



INFORMATION | EMISSION CONTROL AREA (ECA) IN THE MEDITERRANEAN SEA

# Emission Control Area (ECA) for the Mediterranean Sea

Effective measure to tackle air pollution from ships



*Air pollution from ships is a significant threat to health, environment and climate. The Shipping industry lags significantly behind other sectors when it comes to air pollution reduction. Due to the use of low quality fuels and the absence of exhaust gas after treatment ship emissions will outplay improvements made on land soon if we do not take action. There are several measures to decrease emissions from ships. Emission Control Areas (ECAs) are one of the most effective ways to drastically reduce emissions. Latest research has shown a decrease of air pollution levels of up to 80 percent following the introduction of a SECA in the North and Baltic Sea. Therefore, and because a level playing field is needed all European waters have to be declared emission control areas. Currently the designation of a Mediterranean ECA is under consideration and would be a crucial step towards a coherent legislative framework in the European Union.*

The danger posed by ship emissions is clearly underestimated. Not only coastal areas and port cities are affected by ship emissions but the emissions are also transported inland over great distances. It is estimated that emissions from ships cause 50,000 premature deaths and 60 billion EUR in health costs in the EU annually.<sup>1</sup> Ship emissions also negatively affect global warming and eco-systems. Sulphur Oxides contained in shipping exhaust are leading to acid rain and soot belongs to the group of so-called "short lived climate pollutants" (SLCP) and was recognized as the second biggest driver of climate warming just behind carbon dioxide. Due to the fuels used and poor regulation, ships are among the dirtiest emission sources. Heavy fuel oil, a residual refinery product which contains high amounts of sulphur, ashes, heavy metals and other toxic residues is used for propulsion of most ships. Moreover, there are no requirements for exhaust gas after-treatment as it is standard for mobile and stationary machinery on shore since decades. In order to tackle these emissions littoral states have agreed to designate the North Sea, the Baltic Sea and the English Channel an Emission Control Area for sulphur (SECA) since 2015 and for nitrogen (NECA) from 2021 on.

In 2018 France published an ECA impact assessment for the Mediterranean Sea showing the enormous socio-economic benefits of declaring the Mediterranean Sea a combined SECA and NECA. In parallel the European Commission is investigating the impacts of an ECA that covers all EU waters. The International Maritime Organisation (IMO) through its Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC) also looks into a SECA introduction in the Mediterranean Sea. Based on the respective findings which show significant socio-economic benefits it is time to take political action. Several environmental NGOs already called<sup>2</sup> for national governments and EC to support the establishment of a Mediterranean ECA to protect people's health, the environment, the climate and cultural heritage buildings.

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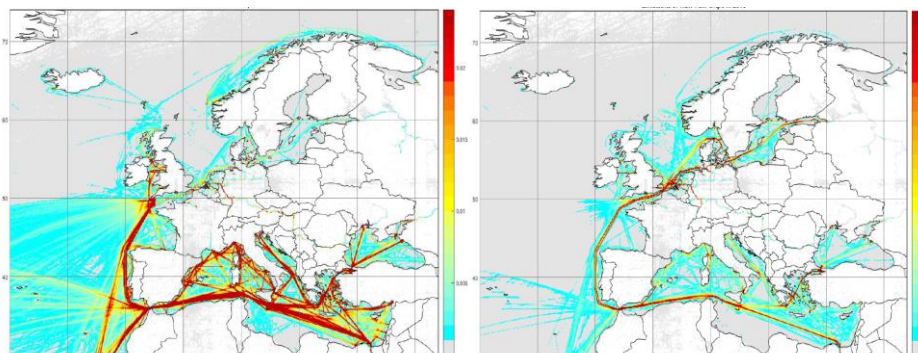
## ECAs – a success story

Emissions of air pollutants from ships are regulated by the International Maritime Organisation (IMO) through Annex VI of the International Convention on the Prevention of Pollution from Ships (MARPOL). It sets standards for the sulphur content of marine fuels and emissions of nitrogen oxides (NO<sub>x</sub>) from new ship engines. To reduce sulphur oxide emissions in the North and Baltic Sea and in the English Channel contracting parties to Annex VI agreed that as of January, 1st 2015 ships are obliged to switch to fuels with a maximum sulphur content of 0.1% or to install equivalent exhaust gas cleaning technology (scrubbers). Further to this a Nitrogen Emission Control Area (NECA) will enter into force in the same region in 2021. In practice this means new-built ships will have to fulfil the Tier III standard which drastically reduces NO<sub>x</sub> emissions e.g. by catalytic system, inner engine measures or alternative fuels. Unfortunately, already existing ships are not affected by this requirement at all and will therefore continue to emit massive amounts of nitrogen oxides.

The northern European SECA has already delivered substantial air pollutant reduction and respective socio-economic benefits worth billions of Euros. At the same time, no significant shifts to other transport modes or safety problems have been registered<sup>3</sup>. Both have been foretold by industry voices as arguments against the SECA. On the contrary, 2015 showed high growth rates among RoRo lines in SECA waters.<sup>3</sup> Still a lot needs to be done in order to limit black carbon and particulate matter emissions caused by vessels and to reduce nitrogen emissions from existing ships. Ensuring appropriate enforcement of the agreed regulatory frameworks is yet another stumbling block. Only if legal requirements are sufficiently enforced and cover geographically wide regions they ensure protection of health and environment and guarantee a level playing field in shipping industry. The latter aspect has not only been criticised by environmentalist but also by industry players and ship operators under the umbrella of the Trident Alliance<sup>4</sup> as they suspect market distortions due to violations of the European Sulphur Directive.

## Next step - the Mediterranean ECA?

Air pollution from ships continues to increase in European waters – including in the Mediterranean Sea – due to a continuous growth of the sector.<sup>5</sup> It is estimated that each day up to 10,000 vessels operate in the Mediterranean Sea. These ships mostly sail on Heavy Fuel Oil (HFO) with higher content of sulphur due to less strict regulations on emissions in the region. At least the EU Sulphur Directive states a maximum sulphur content of 0,1% for fuels used in ships while at berth in EU ports. Furthermore, passenger ships operating on regular services to or from any EU port shall not use marine fuels with a sulphur content exceeding 1,5% in sea areas outside the SECAs. In spite of this regulation comparing shipping data in European waters shows, SO<sub>2</sub> emissions are significantly higher along the routes outside existing SECAs.



Left: SO<sub>2</sub> from ships in 2015 in European waters (in ktons), Source: IIASA (2018)  
 Right: NO<sub>2</sub> from ships in 2015 in European waters (in ktons), Source: IIASA (2018)

The population in the urban coastal areas around the Mediterranean Sea is about 325 million, about 145 million alone in European Union urban areas in 2010.<sup>6</sup> In port cities ships are responsi-

**i** Sulphur dioxide (SO<sub>2</sub>) is a respiratory irritant and is partly responsible for increased mortality rates in coastal areas. SO<sub>2</sub> is also precursor of particulate matter (PM). PM is correlated with more frequent asthma attacks, cardiac arrests, chronic bronchitis and lung cancer. SO<sub>2</sub> is harmful to vegetation and causes acid rain. It attacks marble and limestone e.g. built heritage.

**Nitrogen oxide (NO<sub>x</sub>)** diminish the function of the lungs and increase the risk of cardiovascular disease. NO<sub>x</sub> is also a precursor of ozone a powerful greenhouse gas which is likewise detrimental to human health. Ozone can cause irritation and inflammation of the respiratory system, headaches, an impairment of physical ability and an increase in the frequency of asthma attacks. High concentrations of ground-level ozone in cities are known as summer smog. NO<sub>x</sub> is a precursor of PM. Air pollutant emissions are responsible for significant loss in agriculture productivity and forestry.

ble for up to 80 percent of local NO<sub>2</sub> concentrations.<sup>7</sup> Regulation on shipping will not only protect people's health and reduce negative impacts on the sensitive eco-system but help cities to comply with EU air quality requirements.

The instrument of choice to reduce shipping related air pollution is the designation of an emission control area addressing sulphur and nitrogen emissions in all European waters and the whole Mediterranean Sea. Moreover, the establishment of an ECA in European waters will restore the level playing field in the single European market where ship operators and ports in the South and West face the same regulatory requirements as in the North. It would also enable an uptake of low-emission technologies and transfer of necessary know-how within the European Union leading to leadership in sustainable technology. Therefore, tighter emission standards in Europe are also a vital contributor of ensuring the sustainability of the EU maritime industries, creating jobs and economic competitiveness.

While it is certain that switching to low sulphur fuels results in a significant reduction of air pollutant emissions, scrubbers -an exhaust gas treating system to reduce sulphur emissions- are questionable as they produce residues and prolong the use of toxic heavy fuel oil.<sup>8</sup> Moreover, scrubbers and high sulphur fuels hinder the uptake of advanced exhaust after treatment like particle filters. Only a combined system of particulate filters and catalytic system can guarantee the urgently needed reduction of particulate matter, soot and nitrogen oxides which threaten human health. Substantial reductions can also be archived by alternative fuels or regenerative propulsion.

## Where are we at?

The global 0.5% sulphur cap for marine fuels will enter into force on January 1st 2020. The EU Sulphur Directive requires 0.1% fuel sulphur content while at berth in European ports. Stricter regulations on ship emissions are in force in the North Sea, Baltic Sea and the English Channel – these waters are entirely declared as ECAs with 0.1% fuel sulphur limit and required TIER III standard for new ships to reduce NO<sub>x</sub> emissions from 2021. We will see a patchwork of regulation in European waters with higher emissions in the Mediterranean and Atlantic region. Health and environmental protection levels and competitive advantages differ within the European Union.

## The coalition of NGOs calls for:

- The designation of the Mediterranean Sea as a combined SECA and NECA by 2020
- A coherent ECA for all European waters that covers all major air pollutants such as sulphur and nitrogen oxides but also particulate matter and Black Carbon
- Cooperation of EU states with non EU coastal states to establish a Mediterranean ECA
- A ban of toxic heavy fuel oil and consequently a ban of scrubbers
- A harmonized and effective control and enforcement scheme



**Scrubbers shift pollution problem from air to water and prolong the risks that are linked to heavy fuel oil.** German Umweltbundesamt is advising to shift to cleaner fuels to comply with sulphur cap instead of installing scrubbers. (UBA 2014)

<sup>1</sup> Center for Energy, Environment and Health (2011): Assessment of Health-Cost Externalities of Air Pollution at the National Level using EVA Model System. [www.ceeh.dk/CEEH\\_Reports/Report\\_3/CEEH\\_Scientific\\_Report3.pdf](http://www.ceeh.dk/CEEH_Reports/Report_3/CEEH_Scientific_Report3.pdf)

<sup>2</sup> Rome Declaration 2017: <https://en.nabu.de/imperia/md/content/nabude/verkehr/170407-rome-declaration.pdf>

<sup>3</sup> SECA Assessment: Impacts of 2015 SECA marine fuel sulphur limits: [www.nabu.de/imperia/md/content/nabude/verkehr/nabu-seca-studie2016.pdf](http://www.nabu.de/imperia/md/content/nabude/verkehr/nabu-seca-studie2016.pdf)

<sup>4</sup> <http://www.tridentalliance.org>

<sup>5</sup> <https://www.transportenvironment.org/what-we-do/shipping/air-pollution-ships>

<sup>6</sup> <https://www.eea.europa.eu/soer-2015/countries/mediterranean>

<sup>7</sup> Hansstadt Hamburg Luftreinhalteplan 2017

<https://www.hamburg.de/contentblob/9024022/7dde37bb04244521442fab91910fa39c/data/d-lrp-2017.pdf>

<sup>8</sup> <https://www.nabu.de/downloads/150312-Scrubbers.pdf>