

Guideline **CLEANER SHIPS**

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Inland Waterway Navigation (IWT) is one of the most important means of transportation, after road and rail. While IWT has low CO₂ emissions, its particulate matter (PM) and nitrogen oxide (NO_x) emissions are relatively high. And while it does not contribute very much to overall emissions in Europe, locally it can be of great significance. For many cities, ships are not an issue. For others, their emission contribution might be extremely significant. And while there are a number of good reasons to actually shift more transport onto our rivers and shores, air quality issues need to be resolved first.

The Problem

Inland waterway vessels usually operate with diesel engines and almost always without filter systems. As a result their NO_x and black carbon emissions are so high that the environmental advantage of low CO₂ emissions is virtually nullified. Those two air pollutants alone account for over 95% of the air pollution impact from

ships in Europe's rivers and channels. In Duisburg, the biggest inland waterway harbour in Europe, ships contribute of up to 25% of NO_x emissions. In Düsseldorf, a smaller port, 7% of NO_x emissions are estimated to come from IWT. In cities with ports or rivers where IWT is active, it is often the 2nd biggest emitter of NO_x.



The Industry

Europe's IWT fleet has a market share of about 6.7%, in comparison with 18.3% for rail transport and over 75% for road transport. Naturally, its share in some regions in Europe is significantly higher, whereas in regions without rivers or channels it plays no role at all. The Netherlands has an IWT share of almost 40%. Netherlands, Belgium, Romania, Bulgaria and Germany together account for over 80% of Europe's IWT transport.

Over the next few decades, the IWT industry will undergo a necessary transformation. Recent years have already seen a trend towards larger ships. Also, new emission limits will eventually require many ships to apply after-treatment technology.

The industry itself has repeatedly voiced concern that investing in emission reduction would be an economically infeasible burden for many ship owners. NGOs also support subsidy programmes that help to alleviate these costs. There are several examples of such programmes already in place.

Solutions

The nearest solution to PM and NOx emissions from ships are filter systems. Particulate filters have already been tested in a broad range of ships and there is also an increasing number of ships with NOx filter (SCR) systems.

Another potential that is in the spotlight in recent years is the switch away from diesel to liquefied natural gas (LNG) fuel engines. The technology promises lower emission levels of CO₂, PM and NO_x. For LNG to have a truly positive environmental impact it is crucial that the risk of a methane leakage is eliminated.

Air pollution & Health

In 2010, more than 400,000 people died prematurely in the EU due to air pollution. That makes air pollution the main environmental cause of shortened lives in the EU. The resulting health problems cost society an estimated 330-940 billion euros per year. Over 90% of the urban population in the EU is exposed to concentrations higher than the limit values recommended by the World Health Organisation (WHO). Among the most important pollutants are black carbon (BC), which is a part of particulate matter (PM), Nitrogen Dioxide (NO₂) and ozone (O₃).

When it comes to ships at shore, the most important thing is to prevent the Diesel engines from running only to supply the necessary electric energy on the ship. Ideally the ship is connected to electric power on land. Many harbours and cities work to create the necessary power stations.

A new approach is to install small LNG combustion plants on ships. These LNG-engines can then provide energy for ships in a cleaner way once the main engines are not needed. There are also other initiatives that reduce emission levels in ships as well, such as the fuel-water emulsion (FWE)

technique.

While there are many potential solutions to the NO_x and PM emissions of IWT ships, there has as yet been no widespread application. This is because there are no limit values requiring them.

Without appropriate emission limit values, the industry does not have sufficient incentives to implement these solutions. Now we come to



discuss these incentives, as well as already existing initiatives to promote cleaner IWT shipping.

European Legislation

European laws are important for air quality and IWT in several aspects. With regard to fuel quality, EU-regulation 2005/33/EG, relating to the sulphur content of certain liquid fuels, has required diesel fuel used in IWT to have a reduced sulphur content (<10ppm) since 2010. Modern after-treatment technology like particulate filters is only possible when fuel with low sulphur content is used. The regulation has ensured that this necessary precondition for filters is in place in Europe.

Emission limits for new IWT ships are set in the Non-Road-Mobile-Machinery regulation 2005/33/EG. In 2015, the European Parliament and the European Council agreed on a renewed NRMM directive that will set Stage V standards that sets stricter PM and NOx limits for ships from between 2019 and 2021 onwards.

National and regional initiatives

While emission standards are set at the EU-level, there are different initiatives in several member states that aim at reducing IWT emissions. The following initiatives are examples for possible action at different policy levels:

The German federal transport ministry provides co-financing subsidies for emission reduction measures on ships. It covers new engines with lower emission profiles, LNG engines, other emission reduction measures, fuel consumption reduction measures, noise reduction measures, LNG storage and distribution systems for engines

with reduced emissions. The fund gives subsidies of between 30% and 50% of the total costs. While all kinds of emission reduction measures would receive co-financing, in reality the industry has used the funds almost solely to finance new engines. With regard to retrofitting filter systems, the success of the measure has been very limited. This is due to missing incentives for ship owners to invest in additional emission reduction.

The Dutch province of South Holland, the urban region of Rotterdam and the city of Rotterdam are cooperating in a subsidy programme for NOx reduction measures for IWT ships. They support NOx reduction measures with a total of up to 6.2 million euros. The subsidy programme can cover installation as well as operating costs, depending on potential NOx reduction as well as days the ship is active within Rotterdam.

What can cities do?

On the one hand, cities can make sure that ships are able to connect to power stations on land. Many cities are investing in these power programmes, including Cologne, Düsseldorf and Rotterdam. There are many international initiatives, too.

Furthermore, there are discussions of including ships in low emission zones (LEZ), thereby banning unfiltered ships from cities. National regulation on LEZs needs to allow for this measure.

European regulation requiring ships to be retrofitted with filter systems is still a long way off. Currently, there are few subsidy programmes in place. What is missing are incentives for ship



owners to actually reap economic benefits from retrofitting their ship.

Otherwise the industry will penalise the early movers.

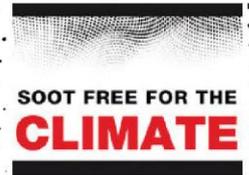
The discussion on additional measures to give incentives for cleaner ships therefore needs to be intensified. Cities and ports are in principal able to introduce port-fees based on emission levels. In some countries, regional authorities are responsible for this. In any case, cooperation between regions and cities is vital. Cross-border cooperation will also have benefits in this aspect, as rivers are international transport routes.

Final Words

Emissions from new ships are regulated by the NRMM, whose update has been decided on in

late 2015. For existing ships, the limits will be set later. In the NAIADES II communication, the European Commission sets its timetable for this as 2016/2017. Only then will there be a decision on emission limits that would require older ships to be retrofitted. With transitional periods we could end up waiting a full decade for binding limits.

The industry can act before that. Also, national, regional and local governments can implement measures to reward early movers. A mix of subsidy programmes and economic levies for emission levels could speed up the transition towards cleaner Inland Waterway Navigation.



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ABOUT US

Clean Air is a project by nine European environmental organisations that fight for clean air in European cities. Despite the existing legislative framework and the citizens' right to clean air, continuing violations of air pollution limits remain a problem in many cities. Air pollution threatens health, environment and climate. It's time to take action!

www.cleanair-europe.org

Started in 2009, the associated campaign "Sootfree for the Climate" aims to reduce diesel soot emissions, which accelerate climate change and pose a threat to public health. To this day twelve European NGOs have joined the campaign.

www.sootfreeclimate.org

a project by



project coordination

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associated
campaign

