



 **Green** Inland Ports

Good Practices

Funded by
the European Union





Decarbonisation strategy/plan

Decarbonisation strategy/plan

1.1 Description

Decarbonisation is the process of reducing carbon dioxide in the atmosphere. A decarbonisation plan enables stakeholders to map out a compliance strategy to help achieve decarbonisation targets in the most efficient way possible, as it sets out the years ahead for optimal utilisation of operational measures to become more energy efficient (DNV, n.d.). A decarbonisation plan aims to create an opportunity for all entities present in the port area to collaborate. To set up a decarbonisation plan and sustainability targets, the following steps should be taken (Nexio Projects, n.d.):

1. Measure and understand the emissions through a carbon footprint assessment or another type of emission measurement technique to measure and establish a baseline scenario.
2. Set the right targets to align the organisation with its personal goals, or to align the organisation with the overarching national or European goals.
3. Identify specific tools to cut emissions based on the type of sector(s) that the specific port area is mainly active in.
4. Plan reduction measures through stakeholder engagement to ensure transparency and buy-in, as it is necessary for an inland port to get as many stakeholders on board as possible to realise maximum effect.
5. Focus on carbon removal, neutralising emissions through existing techniques and technologies. This can be perceived as the realisation stage of the decarbonisation strategy.

This approach is similar to what for example the port of Detroit is doing. Their first step consisted of reaching out to all terminal operators to collect data regarding their energy usage and CO₂ emissions. The results of the terminals within the port of Detroit have been published publicly on a [map](#). This could also be realized in other ways, such as the Port of Antwerp-Bruges, which uses sensors to measure air quality. Air quality is measured based on the SO₂, NO_x and PM emissions in the case of the port of Antwerp-Bruges, but sensors do exist that can provide high quality, accurate and reliable measurements of CO, CO₂ and CH₄ (Edinburgh Sensors, 2018, Port of Antwerp Bruges, n.d.). The next step for the port of Detroit is to establish an action plan based on targets to reduce the carbon footprint and reach their goals, but in the case of the port of Detroit, air pollution is also taken into account, which means this good practice may have overlap with the good practice “Clean air programme” (Schrupp, M. & Moorcroft, R., 2023).

Projects alike have also occurred in Europe. The Wuppertal Institute has developed long-term climate protection scenarios for the port of Rotterdam industrial cluster on behalf of the port of Rotterdam Authority back in 2016. The analysis focused on power plants, refineries and the chemical industry, which are responsible for more than 90% of the port area's CO₂ emissions at that moment. Based on the findings of the scenarios, recommendations for the port authority, the area's companies, and policymakers were derived. These recommendations for action are intended to show which measures should be taken at what time to facilitate a profound decarbonisation of the port area. These results should form the key basis for the development of [a long-term decarbonisation strategy](#) for the port of Rotterdam (Wuppertal Institute, 2016).

1.2 The goal of a decarbonisation plan

The goal of this good practice can vary per port, but generally the goal is to reduce greenhouse gas emissions throughout the port. The challenge is that all terminals within the port must cooperate to achieve this goal. This will not always be easy since terminals are often private entities operating within the port area. The specific goal of the Port of Detroit is to become carbon neutral by 2040.

1.3 Parties that have implemented a decarbonisation plan

- Port of Detroit
- Port of Rotterdam
- APM Terminals

1.4 Stakeholders

- Port authority: The port authority is the party that should initiate a decarbonisation plan or strategy for the port, as they are the entity that manages the port area and assets. Due to the port authority owning much of the port assets, they are also responsible for a large share of the decarbonisation efforts.
- Port terminals: port terminals are a part of the port area and are, in many cases depending on the size and main cargo within the port, responsible for a significant share of the port's GHG emissions. A decarbonisation strategy should be a joint effort, combining all entities that are part of the port area. The terminals would ideally be able to indicate their own carbon emissions on an annual basis, and would also implement the measures indicated by the decarbonisation strategy to become more sustainable.
- Industry within port area: whether or not industry is present within the port area depends on the port, and if this falls under the scope of the decarbonisation plan. If so, their role would be similar to the role of port terminals.
- Environmental research company (optionally): In the case of the port of Detroit, this project was initiated by the port area in collaboration with Tunley Environmental and Southwest Detroit Environmental Vision. Tunley Environmental was responsible for

engaging private businesses within the port area to provide activity data, which could be used to calculate the emissions of their activities.

- National/European legislative organisations regarding inland shipping: These organisations are responsible for formulating goals with which the inland ports have to comply with. The port's long-term goals are often based on this.

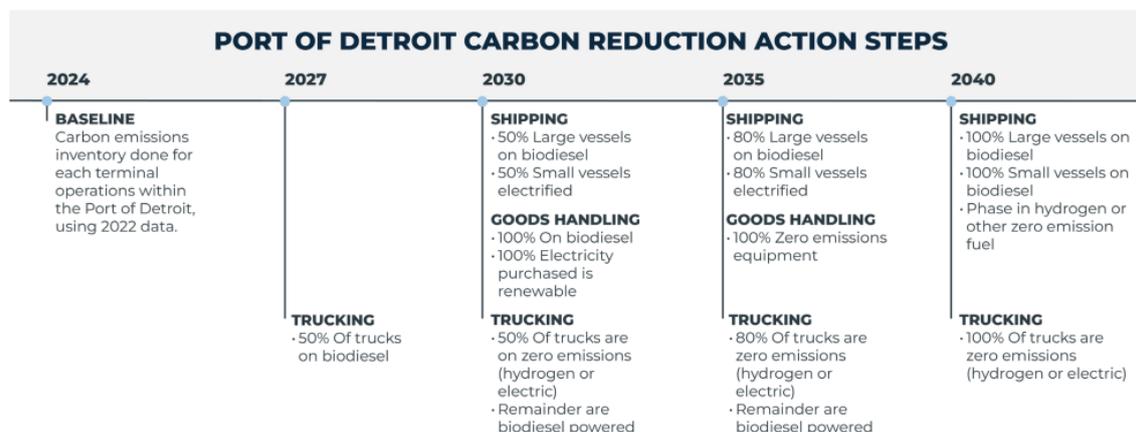
1.5 Voluntary or mandatory

When a goal has been set for a specific country, river basin or region, there is a mandatory duty to realise this goal within that country or port. A decarbonisation plan or strategy may function as a tool to reach this goal, but it is not obligatory to use. The goals may be reached in other ways using other tools, but a decarbonisation plan or strategy is currently not mandatory for ports.

1.6 Realised/potential impact

The port of Detroit has recently finished the mapping of carbon emissions of the terminals within the port area. A map with the results can be viewed [here](#). The executive summary can be viewed [here](#). Based on the analysis results, the port of Detroit has set up carbon reduction action steps together with Tunley Environmental, which serves as a timeline to reach 100% carbon neutrality in 2040.

Figure 1 – Port of Detroit carbon reduction action steps



1.7 Possible obstacles

Lack of willingness from the terminals within the port to cooperate and share data. It is possible that the terminals within the port are competitors of one other. This can make them reluctant to share data, because the data can be sensitive. It can take a long time for terminal operators to feel comfortable enough to share data.

Current actions are often not embracing the full influence of ports, but are only focused on decarbonisation of infrastructure and operations within the direct control of ports. Action in the broader zone of user and community and industry influence, where impacts are often far greater and where potential benefits are significant, is lacking (ARUP & Environmental Defense Fund, 2024). As an example, Detroit is also a major hub for truck traffic. Much transport does not touch the water. However, road transport also emits greenhouse gas and air pollutant emissions, which must be considered.

Financial resources might be insufficient to meet the urgency and scale needed to decarbonise port operations and infrastructure. In many countries and regions, funds do exist to aid ports in this assessment, they are often relatively limited.

Supply of zero emission machinery and vehicles that can be used in certain ports. The Port of Detroit is primarily a bulk port and use tractors and wheel loaders which must be large enough to transport large quantities. Although there are financial resource funds available within the United States to strive for decarbonisation, electrified port equipment is not available yet at the desired level for ports and terminals to become interesting.

1.8 Key learnings

A port decarbonisation plan/strategy can be a very useful tool to come closer to the GHG and decarbonisation goals of ports. However, the scope of such a plan should be carefully considered, as it might be easier to limit the scope of the decarbonisation plan to only what happens within the port area, but this makes the port decarbonisation plan much less effective, as a large share of the emissions occur outside the port area.

It might be a difficult process to include all companies and terminals in this good practice, as all parties should be transparent on their activities and emissions, and when a future vision has been set up, all entities should do their part to reach the common goal.

1.9 Sources

ARUP & Environmental Defense Fund, 2024. *Practical pathways for port decarbonisation and environmental justice*, New York:

DNV.n.d. Decarbonisation Plan by Maritime Advisory,
<https://www.dnv.com/services/decarbonization-plan-by-maritime-advisory-238802/>.

Edinburgh Sensors.2018. Measuring Greenhouse Gas Emissions,
<https://edinburghsensors.com/news-and-events/measuring-greenhouse-gas-emissions/#:~:text=Gas%20Sensors%20for%20Measuring%20Greenhouse,CO2%20and%20CH4.>

Nexio Projects.n.d. How to build an effective decarbonisation strategy?,
<https://blog.nexioprojects.com/how-to-build-an-effective-decarbonisation-strategy.>

Port of Antwerp Bruges.n.d.Air quality, odour and noise,
<https://www.portofantwerpbruges.com/en/our-port/people-and-environment/air-quality-odour-and-noise#geurhinder>.

Schrupp, M. & Moorcroft, R., 2023. Interview port of Detroit.

Wuppertal Institute.2016.Decarbonisation Pathways for the Port of Rotterdam Region,
<https://wupperinst.org/en/p/wi/p/s/pd/628>.

