Project Report on Global Port Expansion Projects

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Glossary

- AI – Artificial Intelligence
- AGV – Automated guided vehicles
- CMA CGM SYMI – Container ship
- DOE – US department of energy
- Electrification – Replacing fossil fuel powered equipment/operations with electrically powered systems
- STS – Ship-to-Ship
- IoT – Internet Of Things (refers to the network of interconnected devices that can collect, exchange, and act on data over the internet)
- JFF / JFF Fendercare – James Fisher Fendercare
- LNG – Liquified Natural Gas
- VTMIS – Vessel Traffic Information System
- TEUs – Twenty-foot equivalent Unit a standard measure of container capacity

Introduction

This report investigates current and planned port expansions projects across major global regions and examines potential opportunities these developments can create for JFF Fendercare.

Importance of ports

Ports play an essential role in global trade. As the ports with deeper and more berths, higher capacity and more durability with different cargo types give the country more opportunities for trade. (UNCTAD, 2025) They also make other countries more interested to do business with them as they are capable and reliable giving the country access to more specialised cargo leading to new and improved infrastructure. Increasing capacity via, deepening berths, improved storage terminals and integrating more modern systems like AI, automatization and improved traffic systems allows ports to handle more cargo and ships making them more efficient and competitive in global trade (UNCTAD, 2025)

Why ports are expanding

As global trade and cargo ship size increases many major ports are expanding and modernizing their infrastructure. For example, Tanger Med is receiving New deep-water berths for ultra sized cargo ships (Tanger med port Authority, 2025) and to increase efficiency and productivity. The port is also receiving advanced container-handling

equipment (Tanger med port authority,2025). Another example is Rotterdam which is receiving new LNG bunkering facilities and LNG terminals due to the increase in demand for LNG fuel and the increase of LNG powered vessels and because LNG is a greener fuel Rotterdam and the rest of Europe are interested, also receiving deeper berths for installation vessels and ultra sized cargo ships (Port of Rotterdam authority, 2025).

Purpose of report

The purpose of this report is to investigate global port expansions, what are the trends of expansion like capacity increases and modernization. And which ports and information is most relevant to JFF and what JFF should do in the future with their services and products to have the best chance for business in the future.

In this report I will be assessing why and how ports are expanding globally. I will be assessing what new technologies, systems and cargo types that are being integrated into ports (UNCTAD,2025; Port of Rotterdam authority,2025; PSA Singapore,2025) and how they improve the ports' ability to handle cargo, ships and other processes. This report will also go over trends in key regions (Asia, Americas, Europe, Africa, Middle East) (UNCTAD,2025) on how and why they are upgrading their ports and in what way and what they are focusing on like increasing capacity, LNG bunkering facilities or integrating new technology etc (port of Rotterdam aurthority,2025; PSA singapore,2025)

What are my objectives

- Identifying why and how ports are expanding globally
- Compare port expansion trends across key global regions
- Investigate new infrastructure, technology and systems being integrated into ports
- Assess how changing global trade, vessels size and cargo types are influencing expansion
- Identifying how these developments could create future business opportunities for JFF Fendercare

Research Methodology

I will conduct my research by using information JFF has provided me. I will also use relevant and trusted sources, for example companies or organisations representing or funding the expansions. These will include port authorities, shipping and logistics organisations and industry reports. The research will help me see currently planned expansions which will help me see which expansions are most relevant to JFF

Key Research questions

- What are the biggest port expansion projects and what are they upgrading/expanding?
- Why are they expanding and does it follow a pattern with other ports in the region?
- What new infrastructure and technology is being added and how and why does it help?
- Which regions and ports are most relevant to JFF and the services they provide?

I will conduct my research by using the resources and interviews with staff that JFF has provided me about the services they provided and port expansions they are aware of while also using the internet for any other information I may need. For my process I will find key port expansions in key regions, research and compare them to other port expansion projects in other regions while also analysing the global trend and reginal trend and the reason for and what are they expanding and then evaluate the impact it has on JFF.

Project Overview

For this project I will be analysing the biggest port expansions. In key regions Asia, The Americas, Europe, Africa and The Middle East (Tues Mega Port, Houston Port, Rotterdam port, Tanger Med Port and the King Abdulla Port). I will research them as they have some of the most major expansion plans in each region.

I will be researching new infrastructure like new terminals, deeper berths and additional berths, modern cargo handling equipment and automated cranes. I will also examine LNG bunkering and storage, AI management systems and offshore wind facilities.

I will show why certain ports are getting expanded and what their goal for expansion is and how that ports' expansion relates to ports in the same region and globally. I will also compare my findings to from each region to find a trend in that region and how they are similar or differ to other regions trends. I will identify find the key regions and ports that most relate to JFF.

Market analysis / Research findings

Port expansions focus on increasing capacity, modernising and automating or becoming more environmentally friendly with cleaner fuels and energy sources. All regions have the aim of strengthening their position in global trade.

Asia

Asia is focusing on increasing capacity and modernising and automating their ports (UNCTAD,2025) as well as building more berths. For example, The Tuas mega port is increasing its capacity of TEUs by 27.5 million and adding 66 new berths including deeper berths for the bigger cargo ships. The port is also getting AI and automation in operations, the Next Generation Vessel Traffic Management System (PSA Singapore). Vietnam is also expanding (Saigon port corporation,2025) their ports for increased capacity, for example Saigon Port is undergoing major expansion through new infrastructure projects and upgrades to increase cargo handling capacity and with its modernised Cat Lai Terminal which alone processes about 70% of total throughput, with deep-water berths, modern cranes, and advanced logistics systems this makes the ports albitites to process more/bigger ships. These shows my point from before about Asia modernizing and increasing capacity for larger ships and growing global trade.

Europe

Europe is focusing on developing their renewable energy like offshore wind farms and LNG fuel including LNG bunkering (European commission,2024). But unlike Asia, Europe is more sustainable and are not increasing capacity so significantly and are mostly focusing on modernising and integrating new systems and cargo into their ports. They are doing this because of the Net zero targets, so renewable energy sources like offshore wind and cleaner fuels like LNG and LNG powered vessels are more popular. For example, the port of Rotterdam is dredging new deeper berths for the ultra large cargo ships (Port of Rotterdam authority,2025). The port is also getting a new railway yard and roads to improve logistics, and improved terminal with new systems like autonomous container handling equipment's as well as vessel tracking systems which will improve the ports, machines like drones also used for cargo handling (port of Rotterdam authority,2025). The port is also integrating LNG storage and bunkering for the increased in demand of LNG (Port of Rotterdam authority,2025) because slowly increasing LNG powered vessels like the UKs Saint-Malo and hybrid LNG. Europe is also increasing their berths sizes not just for the bigger cargo ships for installation vessels used to assemble and carry wind turbine components, for example the UK is increasing Lowestoft's berths depth and increasing storage space to

store turbine components (associated British port,2025). Europe is looking to modernise (European commission,2024) their ports and make them more sustainable.

Middle East

The Middle East is mostly focusing on alternative fuels like LNG and increasing their capacity for TUEs by upgrading their infrastructure while also modernizing and automating their ports (MAWANI,2025). A good example of this is King Abdulla port which is getting new berths for ultra large container ships, 28 new cranes, and new storge areas and new trade routes from global tensions, so they are upgrading their capacity (King Abdulla port,2025). The port is also getting new terminals for LNG storge for their new LNG bunkering facilities as Saudia Arbia is trying to reduce the reliance on oil for example the CMA CGM SYMI, using BioLNG fuel, they currently have 56 vessels that are powered by LNG and plan to have more (CMA CGM,2025) They are using new automated terminals for automated systems for increased productivity, for example King Abdulla port is installing Smart gate E-Systems, state of the art terminal operating systems and automated cargo handling (King Abdulla port,2025) this will be very useful and will help the port increase the amount of cargo and ships they can process as they have become more popular in global trade due to their strategic location and global tensions. Another example of this is Jebel Ali port which is receiving upgrades to also handle and process more cargo they are dredging new deepwater berths to handle bigger ships and 4 extra terminals (DP world,2025). And to help cope with the increased shipping/ cargo the port is also integrating automated systems like remotely controlled quay cranes and automated stacking cranes (DP world,2025). The Middle East is more like Asia then Europe as they are focusing on capacity to take advantage of the interest they have gotten from global trade and adding newer systems and focusing less on sustainability (UNCTAD,2025).

Africa

Africa is mostly focusing on modernizing and upgrading their ports capacity (UNCTAD,2025) due to the increase in trade from global trade route changes. This is unlike Europe and the Middle East who are focusing on automation and capacity. For example, Lamu port is getting a new container terminal and increasing capacity, new berths and new quay cranes (Kenya ports authority,2025). This is to make the port able to accommodate the ultra-sized cargo ships because Africa is becoming more popular in the global trade. Another example of Africa increasing their ports capacity and berth sizes, is Tanger Med port which is implementing new deep-water berths, new quay walls and advanced container-handling equipment which will increase the max capacity by 2 million TUEs (Tanger Med port authority,2025) while also making the port able to handle the larger cargo ships, due to trade routes changing. The port is also receiving new systems like more

modernized container handling (Tanger Med port authority,2025) equipment because of its increased capacity unlike other regions which are also modernising. Because Africa's ports are still emerging, they are focused on more core infrastructure to which most big global ports need like systems to help with container handling and bigger berths for bigger ships, so they are mostly focusing on expanding their ports.

The Americas

Americas are focusing on increasing the capacity of ports, dredging deeper berths for the ultra-sized cargo ships while also leaning towards greener energy. For example, Long Beach port (Port of Long Beach,2025) is expanding its freight rail capacity, upgrading terminal and new deeper berths, as well as normal sized berths and automated systems like expanded automated terminals and gate systems. Their freight rail is being upgraded so they can process and move cargo much more efficiently. New terminal and berths which are also being planned to take installation vessels and store wind turbines components because the U.S. Department of Energy (DOE) aims to deploy 30 GW of offshore wind by 2030 and establish a pathway to deploy 110 GW or more by 2050 so they are upgrading their ports to be able to take bigger vessels as well as upgrading terminals and storage to store turbine components. Another example for this is Houston port which is getting a channel Expansion, new terminal and logistics capacity, new terminal with improved cargo handling equipment and automated gate and traffic control systems (Port Houston,2025), these are for global trade. But the upgrades are also being used for wind turbine components and housing installation vessels, as the Biden administration aims to support by deploying 110 GW of offshore wind by 2050 making the US greener (US department of energy/Biden administration).

Brazil on the other hand is also upgrading their ports systems and capacity and investing in LNG. A good example of this is the port of Santos, which is getting 30 new terminals, export processing zone, mega container terminal (Santos's port authority). These upgrades are relevant because Brazil is modernizing and upgrading its ports because of growing demands of Brazil's trade. The port is also receiving 5G network deployment to, VTMIS and Shore power project (Santos's port authority). The port also has LNG Regasification Terminal which is a significant development in Brazil's energy infrastructure. It is a Floating Storage Regasification Unit (FSRU) type, handling 14 million cubic meters of gas per day and storing 150 thousand cubic meters, making it a major LNG bunkering hub. Overall, the Americas has business for JFF the expansions need JFF's products and services JFF provides like STS operations, provide mooring and fenders. The Americas a lot like Africa increasing their capacity but differ when they invest in LNG like Asia and Europe. The Americas are balancing capacity, sustainability and modernisation (UNCTAD,2025).

Reasons For Expansion

Trend	Number of ports
AI/automation	11
LNG investments	8
Green energy	14
Larger berths	6
Container expansion	15

Growth in Global Trade

Global trade has expanded by roughly 1.5–2 times its 2010 level, reaching a record $35 trillion (UNCTAD,2025) in 2025 as more goods are being transported by sea. This has led to many ports having to expand to keep up with global trade and the increased amount of cargo, with total annual throughput hitting 920 million TEUs (Drewery maritime researrch,2025). A great example of this is Shanghai Port which is undergoing a massive expansion including new deep-water berths for bigger ships, automated handling and LNG storage. New systems have also been integrated like largest automated container terminal. The terminal will integrate advanced automated handling systems, including automated cranes, guided vehicle systems, and AI-driven operational control which will improve the port's ability (Shanghai International Port group,2025) to deal with large amounts of ships and their cargo always making it more efficient. Other systems include real-time data, digital and IoT sensors (Shanghai International Port group,2025).

Larger vessels

Cargo boats have been getting much longer (UNCTAD,2025) and wider as a result the cargo boats have been growing with it from 2010 to 2026, the world's largest cargo ships have grown from 14,000 TEU to over 24,000 TEU, with CMA CGM's Notre Dame currently the biggest in the world. The MSC Irina class holds 24,346 TEUs (MSC,2025) and is 399 meters long and 66 meters wide. Because of the huge increase in size over the years with much bigger cargo boats carrying much larger loads of TUEs it has become essential for major ports to have big enough cranes and deep enough berths to accommodate these huge ships as more and more are transporting goods and carry the bulk of global trade. King Abdulla port is a great example for this as it is getting new berths for ultra large container ships allowing the port to become a major hub for massive cargo boats, 28 new larger cranes (King Abdulla port, 2025) to transport cargo on and off these huge cargo boats. The port is also getting new systems to help with ship traffic, as well as new container handling

equipment so they can move more product in and out per day. Ports are having to change (UNCTAD,2025) or add infrastructure to accommodate these huge vessels.

Automation and modernization

Due to the increase in cargo (UNCTAD,2025) and larger ships, it has become a lot harder to manage the ports, ships and cargo coming in. Ports have started integrating autonomous and AI systems to help manage and perform tasks as they can work 24/7 much more effectively. In 2025, UK ports handled around 1.1 billion tonnes of freight and over 1.2 million ship calls, compared with roughly 0.9 billion tonnes and 0.9 million ship calls in 2010, a rise of about 22% in tonnage and 33% in ship movements over 15 years (UK department for transport,2025). Because of this huge increase ports are relying on automation and AI to help manage the systems and cargo. For example, the London Gateway port has received 2 berths that can house the biggest ship and a second rail terminal (DP world,2025). The port has also received electrified port operations like some renewable energy and machines like automated handling equipment which will greatly help the port process and move cargo with automated stacking cranes and high bay storage technology to move cargo. (DP world,2025). The Port of Rotterdam is using AI systems to control ship traffic and gate systems greatly improving the ports' ability to handle ships and cargo (Port of Rotterdam authority,2025). Because of the massive increase of ship and cargo it is hard to move the newer much larger ports like Tuas Mega port (PSA Singapore,2025) and the Port of Rotterdam are all integrating AI systems and automated systems like AGVs and autonomous cranes and handling equipment to process and move the huge and still growing size of cargo and ships coming in making automation essential (UNCTAD,2025).

Sustainability

Because of the threat of climate change (IPCC,2023) regions like Europe and some other countries have set up targets like Net Zero and are finding more sustainable ways to operate and run their ports, while increasing investments in LNG and renewable energy. While also trying to implement renewable energy into the port and its operations. The port of Lowestoft is being expanded to have deeper berths for large installation vessels (Associated British Ports,2025) used to assemble large wind turbines that typically have rotor diameters of 200–260 m, and rated powers of 15–16 MW, hence why Lowestoft port has had more storge space added (Associated British Ports,2025). Lowestoft is very close to some of the UK's offshore wind it has had extensive upgrades to be able to store and ship off huge components of the turbines. Another great example is the Port of Rotterdam which is implementing lots of renewable energy and strategies to meet the Net Zero targets. It is also got deeper berths like Lowestoft to accommodate large installation

vessels and larger terminals for the large turbine components (Port of Rotterdam authority,2025). Rotterdam is also getting new LNG terminals to store larger quantities of LNG for trading purposes and for their new LNG bunkering sites (Port of Rotterdam authority,2025) and for the increasing growth of LNG powered vessels (Maritime Master plan Netherlands,2025). The Port of Rotterdam also has electrification installed in their port with 30 MW of installed wind capacity within the port area with 90 MWp of installed solar capacity. The port is developing landing points for offshore wind farms and aims to facilitate 7.4 GW of offshore wind capacity by 2030 which is about 35% of all Dutch offshore wind projects (Port of Rotterdam authority,2025). Because of the threat of climate change it has made areas like Europe set up targets and polices like Net Zero (European Commission 2024).

Geopolitics

Because of global tensions like the war in Iran a major shipping route accounting for 34% of the worlds crude oil has been effectively shut down because of strikes from Iran leading to a massive redirect of trade routes that normally go through or near the strait of Hormuz (International Energy Agency). This has led to certain countries ports becoming alternatives which has given them the chance to expand their ports with the sudden increase in income from the attention these ports have got from global trade because of trade route changes (International Energy Agency). The port of Durban is a great example of this, as it has become of interest from other countries as alternative for the trade of crude oil and because of this its hade substantial infrastructural and logistical upgrades. The Port is receiving upgrades to its Durban container terminal for a higher capacity of cargo, improved crane productivity and new terminals, new access roads to improve logistics (Transnet National Ports Authority). The port is also receiving new systems to modernise its ports like plans for a new multi-purpose terminal are underway, a fleet of straddle carriers cranes and the modernization of Pier 2, which handles 72% of Durban's container traffic (ICTSI,2025).

Due to the change in trade routes because of geopolitics some ports like Durban are getting much more attention and can upgrade and modernize its port and thanks to the boost of economy from other countries using it as an alternative while the war goes on letting South Africa develop its ports. The port of Tanger med is also going through the same thing upgrading their systems and terminals (Tanger med port authority,2025) due to the increase in trade letting regions like Africa their ports (UNCTAD,2025).

This table shows the container expansion and green energy are the two most common global investment trends showing the industry's focus to transition to more sustainable operations (UNCTAD,2025), refer to appendix one for more details.

location	port	cost	Construction end	capacity	New infrastructure	Engineering works	technology	Current phase	Main cargo type	Reason for expansion
China	Tues mega port	$20 Billion	Completed in 2040s	+27.5 million TUEs	-66 berths built for world's largest ships including new cranes	Dredging, land reclamation, quay construction and terminal development	Deploy AI and automation in operations, including the Next Generation Vessel Traffic Management System	Phase one complete	Containerised cargo	Increasing trade demands
England	London gateway	$1.3 Billion	Completed in 2030	+1.1 million TUEs	2 berths that can house the biggest ship and a second rail terminal, Europe's tallest cranes	Expansion of Solent container yar, dredging, reclamation, quay construction	Electrified port operations, automated stacking cranes and high bay storage technology	Phase 2 compete	Reefer Automotive shipments, commercial freight, Food products.	Strengthen supply chains and enhance trading capability
Canada	Contiecoear port	$2.3 billion	Completed in 2040s	+1.15 million TUEs	New container terminal, 2 berths and container handling area, new truck gate, secondary facilities	Expansion of port capacity and environmental considerations.	New terminal including new systems	Phase 2 complete	Bulk materials, Containerized goods, Tankers.	Increase container handling capacity
Africa	Tanger med port	$500 million	Completed in 2027	+2 million TUEs	New deep-water berths, new quay walls, advanced container-handling equipment	Construction of 12km of new road, new port infrastructure,	new container handling technologies, including new container handling equipment and new automated services	Phase1 complete	Containers, general cargo, hydrocarbons Vehicles.	Growing demand of global trade
Dubi	Jebel Ali port	$3 billion	Completed in 2030	+3million TUEs	New deepwater berths to handle bigger ships, 4 extra terminals	Construction of new terminals and dredging for new berths	Remotely controlled quay cranes, automated stacking cranes and new terminal is automated	Under construction	containerized goods, breakbulk, Ro-Ro vehicles, liquid and dry bulk, temperature-sensitive shipments.	Growing demand of global trade and the need to increase capacity

Answering Research Questions

What are the biggest port expansion projects and what are they upgrading/expanding?

The biggest port expansion projects are Rotterdam, Tues Mega port, Tanger Med and Shanghai. Rotterdam is focusing less on capacity but mostly on electrification (Port of Rotterdam authority,2025) utilizing solar and wind power as well as heavily investing in LNG and LNG powered vessels, as well as modernizing their ports like Asia utilizing autonomous machinery like drones and systems to control ship traffic and some gate systems. Tues Mega port, Shanghai and Tanger med are all increasing their max capacity with Tues adding 27.5 million (PAS, Singapore,2025) TUEs and 66 new berths, Shanghai adding 17.6 million (Shanghai International port group,2025) TUEs and new deep-water berths and Tanger med adding 2 million TUEs (Tanger Med port authority,2025) with deeper berths as well. (PSA Singapore, Shanghai international ports group). Tanger Med is mostly focusing on increasing its capacity due to the change on trade routes it needs more storage space and berths focusing more on capacity and doing less to modernisation apart from an improved terminal and handling equipment

Why are they expanding and does it follow a pattern with other ports in the region?

Ports are expanding because of the growing global trade that expanded by roughly 1.5–2 times its 2010 level, reaching a record $35 trillion in 2025 as more goods are being transported by sea (UNCTAD,2025). And because of this huge increase ultra large cargo boats are increasing (UNCTAD,2025) in number holding up to 26,000 TEUs. Both points

force ports to modernise and expand as the number of ships and TEUs ports must handle is increasing and making modernise using systems and automation to help make the port more productive. But some regions like Asia is focusing on increasing capacity and integrating new technologies like automated machinery and AI systems like Tues mega port and Saigon Port both increasing in capacity and modernising (PSA Singapore, Saigon PORT CORPORATION). Africa follows a simar plan of expansion with increasing capacity due to the increase in cargo and trade (UNCTAD,2025) it getting as some of its ports like Durban are being used as alternative ports because of trade route changes from global tensions, it isn't investing modernization with the exception of new terminals, cargo handling machinery (Transnet national authority). This is because they are building the core infrastructure first and then with the increase of funds they are getting from the global trade it could make more technological changes.

What new infrastructure and technology is being added and how and why does it help?

New infrastructure and technology like autonomous terminals LNG storage sites and LNG bunkering as well as newer systems like AI, autonyms cranes, traffic control systems (UNCTAD,2025). Port are integrating these because of the increase in cargo that needs to be moved in and out of ports and the increase in size and number of ships entering and leaving ports because of the increase in global trade (UNCTAD,2025) it has become a lot harder to manage the ports, ships and cargo coming in and autonomation can work 24/7 effectively. For example, Lamu port has become an alternative port for the global trade route because of global tensions and is increasing capacity by 1.2 million TUEs and in turn is receiving advanced logistics parks and digital transformation adding smart-port modules to increase the efficiency of the port decrease labour costs and make the port more easier to manage with the increase in ships are cargo coming into the port (Kenya ports authority).

Which regions and ports are most relevant to JFF and the services they provide?

From my research the most relevant regions are Africa, Europe and the Americas. All of these regions shave many major port expansions with the goal of increasing the capacity of not only TUEs but the capacity of ships they can load and unload in the port with them upgrading berths by digging them deeper for the larger vessels or dredging more to increase the number of ships they can process. For example, London Gateway, Lamu and Long Beach port are all having new berths being dredged (2 deeper berths for London Gateway(DP world), Lamu port is getting between 23-32 berths (Kenya ports authority)and Long beach is getting 74 new berths (Port of Long Beach) for more ships to be able to be in

the port at once like Lamu and Long Beach or deeper berths for the bigger cargo ships and installation vessels for installing wind turbines offshore like London Gateway and Saupe port (UNCTAD,2025). What this means for JFF is a lot of ports need a lot of mooring equipment like bollards, pneumatics fenders and fixed fenders all which JFF can provide and the services to those products like inspections and maintenance.

Increase of ships coming in and investment in ports those countries will want to build more ships to increase their trading fleet for example the UK is spending over £4 billion of government investment(UK government) in support of shipyards and suppliers across the UK, with a pipeline of more than 150 new naval and civil vessels planned over the next 30 years and the US Navy has also released a three-decade shipbuilding plan aimed at expanding its fleet beyond 450 vessels in the early 2030s (US Navy). This means for JFF that both these countries will be in need of not only mooring equipment for their ports but also ship equipment for the new ships they are planning to build and also for the higher number of ships that are coming in through there ports due to the increase in berths the ports has upgraded to. Also, Kenya is set to expand its cargo boat fleet with the commissioning of additional vessels, including the construction of a 29-metre ferry (Kenya Ports Authority). All these countries will need ropes, chains, quick release hooks, anchors and fenders for both their navies and their cargo boats.

Europe and the Americas are also interested in LNG fuel and bunkering both are heavily investing in it. For example, the port of Rotterdam is getting a new terminal for the storage of new LNG fuel as LNG has become quite popular as it is has lower emissions fossil fuels so areas like Europe that have the Net zero policy are very interested in it which is also why the port is also getting LNG bunkering facilities for the slowly increasing number of LNG vessels, the Netherlands and the Maritime Master Plan targets the construction of up to 40 sustainable ships that can run on LNG, methanol, or hydrogen, as well as those that can capture CO2 (port of Rotterdam authority, maritime master plan Netherlands). This means for JFF they can advertise pneumatic fenders for STS operations and advertise their STS operations and provide LNG STS equipment like the pipes and quick release emergency hooks. With the plans to build more LNG bunkering sites and LNG ships Europe will need mooring and ship equipment for new berths at the LNG bunkering sites and the new LNG powered ships they are planning to build. Brazil is also interested and investing in LNG for example the port of Santos is getting 30 new terminals some with LNG storge capabilities, larger logistics yard for improved efficiency and storge of goods and improved cold chain infrastructure and mega container terminal that can store and process LNG in large quantities(Santos port authority) .Giving JFF the opportunities to provide ship and LNG equipment to the port as its growing in size to handle more ships and planning to build more LNG bunkering sites. Brazil has seven coastal LNG terminals and plans new facilities

like the Suape FSRU terminal, linking them with large natural gas power plants to supply both industry and power generation (EPE,2025).

JFF can also provide STS operations of crude oil to Africa as the main trade route for crude oil the Hormuz straight is too dangerous to cross which has led to some ports in Africa like Durban, Lamu and Tanger Med to become alternatives (Transnet national ports authority, Kenya ports authority, Tanger med port authority). This can give JFF the opportunity to provide pneumatic fenders, STS operations and LNG equipment and operations (UNCTAD,2025).

These 3 key regions provide huge amounts of opportunities for business and with plans in the future for more upgrades to their ports with more LNG bunkering sites, more berths and more ships (cargo and navy boats and LNG powered ships) this means JFF will have years of business available to them utilizing all three services like inspections and maintenance to installation of fenders and some mooring equipment as well as STS and LNG operations. To get involved with these expansions' projects JFF should get in contact with:

- Port authority – port director, harbour master, engineering director
- Terminal operator – terminal manger, marine operations manager
- ECP/construction contractor – project manager, site manager, lead engineer
- Shipping company – fleet manger, site manager, superintendent
- Procurement department -procurement manager, purchasing manager

As an example, for JFF to get involved in the London Gateway they would need to speak to DP world the port of London authority, engineering contractors working on expansion and procurement managers responsible for purchasing marine supplies and equipment

Environmental and Sustainability

Climate change creates problems for ports as it causes rising sea levels, stronger storms and floods (intergovernmental panel on climate change). These can severely impact ports and their infrastructure as the rising sea levels and storms can cause erosion. This means climate change will have a major effect on developments of ports as they need to be made stronger and more durable to deal with threats like strong storms and flooding. These developments could consist of reinforced higher quay and sea walls to protect from erosion and flooding, stronger berths made of reinforced concreate to protect from huge waves during storm's, improved drainage to more effectively and quickly flush out water from the port during a storm or because of rising sea levels, stronger and reinforced mooring equipment like heavier and more bolted bollards chain and rope more resilient to extreme forces and erosion using alloys and more resilient electrical equipment due not ports using more electrical systems to help run the growing in size ports (PIANIC,2024). For example, the Port of Hamburg has undergone significant upgrades to enhance its resilience against rising sea levels and stronger storms, its receiving advanced flood defence facilities linked to state-of-the-art flood defences systems, Hamburg storm surge warning service provides accurate results for high water levels and climate resilience measures like various flood defences like dike systems and drainage infrastructure (Hamburg port authority) while also ports like Rotterdam are investing in electrification in the port to use more sustainable options to power the port (port of Rotterdam authority) showing the threat of climate change is forcing ports to change and integrate more renewable ideas.

From my research I have seen a lot of investment in LNG, offshore wind and larger cargo ships (UNCTAD,2025), this is mostly seen in Europe, but Asia and the Americas are also investing in offshore wind but mostly LNG. This shows how climate changes policies like Net zero is affecting trade patterns as regions are leaning towards more sustainable options and are upgrading their ports to do so. For example the port of Lowestoft is having deeper berths being dredged and more storge space because it is being upgraded to be able to store the huge offshore wind turbines and be able to accommodate to the huge installation vessels used to carry and install these wind turbines(associated British ports) The port of Rotterdam is installing LNG facilities (port of Rotterdam authority)as LNG is more cleaner then fossil fuels and the port of Santos is investing in the same thing (Santos port authority), China is also upgrading their ports for bigger cargo boats like Tues mega port and Shanghai, as well as the rest of the world as the bigger boats are more efficient and sustainable China is also using these bigger berths for installation vessels (Shanghai international port group) like Lowestoft and has huge offshore wind farms. As of recent reports, the country has added substantial new wind capacity, with over 71.6 GW added in 2020 alone, bringing the total to approximately 281 GW. This growth positions wind power

as China's third-largest source of electricity, accounting for 7.5% of total power generation (Global wind energy counsel). Due to targets set in Europe like Net zero ports and other companies are forced to find alternative cleaner fuel types and energy sources like LNG and offshore wind and LNG powered vessels to further successfully meet the requirements of Net zero as the Netherlands, UK and China are some examples of country's looking to build LNG powered fleets (European commission). As of mid-2026, the UK's orderbook for new LNG carriers. All these new developments and installations will help Europe meet the Net zero requirements.

All of this provides JFF with a lot of opportunities for the future as more ports need to increase the number of berths they have to accommodate for larger vessels like the ultra large cargo ships and installation vessels, and new berths for new LNG powered ships that are close or connected to LNG bunkering sites and with the increase in LNG ships equipment for those ships like quick release hooks, ropes and chains will be in high demand all of which JFF can supply. This makes a massive demand for mooring equipment and strong mooring equipment as climate change has made storms stronger and sea levels high making things like bollards, chains and ropes need to be of a higher and stronger quality which will make company's like JFF stand out for the great quality equipment and products they are known to sell. And with the increase in investment in LNG from regions like China, Europe and the Americas STS operations for LNG and LNG equipment for those STS operations will be at an all-time high giving plenty of options to JFF. So overall JFF has lots of opportunities for the future due to the changes in ports and trade from climate change being able to prove products and services (UNCTAD,2025).

Conclusion

The purpose of this report was to give a general but detailed view into how ports are expanding why are the expanding, where are they expanding, new infrastructure and technology being added, why is it being added and how does this all effect JFF. For the following I have concluded that:

- Ports are expanding because of growing global trade, new cargo types like LNG, bigger cargo ships and global tensions (UNCTAD,2025) making alternative ports grow.
- They are having the huge expansions in China, Europe, Africa and the Americas they are the regions with most and biggest expansions.
- New technologies are being implemented in ports due to growth of global trade and are used increase efficiency 24/7 (PSA Singapore, port of Rotterdam authority).
- JFF has a huge number of opportunities, they can provide ports with much needed mooring products, all types of fenders and ship equipment including maintenance and inspections and STS operations.
- The biggest port expansions in each region is Tues Mega port, The port of Rotterdam, Tanger Med, Port of Santos, King Abdulla Port, I have chosen these for overall cost and scale of the expansion.
- The biggest trends and reason for expansion is growing global trade, global tensions and modernisation.
- The growing global trade leads more ports to have increase their capacity for TUEs and cargo ships making ports innovate and integrate automation and AI to try organising and move cargo and ships more effectively 24/7 as it is becoming harder to do it manually due the increasing scale of cargo and mount of boats.
- Global tension also effects expansion as it gives the opportunity for ports like Durban and Tanger med the opportunity to grow and expand as investment increased due to the increase in cargo and interest these ports get from the global trade.
- Modernisation is also a main theme in port expansions as I said before ports are getting much larger and are handling huge amounts of cargo, so automation and systems are used to improve efficiency of ports
- Asia, Africa the Middle East and Americas are all mostly focusing LNG fuel while also focusing on increasing capacity. Asia and the middle east are also focusing on modernisation. Africa and Brazil are mostly only doing capacity and LNG facilities because Africa needs to focus on core infrastructure and Brazil is heavily investing in LNG

Based on my findings JFF should continue investing in high-quality mooring equipment, LNG services, maintenance services, fender production, fender maintenance and inspections. These will allow the company to take advantage of the future increase in STS operations from LNG, and the ever-growing global trade will always make ports get bigger keeping all services JFF can provide relevant in the future. I also believe my original aim was achieved as I said I would investigate global expansion and I believe I have investigated it very thoroughly by identifying the main drives of expansion, which regions/countries are at the front of the drive, the biggest port expansion's and why they are expanding like global trade expansion, global tensions and modernization. In the future I believe ports will be much bigger accommodating larger ships as they are more efficient, and I believe ports will be nearly fully automated to increase efficiency 24/7 and due to the huge amount of cargo and ships they will need to process a day, I believe they will be environmentally sustainable integrating solar, wind, tidal and possibly nuclear power in the future. JFF will need to adapt their projects to keep up with larger the ports and boats will become but overall, all their services and products will be very much needed and relevant in the future.

Reflection

I think my research went very well as I was able to cover everything and find all the information I needed to find, as JFF was able to provided me with some very information on port expansions they were aware off and I had lots of help from the staff who were able to give me an insight on how they run things and all of their products and services they provided.

What was challenging was finding specific figures as some websites and companies were not agreeing with each other specifics like what exactly where the new systems and what did they do, when would some expansions be completed and what new infrastructure was being added. But with help from company websites that were involved and ran the operation like the London Gateway port DP world was the main investors and planner of the extension, so they provided consistent and reliable information.

What I would consider doing differently is have a timetable to help me plan how and what was going to do for this project per day which improve my time management and make me more organised while also giving me goals to complete each day making me more productive during each day.

From this project I was able to learn a huge amount about ports and how they work and how company's like JFF can support and do business with these ports

Appendices and References

Appendix 1:

The below table was collated by me to provide a summary of all the port expansions and has been used as a reference tool when comparing each of the regions and ports.

Location	**Port**	**Cost**	**Construction end**	**Capacity**	**New infrastructure**	**Engineering works**	**Technology**	**Current phase**	**Main cargo type**	**Reason for expansion**	**Funding/ owner**	**Credibility rating (1-5)**	**Opportunity for JF**
China	Tues mega port	$20 Billion	Completed in 2040s	+27.5 million TUEs	-66 berths built for world's largest ships including new cranes	Dredging, land reclamation, quay construction and terminal development	Deploy AI and automation in operations, including the Next Generation Vessel Traffic Management System	Phase one complete	Containerised cargo	Increasing trade demands	MPA and PSA Singapore	5	LNG equipment, Fender systems, Mooring services, fixed fenders
England	London gateway	$1.3 Billion	Completed in 2030	+1.1 million TUEs	2 berths that can house the biggest ship and a second rail terminal, Europe's tallest cranes	Expansion of Solent container yar, dredging, reclamation, quay construction	Electrified port operations, automated stacking cranes and high bay storage technology	Phase 2 compete	Reefer Automotive shipments, commercial freight, Food products.	Strengthen supply chains and enhance trading capability	DP world	4	Fender systems, LNG systems
Canada	Contrecoear port	$2.3 billion	Completed in 2040s	+1.15 million TUEs	New container terminal, 2 berths and container handling area, new truck gate, secondary facilities	Expansion of port capacity and environmental considerations.	New terminal including new systems	Phase 2 complete	Bulk materials, Containerized goods, Tankers.	Increase container handling capacity	Canada Infrastructure Bank (CIB) and MPA	5	Mooring services, fixed fenders
Africa	Tanger med port	$500 million	Completed in 2027	+2 million TUEs	New deep-water berths, new quay walls, advanced container-handling equipment	Construction of 12km of new road, new port infrastructure,	new container handling technologies, including new container handling equipment and new automated services	Phase1 complete	Containers, general cargo, hydrocarbons Vehicles.	Growing demand of global trade	International Finance Corporation (IFC) and a collection of international banks	3	Fender systems and mooring services, fixed fenders
Dubi	Jebel Ali port	$3 billion	Completed in 2030	+3million TUEs	New deepwater berths to handle bigger ships, 4 extra terminals	Construction of new terminals and dredging for new berths	Remotely controlled quay cranes, automated stacking cranes and new terminal is automated	Under construction	containerized goods, breakbulk, Ro-Ro vehicles, liquid and dry bulk, temperature-sensitive shipments.	Growing demand of global trade and the need to increase capacity	DP world	4	Mooring services and fender system, fixed fenders
Netherlands	Rotterdam port	$1.08 Billion	Completed in 2029	+2.5 million TUEs	Navigable Channel Widening, New Railway Yard, Container Terminal Expansion, shore power systems, Autonomous Navigation.	Dredging, terminal development, new berths and new railroad	Smart port automation, AI for vessel tracking, container movements. Drones used for cargo handling	Phase 1 complete	containers, dry bulk, liquid bulk, breakbulk, and roll-on/roll-off shipments.	Historical growth after WW2, container terminal expansion to enhance its competitiveness for the global supply chain	Municipality of Rotterdam and the Dutch State.	4	Mooring services, fender systems LNG equipment
Germany	Hamberg	$1.29 billion	Completed in 2035-40	+6 million TUEs	New terminal yard space, widening	Ground levelling, dredging, terminal	Automated Terminal Expansion automated stacking cranes,	Under construction	Containers	Infrastructure Investment and modernisation.	Hamburg Port Authority (HPA)	3	Mooring and fender services, fixed fenders

					turning basin from 480-600 meters	development, widening basin	modernized gate system. Electrify portion of its landside equipment.			Capacity Increase New Terminal Developments			
China	Shanghai yangshan port	$12 billion	2030s	+17.4 million TUEs	New deep-water berths, terminal's, new under and over sea pipelines and new LNG storge tanks	Dredging and underwater landscaping pipeline connections and building.	Where is dubi	Phase 1 complete	wide range of goods, primarily containerized cargo. It is a major hub for bulk, liquid, and break-bulk cargo,	It is the world's largest container port. The port is strategically vital to China's Belt and Road. Its deep-water berths accommodate the largest container ships	The Shanghai International Port Group (SIPG)	5	STS operations and LNG equipment, fender services
Sri Lanka	Colombo port	$4.2 million	2026	+3 million TUEs	East Container Terminal (ECT), Colombo West International Container Terminal (CWICT), Colombo International Container Terminal (CICT), Investment Pipeline, Jaya Container Terminal (JCT)	Constructing terminals and new pipeline for above and below the surface	Automation and Digitalization: SLPA is prioritizing automation and digitalization Cybersecurity: The SLPA is implementing cybersecurity	Phase 2 complete	Break Bulk: Fertilizer, Cement, Locomotives Dry Bulk: Fertilizer, Cement Liquid Bulk: Crude Oil, White Oil Containers	Increased demand from the supply chain and global trade. Increase in capacity for more trade opportunities and higher supply	Sri Lanka Ports Authority (SLPA), China Merchants Port Holdings Company Limited, and John Keells Holdings.	4	LNG equipment, STS operations, fender services
Saudi Arabia	King Abdullah port	$720 million	2026	+5 million TUEs	new berths for ultra large container ships, 28 new cranes,	Construction of new 18m deep berths, dredging, building of new cranes and new storge areas for new cargo.	Smart gate E-Systems, state of the art terminal operating systems, automated cargo handling	Multiple phases completed	Container cargo Break-bulk cargo Agricultural bulk cargo	Driven by its strategic location on the red sea which connects to global trade routes. Also, a higher capacity is needed to keep up with global trade	SAGIA (Saudi Arabian General Investment Authority) and Tadawul listed company from Dubi	4	Mooring services, fixed fenders
Africa	Durban port	$647 million	2027	+11.4 million TUEs	Durban container terminal being upgraded, improve crane productivity new terminals, access roads, logistics clusters cargo handling, tug jetty expansion, rail network enhances	Construction of new terminals and container handling systems. Upgrading crane systems to increase productivity. Road laying and rail network expansion, landscaping for new tug jetty	Multi-Purpose Terminal: Plans for a new multi-purpose terminal are underway, Liquid Bulk Terminal, New Equipment and Technology: A fleet of straddle carriers cranes Modernization of Pier 2: The modernization of Pier 2, which handles 72% of Durban's container traffic	Multiple phases complete	containers, breakbulk, bulk commodities, vehicles, agricultural products, minerals, coal, petroleum, and project cargo.	Capacity Increase, Global Shipping Shift Investment and Privatization A significant investment Logistics Efficiency, Geopolitical Tensions Ongoing geopolitical tensions affecting shipping routes have created opportunities for South Africa	Partnership agreement between Transnet and International Container Terminal Services (ICTSI)	5	Mooring services possibly LNG equipment and STS operations, fixed fenders
Africa	Lamu port	$3.1 billion	2026	+1.2 million TUEs	New container terminal increasing capacity, new berths and new quay cranes	Construction of terminal, dredging, installation and building of quay cranes	Ship-to-shore gantry cranes, advanced logistics parks and digital transformation adding smart-port	Phase 2 complete	Containerized cargo Bulk cargo Oil shipments General cargo	The extension of Lamu Port is driven by the need to enhance its capacity and efficiency to meet	Government of Kenya, Kenya ports authority (KPA)	4	Mooring services, STS operations, fixed fenders

							modules to increase efficiency			the growing demands of regional trade and logistics.			
America	Houston port	$1.9 billion	2029	500,000 TUEs	Channel Expansion New Terminal and Logistics Capacity	Dredging, construction of new terminal, new access roads, quay wall construction	New terminal with improved cargo handling equipment and automated systems	Under construction	Containerized Cargo Petroleum and Petrochemical Products Chemicals and Minerals Steel and Metals: Commodities: Dry bulk and liquid bulk Breakbulk and Project Cargo Ro-Ro (Roll-on/Roll-off) Cargo	To accommodate larger cargo vessels	Funding Department of Transportation and the Federal Highway Administration	3	Mooring services, fixed fenders possibly STS operations and LNG equipment
America	Long Beach port	$365 million	2028	500,000 TUEs	Expanding ports freight rail capacity, upgrading terminal, new berths	Dredging, landscaping, upgrading terminal and adding new rail lines	Expanded automated terminals, automated stacking cranes and gate systems	Phase 1 complete	Containerised cargo	need to enhance its container handling capacity to support long-term growth and meet the increasing demand for imports.	California Energy Commission awarding $20 million	4	Mooring services, fender services
India	Vadhavan port	$4.7 billion	2027	+23.2 million	Deep draft for mega ships, offshore mega port on reclaimed land in the Arabian Sea, artificial island and break waters	Dredging, landscaping, construction of mega port offshore, and installation of new systems in the mega port	Automated container terminals, port management systems, VTMS, digital asset management, and smart gate systems	Multiple phases complete	Containers, Liquid Cargo including LNG, Break Bulk Cargo and General Cargo	enhance India's maritime capabilities and reduce reliance on overseas transhipment hubs.	majority-owned by Jawaharlal Nehru Port Authority (JNPA), holds a 74% stake, Maharashtra Maritime Board (MMB),	5	LNS equipment, mooring services, fixed fender services, STS operations
Brazil	Port of Santos	$275 million	2026	+2.1 million TUEs	30 new terminals, export processing zone, new pier, larger logistics yard and improved cold chain infrastructure and mega container terminal	Landscaping, construction of new terminals, clearing of land for new logistics yard	5G network deployment to support digital operations, VTMIS and Shore power project	Multiple phases complete	Containers. Dry Bulk Liquid Bulk Break Bulk General Cargo Includes items like textiles, vehicles	enhance its cargo handling capacity and modernize its operations to meet the growing demands of Brazil's trade.	federal government, São Paulo state, and private sector have contributed to the R$10.64 billion	5	LNG equipment, mooring services and fixed fender services, STS operations
Brazil	Suape port	$522 million	2026	+400,000 TUEs	has a technical offshore wind potential exceeding 1,200 GW, with plans to install up to 96 GW by 2050 under ambitious development scenarios.	Dredging, construction of new terminal and installation of new systems	New terminal is first fully electrified terminal in Latin America, new cargo handlers	Multiple phases complete	Containers General Cargo Liquid Bulk	trade efficiency, accommodate larger vessels, and reduce transshipment costs	Suape Industrial Port Complex, SENAI-PE, and UN Trade and Development (UNCTAD)	5	LNG equipment, STS operations, mooring and fender services

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