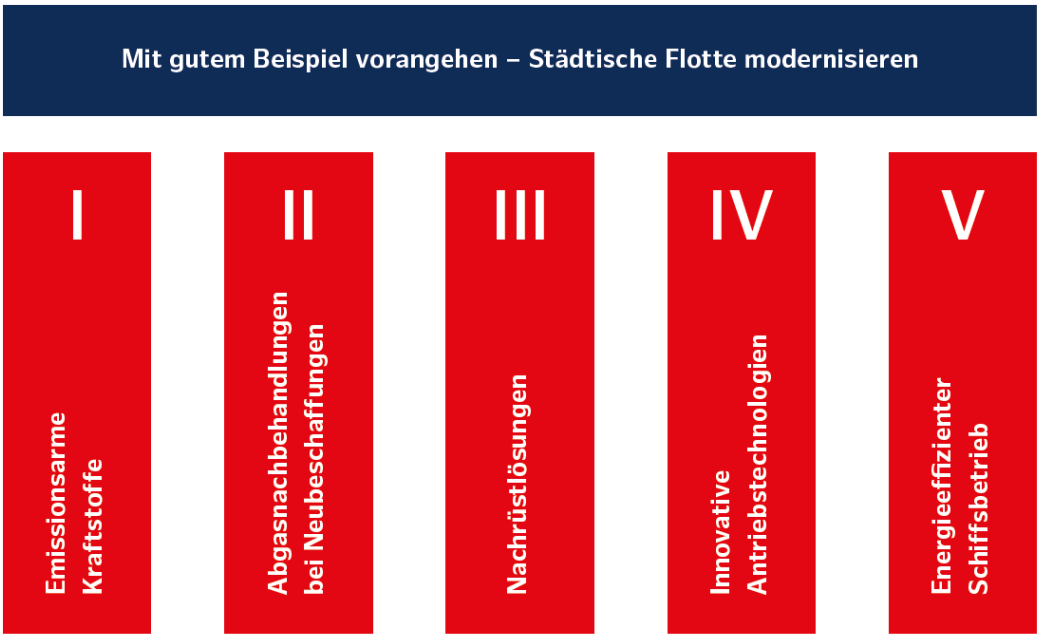
Environmental Strategy of the Hamburg Fleet

Since July 2017, the Hamburg fleet combines the city ships into one fleet management. This founding provides added value for the city and the port. The fleet contains about 50 ships, mostly harbor ships with different functions – firefighting boats, police ships, ice breaker, survey and transportation ships. In addition, the Hamburg Fleet operate dredgers and about 40 barges.

The five pillars of the environmentally friendly urban fleet:



Pillar 1 – Low Emission Fuels

The Hamburg Fleet decreased the emissions of its ships very quickly, using synthetic fuels such as GTL (Gas to Liquid) and HVO (Hydrotreated Vegetable Oil). These fuels cause significantly less Sulphur und even less–particulate matter, depending on the engine configuration. PM emissions decreased by 50 % and Sulphur by about 10 % compared to “truck” diesel, with the use of GTL.

However, the Hamburg Fleet is not done yet. The company participates consequently in the development of climate neutral fuels and offers its ships as testing field for the testing of those fuels. The Hamburg Fleet formed cooperation with different research entities in Hamburg and internationally.

Pillar 2 - Exhaust Gas Treatment For New Ships

The main challenge for the ship management: The ships have a variety of different technical standards due to their different ages and use. To modernize the fleet, the goal is to bring at least two newbuildings per year into service.

The principle for the newbuildings: The ships must fulfil at least EURO 5 Standard in terms of engine technology and thus emission. The first of these newbuildings was delivered in 2018. The fire-fighting vessel “Branddirektor Westphal” is equipped with a particle filter as well as a SCR catalytic converter. Due to the lack of serial availability of this technique during construction, the investment for the exhaust treatment summed up to 1.2 million Euro.

The modernization programme continues to strive for low emission technology. The next newbuildings (smaller fire-fighting vessels) will be equipped with exhaust gas treatment and a plug-in hybrid engine.

Pillar 3 – Retrofit Solutions

Another emission-reduction action is the retrofitting of the existing fleet, wherever technically possible. Due to the retrofit of exhaust gas treatment solution or the installation of a hybrid engine, particulate matter and SOx is decreased by 90 %. The reduction effects are even higher in combination with GTL. The first six ships are retrofitted already. The costs are about 150.000 Euro per ship. Main challenge for the retrofit and its operation is the lack of space in the engine room. All other technical challenges are manageable.

Pillar 4 - Innovative Propulsion Technologies

The Hamburg Fleet promotes new propulsion technologies. Two fire-fighting vessels - currently under construction - are being fitted with plug-in diesel hybrid engines. These allow for a fully electric and zero emission operation for a period of 90 to 120 minutes.

Further, the Hamburg Fleet has developed a finished construction specification for a small passenger ship with methanol fuel cell propulsion. Since 2018 the Hamburg Fleet is also part of an international research consortium that works on a prototype vessel aiming for a ship emission reduction of 97 %. The technology that applies to this HyMeth-Ship is simple but involves an extremely complex construction. Methanol is reformed to hydrogen, which is then burned. The CO2 thus created will be stored and later reconverted into methanol.

Pillar 5 - Energy Efficient Ship Operation

Emissions can be reduced by mindful operation of vessels. All shippers of the Hamburg Fleet have undergone a training for energy efficient ship operation. Starting with reduced power and running the ship not at top speed but at a slightly lowered one will reduce the emissions by 3-7 % per trip.

The “Speed and Consumption Curve” for each ship is placed on the bridge, to remind the crew on the matter constantly.

The application of foils on ship hulls to reduce resistance - and thus decrease fuel consumption – is currently being tested.

Speed Consumption

Vergleich der Verbräuche der „Johannes Dalmann“ bei maximaler und reduzierter Geschwindigkeit: