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GREEN PAPER

On better ship dismantling

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1. INTRODUCTION: EUROPE'S CONTRIBUTION TO TACKLING A WORLDWIDE PROBLEM

The dismantling of ships in the era of globalisation is a reason for concern. At present it is sustainable from a narrow economic point of view, but the costs for human health and the environment are high. A radical change is needed as soon as possible.

- Each year between 200 and 600 sea-going ships of over 2 000 dead weight tons (dwt) are dismantled worldwide. A peak is expected in 2010 when around 800 single-hull tankers will have to be phased out.
- Nowadays two thirds or more of these ships are dismantled on beaches and river banks on the Indian sub-continent, with Bangladesh currently holding the largest share of the market.
- Between 2001 and 2003 14% of the ships that went for scrapping flew the flags of EU Member States and 18% the flags of states which acceded to the EU in 2004. At least 36% of world shipping tonnage in 2006 was owned by companies domiciled in the EU.
- Approximately 100 warships and other government vessels flying EU flags - most of them French and British - are expected to be decommissioned in the next 10 years. The naval vessels that were built between the 1960s and the early 1980s contain relatively high quantities of asbestos and other hazardous materials.
- From the ships scrapped between 2006 and 2015 an estimated 5.5 million tonnes of materials of potential environmental concern will end up in dismantling yards (in particular oil sludge, oils, paints, PVC and asbestos).
- None of the sites used for ship dismantling on the Indian sub-continent has containment to prevent pollution of soil and water, few have waste reception facilities, and the treatment of waste rarely conforms to even minimum environmental standards.
- Ship scrapping is an important source of raw materials in South Asia. Bangladesh derives 80-90% of its steel from end-of-life ships. The prices paid for them by ship-breaking companies are now well in excess of \$400 per light displacement ton (ldt) in Bangladesh and thus considerably higher than in other countries.
- Ship-breaking is a dangerous activity. According to a recent Indian report, one in six of the workers at Alang, India's largest dismantling site, is suffering from asbestosis. The fatal accident rate is said to be six times higher than in the Indian mining industry. In Bangladesh some 200 ship-breaking workers died in accidents between 1998 and 2003. NGOs estimate the total death toll from ship scrapping at several thousands, and this will increase considerably as more inexperienced labourers are recruited to deal with peak numbers of single-hull tankers in the coming years.

- At present there is "green" ship recycling capacity, i.e. conforming to environmental and safety standards, to handle at most 2 million ldt/year worldwide, which is around 30% of the predicted total scrapping demand in normal years. Most of these facilities - particularly in China, but also in some EU Member States - find it difficult to operate, as they cannot offer the same scrap prices and have much higher costs than their competitors in South Asia.

In principle, the transfer of end-of-life ships from industrial to developing countries is covered by international law on the shipment of waste, and the export from the European Community of vessels containing hazardous materials is banned by the EC's Waste Shipment Regulation. However, in recent years several high-profile cases of European ships going for recycling to South Asia have shown the problems of implementing this legislation.

These obvious deficiencies and the failure to provide for socially and environmentally sustainable ship dismantling have alerted the international public and created political momentum. The International Maritime Organisation - IMO - has started to work on an international convention for the safe and environmentally sound recycling of ships. Some maritime countries, such as the UK, are developing national strategies for government vessels and ships flying their flag. The European Parliament and non-governmental organisations have demanded action at EU level.

In its conclusions of 20 November 2006 the Council of the EU acknowledged that environmentally sound management of ship dismantling is a priority for the European Union. It stated that recent events and forecasts of tonnages to be dismantled in the near future call for urgent and appropriate action from the international community, including the EU. The Council welcomed the Commission's intention to work towards an EU-wide strategy on ship dismantling. This strategy should strengthen the enforcement of existing Community law, recognising the specificity of the maritime world, developments taking place therein, particularly in international maritime legislation, and the final objective of reaching a globally sustainable solution. In this context, the Commission is invited to assess the need for building up sufficient ship dismantling capacity in the EU.

The Commission already set out its position in the Green Paper on Maritime Policy of June 2006¹. It proposed that a future EU maritime policy should support initiatives at international level to achieve binding minimum standards on ship recycling and promote the establishment of clean recycling facilities. However, the EU might also have to pursue a set of regional initiatives to account for the gaps in the forthcoming international regime and the possible delay until it becomes effective.

This Green Paper attempts to come up with fresh ideas on ship dismantling, in order to continue and intensify the dialogue with Member States and stakeholders and prepare the ground for future action in the context of EU policies, including the future Maritime Policy. The main purpose of this exercise is the protection of the environment and of human health; the objective is not to artificially bring back ship recycling business volumes to the EU, thus depriving countries in South Asia of a major source of revenue. On the contrary, while acknowledging the structural comparative cost advantage of such countries, the ultimate aim

¹ References are to be found at the end of the Annex.

of the EU is to ensure that minimum environmental and health and safety standards are observed worldwide.

2. KEY ISSUES

2.1. Legal situation: the ban on exports of hazardous waste

In the late 1980s cases of toxic waste from industrialised countries sent to developing countries resulted in international outrage. Eight thousand drums of chemical waste dumped in Koko Beach, Nigeria, and ships like the *Karin B* sailing from port to port trying to offload their cargoes of hazardous waste made the newspaper headlines. A reinforced international legal framework was called for. The United Nation's Basel Convention was adopted on 22 March 1989 to set up a framework for controlling the movement of hazardous wastes across international frontiers. To date 168 countries have signed the Convention and 165 have ratified it. The European Community as a whole is a party to the Basel Convention, as are all the Member States.

An absolute ban on exports of hazardous waste from OECD countries to non-OECD countries was adopted in 1995 as an amendment to the Basel Convention. The ban was introduced due to political concerns raised both by developing and developed countries regarding the increased amounts of hazardous waste being exported from developed countries to developing countries and then managed in an uncontrolled and risky manner.

This "Basel ban" was incorporated into EU legislation in 1997 and is binding on all Member States (Articles 14 and 16 of the current Waste Shipment Regulation²). The EU is the most important global player to have implemented the ban in domestic legislation. The USA, for example, has not ratified the Basel Convention even in its un-amended form. Among the larger countries which are parties to the Convention, China, Indonesia, Egypt and Nigeria have accepted the ban amendment, while Australia, Brazil, Canada, India, Japan, Korea and Russia have not. The EU and its Member States are promoting, together with their international partners, the ratification of the "Basel ban" which constitutes a key element for the improvement of the legal framework for international shipments of waste.

In international waste shipment law it is recognized that a ship may become waste as defined in Article 2 of the Basel Convention and that at the same time it may be defined as a ship under other international rules³. The definition of waste in Community law, according to which waste means any substance or object in the categories set out in Annex I to the Waste Framework Directive⁴ which the holder discards or intends or is required to discard, applies also to ships sent for dismantling. If a vessel contains considerable quantities of hazardous substances, or in the words of the relevant waste entry GC 030, has not been "properly emptied" of hazardous materials, it will be considered a hazardous waste. The export of such a vessel for scrapping from the EC to a non-OECD country is prohibited under the Basel ban and the Waste Shipment Regulation, and any dismantling must take place under environmentally sound conditions in an OECD country. The alternative is to have the ship decontaminated (pre-cleaned) in such a way that the ship no longer constitutes a hazardous waste. This legal interpretation was confirmed by the French *Conseil d'État* in the case of the former aircraft carrier *Clemenceau*⁵.

The obligations for the EU Member States under conventions of the International Maritime Organisation (IMO) do not invalidate these waste shipment rules, even though a ship should

not be stopped or undergo "undue delay" if it has valid IMO certificates. The Basel Convention and the export ban on hazardous waste, as implemented at EU level through the Waste Shipment Regulation, are binding and need to be enforced in the Member States. Both systems of rules are compatible, since both the Law of the Sea and IMO conventions also provide for the rights (and duties) of coastal states to enforce other applicable rules of international law with regard to environmental protection.

In practice, the notification requirements of the Basel Convention, which are binding on all its parties, are rarely complied with in the case of end-of-life ships. It is difficult to apply the export ban under the EC Waste Shipment Regulation if a ship has left European waters and the owner then decides to send it for dismantling in other parts of the world. Specific legally binding international rules on ship recycling are proposed in the draft Convention that is currently being discussed in the IMO, but do not exist at present.

2.2. The economics of ship dismantling

Currently the ship dismantling market functions as follows. Ship-owners who have decided to end the economic life of a vessel will look for a cash buyer. This basically happens when the maintenance costs of the vessel start to exceed possible revenue, or when the vessel has become unattractive for the second-hand market, i.e. it is unlikely that it can be sold on. The cash buyer will either be a dedicated broker or the scrap yard operator himself. Typically, the ship will take cargo for a final voyage to the area where the scrap yard is located. After completion of this voyage, the ship will be brought, under its own power, to the scrap yard where it will be dismantled.

The cash buyer pays a price in US\$ per light displacement ton (ldt), which is roughly equivalent to the steel weight of the ship. For years the price has been around 150 US\$/ldt (with lows around 100 US\$/ldt and highs around 200 US\$/ldt), but recently the strong demand for steel scrap in China and the low supply of ships have driven prices up to record levels of nearly 500 US\$/ldt for average vessels and more for particularly valuable ones. The highest prices are currently paid in Bangladesh.

A very large crude oil tanker (VLCC) with a cargo carrying capacity of 300,000 tonnes or so will be around 45,000 ldt so can fetch 5 to 10 million US\$ (or even much more), depending on market conditions. These figures are just rough indications as the price is also affected by other factors like the amount and quality of the steel, the presence of metals such as copper or nickel, and the equipment that can still be sold. Whether or not there are problematic substances on board do not seem to affect the price.

The Commission looked into the economics of ship scrapping in a study conducted in 2000⁶. The study concluded that under current conditions it would be extremely difficult to make ship recycling economically viable while at the same time respecting sound environmental standards for various reasons.

- The number of ships available for scrapping depends on conditions on the freight market. If ships can still earn good money, owners will not decide to send the ship for scrapping. In the past two years, scrapping volumes were very low due to a booming and profitable freight market. The large majority of ships for scrapping will have to come from the deep sea merchant fleet and will be mainly tankers and bulk carriers (which are the "volume" segments). Other market segments, such as warships, inland waterways vessels and offshore structures, are of limited size and availability and so can hardly provide a steady

stream of material for large-scale recycling. The operator of a modern recycling facility will therefore have difficulty building a business model that fully covers its amortisation costs. This is why the remaining operators in Europe were able to survive only by concentrating on niche markets, in particular offshore structures, fishing boats and inland waterway vessels⁷.

- Ships are individual constructions with a long life-cycle and will have undergone many repairs and maintenance in their 20-30 years of operation. Very little of this will be properly documented. The recycling facility therefore does not know what it is taking on and what recycling work will be required. This is particularly true for passenger ships which contain a wide range of materials, including composites which are very difficult to separate and recycle. The ships currently heading for the scrap yards were built in the 1970s using materials that are no longer used today (e.g. asbestos). Consequently, the amount of manual labour required is significant and likely to remain a major cost factor. The use of heavy machinery for these types of vessels will be limited.
- Some materials on board can be recycled and will create revenue. Others need expensive treatment, for which costs are significant but difficult to calculate in advance.
- The main revenue streams for scrap yards in Asia are steel which is used in building, and the second-hand market in ships' equipment. These revenue streams basically do not exist in developed countries due to regulatory requirements.

Another factor is the difference in labour costs between Asia and Europe. While labourers on demolition sites in Bangladesh and India earn 1-2 US\$/day and employers' expenses for safety and health are negligible, the costs in Europe can be estimated at around 250 US\$/day for a worker in the Netherlands and 13 US\$/day in Bulgaria⁸.

These differences in labour costs, environmental and health requirements and revenue from recycling and second-hand materials explain why operators in South Asia can offer far better prices to ship-owners than their potential competitors in other countries. In Bangladesh breakers who have no environmental or health and safety costs currently pay 450-500 US\$/t for a ship, while Chinese facilities with slightly better standards offer half this price and US operators a tenth. Indeed, in the days before the boom in steel prices recycling yards in industrial countries even used to charge for the dismantling of naval vessels.

As a consequence of market developments, the dismantling capacity in the EU has been reduced in the last 20 years to a marginal level. Nowadays there are facilities for larger ships mainly in Belgium, Italy and the Netherlands, with a combined capacity of about 230,000 ldt/year, and a multitude of smaller facilities for fishing vessels and other small craft in most other maritime Member States. Taken together, the existing capacity in the EU for ship dismantling may be estimated at approximately 500,000 ldt per year⁹. Besides, licensing procedures are ongoing in the UK to allow dismantling activities in two existing shipyards which would have considerably more capacity (600,000 ldt/year in the case of Able UK). This enumeration does not include the many disused dry docks in ports all over Europe, which would be technically suitable for dismantling, but are not likely to be reopened under current economic conditions.

More sizeable than the existing capacity in the EU is that of neighbouring Turkey which, as a member country of the OECD, qualifies in principle as a destination even for hazardous waste

exports. About 20 dismantling yards on the shore of Aliaga (near Izmir) have a joint capacity of approximately 1 million tons per year, which is today largely unused.

The EU facilities in general meet high standards of occupational safety and environmental protection. Their Turkish counterparts have made considerable advances in environmental and safety management over the last years, even though there are still some environmental concerns. There are also a number of facilities with piers for shipbreaking in China, which have been upgraded in recent years to acceptable quality standards, but whose capacity does not amount to much more than 500,000 ldt a year. The dismantling facilities in Brownsville/Texas and other locations in the USA have a similar quality but are in principle not open to foreign vessels.

The existing capacity for clean ship dismantling in the EU, as well as in Turkey is thus sufficient for the warships and other state-owned vessels - an estimated 100 of more than 1,000 ldt, with a combined tonnage of up to 500,000 ldt¹⁰ - that will be decommissioned over the next 10 years, but only for a minor part of the merchant fleet under EU flags. According to UNCTAD reports, a tonnage of between 6 and 30 million dwt have been sold for breaking per year between 2000 and 2005, while approx. 23% of the world merchant fleet fly the flags of EU Member States¹¹.

This problem of insufficient "clean" capacity will be aggravated by the forthcoming phasing-out of all single-hull oil tankers. Accidents involving tankers like the *Erika* and the *Prestige* have caused major environmental disasters in recent decades. In reaction to this, EU legislation and international rules were adopted for the gradual phasing-out of single-hull tankers and will begin to have maximum effect in the next decade. It is estimated that about 1,300 single-hull tankers will be decommissioned and go for scrapping by the year 2015, about a third of them under the flags of Member States¹². The demand for ship recycling capacity is expected to peak around the year 2010, the main phasing-out date for these tankers. However, there will also be increases in the longer term, due to the general boom in shipbuilding over the last years.

For the moment the ship scrapping market is still economically viable, leaving aside the extreme externalisation of costs. Owners have significant income from selling decommissioned ships (the Very Large Crude Carrier – VLCC - given above as an example would today cost some 90 million US\$ to build new, and would fetch 10 million US\$ or more after 25 years of use). Scrap yards make profits from recycling the materials recovered. But the market only functions under highly problematic conditions that will be described below. This is less and less acceptable for the public in the developed countries where most ship-owners reside and where the financial returns from the ship's operations are collected, and it is not compatible with principles of environmental and social sustainability.

2.3. Environmental and social impacts

Most vessels contain large amounts of hazardous materials, such as asbestos (in particular if built before the 1980s), oils and oil sludge, PCBs (polychlorinated biphenyls), and heavy metals in paints and equipment. So when sent for dismantling, these ships, represent one of the major streams of hazardous waste from industrialised countries to the developing world. In 2004 a study for the Commission (DG TREN) estimated that oil sludge from end-of-life ships alone will total between 400,000 and 1.3 million tonnes per year until 2015. Of the hazardous waste in dismantling facilities every year, asbestos will amount to 1,000-3,000 tonnes, TBT 170-540 tonnes and environmentally harmful paints 6,000-20,000 tonnes¹³.

The scrapping of ships in Bangladesh, India and Pakistan takes place on sandy beaches without any containment or barriers to prevent water and soil pollution. There are few reception facilities for hazardous waste, and materials that cannot be recycled are usually dumped on the spot. PVC coatings of cables are often burnt in open fires.

The impact of these practices on the environment has rarely been studied in detail. Available data suggest that the physico-chemical properties of sea water, beach soil and sediments are considerably affected by shipbreaking¹⁴. Oil pollution of the beaches and the adjoining sea is clearly visible on aerial photographs of the dismantling sites at Alang (India) and Chittagong (Bangladesh), and NGOs report that vegetation and fish have disappeared from these areas.

Safety and health conditions in the South Asian scrap yards are critical. There is a high risk of dangerous accidents, particularly because of the lack of heavy machinery (cranes) and safety equipment for workers. According to a 2004 government report in India, there were 434 incidents at the Alang yards between 1996 and 2003, killing 209 labourers¹⁵. In Bangladesh, according to media reports, more than 400 workers have been killed and 6,000 seriously injured over the last 20 years¹⁶. The fact that Bangladesh, unlike India, does not even require "gas-free-for-hot-work" certification in practice accounts for the particularly low costs there, but also for the high frequency of lethal explosions at the dismantling yards.

In addition, it is estimated that thousands contract irreversible disease from handling and inhaling toxic substances without minimum precautions or protection. According to a medical report to the Indian Supreme Court in September 2006, 16% of the workforce handling asbestos in Alang were found to be suffering from asbestosis and thus at serious risk of mesothelioma¹⁷. As is known from medical research, the incidence of this form of lung cancer reaches its peak only several decades after exposure.

In 2005 there were an estimated 25,000 scrapyards workers in Bangladesh. In India the workforce in boom times amounted to about 40,000, which had shrunk to 6,000 by late 2006¹⁸. For both countries it can be said that most workers come from the poorest regions of the country and are usually unskilled. They work without contracts and health or accident insurance and are not allowed to form trade unions. There is little or no compensation for accidents. Some degree of child labour for the lighter work is common.

The conditions in shipbreaking facilities have been criticised by environmental and human rights organisations and the media, and by India's Supreme Court. However, the governments of the South Asian states seem reluctant to enforce a change in practices as they regard ship dismantling as an economically important activity which should be impeded as little as possible.

2.4. International state of play

The problem of ship dismantling has been discussed for many years, both within the EU and within the international organisations involved: the International Maritime Organisation (IMO), the International Labour Organisation (ILO) and the Basel Convention (or more precisely its parent body, the United Nations Environment Programme, UNEP). All three organisations have developed non-binding technical guidelines for ship recycling¹⁹. At two meetings in 2005, a Joint ILO/IMO/Basel Convention Working Group on Ship Scrapping discussed a co-ordinated approach to the issue in order to avoid duplication of work and overlapping of roles, responsibilities and competencies between the three organizations.

Since 2005, the IMO has been working towards a binding international regime for clean ship dismantling. The EU Member States and the Commission take part in this work. A draft Convention on the Safe and Environmentally Sound Recycling of Ships is being negotiated in the organisation's Marine Environment Protection Committee (MEPC) for adoption by a diplomatic conference in 2008/2009, to enter into force some years later. The draft has an annex containing regulations on requirements for ships (including design, construction, operation and maintenance) and for ship recycling facilities, and some reporting requirements. It aims at a "cradle to grave" approach to ship recycling, with a view to avoiding hazardous materials in new ships and removing them from existing ships during their period of operation. Technical details, which also cover the environmentally sound management of ship recycling facilities, are supposed to be set out in recommended guidelines supplementing the Convention.

According to the current draft, the Convention - in line with other IMO instruments - will not apply to smaller vessels of less than 400 or 500 gross tons, nor to warships, naval auxiliary or other vessels which are state-owned or -operated and used only on non-commercial government service. Controversial issues, which will be discussed by IMO working groups in 2007, include the question as to whether reference should be made to rules and standards outside the framework of IMO, the environmental baseline standard for ship recycling facilities, future reporting requirements (in particular whether state-to-state notification should be necessary as under the Basel Convention) and the type of compliance mechanism to help with implementation of the Convention.

In the context of the Basel Convention, the key issue under discussion is whether the proposed Ship Recycling Convention will ensure an equivalent level of control and enforcement as under the Basel Convention. The 8th Conference of the Parties on 1 December 2006 reiterated this demand and stated, among other things, that the future legal instrument should generate conditions of ship dismantling that protect workers and the environment from the adverse impacts of hazardous wastes and unsafe working practices.

3. OPTIONS FOR IMPROVING EUROPEAN MANAGEMENT OF SHIP DISMANTLING

The Commission has examined the wide variety of issues involved and identified some options for closing or at least narrowing the implementation gap and improving the management of ship dismantling. These options should not be seen as mutually exclusive, but as supplementing and supporting each other.

3.1. Better enforcement of EU waste shipment law

The EU Member States are under an obligation to apply and enforce the EC Waste Shipment Regulation, including the "Basel ban" on hazardous waste exports.

Even though the mobility of ships makes it relatively easy to circumvent the export ban, enforcement could be improved, at least in the case of vessels and shipping lines which regularly operate in European waters. This will require:

- more controls by waste shipment and port authorities in European ports, targeting ships that are above a certain age (25 years) or where other indications make it likely that they are intended for dismantling;

- possibly additional guidance by the Commission and the Member States on the definition of waste and hazardous waste in relation to ships, and a list of recycling facilities that meet standards of environmentally sound management and are safe to workers;
- more systematic co-operation and information exchange between the Member States, and between them and the Commission, including the use of databases and press reports to identify potential end-of-life ships and follow their route to dismantling facilities;
- more cooperation with certain third countries, in particular recycling states and transit states (e.g. Egypt in relation to end-of-life ships that pass through the Suez Canal);
- a policy focus on warships and other state-owned ships and commercial vessels that regularly operate in EU waters (e.g. ferries).

As the Waste Shipment Regulation does not apply only to EU-flagged ships, but to all waste exports, and thus end-of-life ships that leave EU ports, ship-owners are not able to escape controls by re-flagging to non-European flags. The risk that shipping activity in Europe might be reduced by tighter enforcement is not very high as long as the EU remains an economically attractive and profitable market. More realistic is the risk that irresponsible non-European ship-owners affected by controls might abandon their vessels in EU ports, so that eventually proper disposal has to be paid for by the taxpayer. This kind of problem can only be addressed by more efficient enforcement of maritime rules in general.

3.2. International solutions

Within the international bodies involved, there seems to be general agreement that the most important issue is to ensure that ships are recycled in an environmentally sound and safe way. In order to create a level playing-field worldwide, binding international standards are necessary. Such standards should generate a real change in current dismantling practices by stopping the frequent pollution of soil and water, and by protecting workers from accidents and contamination. For instance, safe containment of oil residue spills, the prior removal of asbestos with protective equipment, gas-freeing precautions to prevent explosions, and machinery to carry heavy loads safely should all be made mandatory.

There will still probably be a price difference between European and Asian countries, even if the latter meet high environmental and health standards, but it is less likely to prove prohibitive in all cases. In the foreseeable future, developing countries will be able to offer lower labour costs and higher prices for steel and reusable equipment. Still, there would be greater scope for the price gap to be bridged by voluntary measures that allow a certain amount of ship dismantling to take place in Europe where there are particularly high "zero pollution" and "zero human health harm" standards.

The future international Convention will be essential for solving the ship dismantling problem globally. Thus, the IMO is the most relevant forum to deal at the global level with this issue. The new Convention will have repercussions on the Waste Shipment Regulation and other EU law on environmental protection and safety at work. The Community as a whole needs to pursue the objective of becoming a party to this specific Convention of the IMO, . This can be done by including in the Convention a clause on regional economic integration organisations ("REIO clause"), as is the case in all recent multilateral environmental agreements. In order to achieve safe and environmentally sound international standards as soon as possible, there is a need to reinforce the role of the Community in the IMO.

It is in the interests of the EU, firstly, that the work of the IMO be concluded as swiftly as possible, and, secondly, that the Convention be sufficiently broad in scope and generate sound standards for health protection and environmental management, as well as the mechanisms necessary for their enforcement. For this, the Convention should establish clear obligations and prerogatives of flag states, port states and recycling states, and a fair balance between them. The IMO system has to be made effective in the sense of creating a system under which ships can only be dismantled in an environmentally sound and safe way.

It is unlikely that the forthcoming legal instrument will include an obligation to decontaminate a ship prior to its final voyage, since pre-cleaning is seen by the shipping industry as impracticable from a safety point of view or uneconomic. Under the draft Convention, prior removal of hazardous materials may not be required if the recycling facility chosen is fully authorised to manage the type or amount of hazardous materials contained in the ship. The draft (as of December 2006) seeks to match the individual ship's requirements and the capabilities of the recycling yard by means of a Recycling Plan and an International Ready for Recycling Certificate. However, there is still a need to clarify that, in case the final recycling facility is not capable of managing certain hazardous materials, the owner of an end-of-life ship must select another yard or remove the materials for safe disposal or recovery beforehand. For the time being, since the Waste Shipment Regulation requires vessels to be "properly emptied" of hazardous materials in order to be classified as non-hazardous waste, the Commission works on a study concerning the risks, costs and benefits of pre-cleaning. The results should be ready in the late spring of 2007.

To change the EC Waste Shipment Regulation or other Community law affected by the proposed Convention is currently not an option. This EU legislation should and will remain in force and there are no plans for changes until international rules under the IMO achieve the same high standard. In particular, there is no reason to modify the Basel Convention system for controlling transboundary waste shipments and to grant exemptions for end-of-life ships unless and until a new international regime guarantees an equivalent level of control for them.

However, in order to enhance Community involvement in the IMO negotiations on an international Ship Recycling Convention, it is necessary:

- (a) to establish a Community position and possibly give the Commission a mandate for the further negotiation of the IMO Ship Recycling Convention, because of the Community legislation that might be affected;
- (b) to have a "REIO clause" inserted in order for the Community to become a party to the Ship Recycling Convention;
- (c) to intensify the co-ordination of positions in the negotiations between the EU Member States and the Commission; co-operation is already good but further reinforcement is needed.

After their adoption, the Convention and its guidelines have to be transposed into Community law in order to make them mandatory for EU-flagged ships or ships entering EU waters. This was the case with a number of IMO conventions, like for instance the Anti-fouling System (AFS) Convention, introduced into Community law by Regulation (EC) No 782/2003. This approach to establish EU rules on the basis of international legal instruments is currently the basis of EU actions in maritime transport issues which allows taking into account the specificities of international shipping.

The Ship Recycling Convention, however, may come too late to solve the problem of phased-out single hull tankers, as IMO conventions take on average six years to enter into force, and the peak for phasing-out is expected around 2010. So while it is necessary to push for the earliest possible entry into force of the Convention, solutions have to be found for the interim period.

3.3. Strengthening EU ship dismantling capacity

As described above under 2.2, the available capacity for ship dismantling in the EU and in other OECD countries (especially Turkey) is sufficient for all the warships and other state-owned vessels that will be decommissioned over the next 10 years, but not for the much higher number of oil tankers and other large merchant ships that fly EU flags or are owned by EU-domiciled companies. This situation will not change significantly even after several shipyards in the UK that have applied for the necessary licences become operational in the near future²⁰. Even if upgraded recycling facilities in China are included as an option for those EU ships that become waste outside of European waters, there will be a considerable deficit in safe and environmentally sound dismantling capacity over the next years.

However, the under-utilization of existing "green" or upgraded facilities in the EU, Turkey and China shows that the problem of ship dismantling is more on the demand than on the supply side. Current market conditions make it impossible for EU operators to compete with South Asian yards which can offer much lower costs and higher metal prices. As long as there is no level playing-field in the form of effective and sound mandatory standards for ship dismantling worldwide, European facilities will have difficulty competing in the market and ship-owners will tend to send their vessels to sub-standard Asian sites.

Reacting to this situation, the Council of the EU has issued a statement on 17 May 2006, according to which Member States would use their best endeavours to increase capacity for ship dismantling in the EU. Furthermore, the Member States would do their utmost to ensure that good progress is made in the international negotiations to establish mandatory requirements at the global level on ship dismantling. In the Council conclusions adopted on 20 November 2006, before the 8th Conference of the Parties of the Basel Convention, the Commission was invited to assess the need for building up sufficient ship dismantling capacity in the EU.

Looking at ways to strengthen the position of clean ship dismantling facilities in general and EU facilities in particular for the interim period, until a new international regime has established a level playing-field worldwide, action should focus on state-owned vessels. The governments of EU Member States are under a special obligation to comply with Community legislation and to act in an exemplary manner with regard to the dismantling of warships and other vessels which are state property. As regards warships, an additional responsibility is derived from the relatively high proportion of hazardous materials (especially asbestos) on board older vessels.

The governments of Member States could trigger the supply of "green" dismantling and pre-cleaning services for their end-of-life ships by way of public tenders, in which they follow strict public procurement rules that allow dismantling only in accordance with current waste shipment law and high standards of environmentally sound management. The viability of dismantling facilities in Europe could be promoted already by more transparency in the decommissioning of state-owned ships, a coordinated time-schedule, and EU-wide harmonisation of the quality standards required by governments in dismantling contracts.

Where Member States sell their vessels for further use to other countries or commercial buyers, they can still retain some leverage by including provisions on dismantling, such as a clause on prior government consent to disposal, in the sales contract. Such provisions are part of the proposed UK Ship Recycling Strategy published in March 2006²¹.

In relation to the much larger merchant fleet, the economic considerations described above are of prime importance. As long as no binding international regime is fully established, and probably even after that date, strong incentives are needed to induce changes in the current practices of the shipping industry. In the longer term, the objective should be to establish a sustainable funding system whereby ship-owners and possibly other beneficiaries of shipping contribute to the safe and environmentally sound dismantling of ships worldwide. Possible details of such a system are discussed below (3.6).

For the interim period, voluntary commitments in the spirit of Corporate Social Responsibility can play a certain role and should be encouraged (see below 3.5). Awards and certification systems in particular can help to show the way forward.

The question as to whether or not direct financial support should be given to clean ship dismantling facilities in the EU or to ship-owners who send their vessels to "green" yards, either for full ship dismantling or for decontamination, should receive special attention. Such support to innovative facilities might indirectly reduce the number of ships dismantled under unacceptable conditions. It is, however, easy to see the risk that huge sums would be needed for a long period of time without creating a sustainable industrial activity and risking cross-subsidisation to other activities, particularly in the shipbuilding sector where competition is very strong. Apart from this, subsidising dismantling facilities, and even more ship-owners directly, would go against the "polluter pays" principle of European law. For this reason, unsurprisingly, the state aid rules on this kind of aid are rather limited.

The current EU guidelines on environmental state aid²², which are the instrument to define the scope of such aid, include certain waste management services but not ship dismantling as a possible object. Whether subsidies for certain activities, such as innovative investments, the disposal of asbestos or the participation of a company in certification and monitoring schemes, are state aid in this sense and allowed by the guidelines, has to be assessed at present on a case-by-case basis. European cohesion policy can also provide support for shipyards, including for recycling facilities, on condition that this is in accordance with the objectives, rules and procedures of the policy.

3.4. Technical assistance and transfer of technology and best practices to recycling states

In spite of poor and dangerous working conditions and the degradation of the local environment, ship-breaking yards are economically important for South Asian countries. For instance, Bangladesh probably derives about 90% of its steel supply from ship dismantling, and the industry provides jobs for tens of thousands of workers.

In order to encourage an upgrading of facilities in these countries, it will be necessary to provide technical assistance and encourage better regulation. On a small scale this is already done by international organisations, some OECD countries, and also the Commission. This technical and financial aid should be reviewed in close collaboration with the affected countries and other international donors, with the aim of promoting safe and environmentally sound ship dismantling. The EU will soon negotiate new or updated political or economic

agreements with a number of recycling states, and where appropriate, will explore how the goals of improved labour practices and environmental standards could be reflected.

Within the EU, there is a considerable amount of experience and technology for environmentally friendly ship-dismantling available. The EU should endeavour to share such experience with the recycling states and to promote the relevant transfers of technology and best practices. By the same token, the EU can transfer experience and practices in relation to dealing with the risks posed by asbestos, thus helping to raise the standards of protection and precaution in the countries concerned.

Beyond the technical level, however, it is necessary to acknowledge that the absence or non-implementation of elementary rules on safety at work and environmental protection is strongly linked with structural poverty and other social and legal problems in some areas of South Asia, such as the lack of property rights and the frequency of extremely short leases for operators on coastal land, the weakness of enforcement authorities, and the existence of bad governance practices. In order to achieve sustainable change, assistance will have to be embedded in a wider framework.

3.5. Encouraging voluntary action

Merchant ships generate large profits for their owners over a relatively long operating life. When a ship becomes waste at the end of its life, the owner, as the person who has also typically taken the decision to send the ship for scrapping and is thus "producer" of the waste, is best placed to ensure that its disposal or recovery takes place in a safe and environmentally sound way. Ship-owners who take their profession seriously should not tolerate the current dismantling practices, which endanger the life and health of workers and pollute the environment.

Voluntary commitments by ship-owners, their associations and their customers are potentially the simplest and quickest way to change practices on the ground. The shipping company P&O Nedlloyd, for instance, (now part of the Maersk Group) has formed a partnership with Chinese facilities whose environmental and safety standards were upgraded through technical assistance and training. Intertanko, the organisation of independent tanker owners, announced in September 2006 the adoption of an "Interim Strategy", according to which ship-owners should only use recycling facilities that have made demonstrable advances in terms of the safety and environmental management in Section C of the draft international Convention.

The Conference of the Parties of the Basel Convention, in a decision of 1 December 2006, called upon ship-owners and other stakeholders to take all practical steps to ensure that end-of-life ships are dismantled in an environmentally sound manner.

Voluntary agreements may be effective when they are properly designed in terms of substance and comprise clear mechanisms to ensure implementation of the commitments taken by private stakeholders as well as systems for monitoring and control. A commitment of this type is a useful first step to generate change. It should therefore be publicly encouraged and, where possible, supported with incentives from the European Union and the Member States, after which implementation will have to be monitored. If it then turns out that the commitment is not followed up in practice, legislation may still be necessary.

3.6. Ship dismantling fund

Especially in the longer term it will not be acceptable for investment in clean ship dismantling facilities in Europe or Asia to be subsidised out of public funds. "Polluter pays" and producer responsibility principles require that the owners take full responsibility for proper disposal. Such a sustainable funding system could be organised on a voluntary basis, with commitments particularly from the shipping industry, but in view of strong competition on the market it seems more effective to establish it as a mandatory element of the new international regime on ship dismantling. The IMO would be in the best position to operate this fund, similar to the existing oil pollution funds under the MARPOL Convention. To guard against re-flagging to states that do not join the fund system, contributions should be linked to registration at IMO or the operation of ships over their lifetime, e.g. through port fees or mandatory insurance schemes.

This link to the ship's operational phase is also preferable to a deposit at the time a ship is first built, since often the shipyard that built the ship will no longer exist when the vessel is finally scrapped. If an IMO-based fund is not achievable, a regional system could be considered.

3.7. Other options

Several other measures might be useful to assist the process of upgrading the ship dismantling industry in the short and medium term:

- (a) *EU legislation, in particular on single-hull oil tankers.* As these tankers will make up a major proportion of the end-of-life ships to be scrapped in the next few years, it might be worth considering action to supplement the relevant maritime safety legislation with rules on the clean and safe dismantling of the vessels.

Some Member States have indicated that they would support such a proposal if the Commission took the initiative. The disadvantage of this legislation is that, since single-hull tankers are largely banned from EU ports anyway, it would be addressed mainly to EU flag states and could thus trigger off a wave of re-flagging, without producing benefits for safety and the environment.

Apart from the specific issue of oil tankers, more general measures are conceivable to prevent the use of hazardous materials in the construction of new ships. The recent adoption of the new chemicals legislation REACH (Regulation (EC) No 1907/2006) provides the regulatory framework as regards the use of hazardous chemicals. Whether additional measures, specific to the use of other substances in the construction of vessels, are needed would require thorough analysis and impact assessment.

- (b) *Streamlining of shipping aids with a link to green ship dismantling.* Community funding for the shipping industry and state aids for maritime transport could be linked to the beneficiary's use of clean and safe dismantling facilities for all ships under its control.
- (c) *Establishment of a European certification system for clean ship dismantling and awards for exemplary green recycling.* Existing or in future improved certification systems, such as EMAS, could be used for the benefit of improving the management of ship dismantling facilities and making this improvement transparent for clients

and the public. The intended revision of the EMAS Regulation might open the system also for non-EU sites and thus enable interested operators e.g. in Turkey to acquire an environmental management certificate of good standing. Apart from this, early action by ship-owners, recycling facilities and other stakeholders towards safe and pollution-free practices in ship dismantling could be encouraged by a green label or human health and safety award scheme. The already existing "Clean Marine" or "Green Awards" for shipping lines and ports could serve as an inspiration. In addition, a public register of clean facilities could give guidance to ship-owners.

- (d) *Intensifying international research on ship dismantling.* At present, the Sixth Framework Research and Development Programme of the European Commission funds one research project on the issue ("SHIPDISMANTL") which looks at technological options under the aspect of international cooperation. In this framework, research institutes and dismantling yards from the EU, Turkey and India develop Decision Support Systems (DSS) that will be made available for free to the ship-breaking industry worldwide. The recently published first call for proposals of the Seventh Framework Programme defines explicitly the research area of end-of-life strategies for vessels as a priority.

Apart from this and other research that was and is undertaken by the Commission itself²³, more scientific cooperation in partnership mode involving teams from Asia and Europe would be useful to analyse the options and their implications in an integrated way that includes environmental, social, economic and institutional aspects. It would then be possible to propose courses of action on a scientific basis which could be helpful to the different domestic players and in international negotiations. However, it might be several years before the results of this research become available.

4. CONCLUSION

This Green Paper gives the basic facts on ship dismantling and explains the problems. There are more details and data in the Annex. To give us a clearer view of the action required of the EU, we ask Member States, stakeholders and the public to consider the following questions.

1. How can the enforcement of current Community law (Waste Shipment Regulation) affecting end-of-life ships be improved? What is the best mix of measures to divert EU-flagged or EU-owned vessels to dismantling sites with high environmental and safety standards?
2. Would guidance on waste shipment rules and definitions on end-of-life ships help to improve implementation of rules and business practices, and what form should it take?
3. What is the best way of steering the current negotiations on the IMO Ship Recycling Convention in order to improve ship dismantling practices globally?
4. Should the EU aim at global environmental and safety standards under the IMO Convention that are comparable with EU standards?

5. How can the EU best ensure that European ships are dismantled in a safe and environmentally sound way during the interim period before the IMO Convention becomes effective? What about ships owned by the public sector? Will national strategies and voluntary commitments by ship-owners be sufficient? What additional measures would be needed at EU level?
6. Should the EU and its Member States take an active role in increasing the EU's own ship recycling capacity, and how?
7. What measures and actions should the EU take to encourage South Asian states to introduce and implement higher environmental and safety standards for ship dismantling?
8. What measures and actions should the EU take to encourage ship-owners to direct end-of-life ships to dismantling sites with high environmental and safety standards?
9. How should the EU secure sustainable funding for clean ship dismantling in accordance with the polluter pays principle, and what measures and actions should it take?

Contributions in the context of this consultation process should be sent to the Commission by **30 September 2007**, by email to the address “ship-dismantling@ec.europa.eu”, or by post to the following address:

European Commission

Directorate-general Environment

Unit G.4 “Sustainable production and consumption”

B-1049 Brussels

This Green paper and the contributions received will be published on the Commission's website, unless requests not to do so have explicitly been made. In late 2007, the Commission intends to present its analysis of the responses received together with, if appropriate, its proposal and/or initiatives for an EU strategy on ship dismantling.