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*Accompanying document to the*

**GREEN PAPER**

**on better ship dismantling**

{COM(2007) 269 final}

## ANNEX

### **Relevant EU legislation**

A broad range of EU legislation is applicable to end-of-life ships where it sets up binding environmental and safety requirements related to the dismantling activities themselves as well as the transfer of end-of-life ships for dismantling from and to the EU.

In legal terms, Community legislation on environmental protection applies to the management of ships which have become waste. Directive 2006/12/EC on waste<sup>24</sup> (the Waste Framework Directive) sets out a number of requirements, including safeguards for environmental protection during recovery or disposal, planning and permitting requirements, record-keeping and periodic inspections. This directive also lays down the definition of 'waste' in its Article 1(a) as "any substance or object in the categories set out in Annex I which the holder discards or intends or is required to discard".

The shipment of end-of-life vessels within the EU or between its Member States and third countries are currently regulated by Regulation (EEC) No 259/93 on the supervision and control of shipments of waste within, into and out of the European Community<sup>25</sup> (the Waste Shipment Regulation). A new Regulation (EC) No 1013/2006 on shipments of waste was published in OJ L 190 of 12 July 2006 and will replace the current regulation one year later.

The United Nations' Basel Convention<sup>26</sup> establishes a control procedure for the export and import of hazardous waste between the parties to the convention. The procedure is based on prior notification of the export and import and written consent from the concerned authorities before the import or export takes place. The convention contains a list of hazardous wastes and a list of non-hazardous wastes. The parties to the convention may unilaterally designate other wastes as hazardous.

In 1995, an amendment to the Basel Convention was adopted banning all exports of hazardous waste from OECD to non-OECD countries destined for recovery<sup>27</sup>. The ban was adopted upon request of the developing countries (G-77) due to the high incidence of hazardous waste dumping. The ban was heavily opposed in particular by the US which is not a party to the convention, and also by Japan, Canada and Australia. The ban under the convention itself has not entered into force yet, as not sufficient parties have ratified it.

The EU has unilaterally implemented the ban (Council Decision 97/640/EC) meaning that the exports of hazardous waste from the EU to non-OECD countries are banned.

The Waste Shipment Regulation implements the Basel Convention and the Basel ban within the EU. Articles 14 and 16 of the regulation ban the export of hazardous waste to non-OECD countries. No exemptions are possible. Annex V to the regulation defines the wastes that fall under this export ban. End-of-life ships are not explicitly listed in Annex V. However, unless a ship has been built very recently it would in most cases contain hazardous substances listed in Annex V (e.g. asbestos under entries A 2050, 17 06 01 and 17 06 05 or PCBs under entries 16 01 09, 16 02 09 and 16 02 10) and would therefore be covered by the export ban.

The export and import of non-hazardous wastes are also covered by the Waste Shipment Regulation. This regulation allows as a main rule that the destination country outside the OECD determines whether it wants to accept or ban the import of waste<sup>28</sup>.

At international level, non-hazardous wastes are covered by an OECD Decision<sup>29</sup> and are not within the scope of the Basel Convention. Annex II to the EU Waste Shipment Regulation lists all "green" non-hazardous wastes and implements in this regard the OECD Decision. Pursuant to this Annex II, ships are considered non-hazardous if they fall under the entry GC 030 'vessels and other floating structures for breaking up, properly emptied of any cargo and other materials arising from the operation of the vessel, which may have been classified as dangerous substance or waste'.

What the term 'properly emptied' means is not precisely defined in the OECD Decision. The Commission is at the moment assessing how the OECD decision term 'properly emptied' should be interpreted both legally and technically.

To sum up, the Community legislation on waste, in particular the Waste Shipment Regulation, sets the requirements at EU level for management and shipments of end-of-life vessels. A ship is considered as waste when it is "discarded" by its owner. The export of a "discarded" ship which contains hazardous substances to a non-OECD country is prohibited under the Waste Shipment Regulation. Community law, however, is applicable only to EU-flagged ships or to ships leaving or entering EU waters in accordance with the United Nations Convention on the Law of the Sea (UNCLOS). Waste shipment rules in particular, due to their focusing on transports between countries of dispatch, of transit and of destination, are designed to apply within the land territory and territorial waters of states. In any case, an EU-flagged ship can change its flag before its dismantling and a non-EU flagged ship can leave to its last destination for scrapping from a place outside EU jurisdiction. Therefore, an international legal instrument (Ship Recycling Convention) with Flag States and Port States obligations is intended to deliver a practicable and enforceable solution. In addition, the dismantling of the ship must be environmentally sound. In other terms, whatever the economic conditions, the export to a developing country of a ship that has not been "properly emptied" of hazardous materials is an infringement of EU legislation.

### **Implementation of Community (EU) legislation**

The implementation of Community legislation is a task shared between the Commission and the Member States. The Commission shall ensure that the provisions of the EC Treaty and secondary legislation are properly applied (Article 211 of the EC Treaty). The Member States shall take all appropriate measures, whether general or particular, to ensure fulfilment of the obligations arising from the EC Treaty or resulting from action taken by the institutions of the Community. They shall facilitate the achievement of the Community's tasks and abstain from any measure which could jeopardise the attainment of the objectives of the Treaty (Article 10 of the EC Treaty).

## **Data on ship dismantling - records and projections of scrapping volumes<sup>30</sup>**

The analysis of historical scrapping volumes is based on data from Clarkson Research<sup>31</sup>. Data for 2004 to 2006 were derived from the Clarksons Ship Register (July 2006), while data for the period 1994-2003 were taken from the COWI/TREN study, which was also based on data from Clarkson<sup>32</sup>. The information covers a wide range of information on all merchant ships; including type of vessel, size of vessel, place of scrap, scrap price etc. The analysis of historical volumes includes vessels of 2,000 DWT and above.

### *Approximations*

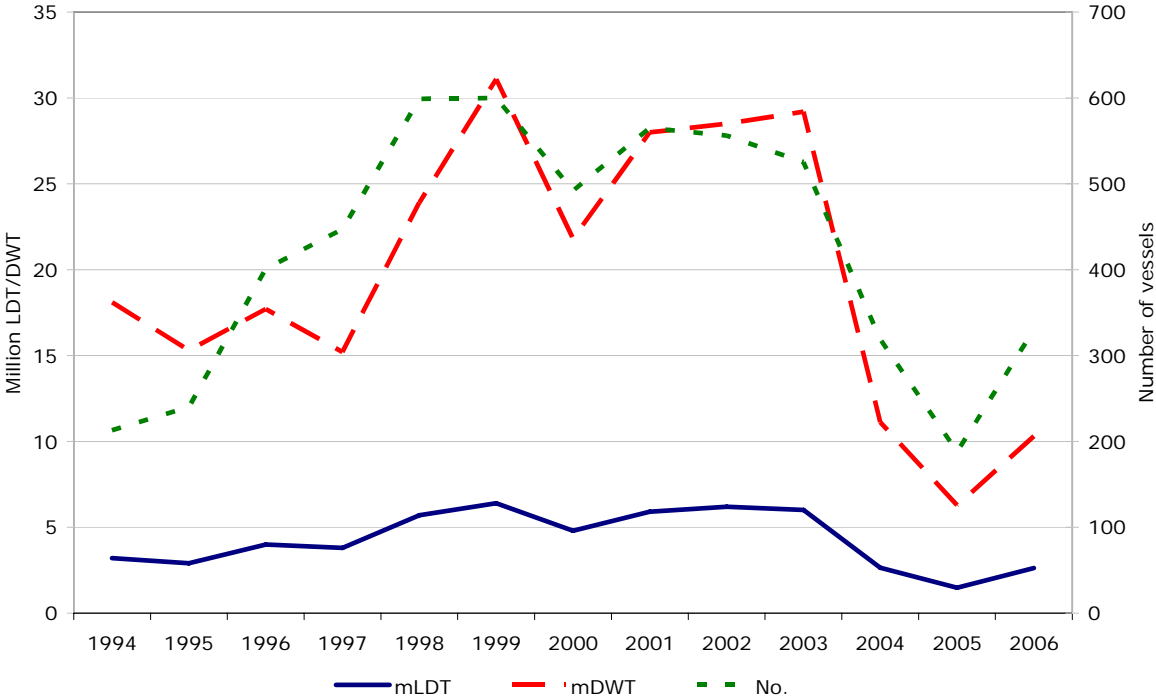
Historical volumes of ship demolition are estimated by number of vessels, dead weight tonnage (DWT) and light displacement tonnage (LDT). For some of the scrapped vessels, information is not available on LDT. For these vessels, LDT is estimated on the basis of a unit conversion factor based on the DWT of the ship. A unit conversion factor is estimated for each segment and size range. The details of this are presented in appendix 2.

### **Historical volumes**

#### *Total volumes*

The estimated level of historical scrappings are summarised in the figure below.

Figure 1 Total historical ship scrapping volumes, all types (Million LDT, Million DWT and number of vessels)



Note: Figures for 2003 and 2006 have been converted to full year.

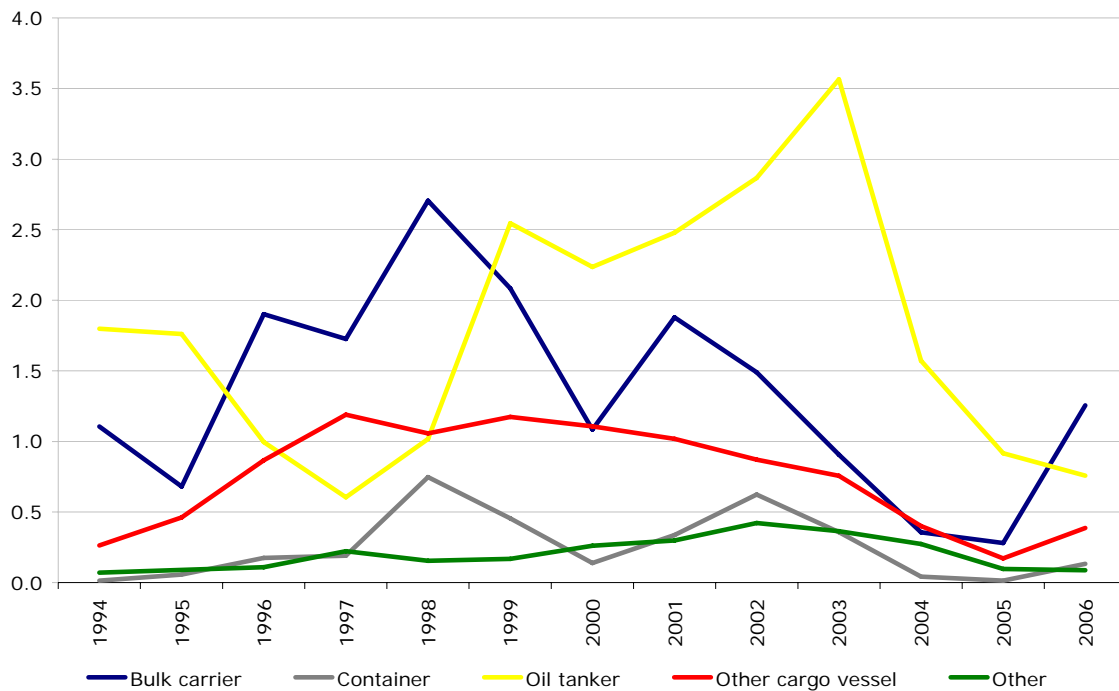
From 1994-2006, approximately 5,600 ships have been demolished worldwide. There have been considerable variations in the level of activity over the years. The ship scrapping activity peaked in 1999 with 600 ships being scrapped representing approximately 6.4 million LDT, while the scrapping activity in 2005 reached an “all time low” of only approximately 1.5 million LDT being scrapped.

*Volumes by ship type*

The historical scrapping volumes by ship type are shown in table below.

The volumes scrapped declined considerable from 2003 to 2004 and 2005 for all major ship types due to historically strong freight markets. It appears - on the basis of data for the first half of 2006 - that a rise in scrapping volumes corresponds to a relatively strong drop in freight rates.

Figure 2 Historical scrapping volumes by ship type (million LDT)



*Projections of the COWI/TREN study (2004)*

The COWI/TREN study included simple projections for the future scrapping activity for 2003-2015. The projections were based on a simple assessment of the age profile of the fleet (for all other vessel types than oil tanker) and the historically observed life time expectancy. For oil tankers the consequences of different phase-out schemes were assessed, i.e. the IMO MARPOL 13G and EC 1726/2003/Revised MARPOL Annex 1.

The projections did not consider the developments in the freight markets, as this is virtually impossible to forecast. Hence the forecasts of the COWI/TREN-study are to be considered as trend forecasts.

The projections from the COWI/TREN study are shown in the table below.

For the years 2004-2006 it was estimated that 7-10 million LDT would be scrapped per year, mainly consisting of bulk carrier, passenger/ro-ro/vehicle ferries, other cargo vessels and oil tankers.

*Table 1 Future volumes of demolition from COWI/TREN study, All types, Accelerated phase-out scheme for oil tankers (Million LDT)*

Phase out year	Other tanker	Bulk carrier	Container	Gas	Passenger/ ro-ro/vehicle	Other cargo vessel	Non-cargo vessel	Oil tanker	Total
2004	0.2	3.5	1.0	0.3	1.2	2.3	0.2	1.5	10.2
2005	0.2	3.2	1.0	0.3	1.0	1.9	0.1	0.1	7.8
2006	0.2	3.0	0.9	0.3	0.9	1.6	0.1	0.2	7.2
2007	0.2	2.9	0.9	0.3	0.8	1.4	0.1	0.3	6.9
2008	0.2	2.8	0.9	0.3	0.7	1.3	0.1	1.3	7.6
2009	0.2	2.7	0.9	0.3	0.7	1.1	0.1	1.1	7.1
2010	0.3	2.6	1.0	0.3	0.6	1.0	0.1	11.0	16.9
2011	0.3	2.4	1.0	0.3	0.5	0.9	0.1	0.4	5.9
2012	0.4	2.3	1.0	0.2	0.4	0.8	0.1	0.3	5.5
2013	0.5	2.2	1.1	0.2	0.4	0.8	0.1	0.4	5.7
2014	0.6	2.1	1.2	0.2	0.4	0.7	0.0	0.4	5.6
2015	0.7	2.1	1.3	0.2	0.4	0.7	0.0	1.2	6.6

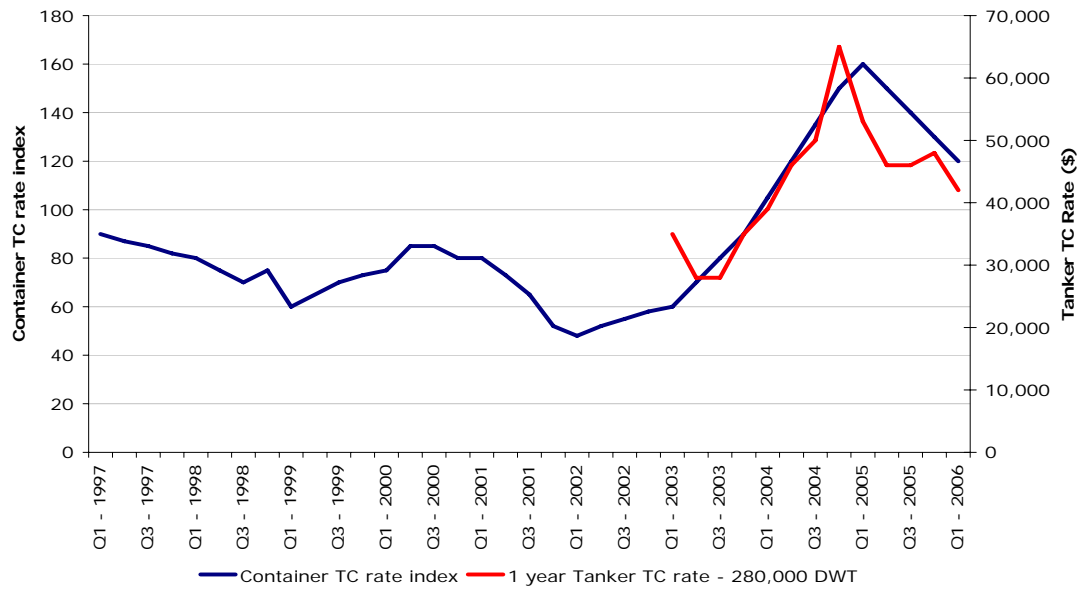
Source: COWI/TREN study, pp. 82 and 84.

The actual level of scrapping are much lower than the levels indicated in the table above. The main reason for this is as mentioned the strong freight markets, which the main driver for the ship-owners' decision when to scrap (as documented in the COWI/TREN study).

#### *Freight rates and decommissioning volumes*

The impressive freight rates are illustrated in the figure below. It can be seen that the container time charter rates more than tripled from early 2002 to early 2005 and the tanker segment has shown on equally impressive development.

Figure 3 Freight (time charter) rates



Source: Container, Clarkson (2006), reading from graph; Tanker, Clarksons.net, reading from graph.

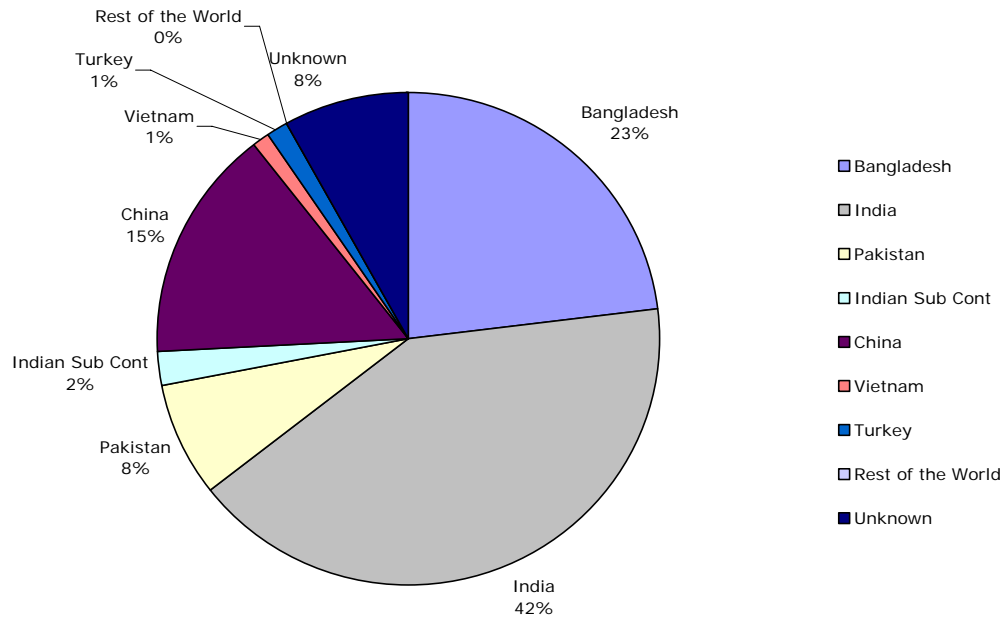
### Ship breaking nations

The main driver for the ship-owner's decision where to scrap is the price offered by the ship-breakers. With the current practice used, ship breaking is a very labour-intensive industry. Labour costs therefore play a predominant role in determining where ships are scrapped and have been scrapped historically. This is reflected in the figure below which shows that the Indian sub-continent (India, Bangladesh, Pakistan) and China account for almost 90% of the ship breaking. This finding is generally in line with the findings of the COWI/TREN study.

Most workers in Bangladesh yards get a wage of 80-120 taka per day. With an exchange rate of 67 taka to the dollar, this makes a daily income of 1.20-1.80 \$<sup>33</sup>.

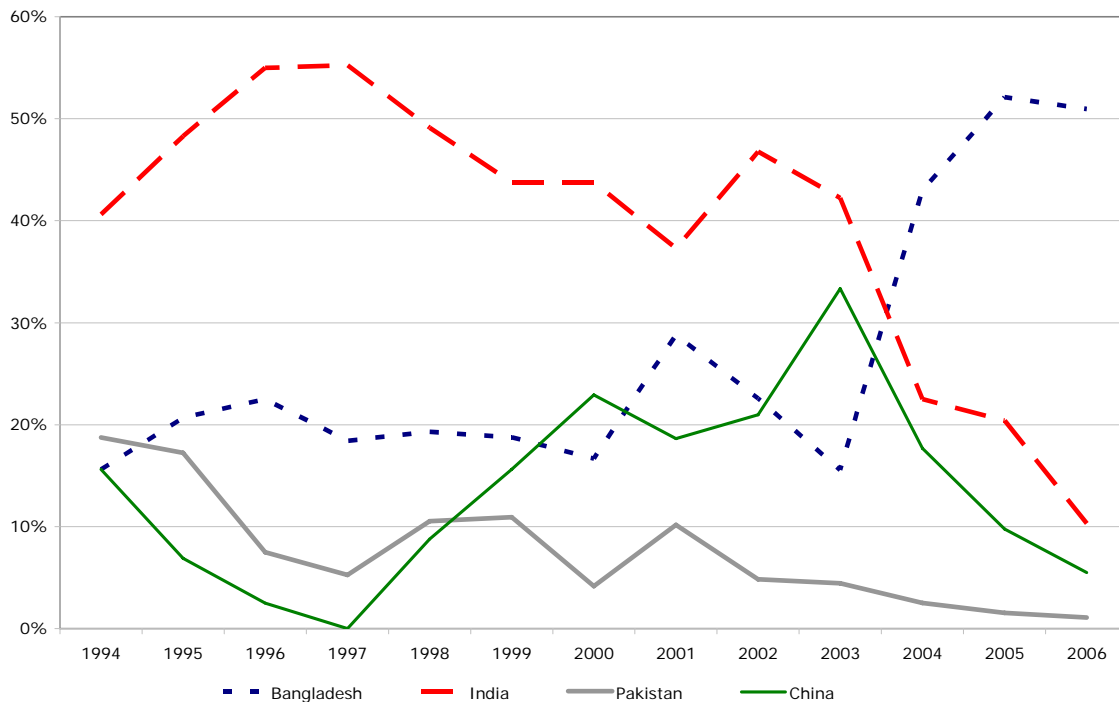


Figure 4 Total historical ship scrapping volumes, all types by region (share of LDT)



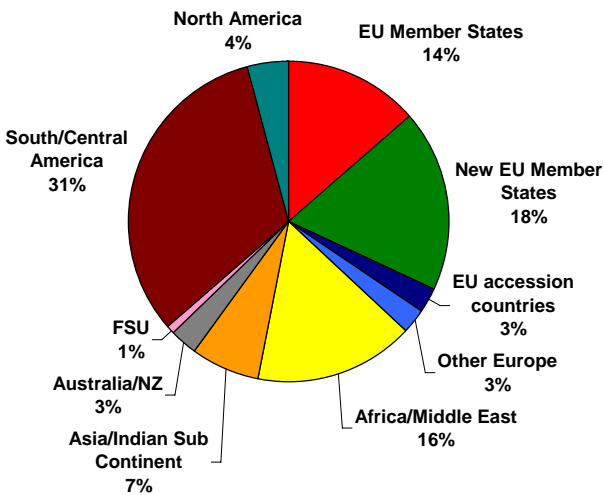
There have been considerable variations market shares of the major shipbreaking nations over the years. The figure below shows that Bangladesh today accounts for the largest share, while only 5 years back in time India was the world's largest shipbreaking nation.

Figure 5 Market share of main ship-breaking nations, 1994-2006



# European-flagged end-of-life ships

Figure 6: Flag States of scrapped vessels, 2001-2003



Source: COWI/TREN study (2004), p. 58, based on Clarkson fleet database.

## Hazardous waste from end-of-life ships

Table 2: Estimated future generation of materials of potential environmental concern from scrapping of ships, ton (densities used: H<sub>2</sub>SO<sub>4</sub>: 1.85 kg/l; paints: 1.4 kg/l; oils: 0.85 kg/l; oil sludge: 1.6 kg/l)

Hazardous materials, ton	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Lead	0.11	0.08	0.08	0.07	0.08	0.08	0.18	0.06	0.06	0.06	0.06	0.07	0.99
Cadmium	32.6	25.0	23.0	22.1	24.3	22.7	54.1	18.9	17.6	18.2	17.9	21.1	298
Pb	38.1	29.1	26.9	25.8	28.4	26.5	63.1	22.0	20.5	21.3	20.9	24.6	347
H <sub>2</sub> SO <sub>4</sub>	22.1	16.9	15.6	15.0	16.5	15.4	36.7	12.8	11.9	12.4	12.2	14.3	201
Paints	12566	9610	8870	8501	9363	8747	20821	7269	6776	7022	6899	8131	114576
TBT	326	250	230	221	243	227	541	189	176	182	179	211	2976
R22/F12	245	187	173	166	182	170	406	142	132	137	134	158	2232
Asbestos	1904	1456	1344	1288	1419	1325	3155	1101	1027	1064	1045	1232	17360
PVC	2720	2080	1920	1840	2027	1893	4507	1573	1467	1520	1493	1760	24800
PCB	0.004	0.003	0.003	0.003	0.003	0.003	0.006	0.002	0.002	0.002	0.002	0.002	0.03
Hg	0.004	0.003	0.003	0.003	0.003	0.003	0.007	0.002	0.002	0.002	0.002	0.003	0.04
Oils	85775	65593	60547	58024	63911	59706	142118	49615	46251	47933	47092	55502	782068
Oil sludge	792064	605696	559104	535808	590165	551339	1312341	458155	427093	442624	434859	512512	7221760

Source: COWI/TREN study, at p. 137, based on data of the Norwegian Ministry of Environment (1999) for a 37,500 LDT vessel.

## Environmentally sound ship recycling facilities

Table 3: Identified facilities which have performed green recycling (2004)

Country	Facility	Annual recycling capacity LDT
Italy	Simont S.p.a. (Naples)	80,000
Belgium	Van Heygen Recycling S.A. (Gent)	120,000
Holland	Scheepssloperij Nederland B.V. (Gravendeel)	30,000
China	China National Ship breaking Corporation Jiangyin Changjiang Xiagang Ship breaking Company	300,000 *
China	Shanghai Xinhua Iron & Steel Co.	250,000 *
USA	Locations of facilities: San Francisco, California, Norfolk, Virginia, Baltimore, Maryland, Brownsville, Texas, Chesapeake, Virginia, Port Everglade, Florida	225,000
Total		1,000,000

\*: The total capacity - has not been proven for green recycling

\*\* : Eight yards have recycled ships for the US MARAD. There are indications that the yards are not open to foreign vessels.

(Source: COWI/TREN study, at p. 112, with added information by US shipbreakers)

To the facilities listed in 2004 may be added:

- UK: Able UK (Hartlepool), Harland & Wolf (Belfast) and A&P Tyne (Hebburn) have applied for ship dismantling licences to expand activities on existing sites. The shipyard of Harland & Wolf possesses the largest dry docks in Europe which can take in ships of any size. Able's modified facility would have a capacity of approx. 600,000 LDT per year. While planning permission has been refused to Able for the time being, positive decisions for the other applications are expected for 2007.
- Denmark: 3 facilities (Fornaes, Jatop, Smedegaarden in Grenaa and Frederikshavn) for fishing and other smaller vessels up to 150 m length; combined capacity approx. 45,000-60,000 tons of steel per year.
- Greece: 2 facilities (Bacopoulos and Savvas Pireus) for dismantling smaller ferries, fishing and naval vessels; capacity of Bacopoulos 2,500 tons of steel per year.
- Lithuania: Undoris JSC (Klaipeda)

- Poland: Gdansk shipyard. Several naval vessels, including the destroyer “Warszawa” were dismantled there in the last years.  
150 fishing vessels were recently scrapped in various locations along the Baltic coast ( Gdańsk, Gdynia, Władysławowo, Kołobrzeg, Dziwnów).
- Spain: Desguaces de la Arena (Soto del Barco). Dismantling of vessels up to 220 m length possible. Several other yards for smaller ships exist along the Northern coast of Spain.
- Bulgaria: 2 facilities operate at Varna and Burgas.
- Turkey: The capacity of the demolition yards at Aliaga (near Izmir) is much higher than that in EU facilities and estimated at 1 million tons per year.
- Norway: Aker-Kvaerner (Stord near Stavanger). Facility dismantles mainly oil-rigs with a capacity of 66.000 tons of steel per year and a high level of mechanisation.

Most EU countries with a fishing fleet have yards that break obsolete fishing vessels. The yards are typically too small for standard oceangoing bulkers and tankers.

(Sources: COWI, Ship Dismantling and Pre-Cleaning of Ships. Inception report, Nov. 2006; OECD Working Report no. 17, 2003; Bertech, Presentation of "Shipmates" project, 2006; results of EMSA ship recycling workshop [Sept. 2006] and press reports)

1. "Towards a future Maritime Policy for the Union: A European vision for the oceans and seas" - COM(2006) 275, 7.6.2006, p. 43.
2. Council Regulation (EEC) No 259/93 of 1 February 1993 on the supervision and control of shipments of waste within, into and out of the European Community (OJ L 30, 6.2.1993, p. 1), as amended.
3. Basel Convention Decision VII/26, recital 6; Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste (OJ L 190, 12.7.2006, p. 1, recital 35).
4. Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste (OJ L 114, 27.4.2006, p. 9).
5. Decision of 15 February 2006, No 288801-288811, see: [http://www.conseil-etat.fr/ce/jurisprd/index\\_ac\\_ld0607.shtml](http://www.conseil-etat.fr/ce/jurisprd/index_ac_ld0607.shtml)
6. Det Norske Veritas / Appledore International, Technological and Economic Feasibility Study of Ship Scrapping in Europe. Final Report (No 2000-3527), 13.2.2001, see: [http://ec.europa.eu/enterprise/maritime/maritime\\_industrial/ship\\_scrapping\\_study/ship\\_scrapping\\_study\\_21feb01.pdf](http://ec.europa.eu/enterprise/maritime/maritime_industrial/ship_scrapping_study/ship_scrapping_study_21feb01.pdf)
7. See table of European dismantling facilities in the Annex.
8. Calculated on the basis of hourly labour costs (NL: 24 €/h, BG: 1.2 €/h) in: Eurostat, Labour Costs Survey 2000, Statistics in focus - Theme 3 - 18/2003. For Bangladesh see: YPSA, Workers in shipbreaking industries, A baseline survey of Chittagong (Bangladesh), 2005.
9. See preliminary list of dismantling facilities in the Annex.
10. Estimate, based on information from European navies and research by the French inter-ministerial mission on ship dismantling.
11. UNCTAD, Review of Maritime Transport 2006, p. 25, 137 et seq. The conversion factor of dwt (dead weight tonnage, i.e. carrying capacity) is 0.15 in relation to ldt (light displacement tonnage).
12. Presentation Stuer-Lauridsen at EMSA ship recycling workshop (Sept. 2006). 32% of all vessels scrapped in 2001-03 flew the flags of EU Member States or the states that acceded in 2004. At least 36% of the tonnage of seagoing vessels above 1,000 gross tons registered on 1 January 2006 were owned by companies domiciled in the EU; calculated from data of UNCTAD, Review of Maritime Transport 2006, p. 33.
13. COWI / EC-DG TREN, Oil Tanker Phase Out and the Ship Scrapping Industry, 2004, at p. 137. The study is accessible via: [http://europa.eu.int/comm/transport/maritime/safety/doc/prestige/2004\\_06\\_scrapping\\_study\\_en.pdf](http://europa.eu.int/comm/transport/maritime/safety/doc/prestige/2004_06_scrapping_study_en.pdf)
14. M. Hossain / M.M. Islam, Ship Breaking Activities and its Impact on the Coastal Zone of Chittagong, Bangladesh, 2006.
15. Lloyd's Register - Fairplay of 1.3.2005.
16. YPSA, Workers in shipbreaking industries: A base line survey of Chittagong (Bangladesh), 2005, p. 15 et seq. Other reports quoted by YPSA speak of 200 deaths from shipbreaking accidents between 1998 and 2003 alone.
17. Lloyd's List of 8.9.2006.
18. Lloyd's List of 1.12.2006.
19. Basel Convention: Technical guidelines for the environmentally sound management of the full and partial dismantling of ships (adopted December 2002); ILO: Safety and health in shipbreaking. Guidelines for Asian countries and Turkey (October 2003); IMO guidelines on ship recycling (December 2003).
20. See also Annex. The Commission launched a study in September 2006 ("Ship dismantling and pre-cleaning of ships") which will also assess the demand for ship dismantling and the existing and prospective capacity. A final report is expected for spring 2007.

21. See Consultation paper, Annex I, under: <http://www.defra.gov.uk/corporate/consult/shiprecycling-strategy/consultation.pdf>, at p. 63.
22. Community guidelines on State aid for environmental protection, OJ C 37 of 3.2.2001, p.3. These guidelines are currently under review and the new guidelines will be adopted before the end of 2007.
23. See above footnotes 6, 13 and 19. Apart from the "SHIPDISMANTL" project (2005-09), another project funded by DG Research ("SHIPMATES" = SHIPrepair to MAintain Transport which is Environmentally Sustainable; 2004-07) looks, among other things, at shipbreaking and recycling as an alternative market for ship-repair facilities.
24. Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste (OJ L 114, 27.04.2006, p. 9).
25. Regulation (EEC) No 259/93 of 1 February 1993 on the supervision and control of shipments of waste within, into and out of the European Community (OJ L 30, 6.2.1993, p. 1).
26. The Basel Convention of 22 March 1989 on the control of transboundary movements of hazardous waste and their disposal. Approved by Council Decision 93/98/EEC of 1 February 1993.
27. Decision III/1 of the Third Conference of the Parties.
28. The Waste Shipment Regulation provides as introduction to Annex II that "regardless of whether or not wastes are included on this list, they may not be moved as green wastes if they are contaminated by other materials to an extent which (a) increases the risks associated with the waste sufficiently to render it appropriate for inclusion in the amber or red lists, or (b) prevents the recovery of the waste in an environmentally sound manner".
29. Decision C(2001)107/Final of the OECD Council.
30. Main data from COWI, Note on historical scrapping volumes, October 2006.
31. Clarkson (2006): Breaking News. Feature by Mr. Martin Macleod.
32. COWI/TREN (2004): Oil Tanker Phase Out and the Ship Scrapping Industry - study on the implications of the accelerated phase out scheme of single hull tankers proposed by the EU for the world ship scrapping and recycling industry. June 2004.
33. YPSA, Workers in shipbreaking industries: A base line survey of Chittagong (Bangladesh), 2005.