

SHORE POWER STRATEGY 2025-2035.

JOINING FORCES TO GO FULL SPEED AHEAD



Gemeente
Rotterdam



FOREWORD.



Boudewijn Siemons
CEO
Port of Rotterdam

Building tomorrow's sustainable port!

The port of Rotterdam is a vital economic engine for the Netherlands and plays a key role in Europe's strategic autonomy. But our responsibility goes beyond that. As the Port Authority, we are fully committed to improving the living environment, driving sustainability, and fostering innovation.

Shore power is a crucial building block in this effort: it directly contributes to a cleaner and healthier port, while reducing emissions and noise. Together with our partners, we aim to make shore power the standard for a significant share of shipping by 2030. This requires collaboration, decisiveness, and investment. Rotterdam wants to lead the energy transition — and that means making bold choices.

Shore power is not a vision for the future; it is a solution for today. This strategy is ambitious, realistic, and above all, necessary. We are proud of what we are initiating together with the Municipality, companies, and residents. Because a sustainable port is a strong port — for everyone.



Robert Simons
Alderman
Municipality of Rotterdam

Rotterdam leading the way in shore power!

Rotterdam is home to the largest and most efficient port in Europe. We are committed to creating a safe, liveable, and attractive port and surrounding area. We aim to be frontrunners in the energy transition and accelerators of sustainability and long-term economic development in the port.

A leading position requires a proactive attitude. This shore power strategy provides direction up to 2035, but we call on all parties to be ready by 2030. Full speed ahead, together! We are aware of the challenges, but we will not let them hold us back. The importance of a pleasant and healthy living environment for residents is significant. The goals are urgent, and our city and port demand speed, courage, and results. We want to do what is possible. What lies before you is the most ambitious shore power strategy in Europe — and we are proud of it!



CONTENTS.

A New Impulse for Shore Power	3
Why Shore Power?	4
How Does Shore Power Work?	5
What Is the Role of the Port Authority and the Municipality?	6
Developments	7
Challenges	8
Preconditions and Efforts	9
Shore Power Strategy 2025–2035	10
Programme Focus and Activities	11
How: Shore Power Development Phases	12
The Transition Towards 2050	13
Strategy Review in 2030	13



A NEW IMPULSE FOR SHORE POWER.

The Municipality of Rotterdam and the Port of Rotterdam Authority are committed to significantly improving the quality of the living environment. Both have aligned themselves with the goals of the Paris Agreement and are working towards a CO₂-neutral port by 2050. To achieve this, the Municipality of Rotterdam follows the objectives of the Rotterdam Climate Action Plan (KAR), while the Port Authority pursues the goals outlined in its corporate strategy. Together, they aim for a substantial reduction in emissions of particulate matter, noise, CO₂, and nitrogen.

Shore power is a key instrument in achieving these goals. It helps reduce emissions of particulate matter, noise, CO₂, and nitrogen, thereby improving the quality of the living environment. That's why the ambition is for moored vessels in Rotterdam to cause no emissions at berth in the future — a concept we call "zero-emission at berth."

¹ For professional shipping, we distinguish between two types of berths in the port and urban area. Public-use berths are locations where any vessel may moor temporarily with permission from the relevant authority — for example, in the Maashaven or near the Boompjes. Private-use berths are locations where an organisation holds exclusive usage rights through a long-term lease from the Municipality or the Port of Rotterdam Authority.

The first steps towards shore power for inland shipping were taken in 2007. In 2020, the Port Authority and the Municipality launched a joint shore power strategy for seagoing vessels. At that time, there was no European legislation mandating the provision or use of shore power, and the technology was still relatively new for seagoing vessels. Since then, air quality standards have also been tightened, with stricter requirements coming into effect from 2030. The Port Authority responded with a development programme focused on regulation, subsidies, standardisation, and technical and commercial innovation to remove market barriers. The Municipality accelerated deployment through supportive policies and funding. Since then, significant progress has been made in implementing shore power in Rotterdam, supported by new (international) regulations and the development of technical standards.

Thanks to our joint efforts and collaboration with various partners in the port area, many of the ambitions set out in the 2020 Shore Power Strategy have been achieved or are on track to be realised by 2030. At the same time, new challenges have emerged, such as grid congestion, geopolitical tensions, and a pressured investment climate.

Therefore, the Port Authority and the Municipality have recalibrated the shore power strategy. For public berths¹, we continue to expand and improve shore power. For private berths, we work with companies in the port to ensure shore power is available for segments covered by European regulations. For private berths serving segments not covered by international legislation, we take a targeted approach, prioritising locations where the greatest emission reductions can be achieved. For these segments, we advocate for European mandates and, where necessary, the Municipality will pursue local shore power requirements.

This strategy is ambitious and focused. We concentrate on the steps where we have the most influence and can achieve the greatest impact on air quality and CO₂ reduction. The strategy considers existing regulations and technical standards, but also identifies opportunities to influence and adapt them.

In the coming decade, we will continue to take major steps towards our ambition of zero emissions at berth, and we remain committed to building a clean, future-proof port.

WHY SHORE POWER?

Vessels use onboard generators to produce electricity for critical functions such as lighting, ventilation, pumps, and IT systems. By connecting directly to the land-based power grid while at berth, vessels can switch off their engines and generators. This offers several important benefits:

- 1. Improved air quality for the living environment**
- 2. Reduced noise pollution for nearby areas**
- 3. Lower emissions of CO₂ and other greenhouse gases**
- 4. Reduced nitrogen deposition², including in nearby Natura 2000 areas**

Many vessels spend most of their time in port moored at the quay. If they connect to shore power during that time, a large part of their stay becomes clean and quiet — and therefore more sustainable. A key requirement is that the vessel must be equipped with the necessary connection equipment. New vessels often already have this capability, while existing vessels may need to be retrofitted.

Based on historical data of vessels visiting the Port of Rotterdam, the use of shore power could prevent approximately 500 kilotonnes of CO₂ emissions per year. However, this requires a sufficient electricity supply — around 750 gigawatt hours annually, which is comparable to the electricity consumption of approximately 300,000 households.

² Airborne nitrogen oxides and ammonia eventually settle on the ground. This is referred to as nitrogen deposition.



HOW DOES SHORE POWER WORK?

The use of shore power can prevent approximately 500 kilotonnes of CO₂ emissions per year.

Cleaner Living Environment.

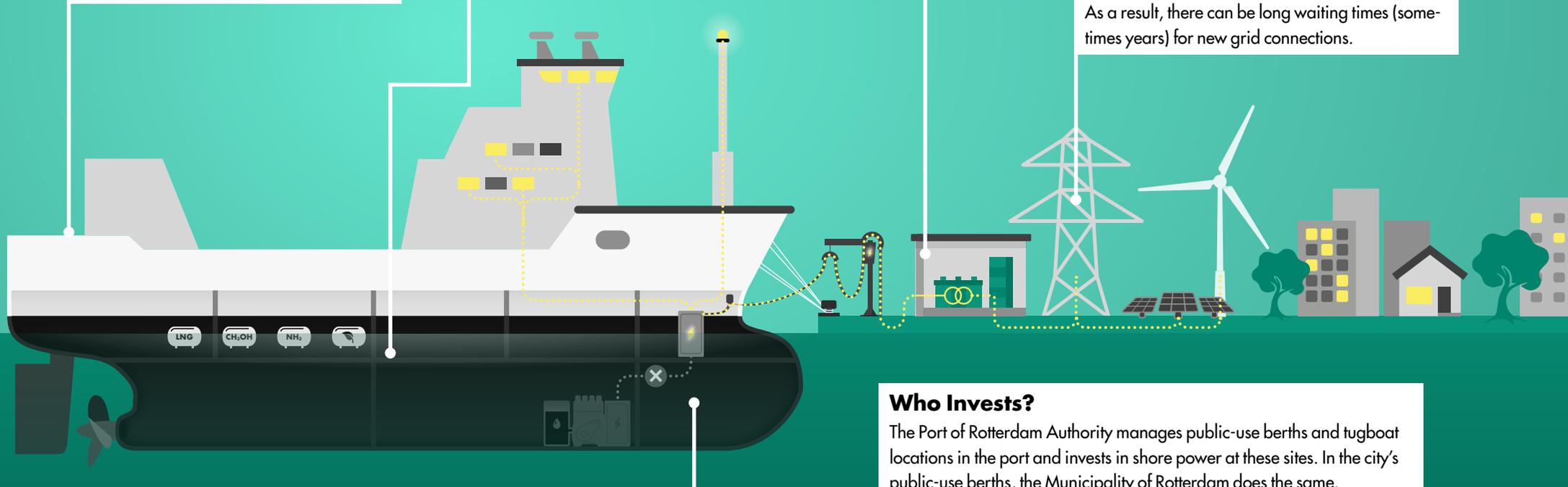
By switching off its (diesel) generator in port and using shore power for lighting, pumps, and other equipment, a vessel produces less noise and particulate matter — and significantly reduces its CO₂ emissions.

A Future-Proof Investment.

Even as vessels transition to sustainable fuels such as green methanol, shore power remains attractive. Electricity is expected to be more cost-effective than these alternative fuels.

Pressure on the Electricity Grid.

To supply sufficient power, grid operator Stedin must provide high-capacity connections — sometimes exceeding 20 megawatts (MW). Electricity demand is rising throughout the port and across the Netherlands due to increasing electrification. As a result, there can be long waiting times (sometimes years) for new grid connections.



Adapted Vessels.

To use shore power, a vessel must be equipped or retrofitted accordingly. This investment is most beneficial for vessels that regularly dock at quays with shore power — such as ferries on fixed routes. For vessels visiting many different ports where shore power is (still) unavailable, the investment is less favourable.

Who Invests?

The Port of Rotterdam Authority manages public-use berths and tugboat locations in the port and invests in shore power at these sites. In the city's public-use berths, the Municipality of Rotterdam does the same.

Most berths are managed by private parties (companies in the port area), who are responsible for shore power at their locations. To support this, the Port Authority and Eneco have jointly established Rotterdam Shore Power. Companies can choose to outsource the investment, design, construction, and operation of shore power systems.

WHAT IS THE ROLE OF THE PORT AUTHORITY AND THE MUNICIPALITY?

In the port, there are berths for private use by customers and berths for public use managed by the Port of Rotterdam Authority. In urban areas, both the Municipality of Rotterdam and the Port Authority manage berths for private use as well as berths for public use.

At the quaysides of public-use berths, the Port Authority and the Municipality are responsible for the realisation of shore power facilities.

At private-use berths, the respective companies are responsible for the installation of shore power, with the Port Authority and the Municipality providing coordination and support.

The Port Authority collaborates with companies in the port, maintains contact with stakeholders, and aims to create the right preconditions for the installation of shore power. It is therefore responsible for the shore power development programme in the port.

The Municipality accelerates and strengthens this effort through, among others, policy, coordination of permits, local obligations, and by offering subsidies for (feasibility) studies and investments.



Together, we operate as reliable partners, promote collaboration, and are committed to increasing international support for shore power. We actively work to influence regulations that can accelerate the global rollout of shore power. After all, the more ports are equipped with shore power, the more attractive it becomes for shipping companies to adapt their vessels accordingly.

THE MORE PORTS THAT ARE EQUIPPED WITH SHORE POWER, THE MORE ATTRACTIVE IT BECOMES FOR SHIPPING COMPANIES TO MAKE THEIR VESSELS COMPATIBLE FOR SHORE POWER.



DEVELOPMENTS.

BEFORE 2020.

Shore Power in Rotterdam > 100 shore power locations in the port, including:

94 SHORE POWER UNITS

at public-use berths managed by the Port of Rotterdam Authority for inland shipping.

5 SHORE POWER UNITS

at public-use berths managed by the Municipality of Rotterdam for inland shipping.

>5 MW

of installed capacity.

1 SHORE POWER UNIT

at private-use berths.

The Port Authority and the Municipality have further supported shore power through:

2 PILOTS

for mobile shore power without grid connection.

€ 8 MILLION

in investments and subsidies.

4 STUDIES

conducted for shore power at terminals.

15 QUICK SCANS

conducted for shore power at terminals.

€220 MILLION

available subsidies from the Dutch national government for shore power.

€10 MILLION

in interest-free loans from the Municipality of Rotterdam.

> €20 MILLION

in investments by the Port of Rotterdam Authority and Rotterdam Shore Power B.V.

4 STUDIES

for the rollout of shore power at container terminals, the cruise terminal, and liquid bulk terminals.

€3,5 MILLION

in subsidies for shore power from the Province of South Holland and the Municipality of Rotterdam.

RSP

joint venture Rotterdam Shore Power established by the Port of Rotterdam Authority and Eneco B.V.



- OPERATIONAL
- UNDER CONSTRUCTION
- PLANNED/IN INVESTIGATION



Realisation by / in collaboration with Rotterdam Shore Power (a joint venture of the Port of Rotterdam Authority and Eneco)

Scaling up shore power.

The port now has more than 100 shore power installations with a total installed capacity of over 43 MW.

Vessels at berth generate the required electricity onboard using their generators; this amounts to approximately 750 GWh of electricity consumption per year. The Port Authority and the Municipality have supported the rollout of shore power in various ways in recent years. For example, subsidies have been made available, and more than 15 quick scans and several studies have been conducted to support the scaling up of shore power. A pilot has also been carried out for the use of mobile batteries for shore power and for connecting smaller container vessels to a low-voltage connection.

New regulations.

In 2023, the Alternative Fuel and Infrastructure Regulation (AFIR) and the FuelEU Maritime legislative package from the European Commission were adopted. These regulations mandate the availability and use of shore power by 2030 for container, cruise, and passenger vessels of at least 5,000 gross tonnage. It is expected that the Netherlands will propose national legislation in 2026 to comply with the EU directives.

To promote the use of shore power internationally, the Port of Rotterdam Authority and the Municipality of Rotterdam collaborate with other ports and countries through various international organisations and projects.³

³ International Association for Ports and Harbours (IAPH), European Commission (EC), International Maritime Organisation (IMO), European Onshore Power Supply Association (EOPSA), Interreg BREEZE project

Can all vessels already connect to shore power?

The level of maturity differs per segment. This depends, among other things, on the presence of a technical standard for shore power and the number of unique vessel calls per segment. Some berths are visited by many different vessels, all of which would need to be retrofitted to use shore power. Other berths, such as those for ferries or cruise vessels, are used year-round by a limited number of vessels. In such cases, only a few vessels need to be adapted to use shore power at the quay.

Grid congestion.

Due to increasing electrification, the demand for electricity and the load on the electricity grid have risen sharply since 2020. As a result, by the end of 2023, grid operators TenneT and Stedin declared grid congestion in most parts of the port area. To resolve this, the grid operators are working on reinforcing the electricity grid, but this will take several years. Requests for higher-capacity grid connections are therefore placed on a waiting list. Although grid congestion will not make the rollout of new shore power projects easier in the coming years, the Port Authority and Municipality present ambitious goals for nearly all vessel segments in this recalibrated shore power strategy. Even if congestion persists over the next few years, preparatory work can often already be carried out to enable a rapid rollout of shore power. The Port Authority and the Municipality are in close contact with Stedin regarding the required grid capacity for shore power.

To mitigate the impact of congestion, the Port of Rotterdam Authority, together with the grid operators and Deltalinqs, has established the New Energy Taskforce. This taskforce also explores solutions for shore power, such as adjusted contract models, local optimisation, and timely registration on the grid operator's waiting list. In addition, we aim to investigate whether smart use of (existing) shore power installations can actually help alleviate grid congestion.

PREREQUISITES AND CONDITIONS FOR ACCELERATION.

The development of shore power is gaining momentum in Rotterdam, and the port is on track to supply over 30% of electricity consumption at berth through shore power by 2030. In this strategy, we look further ahead, despite challenges such as grid congestion and standardisation. We acknowledge that the world of maritime sustainability is still evolving and do not claim that shore power is the solution always and everywhere. At the same time, we observe a growing demand for shore power both locally and internationally – even for vessel segments where no technical standard is currently available.

In this shore power strategy, the Port Authority and the Municipality present new, realistic ambitions for the rollout of shore power in the port and the city. We first focus on what the Port Authority and Municipality can do at public-use berths. Secondly, we look at berths that fall under European shore power regulations. Finally, we present our ambitions to scale up shore power for vessel segments with relatively high emissions, which are not yet covered by international shore power legislation. This way, shore power becomes widely available and contributes to improving the living environment and advancing towards a climate-neutral port by 2050.

To realise these ambitions, the following prerequisites or conditions for acceleration are essential:

- **Shore Power Standardisation:** Technical standards exist for container, cruise, passenger, RoRo seagoing vessels, and inland shipping. For liquid, dry and break bulk, standardisation is crucial for international rollout. The Port Authority is actively involved this through international working groups, although it is a long-term process.
- **Clear EU Legislation:** The port of Rotterdam is on track to comply with current EU legislation, but advocates for expansion to more vessel segments (such as RoRo, offshore, and shipyards) during the 2027 revision. Clear legislation is needed to ensure a level playing field and investment certainty.
- **Sustainability Pays Off:** New legislation makes emissions costly. This encourages sustainability and thus the use of shore power. Rotterdam advocates for maintaining ambitious targets and cost accountability in case of non-compliance.
- **Business Case and Subsidies:** Virtually all shore power installations have been realised with substantial subsidies. Financial support from national and European funds remains essential through 2035. The Port Authority and Municipality actively pursue this with the Dutch government and the EU.
- **Grid Capacity:** Grid congestion is a bottleneck. Additional grid capacity is needed to realise our ambitions. The Port Authority and Municipality are exploring innovative solutions and coordinating with grid operators to ensure timely connections and sufficient grid capacity.



SHORE POWER STRATEGY 2025–2035.

The Shore Power Strategy 2025–2035 serves as a guiding framework for the coming ten years, in which we introduce a tailored approach per development phase to enable acceleration and scaling.

WHY?

Ambition Regardless of the vessel segment, Rotterdam aims for zero emissions at berth by 2050, with shore power as an essential instrument to improve air quality, reduce noise pollution, lower CO₂ emissions from moored vessels, and decrease nitrogen deposition.

Core Task The Port Authority and the Municipality operate as reliable partners, each managing an extensive shore power development programme for both seagoing and inland shipping, promoting collaboration within the Port Industrial Complex, and creating international support for the development, standardisation, and scaling of shore power.

WHAT?

Objectives

1. Expansion & Improvement at Public use Berths

For our quays at public-use berths, we aim for the following:

2027: All public-use berths for inland shipping in the port equipped with shore power.

2030: Tugboats, river cruise vessels, and all other professional inland shipping in urban areas (e.g. sightseeing boats) equipped.

In urban areas, at least 95% of visits to public-use berths moored emission-free.

2035: Most public-use quays for seagoing vessels in the port equipped.

2. Preparing the Port for International Shore Power Obligation

Terminals in the port will comply with the AFIR regulation and with (upcoming) international, European, and Dutch obligations by January 1, 2030.

Vessel segments falling under the FuelEU Maritime regulation, which are required to use shore power, will be assured of this in Rotterdam.

3. Scaling Shore Power with Impact

We focus the development of shore power on vessel segments not yet covered by international shore power legislation and with high emissions.

Our ambition is that by 2030, as many shipyards, Ro-Ro, and offshore terminals as possible offer shore power. For these segments and the break bulk segment, the ambition is that by 2035, (almost) all terminals offer shore power.

For the liquid and dry bulk segments, our ambition is that by 2035, as many terminals as possible offer shore power, thereby initiating shore power development for these segments as well.

Segments

Inland shipping

Seagoing vessels

Tugboats

Vessels with European Obligation

Containers

Passenger Vessels

Cruise Vessels

Vessels without European Obligation

Ro-Ro

Offshore

Shipyards

Break bulk

Liquid bulk

Dry bulk

HOW?

Development Phases

Development

Project Realisation

Commissioning

Role per Phase

Public-use Berths

Design & Permitting

Project Execution

Service & Maintenance

Private-use Berths

Innovate & Motivate

Advise & Encourage

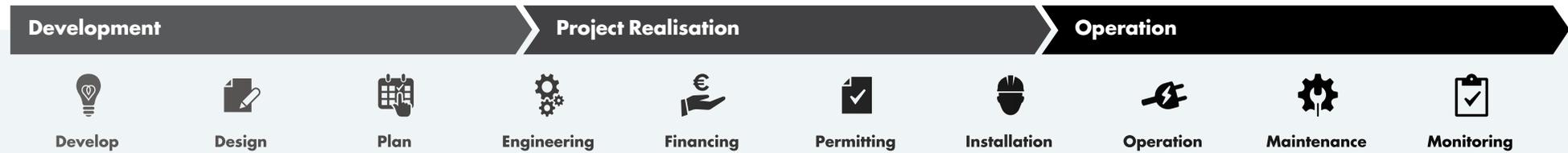
Integrate & Operationalize

Programme Focus & Activities.

SEGMENTS		STRATEGY			SITUATION 2025			FOCUS OF DEVELOPMENT PROGRAMME		
		OBJECTIVES	AMBITION STATUS ROTTERDAM			STANDARD	EMISSION IMPACT		SCOPE	
			2025	2030	2035	Is there a technical standard for this segment?	Can we reduce significant emissions?	How many unique vessels need to be prepared?		
PUBLIC-USE BERTHS	Inland shipping	1. Expansion and improvement at our own quays				✓	●		(Re)invest, expand and improve service & operations.	
	Seagoing vessels					Partially	●	Depends on location & vessel segment	Develop and invest in own assets at public waiting locations for seagoing vessels; applied to the most frequent users.	
	Tugboats					✓	●		Develop and invest in own assets at tugboat locations.	
PRIVATE-USE BERTHS	Vessels with European obligation	2. Achieving compliance at private-use berths	Containers				✓	● ● ●		Advise & encourage during rollout. Prepare for implementation, vessel visits & reporting.
			Passenger vessels				✓	● ●		Advise & encourage rollout; focus on solutions for grid congestion issues.
			Cruise vessels				✓	● ●		Monitor and professionalize operations.
	Vessels without European obligation	3. Scaling shore power with impact	Ro-Ro				✓	● ●		Advise & encourage private parties. Motivate by advocating inclusion of these segments in European legislation during revision.
			Offshore					● ●		
			Shipyards				Not applicable	● ●	Depends on location & vessel segment	
			Break bulk					● ●		Innovate & motivate; assess feasibility & develop standards through coalition building and facilitating pilots.
			Liquid bulk					● ● ● ●		
			Dry bulk					● ●		

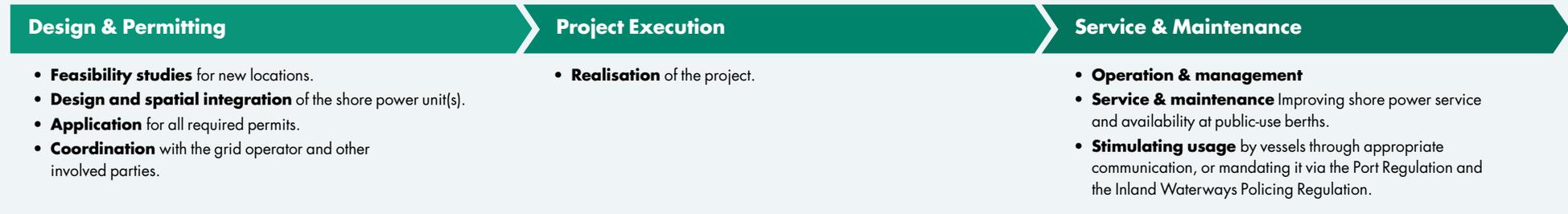
Start development; technically very complex
 Technically feasible, not yet implemented
 Some terminals offer shore power
 As many terminals as possible offer shore power
 (Almost) all terminals offer shore power

How: Shore Power Development Phases.



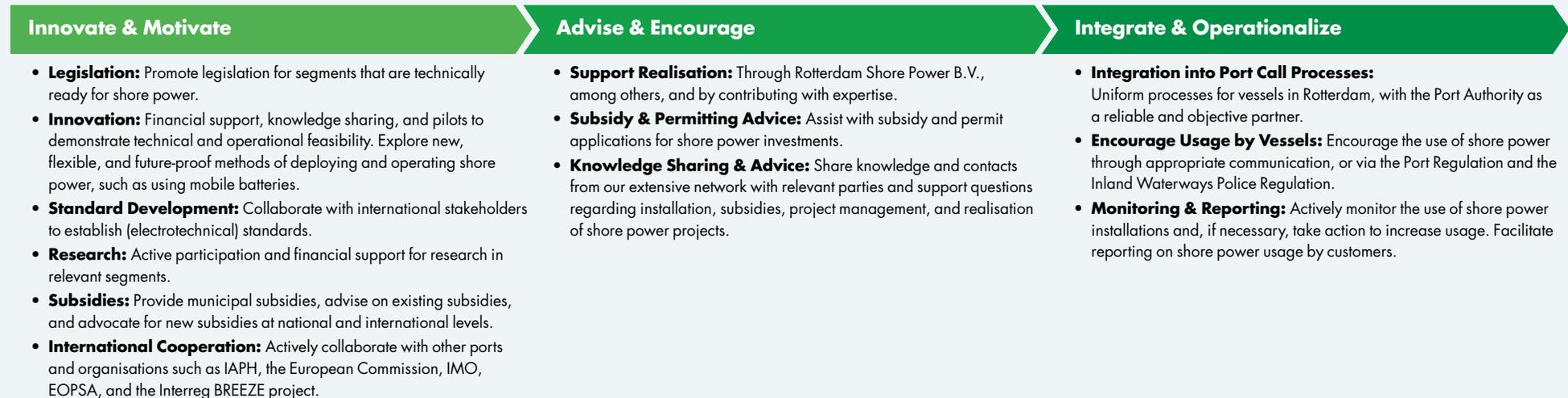
PUBLIC-USE BERTHS.

At public-use berths, the Port of Rotterdam Authority is responsible for the realisation of shore power. In the urban area, the Municipality of Rotterdam manages several public-use berths and is responsible for the rollout there. Both parties ensure the provision of appropriate shore power infrastructure and the improvement of service and maintenance at these locations. We follow standard procedures for project development.



PRIVATE-USE BERTHS.

For private-use berths, the Port Authority and the Municipality have a more facilitating, coordinating, and supporting role. The Port Authority focuses on a development programme to support the rollout of shore power in each phase. The Municipality facilitates through policy and subsidies for research and implementation.



THE TRANSITION TOWARDS 2050.

The Power of Shore Power

The rollout of shore power is a shared responsibility of various parties, including vesselowners, shipping companies, terminals, and ports within international transport chains. Investments in both shore power installations in the port and modifications to vessels only become economically viable when shore power is applied on a broad scale. The maritime sector faces a profound sustainability transition that requires significant investments. Shore power is an important solution in this transition and is expected to be the most cost-efficient method to reduce emissions from moored vessels.

Clear and ambitious legislation is essential to accelerate this transition and to create a level playing field for all involved parties. That is why we advocate for policy objectives and timelines that are both ambitious and realistic, and we actively contribute to the development of legislation that must make shore power a success. The choices and developments in the coming years will be decisive in achieving our shared ambition: a climate-neutral port by 2050.

REVIEW 2030.

This strategy serves as the guiding framework for the next ten years (2025–2035). Based on this framework, the Port Authority and the Municipality will develop and implement their own programme of activities. Experience shows that new developments may arise during the course of these programmes that affect implementation. Examples include expansions of the electricity grid, which may allow for more shore power capacity after 2030, and a possible revision of European legislation in or after 2027. In 2030, this strategy will be re-evaluated to determine whether it still aligns with the prevailing societal, technological, and economic developments. In the interim period, we will monitor progress annually.

**THE ROLLOUT OF SHORE POWER
IS A SHARED RESPONSIBILITY
OF VARIOUS PARTIES.**

