

Briefing: Cutting SO_x emissions from shipping

September 2011

Context

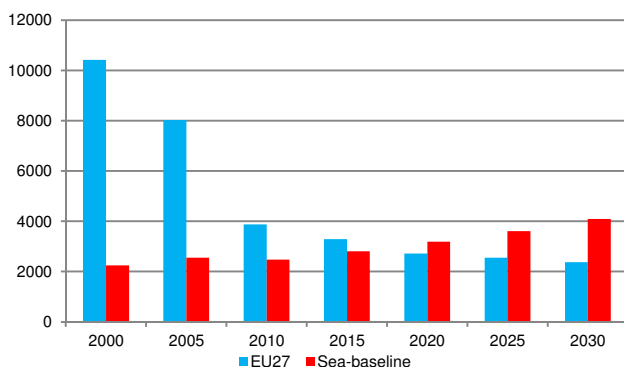
Last July the European Commission published a proposal to revise Directive 1999/32/EC as amended (the “sulphur in fuels directive”) that regulates the maximum level of sulphur permitted for fuels used in combustion plants and in the shipping sector.

Sulphur contained in fuel causes emissions of sulphur dioxide (SO₂) and also contributes to the formation of secondary particulate matter (PM) that is particularly harmful both to humans and the environment. These emissions have a major health impact, with shipping air pollution estimated to cause around 50,000 premature deaths per year in Europe. SO_x emissions also cause environmental problems such as the acidification of soil and water and damage to biodiversity.

Why is it necessary to control SO_x emissions from the shipping sector?

International shipping uses heavy fuel oil (residual fuels) with a very high sulphur content. The marine fuel currently in use is on average 2,700 times dirtier than the fuel used in the road sector where strict limits have applied for many years. Maximum limit values applicable for international shipping are set by International Maritime Organization (IMO) in the Annex VI of the international convention for the prevention of pollution from ships, the so called MARPOL Convention.

SO₂ projections under a business-as-usual scenario



Due to the poor quality of the cheap bunker fuels used in maritime transport, SO₂ shipping emissions are projected to increase and by 2020 exceed SO₂ emissions from all land-based sources such as power plants in the EU, which over the past several decades have been reduced dramatically at great cost to industry.

What is in the Commission proposal?

The purpose of the Commission's proposal is to transpose the standards agreed internationally at the IMO in 2008 into EU law to ensure their proper and harmonised enforcement by all EU Member States.

The directive therefore replicates the standards that have been set by the IMO and updates the EU standards for ships at berth and for passenger ships operating on a regular service given their proximity to land and hence their proximity to people and ecosystems.

Overview of the IMO and EU standards

	IMO			EU		
	2010	2015	2020	2010	2015	2020
Non-SECAs	4.5%	3.5%	0.5%	-	3.5%	0.5%
SECAs	1.0%*	0.1%	0.1%	1.5%	0.1%	0.1%
At berth	-	-	-	0.1%	0.1%	0.1%
PAX ships	-	-	-	1.5%	1.5%	0.1%

* from the 1st of July 2010

For environmental reasons, stricter limit values apply in specific areas designated as sulphur emission control areas (SECAs) that are particularly sensitive to SO_x emissions. For all the limit values, compliance can be achieved by using cleaner low-sulphur fuels (such as gas oils or liquefied natural gas) or alternatively specific after-treatment systems which extract SO_x emissions from the exhaust.

Being binding on all EU Member States, the sulphur in fuel directive provides a legal basis to ensure compliance and makes EU countries liable to enforce the internationally agreed limit values as enforcement through IMO mechanisms is not strict.

What are the benefits of implementing the revised MARPOL Annex VI?

In implementing the new limit values, the Commission expects SO₂ emissions from the affected ships to decrease by more than 90% in SECAs and by more than 75% in the other areas. The diminution of the sulphur content will be also translated into a reduction of secondary PM formation, and the new limit values are predicted to reduce PM_{2.5} emissions by 60 to 75%. Given the considerable share of shipping emissions, the benefits in terms of air quality improvement will be substantial.

How to further cut emissions from the shipping sector?

Making compliant fuel available

While the directive currently sets a system of prohibition for using non-compliant fuels, there is currently no provision to ensure availability and a balanced distribution of compliant fuels. According to regulation 18 of MARPOL Annex VI, 'each Party shall take all reasonable steps to promote the availability of fuel oils which comply with this Annex [...]':

Provisions on fuel availability will be particularly important to ensure compliance, as ships can be exempted from compliance with the limit values where no compliant fuel is available en route.

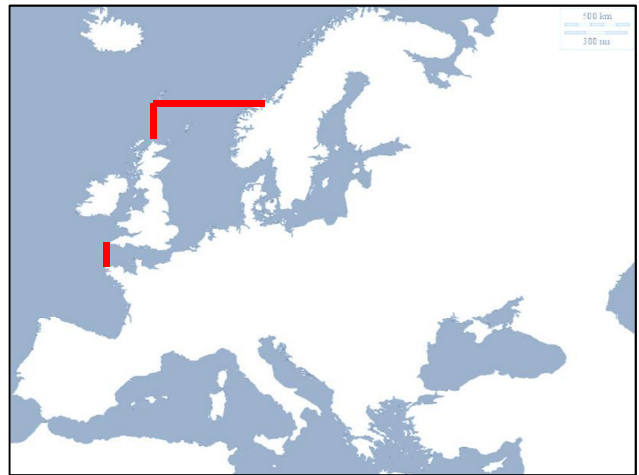
A precedent exists in EU law for such a fuel availability provision; the Council Directive 88/210/EEC required Member States to take all the necessary measures to ensure sufficient availability of compliant fuel when unleaded petrol was introduced in Europe.

Monitoring compliance / sampling

Marine fuels have been found to contain waste substances such as used waste oils. There are also claims that bunker fuels sometimes contain other dangerous substances. This contamination of bunker fuels is another source of air pollution from sea-going ships. Moreover, control of the sulphur content of marine fuels has revealed frequent breaches of the SECA limit value. Effective monitoring and sampling of ship fuels is thus a key factor in the reduction of air pollution. Given the multiple effects and interrelations between different fuel quality parameters, a full quality standard for marine fuel oil should also be developed.

Extending the SO_x Emission Control Areas in Europe

In the EU, sulphur emission control areas are currently limited to the Baltic Sea, the North Sea and the English Channel (see map). The reason why more stringent sulphur limits were introduced first for the Baltic Sea and the North Sea was primarily the widespread problems of acidification in northern Europe. However, emissions of SO₂ contribute also to several other serious health and environmental problems all over Europe. The EU should therefore enlarge the control areas to cover all EU seas, or at least to follow the North American example and designate a distance-to-shore SECA along the EU coastline.



Protect all passengers on EU seas

The 2005 revision of the sulphur in fuels directive introduced a number of provisions that go beyond the requirements of the MARPOL Annex VI. An example is the introduction of a specific limit value for passenger ships operating on a regular service. The limit value for these ships was set at the level of the maximum sulphur limit used in SECAs (i.e. 1.5% in 2005). As the SECA limit value will be reduced to 0.1% in 2015, the current Commission proposal suggests aligning the passenger ships levels to 0.1% in 2020. Because these ships typically navigate near densely populated areas, the passenger limit should be fully aligned with the SECA rule in 2015. Moreover, the scope of this rule should be extended to ensure that all passenger ships including cruise ships are required to use cleaner fuels.

Towards the full implementation of the MARPOL Annex VI: introduce the NO_x provisions

The current proposal only deals with the requirements for low-sulphur fuels in MARPOL Annex VI. However, Annex VI also regulates emissions of nitrogen oxides (NO_x) from marine engines. Similarly to the situation with sulphur, NO_x emissions from the maritime sector are expected to outweigh the emissions of all EU land-based sources by 2020 if no action is taken. The health and environmental impacts of NO_x emissions are also considerable, NO_x being an ozone precursor and also contributing to acid rains in Europe. MARPOL Annex VI introduces engine standards within NO_x ECAs. The EU should consider the designation of NO_x ECAs and legislation to apply the NO_x engine standards in order to further reduce air pollution from shipping. In addition, the EU should consider introducing economic instruments

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