



**Australian Shipowners Association**

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# **New South Wales Non- Road Diesel Air Emissions**

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Submission by: Australian Shipowners Association  
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## Executive Summary

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- A. International regulations to control ship emission have been in place for many years including agreed timeframes and standards for incremental improvement.
- B. The next change in 2020 is less than five years away and in shipping terms is just around the corner. Companies already have plans in place to ensure they are capable of complying by the 2020 date (retrofitting required at dry dock etc).
- C. Regional or local moves ahead of that date will have a considerable impact upon the shipping industry due to the very short notice period.
- D. Existing regional or local control areas were only established after meeting criteria determined by the IMO as well as extensive consultation and long lead times with industry. A *minimum* of one year is required to go through the IMO process.
- E. The only primary control measure available at the moment is for ships to use low-sulphur fuel.
- F. There are questions surrounding the capacity of refineries to supply sufficient low-sulphur fuel to the shipping industry. This may be a particularly difficult issue for Australia as it has a very small market for bunker fuels and will therefore not be a priority location for the fuel suppliers.
- G. Low sulphur fuel is much more expensive than current fuel types and a sudden financial shock of this magnitude is likely to be unmanageable for some businesses and could result in business moving location (i.e. ships not visiting affected ports).
- H. Any change in behaviour of shipping companies that results in a modal shift would result in greater emissions of Green House Gasses (GHG) and other pollutants as other modes of transport have higher emission levels when compared to shipping.
- I. The Australian Maritime Safety Authority would usefully be involved in discussions concerning this matter to provide background concerning the issues discussed at the IMO; timeframes; and technical issues.

## Introduction

The shipping industry has a long-established and comprehensive framework of global Conventions and regulations that have been developed by the United Nations' International Maritime Organization (IMO).

For the most part these IMO Conventions are fully implemented and enforced worldwide, through a combination of flag State inspection and port State control, directly contributing to the improvement of shipping's environmental performance. MARPOL Annex VI is the relevant instrument for the control of air emissions from ships.

The Australian Maritime Safety Authority (AMSA) is the Commonwealth statutory authority with responsibility for the protection of the marine environment from pollution from ships and other environmental damage caused by shipping. Discussions concerning amendment to environment laws that affect shipping ought to include AMSA to ensure proper consideration of all the matters pertaining to shipping and Australia's international obligations.

The key issues that ASA would like NSW EPA to consider further include the following:

- Regulatory framework surrounding ship emissions;
- The options available to the shipping industry to control emissions;
- Concerns surrounding the availability and cost of low sulphur fuel;
- The impact / consequences of changes made without adequate notice to provide for proper planning.

## Global regulations for Shipping Emissions

International standards for the control of SO<sub>x</sub> and PM emission apply to all fuel oil as required by Annex VI of MARPOL.<sup>1</sup> This has been the case for many years and incremental improvement has been built into the regulatory instrument (Annex VI) in order that continual improvement is achieved. The next change is scheduled to take place on 1 January 2020. Since January 2012 the limit has been 3.5% m/m and from 1 January 2020 it drops to 0.5% m/m.

In shipping terms, 2020 is "just around the corner". This is because any significant structural work required to be done to a ship can only occur when a ship is docked.

Docking is a term used to describe a period of time when a ship is taken out of service and placed in a dock yard where servicing, maintenance and repairs are conducted. Docking can be either wet-dock (the ship is still in the water) or dry-dock where the ship is removed entirely from the water. Some work can only be done at dry-dock. Given the size of a ship and the complexity of it being taken from the water, such events happen at regular intervals of up to 5 years, are done with a high level of planning, involve many areas of work being conducted at the same time, are very expensive exercises and can only happen at ship yards with the appropriate facilities. Bookings to enter such ship yards require considerable notice periods, anything less than 1 year is uncommon and unlikely to be able to be accommodated. Further time is required if structural changes to the ship are to be made in order that approval is provided by the authorising authorities.

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<sup>1</sup> Regulation 2.9 of Annex VI of MARPOL. This also includes combustion equipment on board such as main and all auxiliary engines together with items such as boilers and inert gas generators.

Most ships will have one docking between now and the 2020 date for stricter air emissions requirements as per MARPOL Annex VI. Ship owners will already have plans in place to retrofit additional fuel tanks or implement abatement technology during the dry dock. It is not possible to move dry dock schedules or radically change long term plans without considerable prior notice.

What this docking schedule means in practice is that many ships will be equipped to meet the higher standards earlier than 2020 as their capability to comply will come on line gradually, as abatement technology is installed and/or the capability to use low sulphur fuel (provided that the fuel supply is actually available) is provided.

### Regional and Local Emission Control Areas

The existing regulations also provide for Emission Control Areas (ECA) to exist. The sulphur content of fuel used within an ECA is further limited as per the table below.

Outside an ECA established to limit SOx and PM Emissions	Inside an ECA established to limit SOx and PM Emissions
4.50% m/m prior to 1 January 2012	1.5% m/m prior to 1 July 2010
3.5% m/m on and after 1 January 2012	1.0% m/m on and after 1 July 2010
0.50% m/m on and after 1 January 2020 <sup>2</sup>	0.10% m/m on and after 1 January 2015

Regional ECA's have been implemented after meeting criteria determined at IMO.<sup>3</sup> The criteria are extensive and the major point of difference between established ECAs and the Greater Metropolitan Region (GMR) is the comparatively lower shipping volumes within the GMR.

The process required by IMO to establish an ECA takes at least 12 months. If Australia began that process now the earliest an ECA could be implemented is Sept 2016 – just over 3 years ahead of the already programmed change for which the industry is currently preparing.

In the case of “at berth” requirements (such as in the USA) extensive consultation (with long lead times) with industry have transpired. Moving ahead of the 2020 date require both a demonstrated need for early action and careful consideration of the impact upon the shipping industry.

### Methods of Controlling Emissions

The shipping industry has access to a limited range of options and techniques to cut pollution. These include:

- Using low sulphur fuel
- Installing emission scrubbers
- Shore-side electricity
- Substitute fuel – LNG

These are each discussed below.

<sup>2</sup> In the event there are insufficient supplies of low sulphur, it is possible the effective date will be delayed until 1 January 2025.

<sup>3</sup> Appendix III of Annex VI of MARPOL provides the criteria and procedure for the designation of ECAs. The criteria include: adverse environmental impacts as well as an assessment of the economic impacts on shipping engaged in international trade.

## Low Sulphur fuel

This is the means widely adopted for compliance with the existing IMO requirements. While currently the most practical of the compliance options available it does have challenges associated with it and risks that need to be managed carefully.

The major issues with the use of low sulphur fuel to achieve reduced air emissions are outlined below.

### Availability of Low-Sulphur Fuel

Such is the concern over the ability for the oil industry to be able to supply the appropriate fuels to meet the global 2020 requirements that IMO is undertaking a fuel supply review which is due to report in 2018.

Australia faces further challenges with regard to supply. As an importer of low sulphur fuel and a comparatively small market, Australia is likely to be a low priority when it comes to the allocation for distribution.

The capacity to store the fuel ashore is a matter that requires investigation and potentially investment to be made. The ability of the fuel supply market to deliver the required grade of fuel in sufficient quantities is something that EPA NSW should consult with that industry sector about.

### Fuel Cost

Assuming that supply can be obtained, it is almost certain that supplying a small market will attract a premium and it is expected that low sulphur fuel purchased in Australia will be more expensive than that sourced overseas. This will particularly impact the vessels that are predominantly based in Australia and do not have the opportunity to bunker internationally.

Low sulphur fuel carries a higher premium than heavy fuel oil that most ships presently burn. The price differential may exceed 50% due to uncertainties about the extent to which oil refiners will be able to produce low sulphur fuel in the quantities that will be required.

Fuel makes up a large portion of vessel operating costs. A price shock associated with increased fuel costs will have impacts on shipping businesses and in some cases those impacts will be serious.

Investment decisions, business planning and forecasting have been undertaken in good faith on the basis of complying with the IMO 2020 requirements. These business decisions can be impacted by either an accelerated timeframe being adopted, or more onerous requirements being put in place. The latter requires that adequate lead time be provided in order that the industry can adjust. The former, with less than five years until 2020, is simply not enough notice for the industry to adjust to such a cost increase without significant impact.

Such impact could result in vessels choosing to visit alternative ports and/or a shift to other forms of transport should vessel costs rise considerably. Both the cruise and freight markets are highly price sensitive.

Any "modal shift" would result in greater emissions of Green House Gases (GHG) and other pollutants since shipping is the most efficient form of transport and may

also have negative economic impacts not only to the shipping industry but also to marine fuel suppliers and companies who rely on the shipping industry.

### **Use of low sulphur fuel while underway**

Fuel switching, the change between fuel types while underway, has been the subject of much concern and investigation in other jurisdictions. Low sulphur fuel presents operating challenges, such as compatibility, and biological contamination.

Most marine machinery plant and equipment were not designed to operate using low sulphur fuel. These issues stem from the effects of the low sulphur and low viscosity characteristics of low sulphur fuel on machinery plants designed for Heavy Fuel Oil details of which can be found in publications such as CLASSNK (2012) Issues and Measures for Use of Low Sulphur Fuel Oil.

A recent report by the UK P&I Club found that 11% of the 249 ships' surveyed said they have experienced problems when switching between fuels <sup>4</sup>.

We raise this point to note that fuel switching is not without risk and must be undertaken only when circumstances and conditions are optimal. Switching at any time while underway and close to shore cannot be considered a reasonable option.

### **Emission Scrubbers**

These are a possible alternative to low sulphur fuels to cut emissions of and considerably reduce emissions of other polluting particles. They may not be suitable or available for widespread adoption.

Some of the limitations of emission scrubbers include:

- Creation of stability issues for some ships, since the exhaust gas treatment may be installed on top of the exhaust stack;
- Converting exhaust gases into a solution, paste or powder form may create hazardous by-products (as it may contain nickel, vanadium or petroleum hydrocarbons)<sup>5</sup> which then need to be disposed of;
- Existing scrubbers can cut only one exhaust at a time (i.e. SO<sub>x</sub> or NO<sub>x</sub>);

### **LNG as a Fuel Substitute**

The suitability of using LNG as an alternative fuel is being considered by various operators / ports both within Australia and overseas. At this point in time, some drawbacks to the adoption of LNG as ship fuel certainly exist. The major issues are the space required on board for the tanks being some 3 and 4 times larger than for conventional fuels; and the availability (or lack thereof) of this fuel type.

### **Shore-side Electricity (At Berth Measures/Alternative Marine Power)**

Since this is not currently available at GMR ports this option must be considered at best a long term solution.

It is understood that the provision of the required power at berth could be of the order of \$30-\$40 million. Who would fund such investment and what that would mean in

<sup>4</sup> UK P & I Club (2012) Risk Focus: Loss of Power <http://www.dunelmpr.co.uk/Ukp&i-Risk-Focus-Loss-of-power.pdf>

<sup>5</sup> Danish Ministry of the Environment (2011) Assessment of Possible Impacts of Scrubber Water Discharges on the Marine Environment pg 84  
[http://www.alfalaval.com/campaigns/puresox/documents/documents/Assessment\\_of\\_Possible\\_Impacts\\_of\\_Scrubber\\_Water\\_Discharges.pdf](http://www.alfalaval.com/campaigns/puresox/documents/documents/Assessment_of_Possible_Impacts_of_Scrubber_Water_Discharges.pdf)

terms of increased berth fees are all matters that would need to be explored to ensure that cargo owners/shipping activity is not moved away from the berth and the port.

The technical challenges, economic impact and environmental performance of such an option all need to be considered in detail.

### **Incentives to drive behaviour**

ASA notes there is a growing trend internationally to incentivise ships to reduce their impacts on the environment. This carrot in place of the stick approach is a very different to that adopted within Australia and has assisted industry to make the massive investments required to drive research and development programs to find solutions to what are very difficult issues for the industry to solve on their own.

For example, the Port of Los Angeles through its Environmental Ship Index (ESI) offer discounts of up to \$5,250 from berthing fees per call to ships with small emissions. This is intended to encourage increased numbers of environmentally sustainable vessels calling at Los Angeles.<sup>6</sup>

The manner in which a successful incentives program could be established in the GMR is something we would be happy to explore further with all the parties involved.

### **Summary**

The IMO, shipowners, government environmental agencies, public health advocates and non-governmental environment groups are all concerned about ship-sourced emissions. The common goal of these groups is to reduce the harmful effects of ship emissions on air quality.

The shipping industry has been focused for many years on complying with current MARPOL Annex VI requirements, and those due to commence in 2020.

Assuming fuel supply issues are overcome, the shipping industry's ability to reduce their emissions will progressively be improved as the industry's capacity to comply with the 2020 standard comes on line over the next five years.

A strong case needs to be made that demonstrates the necessity to move ahead of this date. This includes the careful evaluation of the impact to the shipping industry as a result of pursuing an accelerated program.

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<sup>6</sup> <http://www.professionalmariner.com/October-November-2012/Los-Angeles-establishes-green-ship-index-with-financial-incentives/>

## About ASA

Australian Shipowners Association (ASA) represents Australian companies which own or operate:

- a. international and domestic trading ships;
- b. Floating Production Storage and Offloading units (FPSO);
- c. cruise ships;
- d. offshore oil and gas support vessels;
- e. domestic towage and salvage tugs;
- f. scientific research vessels; and
- g. dredges

ASA represents employers of Australian and international maritime labour and operators of vessels under Australian and foreign flags.

Members of ASA include companies whose primary business is to provide sea transport services to the freight market as well as companies whose shipping operations form an element of their supply chain; hence some of ASA's Members are very large cargo interests.

ASA provides an important focal point for the companies who choose to base their shipping and seafaring employment operations in Australia.

ASA's purpose is to pursue strategic reforms that provide for a sustainable, vibrant and competitive Australian shipping industry and to promote Australian participation in meeting domestic needs for sea transport services and contribution to Australia's international trade to the benefit of Australian shipowners, their customers and the nation.

ASA's Members represent a very broad cross-section of the maritime industry, including shipowners, shippers and charterers.

ASA's Members are:

ANL Container Line	MODEC Management	Sugar Australia
ASP Ship Management	Services	Svitzer Australia
BP Australia	The Port of Newcastle	Swire Pacific Offshore
Caltex Australia Limited	North West Shelf Shipping	Teekay Shipping
Carnival Australia	Service	(Australia)
EMAS Offshore	Origin Energy	Tidewater Marine
Farstad Shipping (Indian	P & O Maritime Services	Toll Marine Logistics
Pacific)	PB Towage	Viva Energy
Maersk Supply Service	Rio Tinto Marine	Woodside
Mermaid Marine	SeaRoad Shipping	
	Shell Tankers Australia	