

# Science for Environment Policy

## The Turkish shipbreaking industry: review of environmental, health and safety issues

**Turkey is a major ship recycling centre and is the largest OECD member country with a significant ship recycling industry.** In this study, researchers reviewed the environmental, health and safety issues surrounding the Turkish shipbreaking industry, its compliance with environmental regulations and its ability to claim 'green recycling'.

**Shipbreaking – the dismantling of old and non-functional ships, or those which cost more to keep in operation than to scrap – enables the re-use of valuable materials.** It enables the financial viability of the shipping sector, is a major supplier of steel and is a critical part of the economy in many developing countries. In environmental terms, recycling of scrap metals from ships reduces the need for mining, which uses primary energy, generates greenhouse gas emissions and damages the Earth's surface. However, shipbreaking has its own environmental impacts, which this study explores in the context of Turkey.

Shipbreaking is an important industry for sustainable production. However, its potential is currently limited due to the hazardous contaminants found on board ships, which can be harmful to workers and the natural environment. Regulations are essential to control these effects and, since 2004, old ships have been considered to be a form of toxic waste by the [Basel Convention](#)<sup>1</sup>.

The researchers discuss a trend for converting shipbreaking yards into areas for construction and repair occurring across Europe and Asia, and warn that regulations, such as those in the Basel Convention, which include actions aimed to improve occupational safety, occupational health and environmental protection, may cause shipbreaking to become restricted to countries with developing economies.

Turkey is the tenth largest steel producing country in the world<sup>2</sup>. Its steel industry is dependent on scrap iron, a proportion of which (1-2%) comes from ships broken down at one site: Aliağa, in the Aegean Region, west Turkey. This is a major ship recycling site; 4% of the world's global ship fleet were scrapped here between 1994 and 2002, making it one of the top five recycling countries in the world. Shipbreaking has been taking place in Aliağa since 1976. It is near a number of steel works that use the scrap iron and steel as raw material and there are no major tides in the area, making it ideal for ship dismantling.

Ships are broken down following 'modified slipway recycling'. Slipway recycling is used in areas with lower tidal ranges. It involves dragging a ship onto a concrete slipway, which extends into the sea. In the modified form of slipway recycling that occurs at Aliağa, vessels are brought ashore before the vessel is cut from the bow and 600–800 tonne sections are cut off and pulled onto an onshore cutting area. Smaller sections and equipment are later removed by cranes. As the shore ground contains densely packed soil, vehicles and cranes can operate close to the vessel.

This process generates solid and liquid waste, as well as atmospheric pollutants. A study conducted in the seawater around the Aliağa yard took samples from a location near to the shipbreaking yard, at four different times of year – February, June, April and October. The research revealed high levels of aluminium, iron, cadmium, nickel, zinc, fluoride, nitrates and phosphates. Extremely high levels of heavy metals were found and, along with fluid wastes, were identified as the main pollutants of the coastal area. The study also found that levels of fluoride were higher than normal – attributed to the shipbreaking industry.

*Continued on next page.*



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1. Technical guidelines on environmentally sound management of full and partial dismantling of ships'. See: <http://www.basel.int/Portals/4/Basel%20Convention/docs/meetings/sbc/workdoc/techships-e.pdf>

2. Chamber of Mechanical Engineers of Turkey (2005) Report on the Turkish iron and steel industry

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## The Turkish shipbreaking industry: review of environmental, health and safety issues (continued)

In terms of regulation, Turkey is a member of the [Basel Convention](#) on hazardous waste. As an [Organisation for Economic Co-operation and Development](#) (OECD) member country, Turkey is able to recycle ships without violating the Convention's ban on export to non-OECD countries.

The Aliğa yard is also regulated by Turkey's Ministry of Transportation, which requires measures to prevent pollution caused by shipbreaking. In 2004, a regulation, published by the Maritime Under Secretariat, reiterated the importance of hazardous waste disposal stated in the Basel Convention. According to these regulations, companies that do not comply with the preventive measures of the Convention (such as the cleaning of toxic contents from the ship before recycling takes place) will not be allowed to perform shipbreaking. The researchers make recommendations for future enforcement of this regulation, including inspection methods to ensure environmental protection and health and safety outcomes are achieved.



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