

PORT AIR QUALITY STRATEGY

PORT OF FELIXSTOWE



CEO INTRODUCTION

Hutchison Ports is on a journey to create a more environmentally sustainable future. As a responsible industry leader, we are committed to protecting the environment in which we operate. Whilst striving to constantly improve carbon and ecological footprints, we hold 'Environmental Excellence' at the heart of our core values.

Air quality has been of particular environmental focus for Hutchison Ports. With well established, stringent monitoring practices, and continuous investment in cleaner technologies such as; the introduction of electric port vehicles and the upgrading of mature assets, these are just some of the examples of our commitment to attaining air quality improvement. Since the time recording began, Port of Felixstowe has recorded a 90% reduction in Sulphur Dioxide levels and 30% reduction in Nitrogen Dioxide levels site-wide.

In response to the Government's Clean Air Strategy and its Clean Maritime Plan's provisions for Port Air Quality Strategies, Hutchison Ports UK has produced three Port Air Quality Strategies which sets out its commitment for reducing emissions from operations and to support the reduction of emissions from its customers.

Hutchison Ports UK recognises the importance of a sustainable supply chain and has a vision to be the preferred partner for its customers. By working together, and investing in clean, ecologically efficient infrastructure, equipment and rail; well known for being the most environmentally beneficial mode of hinterland transportation, we aim to realise our core vision of 'Environmental Excellence'.

Chris Lewis

Chief Executive Officer
Hutchison Ports (UK) Limited



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INTRODUCTION

BACKGROUND

The UK Government published its **Clean Air Strategy** in January 2019¹ which aims to reduce emissions of air pollution across all sectors (including UK Port and Maritime activities) to protect public health and the environment. As part of this **Clean Air Strategy**, all major ports in England have been asked to produce their own air quality strategies to reduce emissions from port operations. These strategies are voluntary in nature and aim to establish an understanding of air quality in ports and to reflect actions that the port is taking to address emissions under their control.

Underpinning the UK's Clean Air Strategy is the **National Emissions Ceiling Directive (NECD)**² which is implemented into UK law through the **National Emission Ceilings Regulations 2018**³. This legislation sets emission reduction commitments for European countries for the total emissions of five key pollutants: Oxides of Nitrogen (NO_x), Sulphur Dioxide (SO₂), Non-Methane Volatile Organic Compounds (NMVOC), Ammonia (NH₃) and fine Particulate Matter (PM_{2.5}) in 2020 and 2030. The emission reduction commitments are "ambitious, legally binding international targets to reduce emissions of five of the most damaging air pollutants". The motivation for capping and reducing the overall emissions burden is to help reduce exposure to harmful air pollutants which can impact human health and habitats. Exposure to the pollution still present in the atmosphere is one the UK's biggest public health challenges, shortening lifespans and damaging quality of life for many people. It also harms the natural environment, affecting our waterways, biodiversity and crop yields.

“ambitious, legally binding international targets to reduce emissions of five of the most damaging air pollutants”

Action to manage and improve air quality is largely driven by European (EU) legislation. The **2008 Ambient Air Quality directive**⁴ (2008/50/EC) sets legally binding limits for concentrations in outdoor air of major air pollutants that impact public health, such as, Particulate Matter (PM₁₀ and PM_{2.5}) and Nitrogen Dioxide (NO₂). As well as having direct effects, these pollutants can combine in the atmosphere to form ozone, a harmful air pollutant (and potent greenhouse gas) which can be transported great distances by weather systems.

The 2008 directive replaced nearly all the previous EU air quality legislation and was made law in England through the **Air Quality Standards Regulations 2010**⁵, which also incorporates the **4th Air Quality Daughter Directive** (2004/107/EC), that sets targets for levels in outdoor air of certain toxic heavy metals and polycyclic aromatic hydrocarbons. Equivalent regulations exist in Scotland, Wales and Northern Ireland.

Local Authorities are responsible for air quality under **Local Air Quality Management (LAQM)**⁶; they have a duty to assess and manage air quality in their areas, with the main focus being on complying with limit values and reducing exposure for NO₂ and particulate matter. Where ports have been a contributor to exceedances of limit values, they will have been engaged by the Local Authority on potential mitigation measures.

Linked to the UK's Air Quality Strategy is the **National Roadside NO₂ Compliance Plan**⁷ and Clean Air Zones, which helps form the UK Government's plan for achieving NO₂ compliance in relation to the Ambient Air Quality Directive. Ports may have been a contributing source and so again were engaged with these studies. Key contributions from ports to NO₂ concentrations include the traffic to/from ports as well as shipping and port landside emissions.

¹ <https://www.gov.uk/government/publications/clean-air-strategy-2019>

² <https://www.eea.europa.eu/themes/air/air-pollution-sources-1/national-emission-ceilings>

³ <http://www.legislation.gov.uk/uksi/2018/129/contents/made>

⁴ <https://uk-air.defra.gov.uk/air-pollution/uk-eu-policy-context>

⁵ <https://uk-air.defra.gov.uk/air-pollution/uk-eu-limits>

⁶ <https://laqm.defra.gov.uk/>

⁷ <https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017>

In the UK, steps to reduce emissions from shipping and ports form part of the wider initiatives under the Government's **Clean Maritime Plan**⁸ which sets out future plans to meet ambitions for zero emission shipping by 2050. Part of these plans include an expectation that by 2025:

- All vessels operating in UK waters maximise energy efficiency.
- All new vessels ordered for use in UK waters are designed with zero emission propulsion capability.
- All new ships for UK waters ordered from 2025 should be designed with zero emission capable technologies.
- UK builds clean maritime clusters focused on innovation and infrastructure associated with zero emission propulsion technologies, including bunkering of low or zero emission fuel.

By 2035, the expectation will have gone further, to:

- UK has built a number of clean maritime clusters.
- UK Ship Register known as a global leader in clean shipping.

The development of port air quality strategies is not being undertaken in isolation. Worldwide steps are being taken to reduce emissions from shipping which is the most environmentally friendly way to move freight around the world but remains a significant source of air pollutants and greenhouse gases. These international actions include the adoption of more stringent limits on the sulphur content of marine fuels, the use of exhaust gas cleaning systems (or scrubbers) and emission control areas for shipping.

⁸ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/815664/clean-maritime-plan.pdf

AIMS OF THIS PORT AIR QUALITY STRATEGY

The Port of Felixstowe (PFL) is within the scope of the request under the new Clean Air Strategy, and clarified by guidance published by the Department for Transport on 11 July 2019⁹, to produce a Port Air Quality Strategy (PAQS). This document is the Port of Felixstowe’s Air Quality Strategy.

The Port of Felixstowe is committed to reducing the impact of its operations on the environment. The need to reduce air pollutant emissions, and greenhouse gases, from port activities and those of others using and operating within the port estate is recognised as a strategic priority for the business. The Port of Felixstowe’s workforce continues to demonstrate a strong commitment to improving the environment within which Port of Felixstowe operates and to realising ever higher standards of environmental performance.

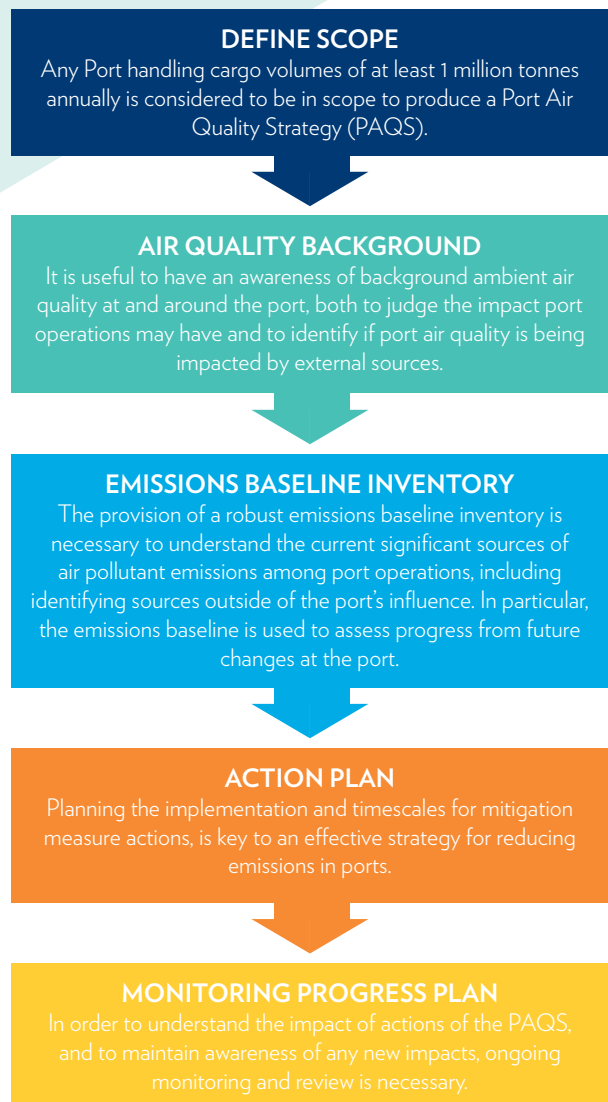
The aims of the PAQS were set out in the Hutchison Ports UK Statement of Intent published in December 2019¹⁰. These remain valid and are reproduced here:

- Ensure the port meets statutory air quality standards.
- Establish a baseline emissions inventory for the port’s ship and shore activities.
- Allow for the monitoring of improvements to air quality over time.
- Review the existing fleet of non-road mobile machinery and equipment, to identify opportunities for the use of lower emission fuel solutions, to trial and implement new technologies and to understand the most efficient ways of deploying assets.
- Promote low emission behaviours into the culture of Port of Felixstowe.
- Reduce Nitrogen Dioxide (NO₂), Sulphur Dioxide (SO₂) and Particulate Matter (PM₁₀) concentrations across the port estate.
- Reduce the amount of CO₂ emitted on site as a result of the port operations.

- Increase the number of ultra-low and zero emission vehicles in the internal fleet and promote the use of these by employees, tenants and other users of the site.
- Engage with land and quayside stakeholders, such as shipping lines, tenants and contracted services to identify collaborative ways of reducing emissions.

The development stages of the PAQS is summarised in Figure 1.

Figure 1: Stages of Development for the PAQS



⁹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/815665/port-air-quality-strategies.pdf

¹⁰ <https://www.portoffelixstowe.co.uk/company-information/corporate-governance/>

SCOPE

The geographical area relevant to the Air Quality Strategy is defined as all areas of port and maritime related activity within the port's jurisdiction. For the Port of Felixstowe, this includes significant emitters of relevant emissions from port operations, which include road movements such as internal and external Heavy Goods Vehicles (HGVs), port equipment such as yard crane operations, rail operations, and vessels at berth.

Emissions from visiting ships, pilot launches and harbour tugs – particularly whilst not at berth in port – are beyond the control of Port of Felixstowe and therefore out of the scope of direct actions to reduce emissions from on-site activities. Port of Felixstowe will, however, continue to consult and liaise with the relevant operators regarding their own emissions and actions they could take to reduce them. Specifically, Port of Felixstowe is not the Statutory Harbour Authority responsible for the waters beyond a short distance from the quayside; therefore, the portion of vessel emissions included in scope of this PAQS are only those released whilst vessels are at berth in port (and even these are not directly under the control of Port of Felixstowe).

This PAQS has been created through the development and analysis of a baseline emissions inventory, which considered all relevant major emissions generated on site, based on historical

data held by the Port of Felixstowe, that are within a sphere of control or influence for the port. The emissions inventory includes the following emission sources: vessels, non-road mobile machinery (NRMM) (such as rubber-tyred gantry cranes, and internal tractor movements), rail locomotives, road vehicles (HGV hauliers accessing the site, as well as any other vehicles entering the port boundary, including tenants and employee commuting). It is noted that some of the emissions estimated through this inventory are generated by third party users; the scope of influence for Port of Felixstowe to act on driving emissions down is an important consideration within this PAQS.

The pollutants covered in the PAQS are:

- **Coarse particulate matter (PM₁₀)**¹¹;
- **Nitrous Oxides (NO_x)**;
- **Sulphur Dioxide (SO₂)** and
- **Carbon Dioxide (CO₂)**¹².

Non-methane volatile organic compounds (NMVOCs) are not covered within this first iteration of the PAQS, but may be considered for future PAQS. As the Port of Felixstowe is also committed to the reduction of greenhouse gases, the development of the PAQS with its associated baseline emissions inventory was seen as an opportunity to also quantify CO₂ emissions alongside those of the key air pollutants.

¹¹ PM₁₀ will be covered rather than PM_{2.5}, as PM₁₀ has monitoring data available at Felixstowe.

¹² CO₂ is not an obligatory pollutant component of the PAQS, but it is important to recognise its importance due to the main emissions inventory baseline being fuel based.

STAKEHOLDER CONSULTATION

Engagement with port tenants, users and other stakeholders (including port user associations, the Port of Felixstowe Local Authority Liaison Committee and the Felixstowe Freight Quality Partnership) is an important step in developing the Strategy, and in securing buy-in from those who may have some ability to support efforts to reduce emissions.

Due to the effects of COVID-19, stakeholder engagement sessions have so far been limited during 2020, but PFL looks forward to working with relevant stakeholders at engagement sessions to realise the aims of this PAQS.

SUMMARY OF AIR QUALITY BACKGROUND REVIEW

Reviewing long-term monitoring data allows both trends and local exceedances to be understood. An air quality review of the Port of Felixstowe's own measurements and East Suffolk Council (local authority) monitoring data suggests that there has been an improvement in NO_x and therefore NO_2 concentrations at the port; however, East Suffolk's measurement data shows fairly stable concentrations since 2012. This suggests that HGVs may be a bigger contributor than the source apportionment study suggests, since a decrease would also be expected at East Suffolk's monitoring sites given a decreasing trend in the Port of Felixstowe's results. This would be especially relevant as monitoring undertaken by the Port of Felixstowe is more representative of container handling and shipping rather than HGVs in transit.

Based upon the data available, emissions from HGVs in transit seems a target for reduction outside of PFL's boundary. However, this may be less effective at achieving reductions in NO_2 concentrations within the site boundary.

Reviewing the Port of Felixstowe's air quality dataset, SO_2 and PM_{10} concentrations show that there has been an improvement in concentrations of both pollutants across the course of the monitoring periods, in particular SO_2 , where levels have been low and consistent for several years.



EMISSIONS INVENTORY

INTRODUCTION

A baseline emissions inventory has been developed to support this strategy, which provides an understanding of current emissions in the port, and allows for the impact of mitigation actions to be estimated. The inventory has a base year of 2019 (i.e. represents emissions from that year), with the model estimating emissions of NO_x, SO₂, PM₁₀ and CO₂.

The scope of the model is divided into **five** main activity emission source areas:

- **Vessels (at berth)** - for the emissions baseline of vessels (at berth), emissions data has been extracted from the National Atmospheric Emissions Inventory's (NAEI) detailed ship emissions inventory¹³. This extract is based around the port boundary for Felixstowe; only those emissions associated with vessels marked as "at berth" in the NAEI have been extracted
- **Non-Road Mobile Machinery (NRMM)** – port machinery including Forklifts, Rubber-Tyred Gantry Cranes (RTGs), Internal Tractors (ITs), and other equipment that remain on port at all times
- **Rail** - emissions from freight train locomotives entering, idling, and leaving the port
- **Road Vehicles** - refers to emissions from vehicles driven within the port boundary (e.g. HGVs carrying freight)
- **Gas Consumption Related Emissions** - consumption of natural gas used for heating buildings at PFL.

¹³ <https://ee.ricardo.com/digital-services/data-visualisation-and-apps/uk-shipping-emissions-inventory>

EMISSIONS BASELINE 2019

The following figures shows that Vessels (at berth) and NRMM are the two activity sectors which contribute to the highest estimated percentage of emissions from the Port of Felixstowe.

Figure 2: Port of Felixstowe 2019 NO_x Emissions Distribution

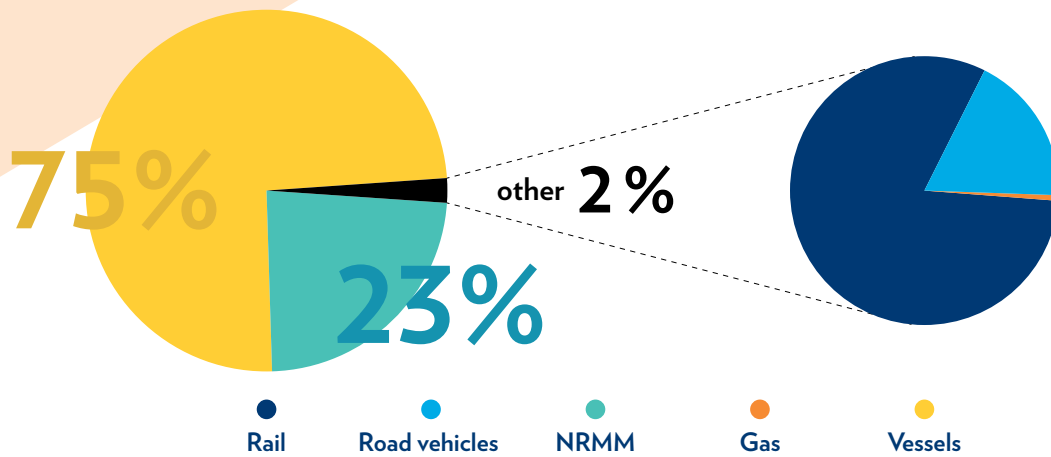


Figure 3: Port of Felixstowe 2019 SO₂ Emissions Distribution

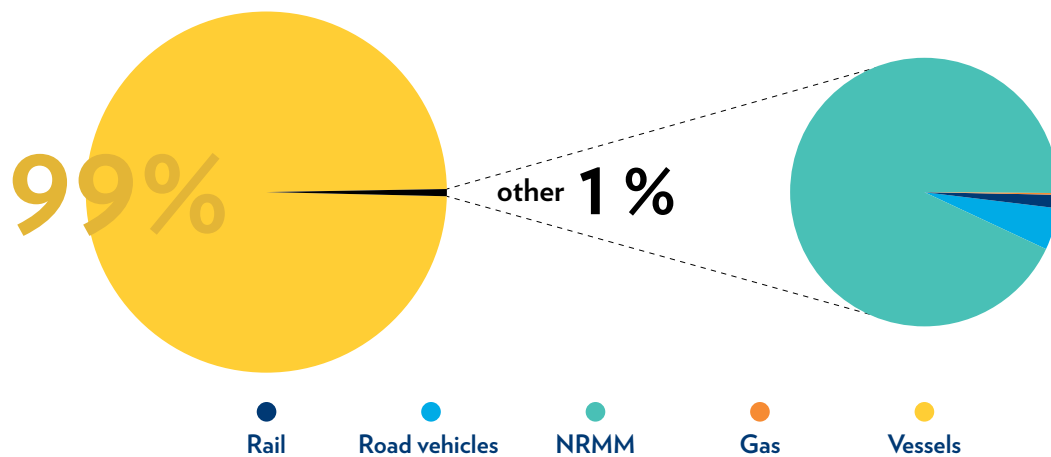


Figure 4: Port of Felixstowe 2019 PM₁₀ Emissions Distribution

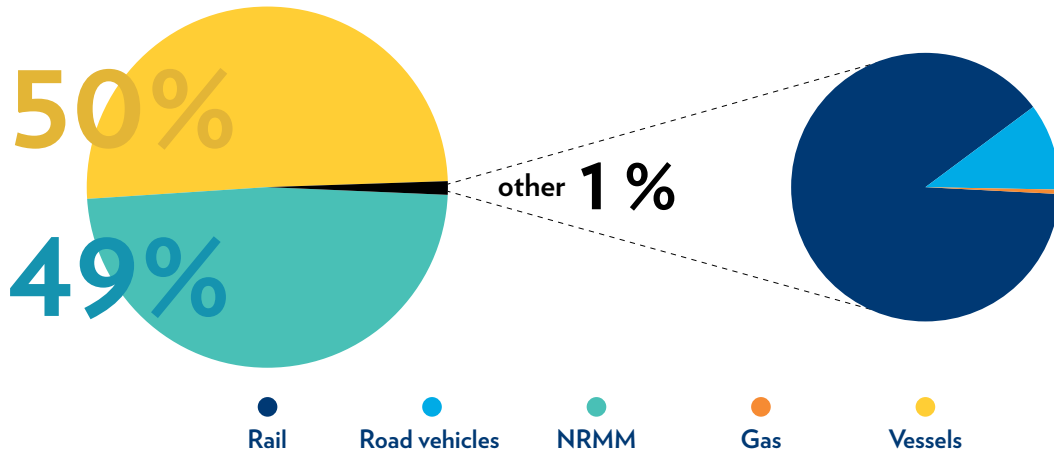
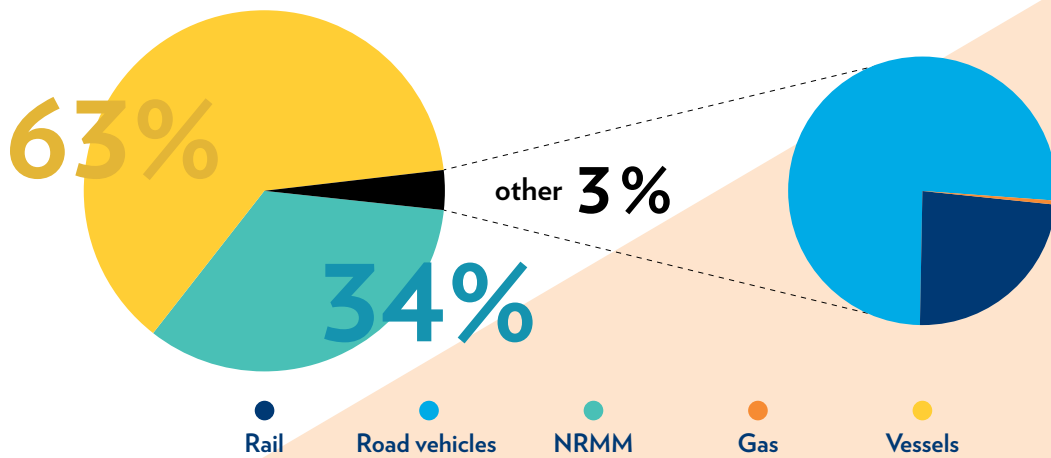


Figure 5: Port of Felixstowe 2019 CO₂ Emissions Distribution



An aerial photograph of a port terminal at dusk. The scene shows a long pier extending into the water, with several large gantry cranes. A container ship is docked at the pier, and stacks of colorful shipping containers are visible on the right side. The sky is a mix of blue and orange, suggesting sunset or sunrise. The image is partially overlaid with a white and light blue geometric design on the right side.

EMISSIONS FORECAST TO 2030

A forecast accounting for the business as usual actions at the Port of Felixstowe up to 2030, has also been developed, based on the emissions inventory for 2019. This shows the projections of in-scope pollutant emissions, before any specific action plan mitigation measures are considered.

The Port of Felixstowe Masterplan document¹⁴ details an overall planned annual growth rate in line with the UK GDP growth between 2020-2030, based on current levels of quayside and yard productivity. This growth rate has been incorporated into the Emissions Inventory baseline model, to calculate an emissions forecast up to 2030, grouped into each activity. As such, this represents a “business as usual” forecast without taking into account the impact of additional action plan mitigation measures.

¹⁴ Port of Felixstowe “Development Masterplan Port of Felixstowe 2020 – 2030”, dated October 2019

The following figures show “business as usual” projections, focusing on the emissions from vessels and NRMM (port machinery), as these two sectors are the highest contributors to PFL emissions.

Figure 6: Port of Felixstowe NO_x emissions 2019-2030

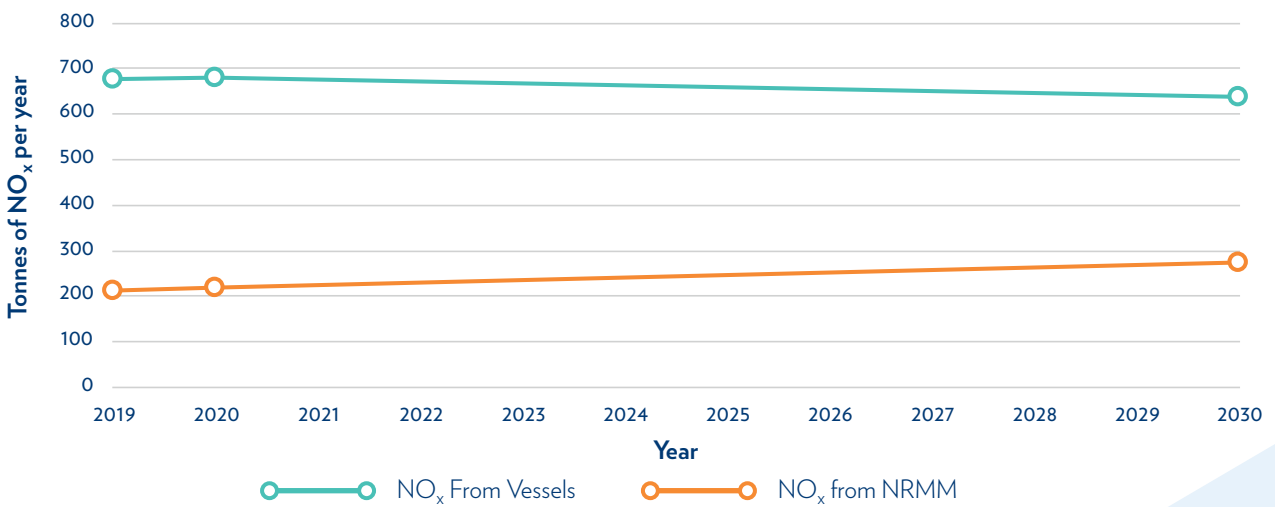


Figure 7: Port of Felixstowe SO₂ emissions 2019-2030

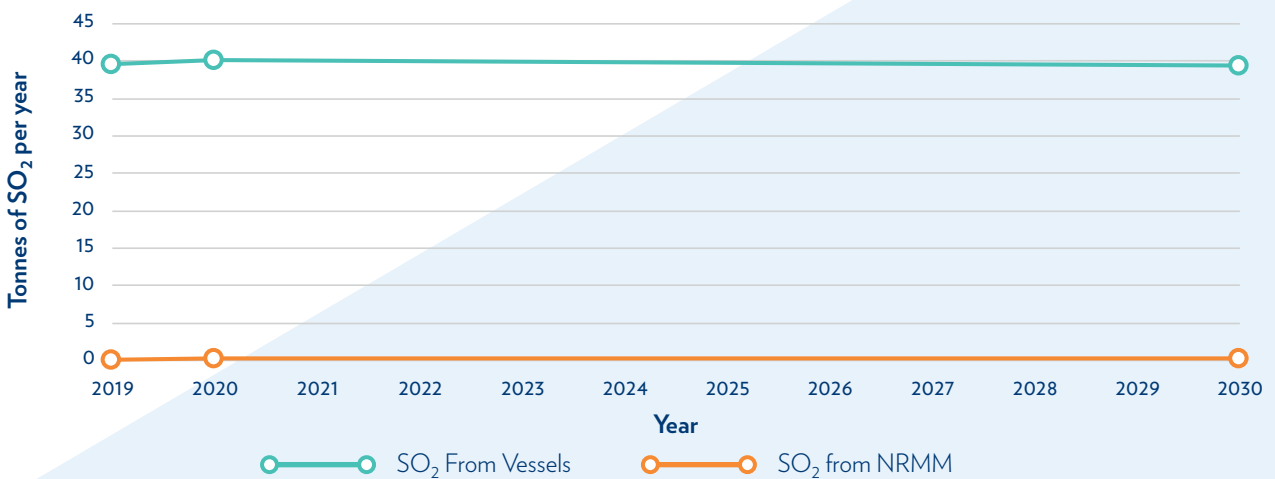


Figure 8: Port of Felixstowe PM₁₀ emissions 2019-2030

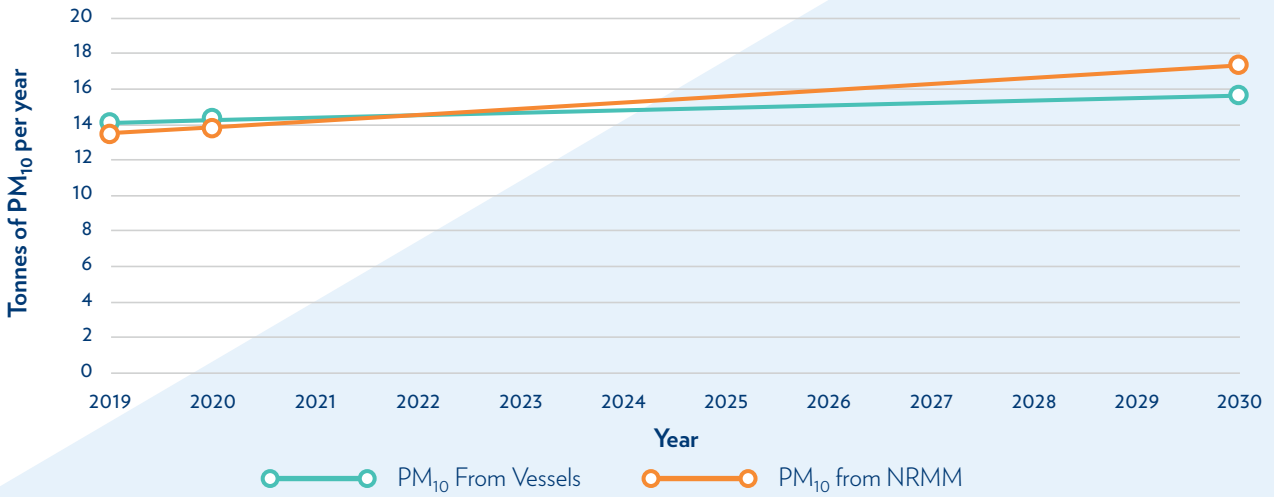
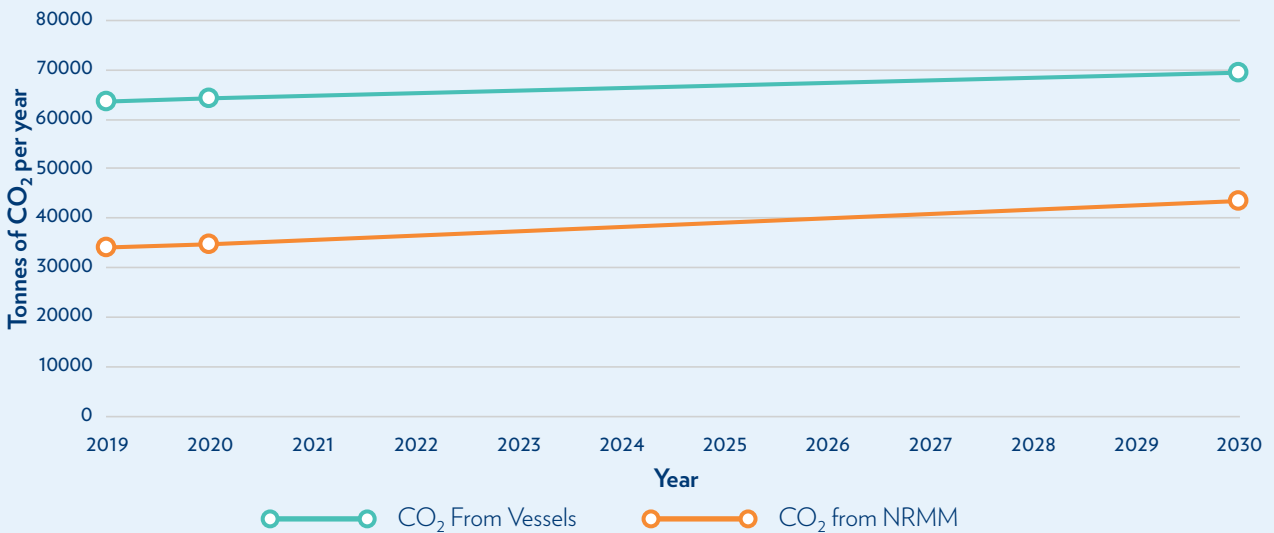


Figure 9: Port of Felixstowe CO₂ emissions 2019-2030



The projections for vessel emissions show a small decrease in NO_x emissions; this is due to accounting for improvements in fuel efficiency, as well as decreases in NAEI NO_x emission factors (for scaling). SO₂ emissions remain broadly the same in 2030, along with PM₁₀, which shows a small increase. CO₂ shows a small gain by 2030.

With regards to NRMM, there is an increase in all emissions by 2030, without taking into account the Port of Felixstowe

Development Masterplan and associated Action Plan mitigation measures, and as such not taking into account any turnover in NRMM fleet to a later Euro standard.

With regards to Road Vehicles, these show a decrease in predominantly NO_x emissions. This is due to changes in their Euro standards by 2030, compared to 2019.

ACTION PLAN

INTRODUCTION

This section of the PAQS summarises what actions are being taken now and are planned for in the future by the Port of Felixstowe to reduce emissions from its activities. These emissions reduction measures will help support a number of domestic and European legislative and policy measures, including:

- The UK Government's Clean Air Strategy;
- The Government's Maritime 2050 vision, and the Clean Maritime Plan;
- Local Air Quality Management;
- The National Roadside NO₂ Compliance Plan and Clean Air Zones together with compliance with the Ambient Air Quality Directive.

It is recognised that mitigation actions can involve significant costs and that the UK ports sector is largely privately owned and operated and is a highly competitive sector. As such, the sector would welcome UK Government support and coordination. Some measures which could offer significant benefits for air quality in ports (as well as offering GHG savings) which may have particularly high capital costs without assurance of full take-up of the measure – such as vessels using shore power in ports, or the provision of hydrogen infrastructure – would for example benefit from such Government coordination to help ensure a level playing field.

The backdrop of this PAQS is that, with the COVID-19 pandemic and its associated economic impacts, the British Ports Association (BPA) has proposed the UK Government supports green growth through a Green Maritime Fund to drive sustainable development and help stimulate growth consistent with net zero aims¹⁵.

¹⁵ <https://www.britishports.org.uk/news/uk-ports-look-to-green-investment-and-freeports-as-part-of-economic-recovery>

MITIGATION MEASURES

The Action Plan mitigation measures outlined within this strategy will also help support the Port of Felixstowe to achieve the goals outlined within the Statement of Intent. The mitigation measures have been developed in discussion with senior staff at PFL and have drawn upon the Port of Felixstowe's Master Plan.

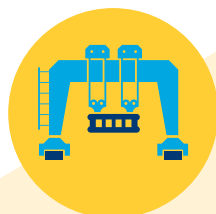
Planning the implementation and timescales for actions is key to an effective strategy for reducing emissions at the Port of Felixstowe. PFL recognise that there are a number of variations in the way an action can be taken, the time it will take to deliver, how long it will take to have an effect, as well as, the scale of impact that it might have. Impacts on emissions and other considerations (for example costs and technical difficulty of implementation) also need to be considered.

The mitigation measures considered within this section of the strategy includes actions with short, medium and long term interventions. Short term mitigation options would be implemented between 2020-2023, medium term between 2023-2030, and long term from 2030 onwards.

This section outlines the practical measures that Port of Felixstowe have considered in order to improve air quality across the port. The mitigation measures are split into the following

sectors of activity (similar to that of the Emissions Inventory, with the addition of a Corporate & Commercial sector):

- **Vessels:** Measures that can be taken to reduce emissions from vessels when at berth.
- **Port machinery / Non-road Mobile Machinery (NRMM):** Measures that can be taken to reduce emissions across the port estate by streamlining operational activity and adopting clean or alternative fuels.
- **Rail:** Measures that can be taken to improve efficiencies in the onward movement of cargo and influence port users to reduce emissions through the use of clean fuels.
- **Road Vehicles:** Measures that can be taken to reduce emissions from the range of vehicles used operationally across the port estate.
- **Corporate and Commercial:** Measures that can be taken to reduce emissions in the port estate by influencing the behaviour of port employees, as well as tenants and users.



SUMMARY OF MEASURES

Table 1 shows a summary of the action plan mitigation measures that the Port of Felixstowe has considered key to producing an effective strategy for reducing emissions at the port.

Each measure is then discussed in more detail, in terms of the timescale of mitigation measure implementation, the impact on emissions, which pollutants are addressed, the cost of the mitigation measure, and Port of Felixstowe’s ability to influence the measure.

Table 1: Summary of Mitigation Measures at the Port of Felixstowe

Mitigation Measure	Timescale	Impact on Emissions	Pollutants addressed	Cost	Ports ability to influence
Mitigation Measures addressing Vessel Emissions					
Shore power at all berths	Long term	High	NO _x , PM ₁₀ , SO ₂ , CO ₂	High	Indirect
Mitigation Measures addressing port machinery - ITs					
Full electrification of the IT fleet	Medium/ long term	Medium	NO _x , PM ₁₀ , CO ₂	Medium	Direct
Electrifying 10% of the IT fleet	Medium term	Small	NO _x , PM ₁₀ , CO ₂	Low/ medium	Direct
Replace existing diesel ITs with new diesel ITs	Short term	Small	NO _x , PM ₁₀ , CO ₂	Low	Direct
Mitigation Measures addressing port machinery – RTGs					
Electrification of all RTGs at Landguard Terminal	Short/ medium term	Medium	NO _x , PM ₁₀ , CO ₂	Medium	Direct
Increase utilisation of Electrified Rubber-Tyred Gantry Cranes (E-RTGs) in electric mode at Trinity Terminal	Short term	Small	NO _x , PM ₁₀ , CO ₂	Low	Direct
Electrification of remaining diesel RTGs at Trinity Terminal	Medium term	Small	NO _x , PM ₁₀ , CO ₂	Medium	Direct

Table 1: Summary of Mitigation Measures at the Port of Felixstowe

Mitigation Measure	Timescale	Impact on Emissions	Pollutants addressed	Cost	Ports ability to influence
Mitigation Measures addressing Rail Emissions					
Electrifying Rail Lines	Long term	High	NO _x , PM ₁₀ , CO ₂	High	Indirect
Loco Stop-Start Functionality	Medium term	Medium	NO _x , PM ₁₀ , CO ₂	High	Indirect (encourage)
Increase modal Shift to Rail	Medium term	Medium	NO _x , PM ₁₀ , CO ₂	High	Indirect
Mitigation Measures addressing Vehicle Emissions					
Electrifying Light Vehicle Fleet	Medium term	Low	NO _x , PM ₁₀ , CO ₂	Low	Direct
Mitigation Measures addressing Corporate & Commercial Emissions					
Remote & Flexible Working	Short, Medium & Long term	Low	NO _x , PM ₁₀ , CO ₂	Low	Direct (encourage)
“The Hub” People Facility	Short term	Low	NO _x , PM ₁₀ , CO ₂	Low	Direct

MONITORING PROGRESS PLAN

INTRODUCTION

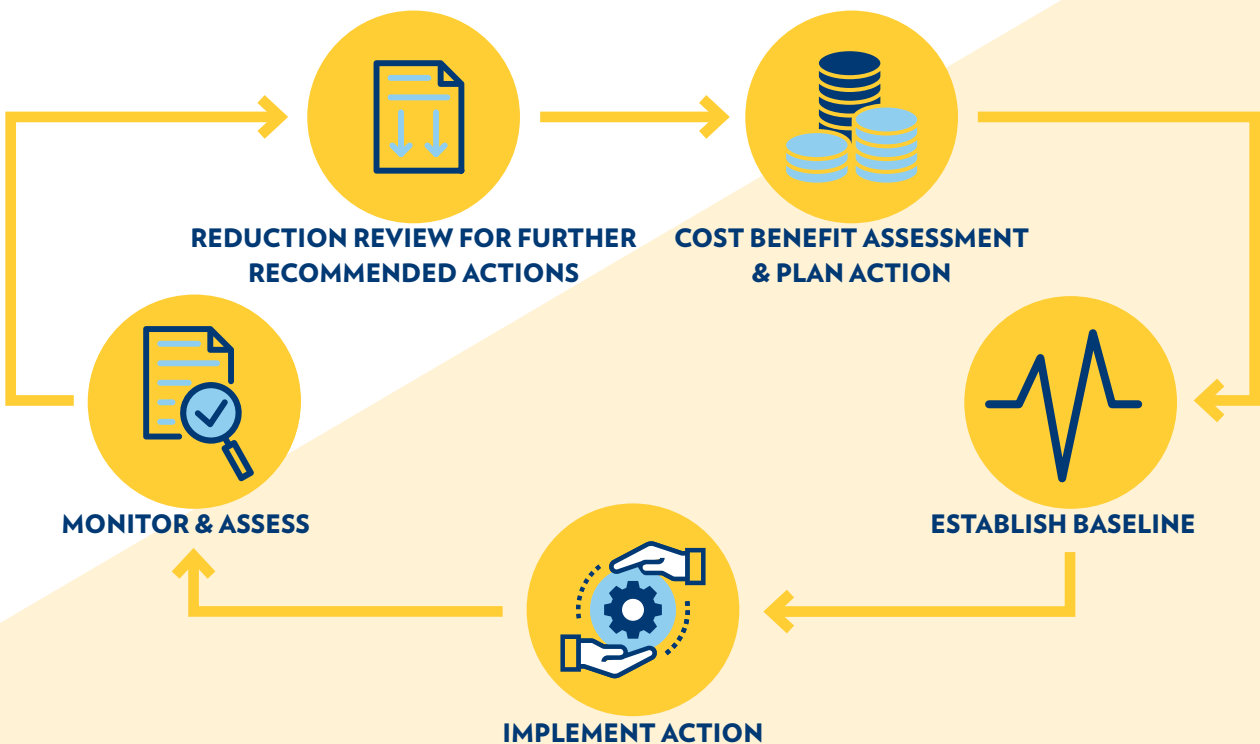
This section of the PAQS provides a monitoring progress plan to enable PFL to track and understand the impacts of implementing the actions chosen by the port from those listed in the action plan. Monitoring the progress against the Action Plan comprises three elements:

1. **Monitoring progress of implementing actions listed in the PAQS.**
2. **Estimating the impact of the actions on pollutant emissions**, through updating on a regular basis the emissions inventory that supports the PAQS, to confirm if the targeted emission reductions have been achieved.

3. **Monitoring ambient air pollutant concentrations**, to track the actual air quality situation and to try to confirm the impact of implementing the mitigation measures. This includes recommendations for changes to the current air quality monitoring that is undertaken, in order to better target the monitoring of the actions.

The monitoring of progress against the PAQS is a cyclical progress, as shown in the guidance set out by the Department for Transport (DfT)¹⁶ (Figure 10).

Figure 10: Monitoring and action plan cycle



Reviews should consider the effectiveness of the monitoring (reliability and availability of the data), the scope of the monitoring and whether this is still sufficient, and the trends in the data analysis.

As part of the review cycle, the PAQS will be resubmitted to the DfT every 3 years from initial submission. It is recommended that, as a minimum, the action plan is updated as part of this resubmission. The appropriateness of the monitoring plan should also be reviewed if any changes occur.

¹⁶ Department for Transport (DfT), "Port Air Quality Strategies, Moving Britain Ahead", 2019. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/815665/port-air-quality-strategies.pdf

MONITORING PROGRESS OF IMPLEMENTING ACTIONS IN THE PAQS

This step is simply for Port of Felixstowe to undertake a tracking of the status of implementing actions identified in the Action Plan. This means to simply record the information about the status of each action that will enable the assessment of the emissions to be re-considered at the next baseline inventory update. Suggested aspects to monitor for are shown in the table below.

Table 2: PAQS Aspects to Monitor

Mitigation Measure	Aspects to monitor each year
Mitigation Measures addressing Vessel Emissions	
Shore power at all berths	Berths with shore power connection provided Proportion of vessels calling at the berth connecting to shore power
Mitigation Measures addressing port machinery - ITs	
Full electrification of the IT fleet And Electrifying 10% of the IT fleet	Diesel ITs removed from fleet (specifying emissions Stage) Number of electric ITs added to fleet Operational hours for each unit
Replace existing diesel ITs with new diesel ITs	Diesel ITs removed from fleet (specifying emissions Stage) Number of diesel ITs added to fleet (specifying emissions Stage) Operational hours for each unit
Mitigation Measures addressing port machinery – RTGs	
Electrification of all RTGs at Landguard Terminal And Electrification of remaining diesel RTGs at Trinity Terminal	Fuel consumption of RTGs (should drop to zero)
Increase utilisation of E-RTGs in electric mode at Trinity Terminal	Diesel fuel consumption of E-RTGs Operational hours in each mode Electricity consumption of E-RTGs
Mitigation Measures addressing Rail Emissions	
Electrifying Rail Lines	Proportion of locomotives using electrified rail line that are still diesel locomotives
Loco Stop-Start Functionality	Proportion of locomotives with stop-start functionality deployed
Increase modal Shift to Rail	Utilisation rate of each service (% of wagons full) % Twenty-foot Equivalent Units (TEUs) transported by rail Number of rail services at each rail terminal each week
Mitigation Measures addressing Vehicle Emissions	
Electrifying Light Vehicle Fleet	Number of diesel vehicles replaced with electric Fuel consumption of this fleet
Mitigation Measures addressing Corporate & Commercial Emissions	
Remote & Flexible Working And "The Hub" People Facility	Automatic Number Plate Recognition (ANPR) data Distances travelled internally in the port

ESTIMATING THE IMPACT OF THE ACTIONS ON POLLUTANT EMISSIONS

The baseline emissions inventory developed for this PAQS should be updated ideally every year. The same methodology should be followed for completing the baseline inventory, i.e. drawing on the same sources of data each year (e.g. fuel records, numbers of internal tractors and their emission standards etc.). By re-conducting this exercise annually, revised emissions estimates for the port will be developed each year, which can then be compared against the previous year, and against the previous year's future projections. It will be possible, upon completion of an action, to ascertain if the emission reductions achieved have met the targets.

This annual exercise will complement the trend analysis of continuous and long-term ambient air monitoring data (through the existing ambient air quality monitoring network around PFL), and in the longer term help assess progress in improvements of air quality (i.e. reductions in key pollutants). This will enable both annual trends in emissions and in monitored concentrations to be compared.

Reviews should consider the effectiveness of the monitoring (reliability and availability of the data), the scope of the monitoring and whether this is still sufficient, and also the trends in the data analysis.

This Port Air Quality Strategy is intended to be a working document, that will be reviewed and updated at 3 yearly intervals, or when a significant change within the business triggers an amendment. The port of Felixstowe is committed to improving the air quality on site, however it should also be recognised that the air quality strategy will be shaped by external influences such as the availability of suitable technology, external economic market factors and finally adjusted in line with the needs of the business.



