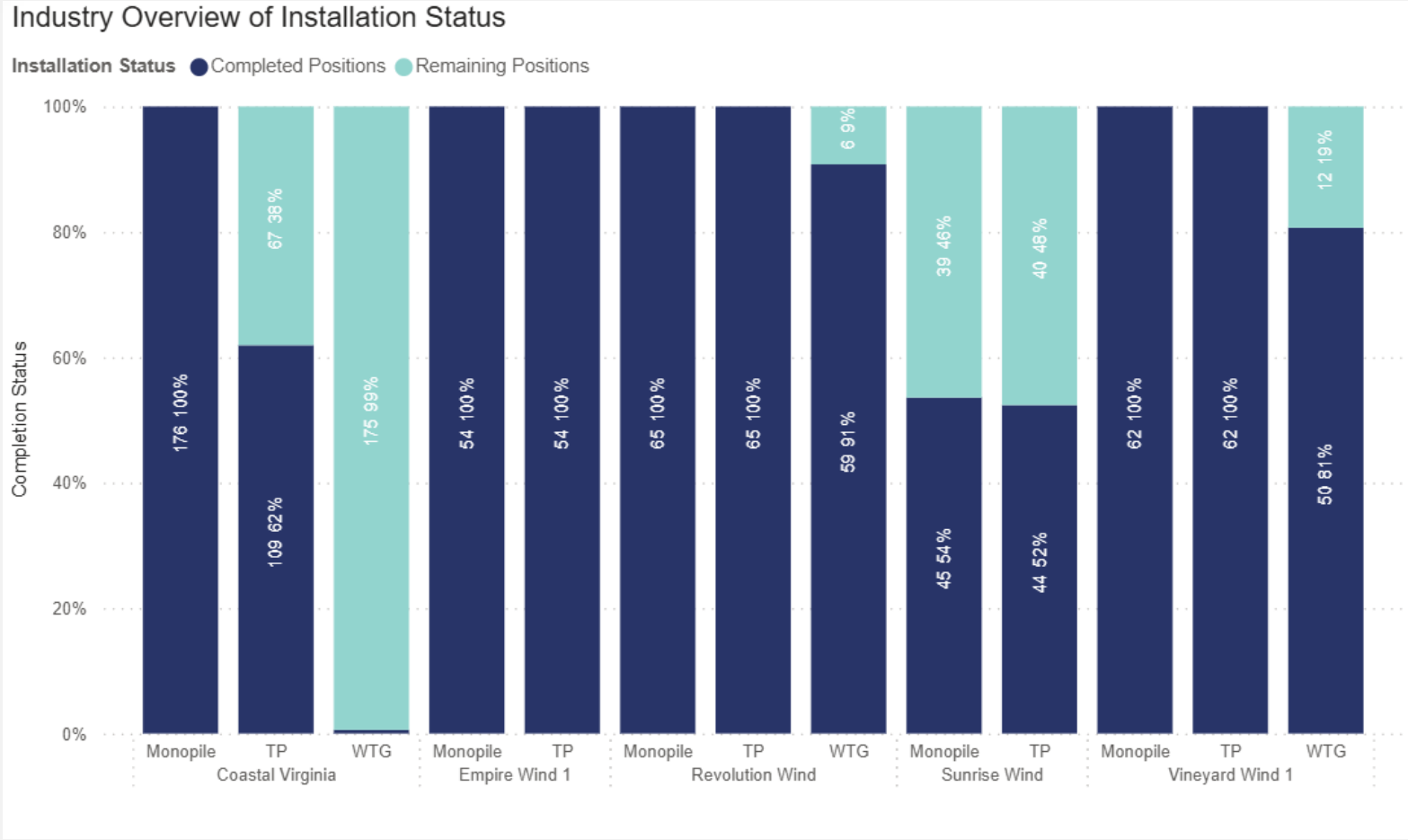
Vineyard Wind 1
At Vineyard Wind 1 it is estimated that 50 positions have full turbines installed, while 61 have the tower and nacelle installed. The blade exchange campaign is still on going.

Sunrise Wind
At Sunrise Wind, 54% of monopiles have been installed. The installation vessel have left the site; there is pilling restriction in the area in the winter/spring. The campaign can resume in May 2026.

Revolution Wind
Before the stop work order in late the December 91% completion was reached on the WTG scope.

Empire Wind 1
The foundation scope has been completed, and with the vessel dispute between Maersk Offshore Wind and Seatrium resolved the WTG campaign is expected to start in Spring 2026.

Coastal Virginia
All 176 monopiles have been installed at Coastal Virginia. The TP scope has reached 62% completion with 109 positions installed. The turbine installation kicked off with Charybdis installing the first turbine (completed in January 2026).



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4. New Foundation Installation – Number Installed

Foundation Installation

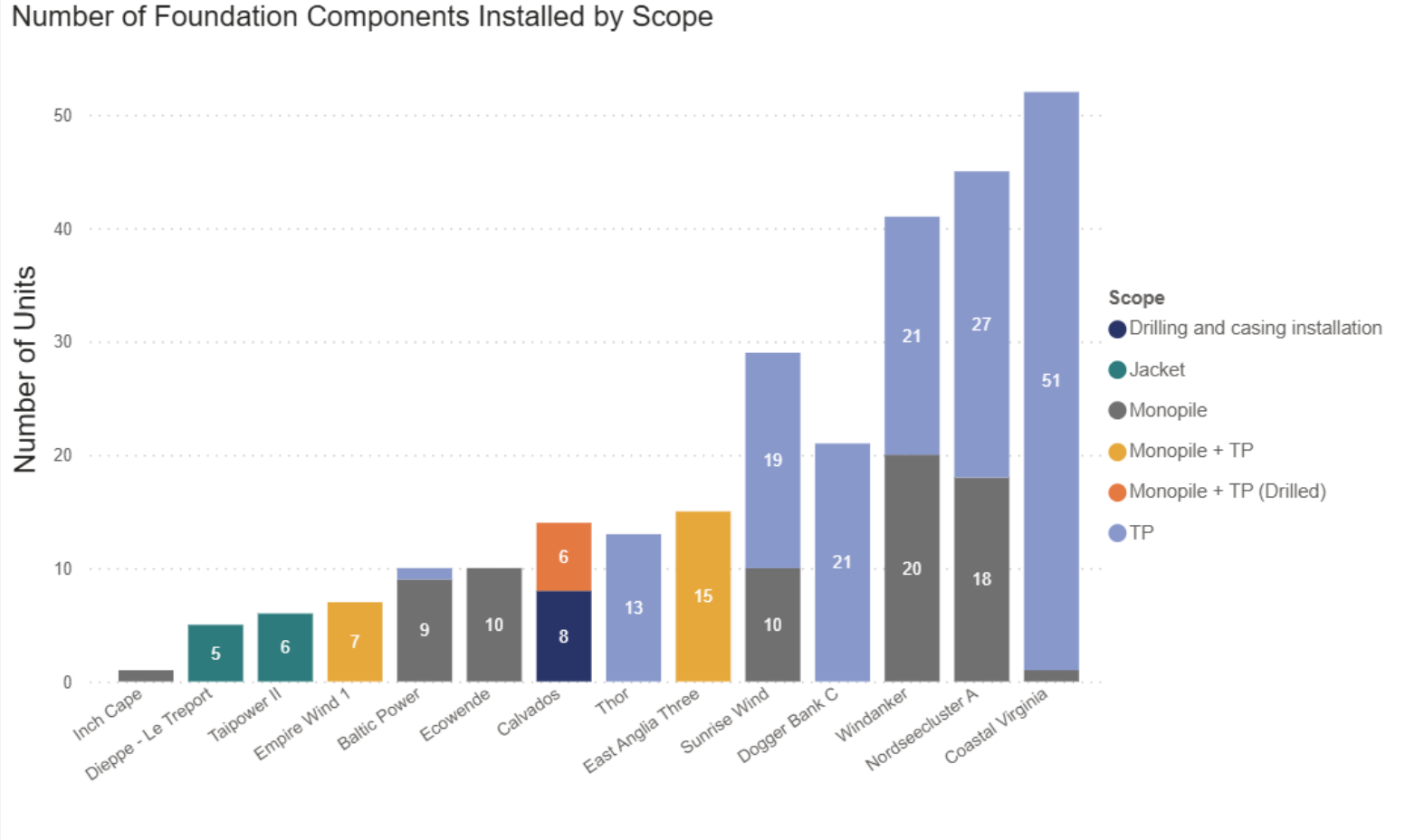
Foundation Installation Q4-2025

At **Coastal Virginia**, strong progress continued with **51 TPs installed in Q4**. Further north in the **U.S.**, **Bokalift 2** and **Bokalift 1** installed **10 MPs** and **19 TPs**, respectively, at **Sunrise Wind**, while **Thialf** installed the **final seven MP+TP sets** at **Empire Wind 1**.

In **Germany**, **Nordseecluster A** completed its foundation scope with **18 MPs** and **27 TPs installed**. At **Windanker**, the foundation scope was also completed, with the **final 20 MPs** and **all 21 TPs** installed in **Q4**.

Completion defined **Q4**, with **Dogger Bank C** installing its **final 21 TPs**, **Thor** completing the **last 13 TPs**, and **Taipower II** installing the **final six jackets**.

In **France**, **Calvados** completed an additional **eight positions** for **drilling and casing**, while **MP+TP** installations were completed at **six positions**.



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4. New Foundation Installation – Average Durations

Foundation Installation

On-Position Foundation Installation Durations Q4-2025

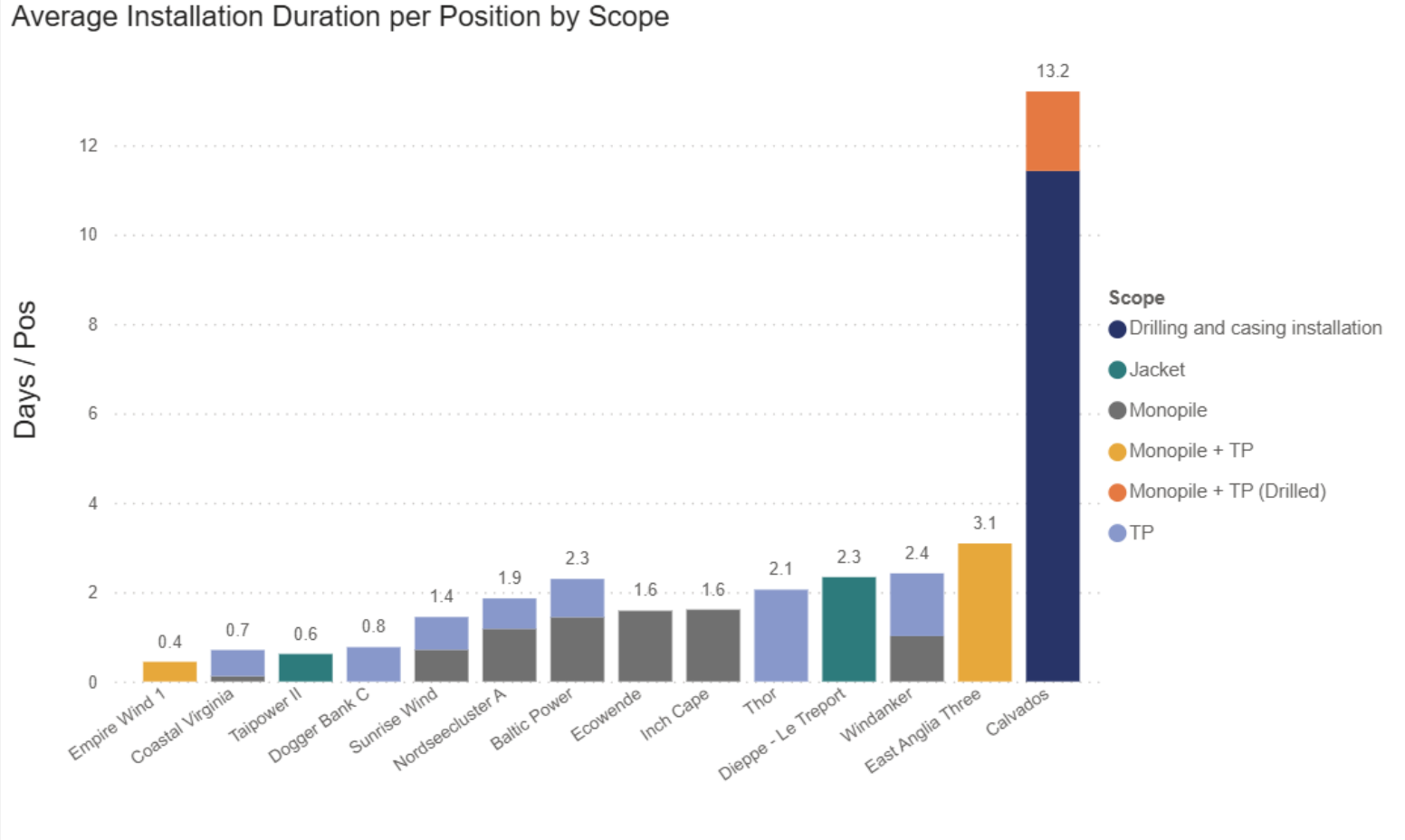
Monopile campaigns recorded an **average on-position duration of 1.2 days** in Q4 (**Q4 five-year average: 1.3 days**) and a **median duration of 0.9 days** (**Q4 five-year average: 0.7 days**). **Sunrise Wind** led performance with an **average duration of 0.7 days per position**.

For **combined monopile + TP installation**, **Empire Wind 1** outperformed peers with just **0.4 days per position** across the final seven installations, highlighting the **high efficiency of Thialf** as a monopile installation vessel (albeit at a **premium day rate**).

At the other end of the spectrum, **East Anglia Three** experienced slower progress, averaging **3.1 days per position**. As this marks the **first foundation campaign deployment of Seaway Ventus**, there appears to be **significant potential for efficiency gains**.

For **pure TP / secondary steel campaigns**, an **average duration of 0.9 days per position** was recorded in Q4, with **Coastal Virginia** leading performance at a **0.6-day average**.

At **Calvados**, **drilling and casing** activities continue, with **early signs of improving installation efficiency**. However, performance **remains above Saipem's target of 7 days per position**.



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5. New WTG Installations – Number Installed

WTG Installation

WTG Installation Q4-2025

In **Q4**, **127 turbines were installed**, **down 40% vs. Q3**, but **up 76% vs. Q4-2024**.

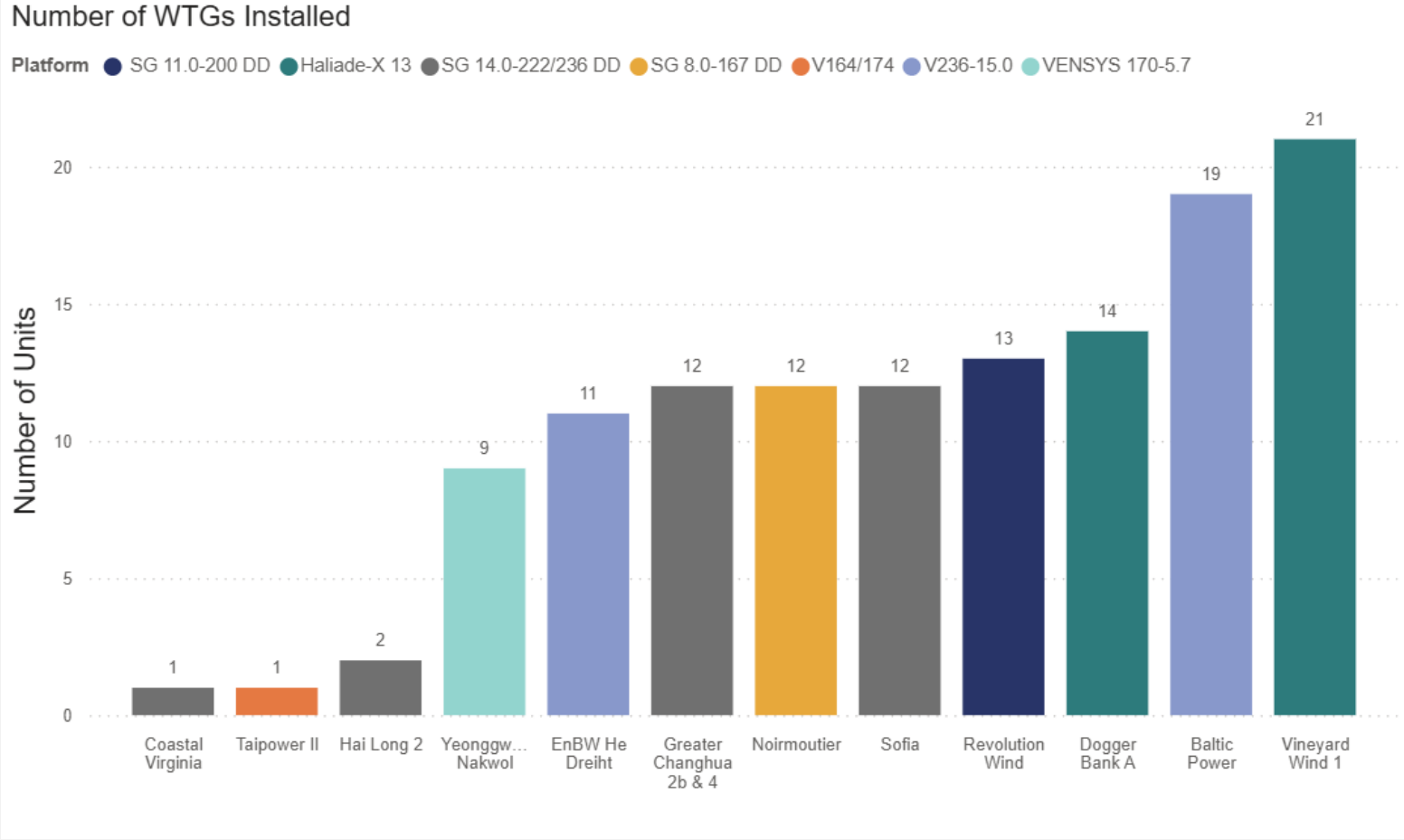
At **Vineyard Wind 1**, **21 turbines were visited**, reflecting a mix of **new installations** and **blade-related repair work**. Elsewhere in the **U.S.**, **13 turbines** were installed at **Revolution Wind**. **Both projects faced stop-work orders in late December**, which were **resolved in January**.

At **Baltic Power**, **19 Vestas V236-15 turbines** were installed, **outpacing He Dreiht**, where **11 turbines** were installed.

In the **UK**, **Dogger Bank A** saw installation of **14 turbines**, while **Sofia** recorded **12 turbine installations**.

In **APAC**, **Greater Changhua 2b & 4** installed **12 turbines**, **Hai Long 2** completed installation with the **final two turbines**, and **Taipower II** installed its **first turbine**.

In **South Korea**, **Yeonggwang Nakwol** saw installation of **nine VENSYS 170-5.7 turbines**.



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5. New WTG Installations – Average Durations

WTG Installation

On-Position WTG Installation Durations Q4-2025

On-position WTG installation duration rose to **5.1 days per position in Q4**. This represents a **long duration** both in the context of historical Q4 performance and **2025 YTD benchmarks**.

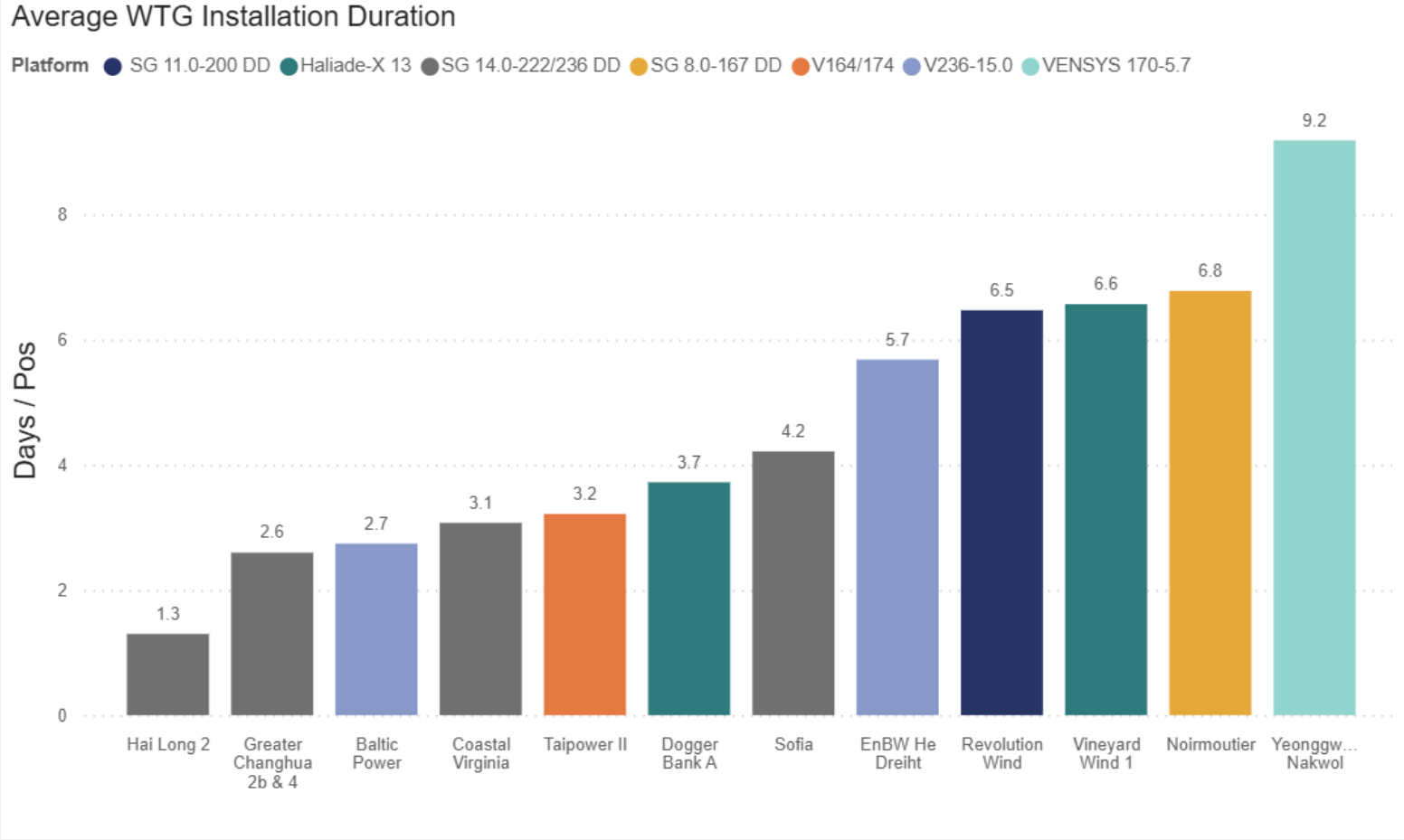
Yeonggwang Nakwol recorded a **9.2-day average**, likely driven by the **novel installation technique** and a **barge-based setup**.

U.S. projects, as usual, saw **longer installation durations**; however, performance remained broadly **in line with historical U.S. benchmarks**, despite **very high wind conditions in Q4**.

Noirmoutier experienced **extended durations on a few positions**, though the **underlying driver remains unclear**.

EnBW He Dreiht saw **significant weather impact**, likely contributing to **slower installation rates**. **Sofia** and **Dogger Bank A** also recorded **relatively long durations**, partly due to **adverse weather**.

Baltic Power and **Greater Changhua 2b & 4** were among the **fastest performers**, with **limited weather impact** on on-position activities (**Hai Long 2 saw only two turbines installed**, limiting comparability).



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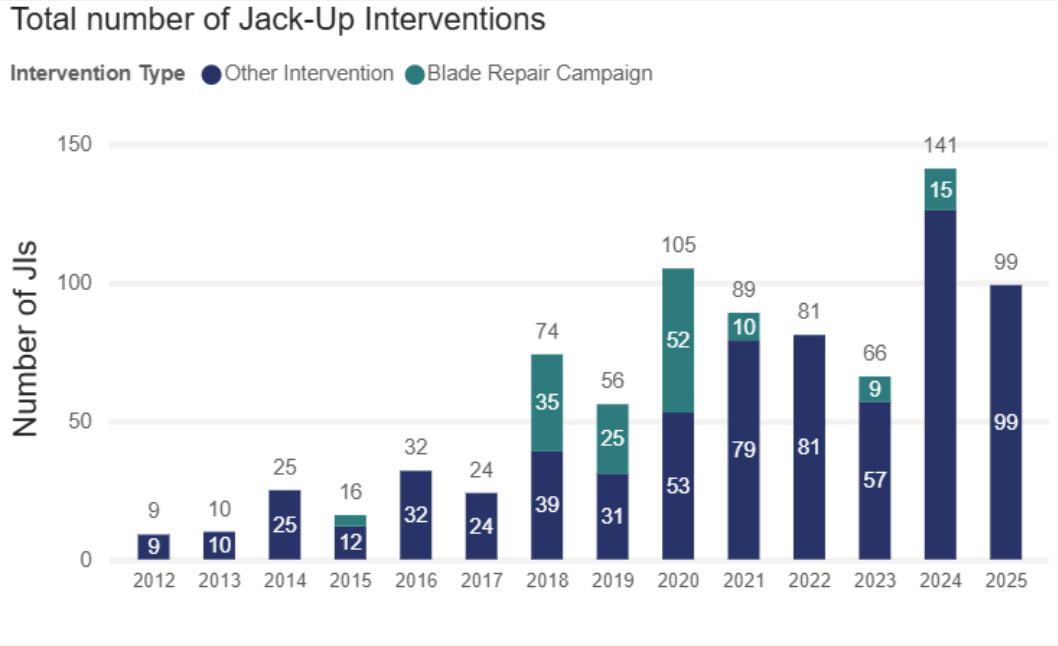
6. New O&M Activities

Jack-Up Interventions (Major Component Exchanges)

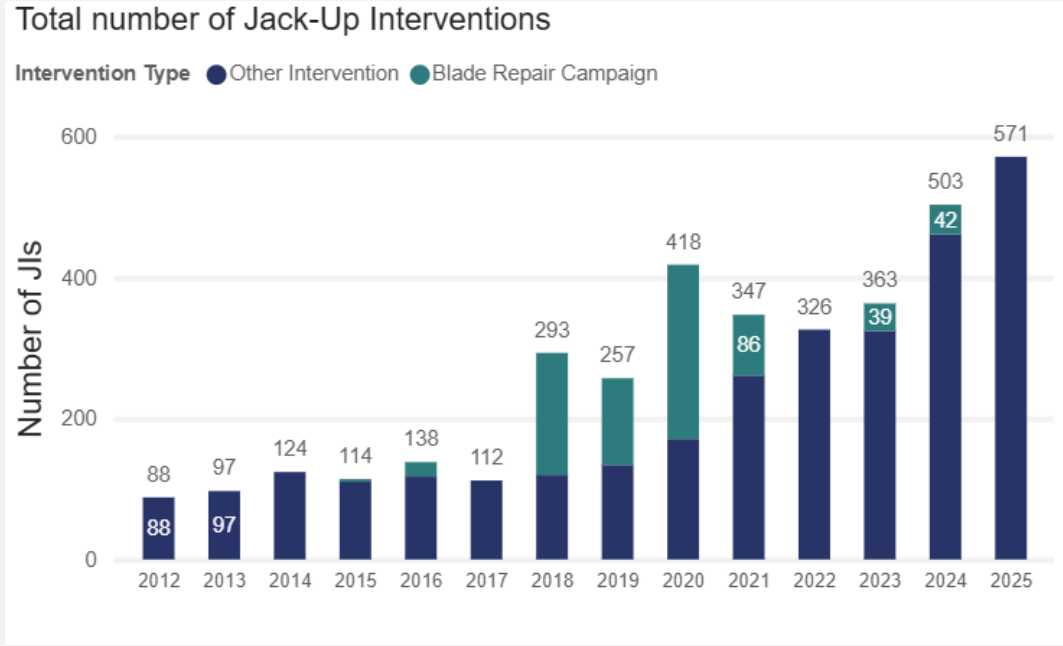
Number of Jack-Up Intervention Q4 2012-2025

- **Q4 2025 recorded 99 jack-up interventions**, representing a **30% decrease compared to the record level in Q4 2024**.
- There is **no clear indication of the drivers** behind this decline. The **platform mix of visited turbines** remained broadly **consistent with Q4 2024**.



Number of Jack-Up Intervention 2012-2025

- O&M jack-up intervention activity **continued to increase in 2025**, with **571 interventions recorded**, representing a **14% increase compared to 2024**.
- The increase was primarily driven by the **widely deployed Siemens Gamesa G4 and D6/D7/D8 platforms**, as well as the **Vestas V164 and V174 platforms**.



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6. New O&M Activities – Review of ZITON Activities

Jack-Up Interventions (Major Component Exchanges)

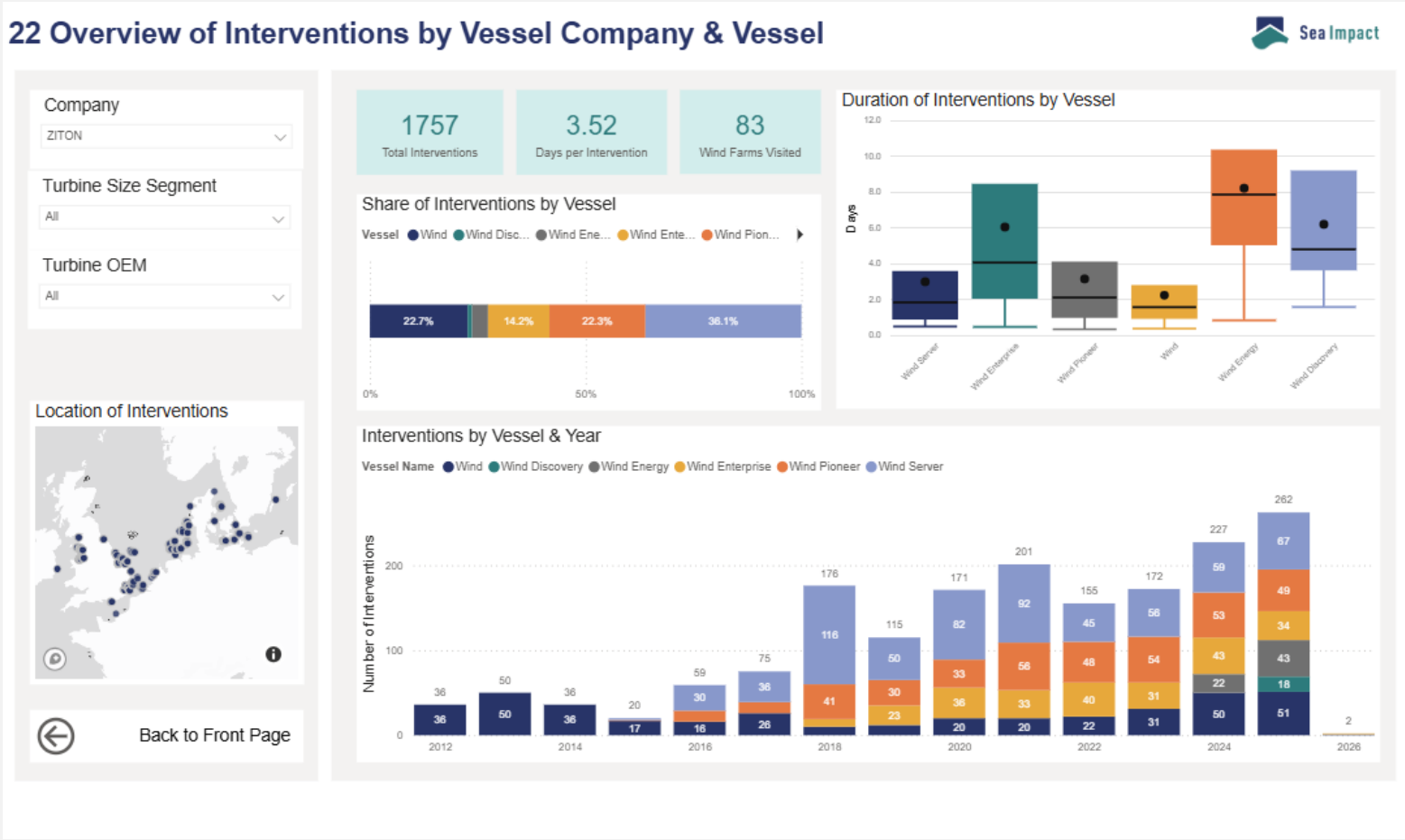
ZITON O&M Activities

ZITON is the **market leader in the O&M jack-up intervention segment**.

In **2025**, ZITON set a **new annual record**, completing **262 interventions**. Across the **14-year period tracked by Sea Impact**, **Wind Server** has carried out the **highest number of interventions**, with **635 interventions**, accounting for **36.1% of all ZITON interventions** over the period.

ZITON's continued growth has been supported by **fleet expansion**, with **Wind Energy** joining the fleet in **2024** and **Wind Discovery** added in **2025**.

Intervention durations partly reflect the **turbine platforms serviced**, with **Wind Enterprise**, **Wind Energy**, and **Wind Discovery** increasingly deployed on **larger turbine classes**, which typically require **longer service durations**.



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7. Project Deep Dive

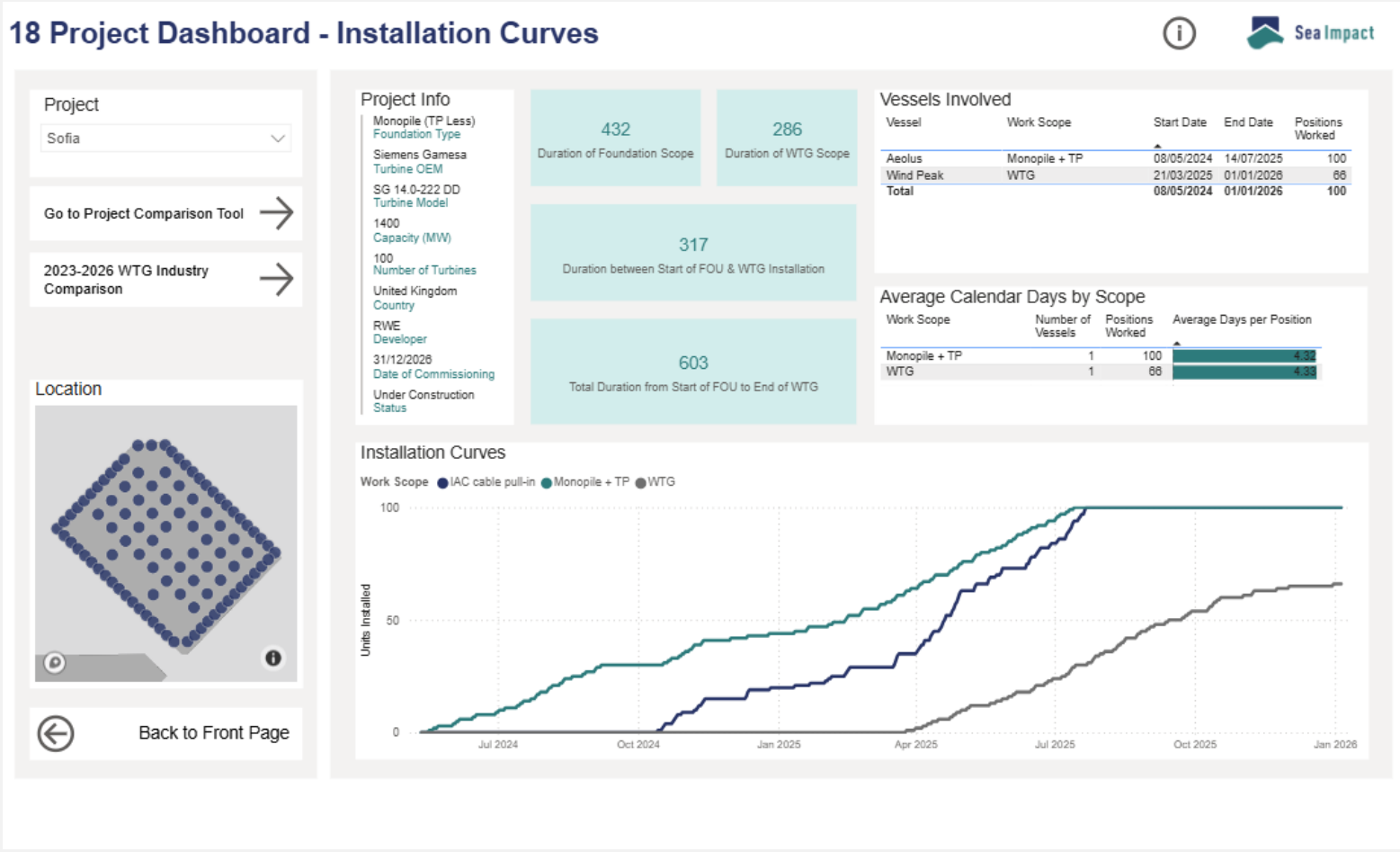
Sofia Wind Farm

Sofia Installation Progress – RWE with Steady Progress

The **Sofia Wind Farm** is currently under installation, featuring large **TP-less monopiles** and **Siemens Gamesa's SG 14.0-222 DD turbines**.

Key Installation Highlights:

- The **foundation scope** achieved steady progress, completing **100 monopile and secondary steel sets** in **432 days**.
- The campaign has been in the slower half of the market, with longer durations both on-position, in transit, and in port compared to industry averages.
- The **turbine campaign** is progressing steadily, with **66 turbines installed over 286 days**, averaging **4.3 days per position** — slightly slower than industry norms for this turbine model.
- There has been a slow in Q4 partially due to **weather impact**.
- The **float between foundation and turbine installation** was **317 days (3.2 days per position)**, slightly below the industry average.
- For comparison, **Ørsted** projects have typically operated with a more aggressive float of **1.0–1.5 days per position**. They are the only developer consistently applying this aggressive approach.



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7. Project Deep Dive

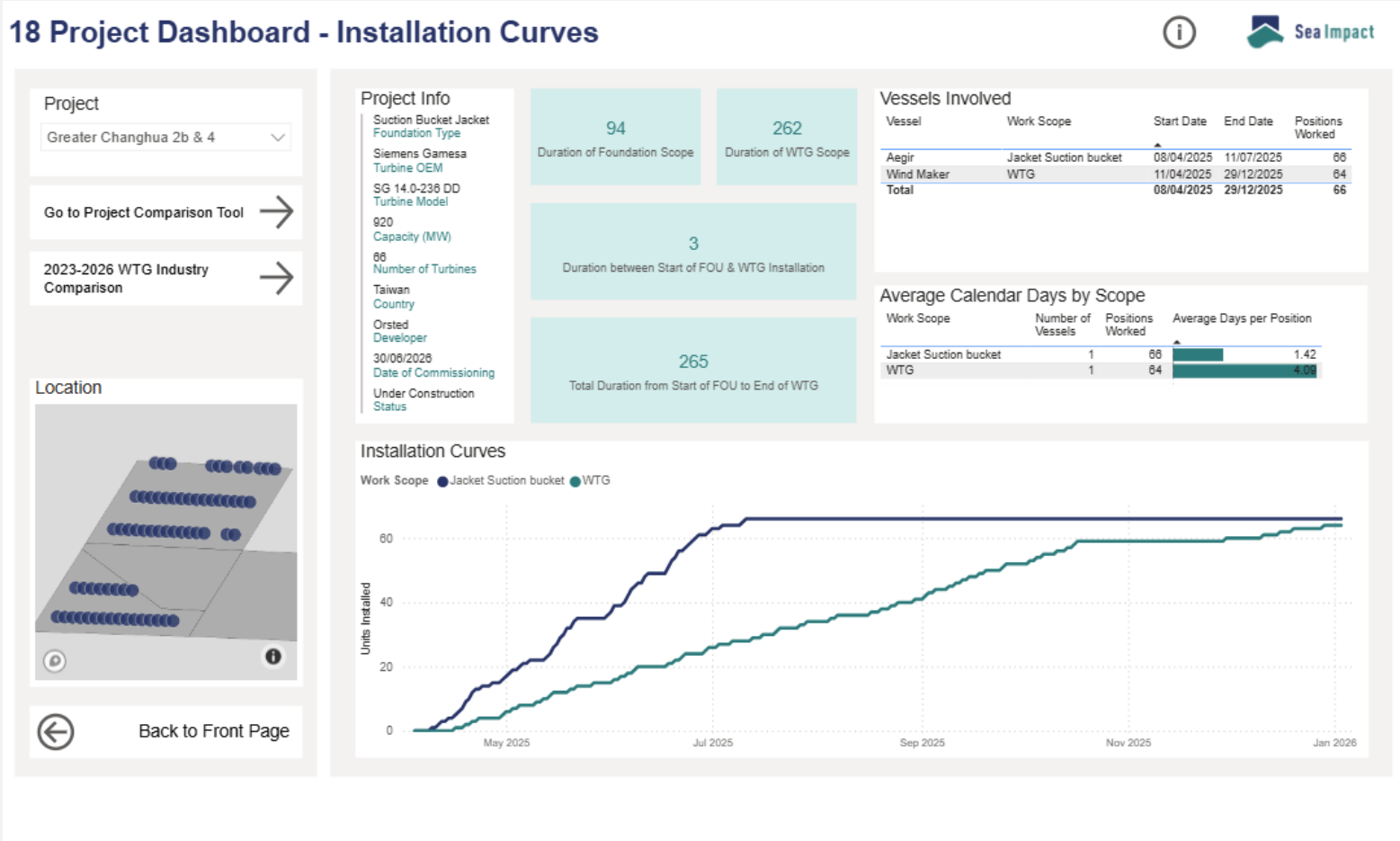
Greater Changhua 2b & 4

Greater Changhua 2b & 4 Installation Progress – Ørsted with Tight Program

Greater Changhua 2b & 4 is currently under installation, featuring suction bucket jackets and **Siemens Gamesa's SG 14.0-236 DD turbines**.

Key Installation Highlights:

- The **foundation scope** saw rapid progress, completing **66 suction bucket jackets in 94 days**.
- The campaign has been among the **fastest foundation campaigns** in the industry.
- The **turbine installation campaign** initially progressed at a strong pace. However, a **campaign pause in November** reduced overall efficiency, with **64 turbines installed over 262 days**.
- The **float between foundation and turbine installation was just three days**, representing the **shortest foundation-to-WTG transition observed in the industry**.



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Contact Us

Let’s have a meeting to discuss recent insights and check in on your user experience

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Thanks for reading!
Let’s setup a call to catch up