KEEPING BRITAIN TRADING

Optimising LEEF: Berth Utilisation, Services and Port-Call Efficiency

Introduction:

Associated British Ports operates 21 separate locations across the UK, each being in strategic locations to maximize efficiency and business opportunities. Lowestoft harbour mainly supports: Aggregate, Liquid Bulks, Offshore Wind and Project Cargo.

Whilst other ports in the ABP ecosystem are tailored to other services, Lowestoft is mainly known for being the most Easterly port and town in the UK.

This report assesses the operational efficiency of the outer port, LEEF, with a particular focus on berth utilisation, available services and opportunities to improve the overall port-call experience for vessel crews, agents and operators using LEEF's berths.

The 4 Week Plan

The plan for these 4 weeks will be spent coming up with ways of making LEEF the best port possible. The entire project has been made so that every week is doing something new whilst also keeping it realistic. Week 1 was planned by day, and the rest were a rough outline.

4-week plan:

Week 1 – Define and baseline

• Day 1–2: get access to berth logs for LEEF

• Day 3–5: Pull 5-month dataset, clean in Excel, build simple occupancy dashboard, walk LEEF to verify berth numbering and utilities

Week 2 – Listen and map

• Send short survey via port agents

• Draft process map of a standard port call (didn't get to in time)

Week 3 – Analyse

• Calculate utilization by berth and by vessel type, identify peak vs idle patterns

• Crosstab service demand vs current offer.

Week 4 – Recommend and present

• Build final outputs: 1finalise report and cross check information

• Present to supervisor

Berth Usage:

The data I have been able to cover which spans from January to the end of May 2026.Berth 3 has the highest usage rate having a staggering 85.3% occupancy rate. With berth 1 having the lowest at a 36.9% occupancy rate. Whilst berths 1 and 2 all see around the 1,500 hours mark with the lowest being berth 1 at 1,335.5 hours of usage in this timeframe with the highest of the 2 being berth 2 at 1,590.6 hours respectively showing good amounts of usage on the outer port. With the average overall utilization being 57.9% across all 4 berths

Utilization Breakdown by Asset

Berth ID	Total Hours Active	Estimated Occupancy % (Jan-May: 3,624 hrs)
LEEF Berth 1	1335.5	36.9%
LEEF Berth 2	1590.6	43.9%
LEEF Berth 3	3090.2	85.3%
LEEF Berth 4	2379.4	65.7%

Figure 1: Utilization chart

Estimated percentages of berth usage are out of 672 hour months as follows for each berth. Berth 1 has an occupancy rate of 36.9%, Berth 2 has an occupancy rate of 43.9%, Berth 3 has an occupancy rate of 85.3%, and finally Berth 4 has an occupancy rate of 65.7%. This shows that the berths are being utilized well with them having such high occupancy percentages.

The data I have collected also compiles into some performance KPI's (key performance indicators) with 79 vessels recorded in the data I have collected. These include data such as average stay duration and average vessel length. The statistic for average vessel length goes around 69.9 meters (when rounded to 1 decimal place). This shows

LEEF's capacity when it comes to ship sizes. The average stay duration for these vessels works out at 193.9 hours (again rounded to 1 decimal place) so this shows that LEEF has a relatively quick turnaround when it comes to vessels mooring up and leaving again especially as some stay for longer periods of time for maintenance or inspections. One final KPI is the total hours utilized by all the berths together, which is 8,395.7 hours.

Key Performance Indicators (KPIs)	
Total Recorded Vessel Visits	79
Total Hours Utilised (All Berth)	8395.666667
Average Stay Duration (h)	106.2742616
Average Vessel length (m)	69.94582278
Shore Power Adoption Rate	0.0%
Total Fresh Water Supplied (m3)	3033
Total Fuel supplies (T)	16292

Figure 2: KPIs

LEEF's berths can also support vessel refueling and freshwater provision. These services are valuable for vessels undertaking longer journeys, as they enable operators to replenish essential supplies without entering the inner harbor. This is useful as boats can come in just to refuel especially on longer journeys making LEEF an optimal location for those maneuvers. This also proves beneficial to the port as they can also get a higher income per berth from the incoming ships.

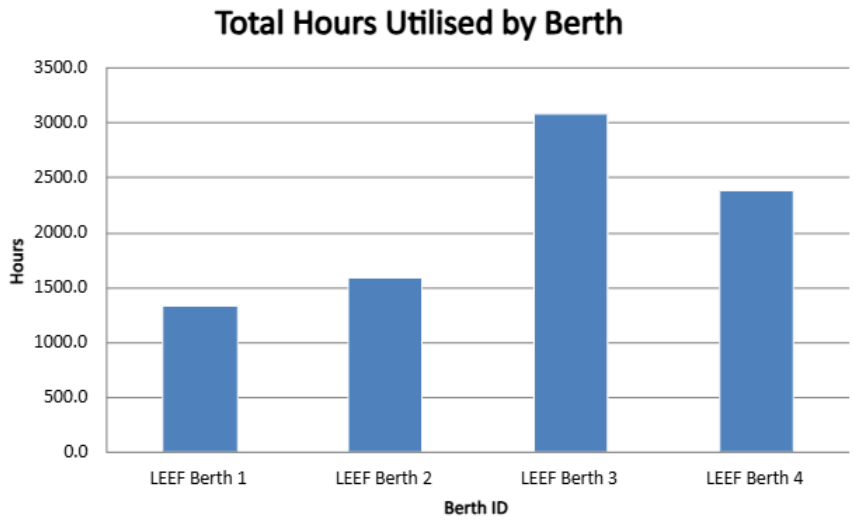

Figure 3: LEEF berth utilization graph

LEEF has accommodated a varied range of vessel types, including anchor-handling vessels, CSOVs, dredgers, jack-up vessels, platform-supply vessels, research and survey vessels, tugs and WTW vessels. Platform-supply vessels were the most frequently recorded vessel type, while dredgers and tugs were the least frequent, each recorded once between January and May 2026.

With the most amount of these boats being the platform supply and the least being both dredgers and tugs with them both only mooring up at LEEF once between January and May 2026.

Other bits of data that can be taken are the fleet statistics. Like with the longest and shortest stays at LEEF with 26 unique vessels served with the most frequent visitor within this data being Bos Prelude with it visiting 10 times.

Fleet Statistics	
Unique Vessels Served	26
Vessel Types Recorded	9
Most Frequent Visitor	BOS PRELUDE
Visits by Top Vessel	10

Figure 4: Fleet Statistics

The longest stay at LEEF during this data is 1215.0 hours by Ocean Researcher. Also, the shortest stay at LEEF was 3.6 hours by BB Ocean. Grampian Eagle also is the largest vessel at 95.9m and smallest vessel being Haven Seachallenger

Docking Records	
Longest Stay (hours)	1215.0
Longest Stay Vessel	OCEAN RESEARCHER
Shortest Stay (hours)	3.6
Shortest Stay Vessel	BB OCEAN
Largest Vessel (m)	95.9 (GRAMPIAN EAGLE)
Smallest Vessel (m)	5 (HAVEN SEACHALLENGER)

Figure 5: Docking Records

Another statistic that can be shown is the services and resources with everything from fresh water to the total fuel that was supplied. The total for fuel on LEEF is 16,292 m^3 can also be shown as part of an average which is 239.6 m^3. The amount of fresh water supplied to all the vessels is 3,033 liters with the average being 38.4 liters

Services & Resources	
Total Fresh Water Supplied (L)	3,033
Avg Fresh Water per Visit (L)	38.4
Total Fuel Supplied (m^3)	16,292
Avg Fuel per Visit (m^3)	239.6
Shore Power Adoption Rate	0.0%

Figure 6: Services and Resources

The last amount of data that we have is the vessel type percentage. With the most being platform supply vessels at 65.8% of all vessels to come through during January to May 2026. With the lowest being between dredgers and tugs both at 1.3% each.

Vessel type	*Vists*	*%of Total*
PLATFORM SUPPLY	52	65.8%
ANCHOR HANDLING	6	7.6%
CSOV	6	7.6%
RESEARCH/SURVEY	5	6.3%
JACK UP	3	3.8%
WTW	3	3.8%
RESEARCH	2	2.5%
DREDGER	1	1.3%
TUG	1	1.3%
TOTAL	**79**	**100.0%**

Figure 7: Vessel type and visit percentage

Possible services for boats and their crews:

One potential enhancement is the provision of vessel shore power. This could make Lowestoft more attractive to operators with hybrid or low-emission vessels and to companies working towards carbon-reduction targets. However, this would require investment in infrastructure and careful consideration of electricity capacity, costs, and potential on-site generation requirements. ABP would also need to determine an appropriate charging model for the service.

This could make Lowestoft more of a destination for companies with carbon emissions targets as the infrastructure would already be in place. ABP would have to charge for this service due to high electricity fees and due to maxing out its allowed electricity intake by UKPN, meaning ABP will have to make its own on-site electricity to make it work whilst also having the necessary infrastructure to transmit the power onto the boats whether they make enough to charge them or keep the boats systems running whilst docked will be up to ABP to decide due to structural limitations of the area.

Another service that LEEF could provide is the option for loading equipment such as cranes and forklifts to be always positioned on site for ease of access by companies so they can load and unload equipment faster than the can already meaning that ABP can generate more money from ships mooring in and not staying for longer

periods of time at LEEF, especially as it's on the outer ports so the bridges are not always needing to be raised making LEEF more optimal for boat operators who want to unload or load equipment quickly whilst possibly helping ABP generate a higher income from LEEF in the long term just from the equipment being sat there. The equipment on LEEF could also be rented by ABP, making them more of a long-term investment rather than a deficit.

A service that could be provided and requested from the survey is automatic vehicle registration recognition systems to make access to the port easier. This would help security differentiate the port cars from the third-party contractors. It would also help increase port security overall because if it's a car that doesn't get registered, then security should question what their business at the port is. The other reason for this is that it can improve the efficiency of vehicles coming on and off the site.

Welfare facilities for third party contractors are also something that could be offered on LEEF. This is so these people can have an area to rest and use the toilet whilst on break, so they don't have to use the boats' toilets or travel off site. This can also increase productivity as they wouldn't need to go off the site to find certain facilities. It would also increase satisfaction with LEEF if these types of services were in place.

The last service that is wanted is an on-site refueling facility. This can be included in the port tariff making ABP more money from the Lowestoft location. It would also make LEEF a more desirable location for vessels which need fuel regularly during port call making the crew not have to find elsewhere to refuel whilst staying out on the outer harbour.

Service Comparison (Great Yarmouth)

The nearest Port to Lowestoft is Great Yarmouth, and this will be the main port for comparison. Through this research I will be writing the differences between the 2 ports and providing practical solutions to make Lowestoft the better port for businesses.

One key difference between Lowestoft and Great Yarmouth ports is the depth of the berths with Yarmouth reaching 10 to 11 meters deep with smaller berths going to 5 meters. Lowestoft, on the other hand, goes down to 7.5 meters showing the difference in the depth of the boats that can moor up at both Ports. This will impact Lowestoft's trade capability compared to Yarmouth due to the smaller berth size but due to the geology of the area. Attempting to have higher berth depths at Lowestoft is a bit of a practical challenge because of the geology of the seabed outside the harbour would make it difficult to keep it at a higher depth, making it cost more money to maintain than it would bring in.

Another difference between LEEF and Great Yarmouth is the pricing between them both. The prices you are about to see are from a boat that is an SOV with 68m LOA, 16.08m beam, 2182GT, 1000NT, 5m draft. The first port dues that are paid differ between Lowestoft and Great Yarmouth because in Lowestoft you get charged £1.86 every 48 hours and in Great Yarmouth you get charged £1.87 every 96 hours these are charged by tonnage at LEEF and by meter at Great Yarmouth. Next is the mooring charge that comes to £182.46 at

Lowestoft and £168 at Great Yarmouth. The next set of charges is the waste fee with Lowestoft charging £128.40 for waste removal while Great Yarmouth on the other hand charge £92.50 showing. For boats Lowestoft charges by the ton whilst Great Yarmouth charges by the meter making vessels that are longer cost more to moor up.

Figure 5: Great Yarmouth (drone view)

Infrastructure Comparison: LEEF vs. Great Yarmouth

A side-by-side infrastructure and future capability breakdown comparing Lowestoft's LEEF asset directly to Great Yarmouth's Outer Harbour.

Operational / Tech Feature	Lowestoft: LEEF Infrastructure	Great Yarmouth: Outer Harbour / Port	Strategic Advantage Winner	Commercial / Operational Impact
SHORE POWER & DECARBONIZATION				
CTV Shore Power	Fully active, operational plug-in shore power links established across 6 dedicated CTV pontoons.	Standard commercial multi-user pontoons. No widespread active smart-grid CTV shore plugging built-in.	**Lowestoft (LEEF)**	Allows standard daily CTV fleets to turn off generators instantly, cutting fuel use and meeting strict green O&M mandates.
SOV / Large Ship Cold-Ironing	345m main quay has subterranean utility conduits built-in for future-proofed high-voltage connection (not yet live).	Traditional heavy-berth grid distribution. High-voltage marine shore-power requires bespoke grid infrastructure setup.	**Tie / Future-Proofed to LEEF**	Both ports require substation/commissioning upgrades for heavy ships, but LEEF has the physical underground routes pre-laid.
Alternative Green Fuels	8 acres of flexible quayside land adjacent to berths optimized for future modular Hydrogen/Methanol storage tanks.	Massive acreage, but largely prioritized for heavy industrial marshalling, decommissioning space, and aggregate layouts.	**Lowestoft (LEEF)**	LEEF is more physically optimized for a compact, localized 'green fueling ecosystem' specifically for dedicated O&M fleets.
VESSEL ACCOMMODATION & NAVIGATION				
Draft Depth & Vessel Size	7.5m constant depth. Built explicitly for standard SOVs, CTVs, and medium bulkers.	10m to 12m deep-water draft. Built for massive heavy-lift installation ships, jack-up rigs, and large deep-sea cargo.	**Great Yarmouth**	Yarmouth completely dominates on scale; it can host massive installation vessels and jack-ups that physically cannot enter Lowestoft.
Tidal / Open Sea Access	Protected outer harbor design, but requires entering Lowestoft's approach channels.	Completely open, direct-access tidal Outer Harbour right on the North Sea coast. No river transit or locks needed for outer basin.	**Great Yarmouth**	Provides faster, lock-free access for massive deep-sea vessels with zero air-draft or beam restrictions.
MULTIMODAL LINKAGES & LAND USE				
Logistics Connections	Directly integrated with the wider port's active quayside rail infrastructure.	Completely reliant on road freight via the A47 / local road networks (supported by the new Herring Bridge).	**Lowestoft (LEEF)**	LEEF can seamlessly feed heavy cargo (Sizewell C aggregates/steel) directly from ship to rail, taking freight entirely off roads.
Acreage & Project Marshalling	8 acres of dedicated, secure co-located space. Highly specialized but constrained in total size.	Extensive open terminal storage footprint over multiple hectares, optimized for massive wind turbine blade/tower assembly.	**Great Yarmouth**	Yarmouth is the definitive choice for initial wind farm assembly/construction phases due to its massive layout space.

Figure 6: Differences between Great Yarmouth and LEEF

Service Comparison (Kings Lynn)

The differences between LEEF and Kings Lynn are very different in terms of the cargo they both import and export. With LEEF mainly being tailored and marketed as an offshore energy resources supplier and exporter. Kings Lynn is mainly tailored to general bulk goods like forest products, construction, and bulk energy.

These differences make an odd look at both harbours. This is due to having purpose-built infrastructure for their respective industries. Like Kings Lynn has grain silos on site and LEEF is having a warehouse built for Clarkson's on behalf of RWE.

The storage areas available on Kings Lynn are:

- covered storage (13,000 m^2),
- grain silos (25,000 t)
- steel sheds
- 7,000 m^2 transit stores.

This shows the diverse amount of storage on the port at Kings Lynn. It also highlights how different they are compared to LEEF due to their assortment of different services that they offer.

The storage areas available on LEEF are:

- Up to 8 acres (3.23 ha; 32,375 m^2).
- New 2,000 m^2 warehouse

This does highlight how new LEEF is compared to Kings Lynn due to how little covered space there is on LEEF currently. This should change in the near future due to expansions allowing for more covered storage operations on LEEF.

Other things you could also see are the different specialist services they both offer with Lowestoft offering services such as CTV berths (six), SOV berthing, utilities at berths (power/water; future fuels/shore power provision), heavy lift capable quays. Showing that LEEF is more tailored to the offshore power industry in the North Sea.

Kings Lynn's port offers other specialist services with them being, on dock machining, haulage, sampling/testing, project cargo handling, cranes and stevedoring. The offer of things like cranes makes boats more likely to go there as it can be included within the port tariff rather than getting a 3rd party crane in making it easier for the ship agent and company to get their cargo unloaded at Kings Lynns port.

The last set of differences are the quay size, depth and the maximum vessel size of the ports berths and the entrance. Kings Lynn has an enclosed dock and riverside quay; handles vessels up to 119 m with a

typical max draft 6–7 m. This means that Kings Lynn has the availability to have bigger boats that LEEF.

LEEF on the other hand has these facilities: 345 m quayside; three deep-water berths with 7.5 m draft; designed for uninterrupted SOV operations at all tides. This is perfect for Leef due to the smaller land area than Kings Lynn. The need for any tide operations is vital to LEEFs' success due to low tide making it difficult to get boats into the harbor.

Figure 7: Kings Lynn port (drone view)

Service Comparison (Felixstowe)

Felixstowe differ significantly from LEEF in scale, purpose and infrastructure. Felixstowe is a major container port with facilities designed for high-volume container handling, while LEEF is a smaller, specialist facility focused on offshore energy support.

The differences between the two are as follows:

Felixstowe has a huge operational capacity with them having the room for up to 18.0 m draft; 9 berths across two terminals; 2,354 m Trinity Terminal creating a huge space for them to import and export large amounts of cargo. The other major difference between both LEEF and Felixstowe is the specialist services that Felixstowe offer is Rail intermodal (58 trains/day), automated cranes, project cargo handling, 24/7 marine services. The use of rail services makes Felixstowe more connected to the rest of the country whilst keeping them able to operate efficiently from the east of England. The storage capacity of this port is also much larger than LEEF with access to large container yards (152k TEU (Twenty-Foot Equivalent Unit) yard capacity); specialist container services and limited heavy laydown.

LEEF on the other hand is much smaller in size than Felixstowe, meaning that storage capacity and the size of vessels that they can accommodate are vastly different. With LEEF having a 345m quayside

and 3 deepwater berths each with a 7.5-meter draft, LEEF can have large vessels in but not as big as the ones mooring up at Felixstowe. Also, LEEF specializes in Berth utilities (power/water), future shore power/alternative fuels, CTV/SOV staging and marshalling. The storage capacity at LEEF is Up to 8 acres open operational space; new 2,000 m^2 warehouse for sensitive kit. This shows the challenge of not having as much room as Felixstowe whilst still trying to maintain the throughput of cargo for both imports and exports.

Figure 8: Arial photo of Felixstowe port

The Survey

A survey was sent to ships agents to see what services are available and what could be offered at LEEF and what the agents want to increase efficiency of the general port call. These questions were sent to the following companies/people:

- GAC
- Clarkson's
- Petersons
- Seletar
- Cory
- Gardline
- Arthur Smith
- AWSML
- North Star

The questions are as follows:

Question 1: What do you believe could make your port call any easier at LEEF

Question 2: Are there any services that are not offered currently you would like to be investigated and implemented in the future

Question 3: How satisfied are you with the currant services that LEEF provides as of this current moment

Q1 responses
Security to offer proper instructions to site visitors. Designated walkways and roadways that are clearly marked.
Sometimes we need quicker responses to questions on pilot boarding times and tidal conditions to make decisions on port calls.
Booking system is straightforward.
Ex Pipe fuel delivery, or local fuel barge availability, local tug service availability can be a problem for the larger vessels that require assistance to berth
Agents deal with port calls
Just in time arrivals so not waiting around for pilots.
None

The responses to Question 1 highlight several opportunities to improve port-call efficiency. Some respondents requested quicker communication regarding pilot boarding times and tidal conditions, suggesting that more timely updates would support better decision-making.

This is said in 2 responses showing it's an issue for these companies. This can be fixed with quicker communication to clients, making their port call easier. Security also needs to make sure that they are offering clear instructions to site visitors and designated walkways to keep people safe and away from traffic.

Q2 responses
Ex-pipe MGO delivery
fuel ex pipe, vehicle plate recognition to open security gate if gatehouse not manned, although not had any real issues so far
Welfare facilities for third-party contractors.
Fuel supply, reliable local tug availability.
Refueling facility
Shore power to keep emissions down
Quick fixes that are included in the port tariff but aren't always available when you need it. The use of a forklift is an example when cargo needs to be moved slightly

The responses for question 2 show that Ex-pipe MGO delivery is wanted at LEEF. This would be expensive to build and maintain, but it would make port call a lot easier and quicker for companies reducing port call delays.

Welfare facilities for 3rd party contractors are also something needed at LEEF due to them not having any on-site. This usually leads to them using other companies' toilets or other buildings off site. It can also increase the moods of these contractors as they would have somewhere dry to sit or go to the toilet whilst getting off the boat and onto land.

There are also questions about possible vehicle plate recognition at the security gates at LEEF which can open and close the gates when they enter and leave.

Q3 responses
It's a good site and clearly still in the development stages
quite satisfied, although berth availability can be an issue now LEEF is being utilized more
Security needs to be more visible as some keep blinds closed and do not communicate; they just open the barriers.
Very satisfied. The ABP team are very proactive in trying to accommodate our requirements, quite often at short notice
Good platform for cargo ops and water only service provided.
Not many services are offered
LEEF is a hub for many offshore projects, but most services are obtained from other parties as with most other ports.

Responses to Question 3 were generally positive, with several respondents recognizing LEEF as a strong platform for cargo operations and offshore energy activity. With others saying there's not many services are offered and how many services are obtained from third party companies.

Security also needs to be more visible to people as some keep their blinds closed and just open the barriers. This would make LEEF seem much safer is security was more visible making boat companies feel safer and more confident leaving their cargo on the harbor rather than keeping it on board for longer than needed.

The future projects at LEEF

The future of LEEF looks bright from current projects to future aspirations. These current and future projects are the warehouse project being undertaken on LEEF already with progress ramping up with parts of the roofing beams being put up at this point for an estimated completion date of November. The companies the warehouse is being built for is Clarkson's' and RWE.

Another development on LEEF is the fuel bunds which are going to be used to refuel ships along LEEF which will increase business in the long term.

There are 2 projects which are being investigated as a possibility and could happen a long while from now on is an expansion of LEEF to either have the availability of having larger ships whilst also keeping up with efficiency and safety requirements. The other project being looked at is shore power which would make electric boats be able to charge at LEEF keeping in line with carbon targets making the port produce less CO2 than it currently does, making it more eco-friendly in the long run.

The possible expansion of LEEF in the future could make a lot of sense as they would be able to accommodate both bigger boats or more boats than before making LEEF more profitable in the long run. It would also increase the base load capacity that can be dropped off at LEEF, creating more opportunities for business.

This could then open the opportunity for another warehouse to be built with the possible extension. This would house another company after completion and be used as a storage space for materials that are going to be exported.

The possibility of having shore power at LEEF is good due to the fact that they would be able to charge electric vessels, helping cut down on carbon emissions. This can also bring more money for ABP due to the service being added to the list of extra services that can be utilized whilst at LEEF.

Figure 9: Visualization of LEEF in the future

The Conclusion

This report has reviewed LEEF's current operation, berth utilization and role in supporting cargo and offshore energy activity. It has also considered feedback from ship agents and companies to identify potential improvements that could strengthen the port-call experience and increase operational efficiency.

One key attribute of this entire project is the visualization of the boat mooring data. This was created in excel to get the percentages necessary to be presented as evidence of the full berth utilization at LEEF. This data shows everything from the time spent at a berth to the amount of fresh water each individual vessel had taken. This data is useful to show LEEFS potential for the use of only refueling and not having to worry about booking any bridge lifts.

The service comparison with Great Yarmouth, King's Lynn and Felixstowe highlighted both opportunities and limitations for Lowestoft. While LEEF cannot match the scale, depth or storage capacity of larger ports, it has a clear specialist role in offshore energy support and can strengthen its position by improving services that directly benefit vessel operators, agents and contractors.

This was done to highlight anything Lowestoft could do as a future project to try and get as much business as possible. It was also done to highlight anything that couldn't possibly be done due to site restrictions with load size and applicable storage, same with the size of the boats as well due to the restrictions on the entrance to LEEF.

The survey is the main part of the project that was the most interesting by far. This is due to the feedback I got from actual companies and ships agents. I got 7 responses to my survey in which I asked 3 simple questions based on satisfaction with the port and any future services that could be of any use.

The responses were mostly positive and gave good feedback on future additions that can be realistically done at LEEF to make it the best port possible.

By prioritizing these improvements, LEEF can continue to develop as a competitive, efficient and specialist port facility that supports offshore energy growth while improving the experience for vessel crews, agents, contractors and port users.