

**V.01 November 2020**

# Director Introduction

Hutchinson 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 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

In response to the Governments 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 customers.

London Thamesport recognises the importance of a sustainable supply chain and has a vision to be 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 realize our core vision of Environmental Excellence



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# INTRODUCTION

## BACKGROUND

**THE UK Government published its Clean Air Strategy in January 2019<sup>1</sup> which aims to reduce emissions of air pollution across all sectors (including UK Ports 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 emissions from port operations. These strategies are voluntary in nature and aim to establish an understanding of air quality in ports to address emissions under control.**

Underpinning the UK's Clean Air Strategy is the **National Emissions Ceiling Directive (NECD)**<sup>2</sup> which is implemented into UK law through the **National Emission Ceilings Regulations 2018**<sup>3</sup>. This legislation sets emission reduction commitments for European countries for the total emissions of five key pollutants: Oxides of Nitrogen (NO<sub>x</sub>), Sulphur Dioxide (SO<sub>2</sub>), Non-Methane Volatile Organic Compounds (NMVOC), Ammonia (NH<sub>3</sub>) and fine Particulate Matter (PM<sub>2.5</sub>) in 2020 and 2030. The emission reduction commitments are "ambitious, legally binding international target 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 of 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**<sup>4</sup> (2008/50/EC) sets legally binding limits for concentrations in outdoor air of major air pollutants that impact public health, such as Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>) and Nitrogen Dioxide (NO<sub>2</sub>). 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 legislations and was made law in England through the Air Quality Standards Regulations 2010<sup>5</sup>, which also incorporates the 4<sup>th</sup> Air Quality Daughter Directive (2004/107/EC), that set targets for the 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)**<sup>6</sup>: 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 NO<sub>2</sub> 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 NO<sub>2</sub> Compliance Plan**<sup>7</sup> and Clean Air Zones, which helps from the UK Government's plan for achieving NO<sub>2</sub> 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 NO<sub>2</sub> concentrations include the traffic to/from ports as well as shipping and port landside emissions.

In the UK, steps to reduce emissions from shipping and ports form part of the wider initiatives under the Government's **Clean Maritime Plan** which sets out future plans to meet ambitions for zero emissions 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 building clean maritime clusters focused on innovation and infrastructure associated with zero emission propulsion technologies, including bunkering of low or zero emission fuel.

## **AIMS OF THIS PORT AIR QUALITY STRATEGY**

London Thamesport (LTP), is not within the scope of the request under Defra's Clean Air Strategy from January 2019, however as a part of the HPUK group London Thamesport have engaged in producing a Port Air Quality Strategy (PAQS) and clarified by guidance published by the Department for Transport (Dft) on 11 July 2019, to produce a Port Air Quality Strategy (PAQS). This document is London Thamesport's Air Quality Strategy.

London Thamesport 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.

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.

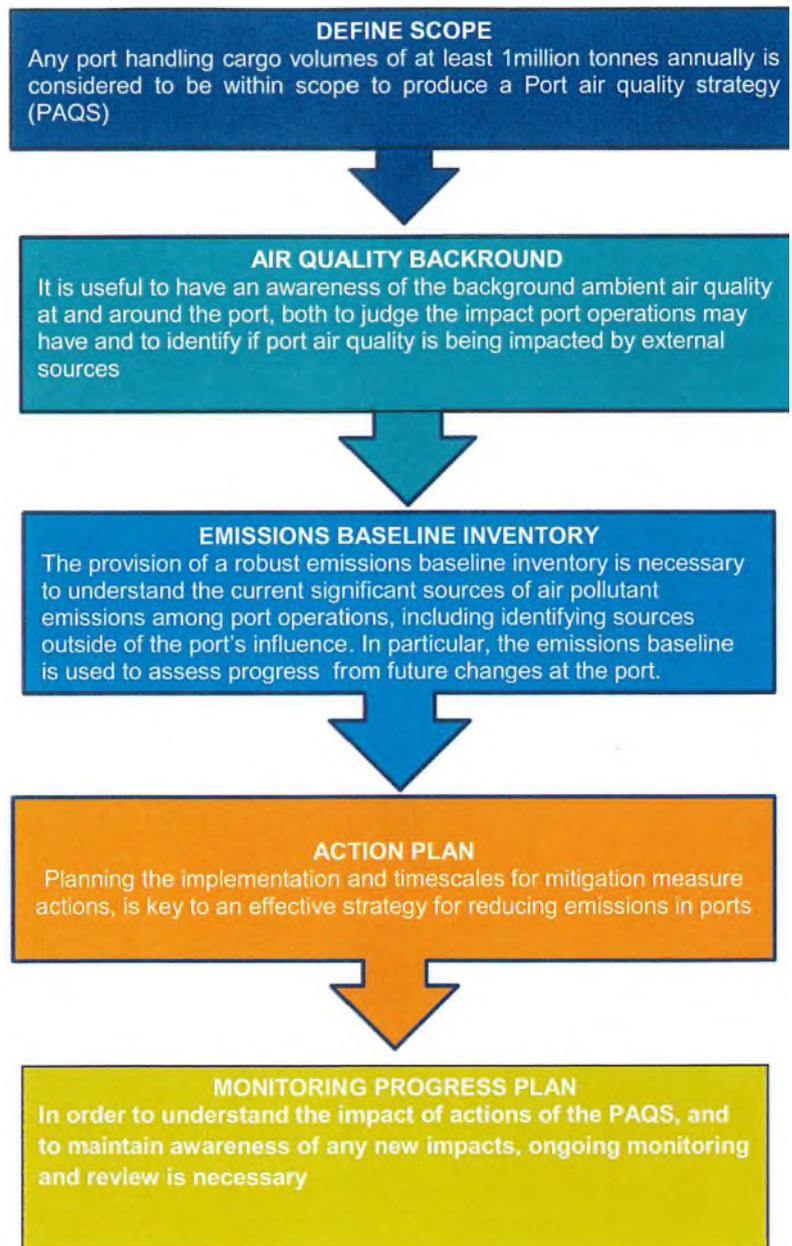
London Thamesport's workforce continue to demonstrate a strong commitment to improving the environment within which London Thamesport operate and to realising ever higher standards of environmental performance.

The aims of the PAQS were set out in Hutchison Ports Statement of Intent published in December 2019. 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 London Thamesport.
- Reduce Nitrogen Dioxide (NO<sub>2</sub>), Sulphur Dioxide (SO<sub>2</sub>) and particulate matter (PM<sub>10</sub>) concentrations across the port estate.
- 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 of the PAQS. Is summarised in figure 1.  
**Figure 1. Stages of Development for the PAQS**



## 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 London Thamesport, this includes significant Emitter of relevant emissions from Port operations, which include road movements such as internal and external Heavy Goods Vehicles (HGVs). Port equipment; such as yard cranes, rail operations, and vessels at berth.

Emissions from visiting ships, pilot launches and harbour tugs whilst not at berth in the port are beyond the control of London Thamesport are therefore out of the scope of direct actions to reduce emissions from on-site activities. London Thamesport will, however, continue to consult and liaise with the relevant operators regarding their own emissions and actions they could take to reduce them. Specifically, London Thamesport 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 the scope of this PAQS, are only those released whilst the vessels are at berth at the terminal (even these are not directly under the control of London Thamesport).

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 London Thamesport that are within a sphere of control or influence for the port. The emissions inventory includes the following emissions sources: vessels, non-road mobile machinery (NRMM) (such as internal tractor movements), road vehicles (HGV hauliers accessing the site, as well as any other vehicles entering the port boundary, including tenants and employee commuting), and emissions from rail (within the port boundary). It is noted that some of the emissions estimated through

this inventory are generated by third party users; the scope of influence for London Thamesport to act on driving emissions down is an important consideration within this PAQS.

The pollutants covered in this PAQS are coarse particulate matter

- Coarse particulate matter (PM<sub>10</sub>),
- Nitrous Oxide (NO<sub>x</sub>)
- Sulphur Dioxide (SO<sub>2</sub>)
- Carbon Dioxide (CO<sub>2</sub>.)

Non-methane volatile organic compounds (NMVOCs) are not covered within this first iteration of the PAQS, but may be considered for future PAQS. As LTP 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 CO<sub>2</sub> emissions alongside those of the key air pollutants.

## Stakeholder Consultation

Engagement with port tenants, users and other stakeholders 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 London Thamesport looks forward to working with relevant stakeholders at engagement session 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 London Thamesport's own measurements and Medway council (Local Authority)

Medway Council has declared four Air Quality Management Areas (AQMAs) : The AQMA closest to London Thamesport is the Central Medway AQMA, which encompasses the town of Strood, approximately 14 km from the London Thamesport site. Results show exceedances of the annual mean nitrogen dioxide (NO<sub>2</sub>) objective.

The main source of air pollution in the area is road traffic emissions from major roads, notably the M2, A2, A228, A229, A230 and A289. Medway suffers from significant congestion, particularly in the town centres. Other pollution sources, including commercial, industrial and domestic sources, also contribute to background pollution concentrations.

Based upon the data available, emissions from HGV's in transit seems a target for reduction outside of the port's boundary. However this may be less effective at achieving reductions in NO<sub>2</sub> concentrations within the boundary.

Reviewing the London Thamesport's air quality dataset, SO<sub>2</sub> & NO<sub>2</sub> concentrations show that concentrations of both pollutants have been consistently low for the recording period. Monitoring suggests that the port emissions are far below the annual exceedance

## EMISSIONS INVENTORY

### Introduction

A baseline emissions inventory has been developed to support this strategy that 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 a base model estimating emissions of NO<sub>x</sub> & SO<sub>x</sub>

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

- Vessels at berth - for the emissions baseline of vessels, emissions data have been extracted from the National Atmospheric Emissions Inventory's (NAEI) detailed ship emissions inventory<sup>1</sup>. This extract is based around the port boundary for London Thamesport; only those emissions associated with vessels marked as "at berth" in the NAEI have been extracted.
- Non-Road Mobile Machinery (NRMM)- port machinery including fork trucks, including Internal Tractors (ITs) and Rubber Tyre Gantry Cranes (RTGs) and other equipment that remain on the port at all times
- Road Vehicles - Road vehicles activity refers to emissions from vehicles driven within the port boundary (e.g. HGVs carrying freight).
- Rail - Rail activity refers to the emissions from freight train locomotives entering, idling, and leaving London Thamesport.

### Emissions Baseline 2019

The following figures show that Vessels (at berth) and NRMM Are the two activity sectors which contribute to the highest estimated percentage of emissions from London Thamesport.

Figure 2: London Thamesport 2019 NO<sub>x</sub> Emissions Distribution

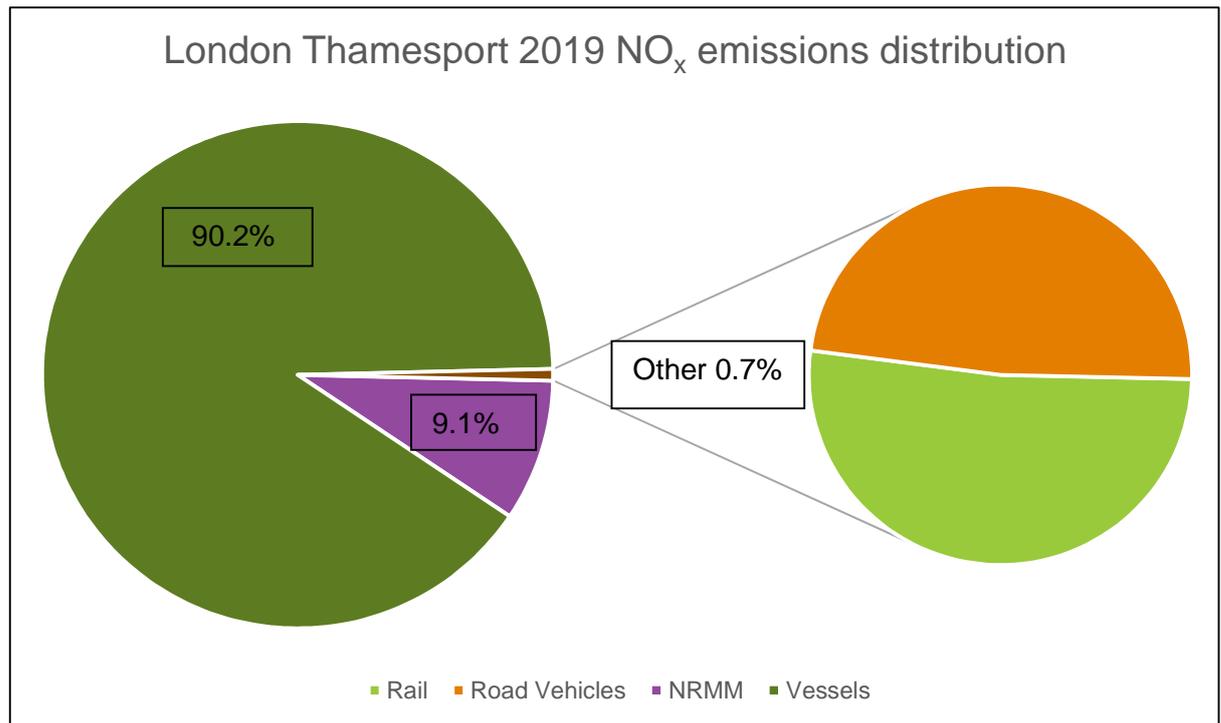


Figure 3: London Thamesport 2019 SO<sub>2</sub> Emissions Distribution

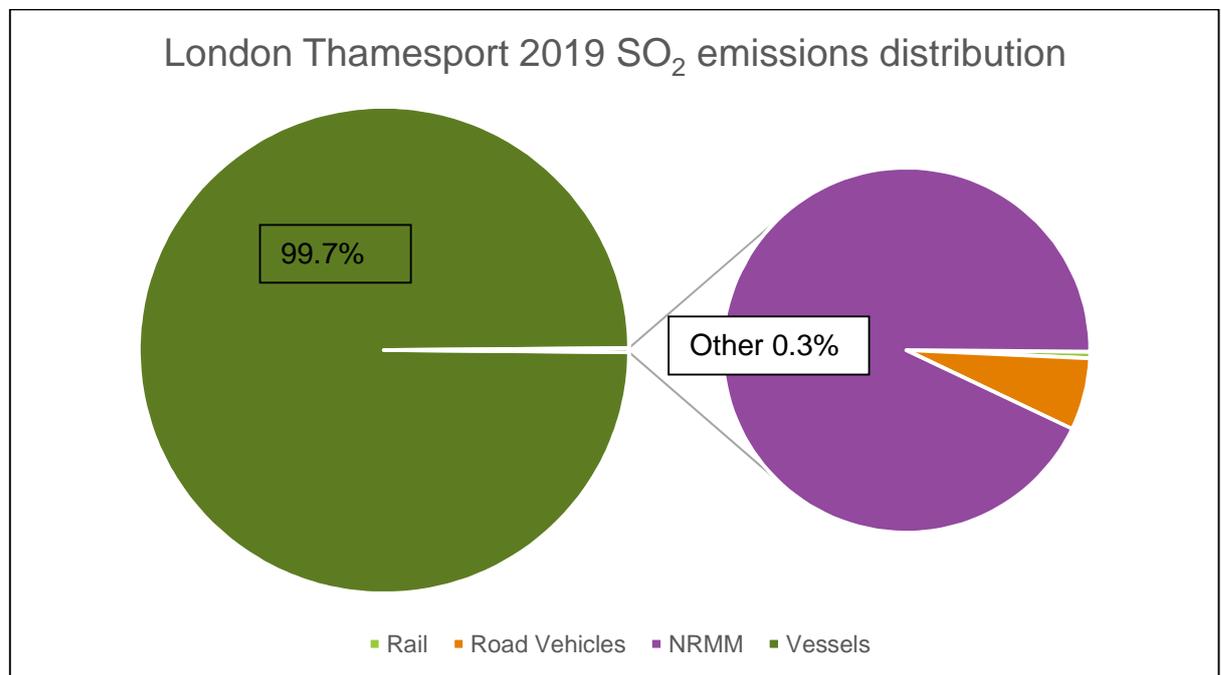


Figure 4: London Thamesport 2019 PM<sub>10</sub> Emissions Distribution

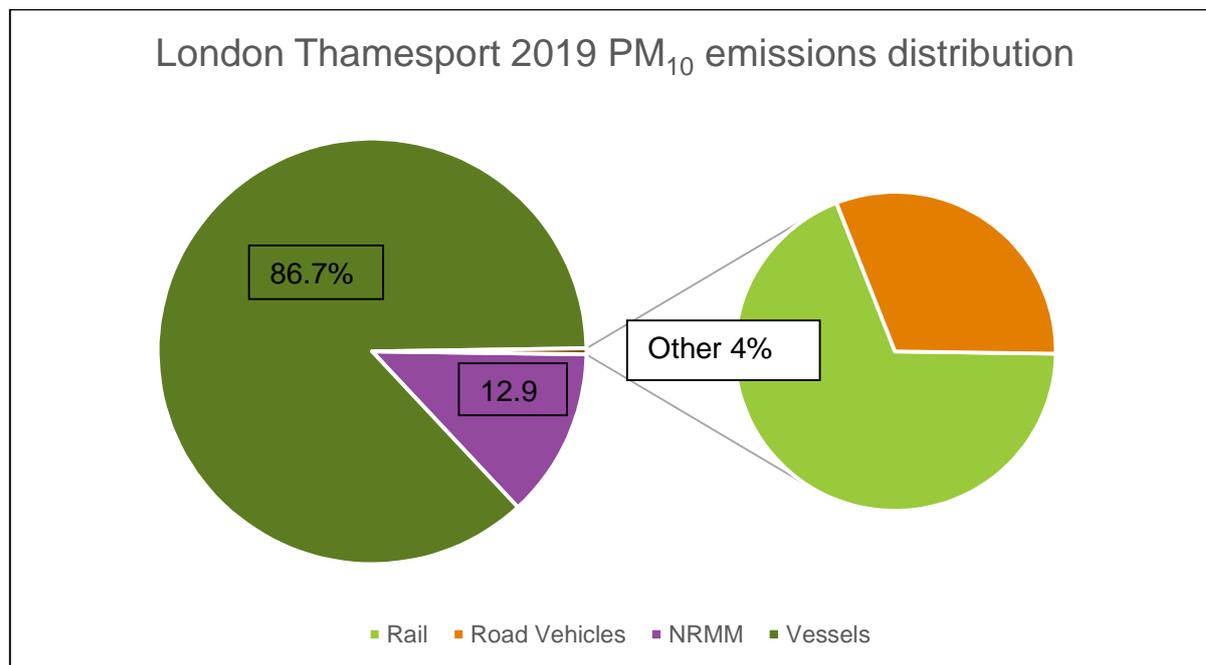
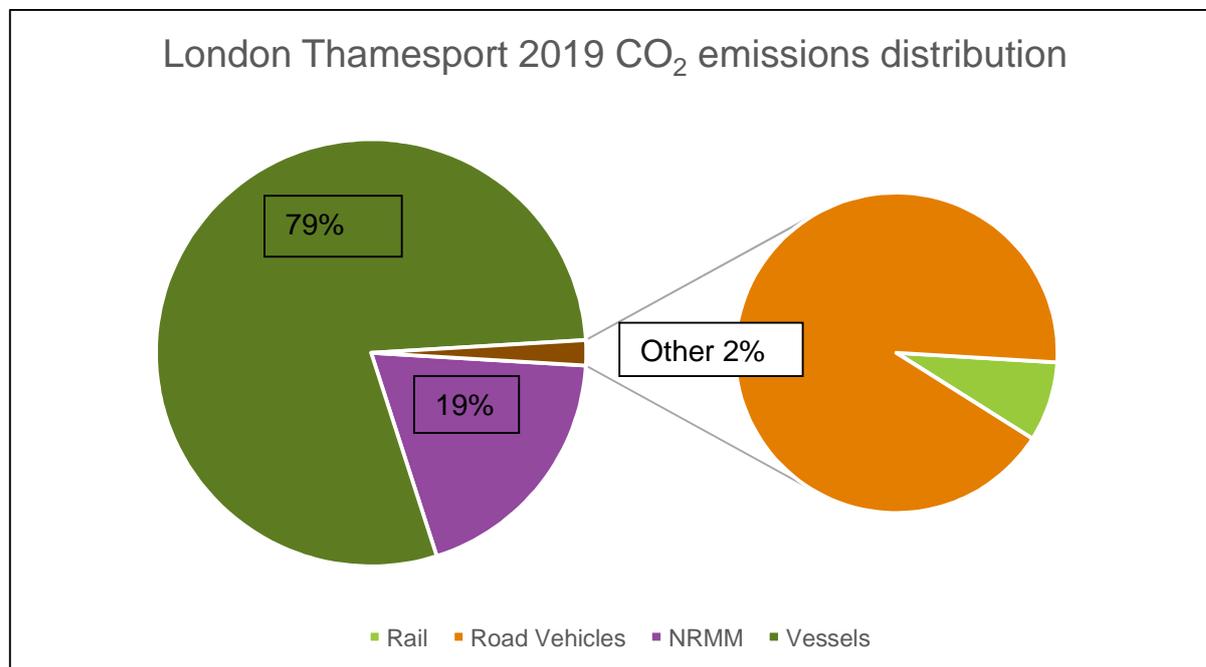


Figure 5: London Thamesport 2019 CO<sub>2</sub> Emissions Distribution



## Emissions Forecast to 2030

A forecast for the business as usual actions at London Thamesport up to 2030 has been developed, based on emissions inventory for 2019. This shows the projection of in scope pollutant emissions, before any specific action plan mitigation measures.

The below shows that based on “business as usual” projections, the emissions from the in-scope pollutants show small changes up to 2030.

The projections show a decrease in NO<sub>x</sub> emissions; this is predominantly due to a reduction in vessel emissions which account for improvements in fuel efficiency, as well as decreases in NO<sub>x</sub> emission factors. SO<sub>2</sub> emissions show a small decrease, also due in the main to a reduction in vessel SO<sub>2</sub> emissions due to improvements in fuel efficiency. PM<sub>10</sub> and CO<sub>2</sub> show small increases by 2030.

With regards to NRMM there is an increase in all emissions by 2030, without taking into account London Thamesport’s Development and associated Action Plan mitigation measures, and as such not taking into account any turnover/replacement in NRMM fleet to a later Euro standard.

With regards to Road Vehicles, these show a decrease, predominantly in NO<sub>x</sub> emissions. This is due forecasted changes in their Euro standards by 2030, compared to 2019.

Activity	Description	2019 NO <sub>x</sub>	2030 NO <sub>x</sub>	2019 SO <sub>2</sub>	2030 SO <sub>2</sub>	2019 PM <sub>10</sub>	2030 PM <sub>10</sub>	2019 CO <sub>2</sub>	2030 CO <sub>2</sub>
Vessels	All emissions from maritime vessels (at berth)	48.9	42.3	3.24	2.98	1.1	1.1	5187	5234
NRMM	Emissions from all NRMM activities including ITs (Terbergs) & RTGs	4.9	6.8	0.008	0.011	0.16	0.226	1255	1737
Road Vehicles	Exhaust emissions from road vehicles within the port	0.19	0.24	0.00055	0.00076	0.0018	0.0004	116	161
Rail	Emissions from locomotives within the port boundary	0.20	0.28	0.00004 9	0.00006 8	0.0039	0.0054	10	14
<b>Total Emissions</b>		<b>54.2</b>	<b>49.6</b>	<b>3.24</b>	<b>2.99</b>	<b>1.27</b>	<b>1.36</b>	<b>6568</b>	<b>7146</b>

# ACTION PLAN

## Introduction

This section of the PAQS summarises what actions are being taken now and planned for the future at London Thamesport 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 NO<sub>2</sub> 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 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 aims<sup>2</sup>.

## Mitigation Measures

The Action Plan mitigation measures outlined within this strategy will also help support London Thamesport' to achieve the goals outlined within the Statement of Intent. The mitigation measures have been developed in discussion with senior staff at London Thamesport.

Planning the implementation and timescales for actions is key to an effective strategy for reducing emissions at London Thamesport. LTP 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 London Thamesport has considered in order to reduce emissions and improve air quality across the terminal. 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 3 shows a summary of the action plan mitigation measures that London Thamesport have considered key in producing an effective strategy for reducing emissions across 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 LTP's ability to influence the measure.

Table 3: Summary of Mitigation Measures at London Thamesport

Mitigation Measure	Timescale	Impact on Emissions	Pollutants addressed	Cost	Ports ability to Influence
<b>Mitigation Measures addressing Vessel Emissions</b>					
Shore Power at all Berths	Long term	High	NO <sub>x</sub> , PM <sub>10</sub> , SO <sub>2</sub> , CO <sub>2</sub>	High	Indirect (encourage)
<b>Mitigation Measures addressing port machinery</b>					
Replacement of existing ITs to be natural gas-powered	Short/ medium-term	Medium	NO <sub>x</sub> , PM <sub>10</sub> , CO <sub>2</sub>	Medium	Direct
Electrification of all RTGs at London Thamesport Terminal	Medium term	Medium	NO <sub>x</sub> , PM <sub>10</sub> , CO <sub>2</sub>	Medium/High	Direct
<b>Mitigation Measures addressing Rail Emissions</b>					
Increase Modal Shift to Rail	Medium term	Medium	NO <sub>x</sub> , PM <sub>10</sub> , CO <sub>2</sub>	High	Indirect
<b>Mitigation Measures addressing Vehicle Emissions</b>					
Electrifying Light Vehicle Fleet	Medium term	Low	NO <sub>x</sub> , PM <sub>10</sub> , CO <sub>2</sub>	Low	Direct
<b>Mitigation Measures addressing Corporate &amp; Commercial Emissions</b>					
Remote & Flexible Working	Short, Medium & Long term	Low	NO <sub>x</sub> , PM <sub>10</sub> , CO <sub>2</sub>	Low	Direct (encourage)

# MONITORING PROGRESS PLAN

## Introduction

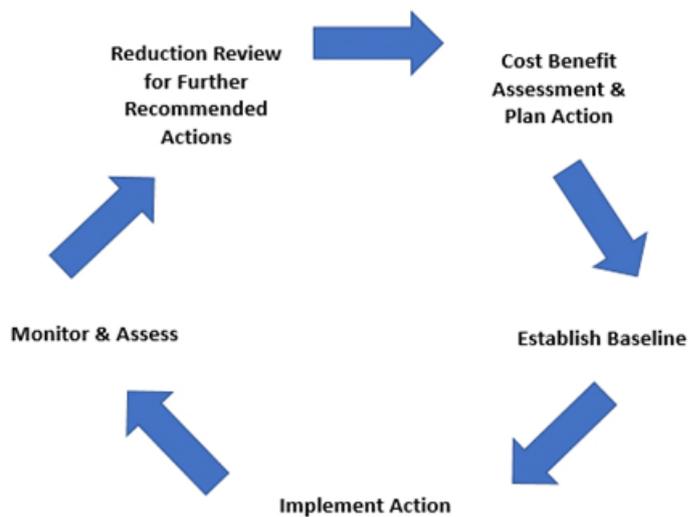
This section of the PAQS provides a monitoring progress plan to enable LTP to track understand the impacts of implementing actions chosen by the port from those listed in the Action Plan. Monitoring the progress against the Action Plan comprises three elements:

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 at the port 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)<sup>3</sup> (Figure 6).

Figure 6: 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 is resubmitted to the Department for Transport (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.

## Monitoring progress of implementing actions in the PAQS

This step is simply for LTP to undertake a tracking of the status of implementing actions identified in the Action Plan. This means simply to 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

Table below.

Table 4 : PAQS Aspects to Monitor

Mitigation Measure	Aspects to monitor each year
<b>Mitigation Measures addressing Vessel Emissions</b>	
<b>Shore Power at all Berths</b>	Berths with shore power connection provided Proportion of vessels calling at the berth connecting to shore power
<b>Mitigation Measures addressing Port Machinery (NRMM) Emissions</b>	
<b>Replace 100% of existing ITs to be natural gas-powered</b>	Diesel ITs removed from fleet (specifying emissions Stage) Number of natural gas ITs added to fleet Operational hours for each unit
<b>Electrification of RTG Fleet</b>	Fuel consumption of RTGs (should drop to zero)
<b>Mitigation Measures addressing Rail Emissions</b>	
<b>Modal Shift to Rail</b>	Proportion of goods transported by rail
<b>Mitigation Measures addressing Vehicle Emissions</b>	
<b>Electrifying Light Vehicle Fleet</b>	Number of diesel vehicles replaced with electric Fuel consumption of this fleet
<b>Mitigation Measures addressing Corporate &amp; Commercial Emissions</b>	
<b>Remote &amp; Flexible Working</b>	Vehicle booking inventory database 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 each year, revised emissions estimates for the port each year will be developed, which can 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 met the targets.

The annual exercise will complement the trend analysis of continuous and long-term ambient air monitoring data (through the existing ambient air quality monitoring around London Thamesport), 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 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 year intervals or when a significant change within the business triggers an amendment. London Thamesport is committed to improving 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.