



EUROPEAN  
COMMISSION

Brussels, 28.6.2013  
SWD(2013) 237 final

**COMMISSION STAFF WORKING DOCUMENT**

**Impact Assessment - Part 2**

*Accompanying the document*

**Proposal for a Regulation of the European Parliament and of the Council  
on the monitoring, reporting and verification of carbon dioxide emissions from maritime  
transport and amending Regulation (EU) N° 525/2013**

{COM(2013) 480 final}  
{SWD(2013) 236 final}

## GLOSSARY

CDM	Clean Development Mechanism
CER	Certified Emissions Reductions
EEA	European Environment Agency
EEDI	Energy Efficiency Design Index
EEOI	Energy Efficiency Operational Index
EIB	European Investment Bank
EMSA	European Maritime Safety Agency
EUA	European Union Allowances
GT	Gross tonnage
GHG	Greenhouse gas
HFO	Heavy Fuel Oil
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
MARPOL	International Convention on MARitime POLLution
MEPC	Maritime Environmental Protection Committee
MDO	Marine Diesel Oil
MGO	Marine Gasoil
MRV	Monitoring, reporting and verification of emissions
NGO	Non-governmental organisation
SEEMP	Ship Energy Efficiency Management Plan
SOLAS	International convention for Safety Of Life At Seas
toe	Tons of oil equivalents
UNCLOS	United Nation Convention on Law Of the Seas

## TABLE OF CONTENT

<b>ANNEX I - OVERVIEW OF THE SHIPPING SECTOR.....</b>	<b>83</b>
<b>ANNEX II - SMES IN THE SHIPPING SECTOR .....</b>	<b>87</b>
<b>ANNEX III - SUMMARY OF RESULTS OF THE ON-LINE CONSULTATION.....</b>	<b>89</b>
<b>1. INTRODUCTION.....</b>	<b>91</b>
<b>2. STRUCTURE OF THE QUESTIONNAIRE .....</b>	<b>91</b>
<b>3. CHARACTERISATION OF THE RESPONDENTS.....</b>	<b>91</b>
<b>4. RESULTS OF THE ON-LINE CONSULTATION.....</b>	<b>92</b>
<b>4.1. GENERAL CONTEXT .....</b>	<b>93</b>
4.1.1. <i>Equal treatment of all sectors of the European economy.....</i>	93
4.1.2. <i>Use of revenues .....</i>	94
<b>4.2. SCOPE OF A POSSIBLE PROPOSAL.....</b>	<b>95</b>
4.2.1. <i>Route coverage.....</i>	95
4.2.2. <i>Ships covered .....</i>	96
<b>4.3. RELIANCE ON SHIPPING AT A LOCAL OR REGIONAL LEVEL .....</b>	<b>96</b>
<b>4.4. EVASION .....</b>	<b>97</b>
<b>4.5. POLICY OPTIONS.....</b>	<b>97</b>
4.5.1. <i>Compensation fund.....</i>	97
4.5.2. <i>Mandatory emission reduction per ship.....</i>	99
4.5.3. <i>ETS.....</i>	100
4.5.4. <i>Tax.....</i>	103
<b>4.6. CHOICE OF POLICY OPTIONS.....</b>	<b>104</b>
<b>4.7. GENERAL COMMENTS .....</b>	<b>106</b>
<b>5. GENERAL CONCLUSIONS .....</b>	<b>107</b>
<b>ANNEX IV - MINUTES OF THE ECCP MEETINGS .....</b>	<b>109</b>
<b>ANNEX V - PARTICIPANTS AND CONCLUSIONS FROM THE TECHNICAL WORKSHOP HOLD BY AEA TECHNOLOGY IN LONDON ON 9 MARCH 2012 .....</b>	<b>138</b>
<b>ANNEX VI - METHODOLOGY FOR MODELLING .....</b>	<b>143</b>
<b>ANNEX VII - IDENTIFIED REGIONS RELIANT ON SHIPPING .....</b>	<b>156</b>
<b>ANNEX VIII - ANALYSIS OF POSSIBLE TECHNICAL SCOPE OF AN EU MEASURE.....</b>	<b>158</b>
<b>ANNEX IX - LIST OF IMO PROPOSALS (24 MAY 2011) .....</b>	<b>164</b>
<b>ANNEX X - DESCRIPTION OF MARKET BARRIERS.....</b>	<b>165</b>
<b>ANNEX XI - GRAPHICAL REPRESENTATION OF THE COMPARISON OF THE POLICY OPTIONS.....</b>	<b>168</b>
<b>ANNEX XII - ANNUAL COMPLIANCE CYCLE FOR MONITORING, REPORTING AND VERIFICATION OF EMISSIONS.....</b>	<b>170</b>
<b>ANNEX XIII - ADMINISTRATIVE COSTS AND ADMINISTRATIVE BURDEN.....</b>	<b>171</b>

**ANNEX XIV – SPECIFIC ELEMENTS OF OPTION 2 – MONITORING AND REPORTING BASED ON FUEL CONSUMED ..... 181**

**ANNEX XV – SPECIFIC ELEMENTS OF OPTION 4 – EMISSIONS TRADING SCHEMES ..... 182**

## ANNEX I - OVERVIEW OF THE SHIPPING SECTOR

In 2010, the Commission set up a contract with IHS Fairplay to have an overview of ships calling into EU ports. The full study can be found on Commission's website<sup>1</sup>. However, this annex aims to provide an overview of the results of this study.

### 1. ORGANISATION OF THE SUPPLY CHAIN OF THE SHIPPING SECTOR

The supply chain of the shipping sector is organised around the follow main actors:

- the ship-owner who owns the vessels
- the ship operator who operates the vessel
- the charterer who rents the vessels (with or without the crew)
- the shipper who provides the cargo

Other actors may also take part of this supply chain, such as the ship-broker who negotiates the use of a ship between ship-owners and charterer or the ship-manager who performs the technical operation of the ship but not its commercial management. These actors may not be distinct. For example, a ship operator can own its ships or a ship-operator can charter a ship.

Different type of chartering contract exists<sup>2</sup>:

- A voyage charter is the hiring of a vessel and crew for a voyage between a load port and a discharge port. The charterer pays the vessel owner on a per-ton or lump-sum basis. The owner pays the port costs (excluding stevedoring), fuel costs and crew costs. The payment for the use of the vessel is known as freight. A voyage charter specifies a period, known as laytime, for unloading the cargo. If laytime is exceeded, the charterer must pay demurrage. If laytime is saved, the charter party may require the shipowner to pay despatch to the charterer.
- A contract of affreightment is a contract similar to a voyage charter, but ship-owner undertakes to carry a number of cargoes within a specified period of time on a specified route. Agreed frequency of cargoes may require more than one ship.
- A time charter is the hiring of a vessel for a specific period of time; the owner still manages the vessel but the charterer selects the ports and directs the vessel where to go. The charterer pays for all fuel the vessel consumes, port charges, and a daily hire to the owner of the vessel.
- A trip time charter is a comparatively short time charter agreed for a specified route only (as opposed to the standard time charter where charterer is free to employ the vessel within agreed trading areas).
- A bareboat charter or demise charter is an arrangement for the hiring of a vessel whereby no administration or technical maintenance is included as part of the agreement. The charterer obtains possession and full control of the vessel along with the legal and financial responsibility for it. The charterer pays for all operating expenses, including fuel, crew, port expenses or hull insurance.

---

<sup>1</sup> [http://ec.europa.eu/clima/policies/transport/shipping/docs/ships\\_visiting\\_en.pdf](http://ec.europa.eu/clima/policies/transport/shipping/docs/ships_visiting_en.pdf)

<sup>2</sup> <http://maritimeknowhow.com/>

## 2. SHIPPING SEGMENTS<sup>3</sup>

### a. General data

Table I.1: Ship types in the world fleet in 2010

Ship type	Number of ships	Ship type	Number of ships
Oil tankers	7.568	Container	4.928
Chemical tankers	5.071	Vehicle	5.784
LPG	1.199	Roro	1.793
LNG	364	Ferry	6.354
Other tanker	399	Cruise	5.525
Bulker	9.100	Yacht	1.523
General cargo	16.486	Offshore	8.027
Other dry	2.326	Service	18.406
<b>TOTAL</b>		<b>83.863</b>	

Table I.2: World fleet, percentage of ships for different flags, 2010

GROUP	World fleet, percentage of ships, by vessel type and flag														Total		
	Oil tanker	Chem tanker	LPG	LNG	Other tanker	Bulker	Cargo	Other dry	Container	Vehicle	Roro	Ferry	Cruise	Yacht		Offshore	Service
AUSTRIA								0%									0%
BELGIUM	0%	1%	1%	2%	1%	0%	0%		0%		1%	0%	0%	0%	0%	0%	0%
BULGARIA	0%	0%	0%	0%	1%	0%	0%		0%	0%	0%	0%	0%	0%	0%	0%	0%
CYPRUS	1%	1%	1%	1%	1%	3%	1%	0%	4%	1%	1%	1%	0%	1%	1%	1%	1%
DENMARK	1%	2%	0%	1%	1%	0%	0%	0%	2%	0%	1%	1%	0%	0%	1%	1%	1%
ESTONIA	0%	0%						0%				0%					0%
FINLAND	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	1%	1%	0%	0%	1%	0%
FRANCE	0%	1%	1%	1%		0%	0%	1%	0%		2%	2%	1%	0%	1%	1%	1%
GERMANY	0%	1%	1%	0%	0%	0%	0%	0%	6%	0%	1%	2%	0%	0%	0%	1%	1%
GREECE	5%	2%	1%	2%	3%	3%	1%	0%	1%		2%	5%	2%	3%	0%	1%	2%
IRELAND	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
ITALY	1%	3%	2%	1%	6%	1%	0%	0%	0%	4%	4%	6%	4%	3%	1%	2%	2%
LATVIA	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
LITHUANIA	0%							0%	0%		0%	0%				0%	0%
LUXEMBOURG	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	5%	0%	0%	0%
MALTA	2%	6%	3%	1%	1%	6%	2%	0%	2%	2%	3%	1%	9%	4%	0%	0%	2%
NETHERLANDS	0%	5%	2%	0%	1%	0%	3%	1%	1%	0%	2%	0%	5%	2%	0%	1%	1%
POLAND	0%	0%						0%				1%			0%	1%	0%
PORTUGAL	0%	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	1%	3%	2%	0%	0%	0%
ROMANIA	0%	0%						0%			0%	0%		0%	0%	0%	0%
SLOVAKIA	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SLOVENIA																	0%
SPAIN	0%	0%	0%	2%	1%	0%	0%	0%	0%	1%	1%	1%	0%	1%	0%	2%	1%
SWEDEN	0%	0%			1%	0%	0%	0%		3%	4%	2%	0%	0%	0%	1%	1%
UNITED KINGDOM	1%	1%	1%	0%	1%	0%	1%	0%	4%	3%	3%	2%	1%	14%	3%	2%	2%
ICELAND	0%					0%	0%					0%			0%	0%	0%
NORWAY	1%	3%	3%	3%	1%	1%	1%	1%	0%	6%	1%	6%	0%	0%	4%	1%	2%
<b>EEA TOTAL</b>	<b>13%</b>	<b>28%</b>	<b>15%</b>	<b>15%</b>	<b>18%</b>	<b>15%</b>	<b>11%</b>	<b>6%</b>	<b>22%</b>	<b>21%</b>	<b>33%</b>	<b>33%</b>	<b>28%</b>	<b>34%</b>	<b>12%</b>	<b>17%</b>	<b>17%</b>
RUSSIA	4%	1%			3%	1%	5%	4%	0%		2%	1%	2%	0%	1%	3%	3%
OTHER EUROPE	2%	3%	3%	2%	1%	1%	3%	1%	1%	1%	2%	2%	1%	9%	2%	1%	2%
NORTH AFRICA	1%	0%	1%	2%	5%	0%	0%	0%	0%		3%	1%	1%	0%	1%	2%	1%
MEDITERRANEAN	2%	2%	1%	0%	3%	1%	3%	1%	1%	1%	5%	4%	0%	1%	0%	1%	2%
BL SEA	1%	0%	0%		2%	0%	2%	1%	0%	0%	1%	2%	1%	0%	2%	2%	1%
CANADA	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	1%	2%	0%	1%	0%	1%	1%
USA	1%	1%			0%	1%	0%	1%	2%	3%	1%	3%	5%	3%	15%	9%	4%
BAHAMAS	3%	2%	2%	14%	1%	3%	1%	5%	1%	8%	2%	1%	18%	1%	2%	0%	2%
BERMUDA	0%	0%	0%	10%		0%		0%	0%		0%	0%	5%	2%	0%	0%	0%
PANAMA	8%	12%	13%	10%	9%	27%	8%	12%	15%	37%	14%	2%	8%	1%	9%	3%	9%
OTHER AMERICA	6%	3%	5%		5%	4%	11%	9%	10%	1%	10%	4%	17%	37%	12%	7%	8%
CHINA	8%	5%	8%	1%	8%	15%	7%	6%	10%	4%	2%	7%	0%	0%	3%	4%	7%
JAPAN	8%	9%	11%	9%	7%	5%	8%	0%	0%	7%	7%	8%	1%		0%	7%	6%
SOUTH KOREA	3%	4%	5%	1%	3%	3%	2%	1%	1%	1%	1%	3%	0%	0%	0%	3%	2%
OTHER ASIA	23%	13%	25%	14%	21%	9%	22%	34%	13%	11%	8%	19%	3%	2%	20%	28%	21%
REST OF WORLD	14%	14%	10%	22%	8%	12%	9%	16%	22%	5%	7%	5%	6%	7%	16%	6%	11%
Unknown	5%	2%	2%		6%	2%	7%	4%	1%	1%	3%	5%	2%	2%	4%	6%	4%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Table I. 3: Percentage of calls in an EEA port by flag and ship type, all ships, 2010

<sup>3</sup> Source: IHS Fairplay, 2010 and 2012

Share of port calls in the EEA, by vessel type and flag																	
COUNTRY	Oil		Chem		Other		General		Other		Roro	Ferry	Cruise	Yacht	Offshore	Service	Total
	tanker	tanker	LPG	LNG	tanker	Bulker	Cargo	dry	Container	Vehicle							
AUSTRIA														0%			0%
BELGIUM	2%	1%	1%	1%		0%	1%			0%		8%		0%	0%	2%	1%
BULGARIA	1%	0%	0%		0%	1%	0%			0%		0%	0%		0%	0%	0%
CYPRUS	2%	3%	3%		0%	6%	3%	1%		11%	5%	3%	3%	1%	2%	1%	4%
DENMARK	3%	8%	0%	1%	9%	0%	2%	1%		3%		4%	9%		6%	8%	6%
ESTONIA	2%	0%					0%									1%	1%
FINLAND	1%	1%	0%			1%	2%	1%		1%	4%	9%	2%	1%	1%		3%
FRANCE	2%	3%	0%	8%		0%	0%			1%		1%	5%	1%		3%	3%
GERMANY	4%	2%	2%			1%	3%	1%		10%		2%	5%	0%	2%	0%	9%
GREECE	15%	5%	2%	2%	4%	4%	1%	1%		1%		3%	5%	1%	1%	0%	4%
IRELAND		0%					1%			0%		0%	0%		0%	1%	0%
ITALY	2%	10%	9%	11%	22%	3%	1%	4%		0%	15%	8%	15%	16%	2%	3%	10%
LATVIA	0%	0%					0%					0%	0%				0%
LITHUANIA							1%	0%		0%		2%	0%				0%
LUXEMBOURG		1%					0%			1%		8%		0%	1%	0%	0%
MALTA	8%	13%	5%		2%	11%	6%	1%		4%	5%	4%	2%	16%	4%	2%	4%
NETHERLANDS	1%	8%	11%	6%	20%	0%	16%	8%		7%		8%	1%	5%	8%	5%	16%
POLAND	2%	0%					0%					0%	0%		1%	0%	2%
PORTUGAL	0%	2%	2%		2%	2%	1%	1%		0%	7%	1%	0%	6%	0%	0%	1%
ROMANIA	0%	0%											0%			0%	0%
SLOVAKIA							0%	0%									0%
SLOVENIA																	0%
SPAIN	1%	1%	1%	7%	4%	3%	1%	0%		0%	5%	2%	5%		1%	6%	4%
SWEDEN	6%	3%			8%	3%	1%	0%		3%	11%	9%	0%	4%	0%	5%	6%
UNITED KINGDOM	8%	2%	1%			2%	3%	0%		8%	2%	7%	18%	2%	11%	20%	13%
ICELAND	0%					0%							0%			0%	0%
NORWAY	3%	6%	4%	4%	20%	2%	4%	3%		4%	2%	10%	0%	0%	32%	5%	7%
<b>EEA TOTAL</b>	<b>63%</b>	<b>71%</b>	<b>41%</b>	<b>41%</b>	<b>91%</b>	<b>39%</b>	<b>46%</b>	<b>22%</b>	<b>46%</b>	<b>50%</b>	<b>81%</b>	<b>94%</b>	<b>50%</b>	<b>37%</b>	<b>73%</b>	<b>92%</b>	<b>77%</b>
RUSSIA	0%	1%			0%	2%	3%	1%		0%		0%	0%	0%	0%	0%	0%
OTHER EUROPE	9%	9%	10%	1%		2%	9%	4%		3%	7%	2%	0%	11%	7%	2%	3%
NORTH AFRICA	0%	0%	1%	2%		0%	0%			0%		2%	1%		0%	0%	1%
MEDITERRANEAN	0%	1%	0%		0%	2%	2%	0%		2%	0%	2%	0%	0%	0%	0%	1%
BL.SEA	0%	0%			0%	1%	1%	1%		0%	0%		0%		0%	0%	0%
CANADA	0%					0%	0%					0%			0%	0%	0%
USA	0%	0%				0%	0%	0%		1%	1%		0%		0%	0%	0%
BAHAMAS	7%	2%	4%	16%	0%	7%	3%	16%		0%	9%	2%	2%	27%	1%	6%	3%
BERMUDA	0%	0%		14%		0%		3%		1%		0%	1%	8%	3%	0%	1%
PANAMA	2%	3%	7%	1%	4%	16%	2%	13%		11%	21%	2%	0%	10%	1%	3%	3%
OTHER AMERICAS	3%	3%	9%		1%	8%	28%	18%		18%	1%	6%	1%	1%	42%	4%	6%
CHINA	1%	1%	2%		0%	5%	0%	0%		3%	0%	0%			0%	0%	0%
JAPAN	0%					0%	0%			0%	2%		0%	0%		0%	0%
SOUTH KOREA	0%	0%				0%	0%			0%			0%				0%
OTHER ASIA	2%	2%	15%	2%	1%	3%	0%	2%		2%	8%	1%	0%		1%	3%	1%
REST OF WORLD	9%	8%	11%	21%	3%	15%	5%	19%		14%	2%	2%	0%	4%	4%	3%	3%
Unknown	0%	0%				0%	0%			0%	0%	0%	0%		0%	0%	0%
<b>TOTAL</b>	<b>100%</b>																

b. CO2 emissions and efficiency

Table I.4: CO2 emissions on EU related routes in 2010 (tCO2)

	from EU27	to EU27	intra EU27	Domestic	TOTAL
01 Oil tanker	5.608.190	6.011.682	2.743.508	1.411.465	15.774.845
02 Chemical tanker	4.286.408	4.515.222	5.067.885	2.014.793	15.884.307
03 LPG	614.856	565.809	668.851	419.477	2.268.994
04 LNG	2.227.206	2.242.901	285.072	473.119	5.228.299
05 Other tanker	165.863	148.205	67.283	49.631	430.982
06 Bulker	8.853.597	9.793.108	2.693.337	941.744	22.281.786
07 General cargo	3.666.037	3.664.151	5.036.541	1.187.354	13.554.083
08 Other dry	1.409.449	1.435.208	1.264.408	517.024	4.626.089
09 Container	20.797.067	22.765.949	10.052.641	1.546.880	55.162.536
10 Vehicle	1.638.468	1.930.954	1.888.082	193.478	5.650.981
11 Roro	840.470	908.774	3.199.086	1.307.121	6.255.451
12 Ferry	1.473.840	1.472.736	8.461.109	8.452.329	19.860.014
13 Cruise	1.549.139	1.427.755	3.025.106	1.055.131	7.057.131
14 Yacht	229.548	274.957	172.867	177.735	855.107
15 Offshore	392.762	414.958	225.212	857.630	1.890.562
16 Service	253.733	224.546	299.617	1.477.012	2.254.908
17 Fishing	81.085	93.499	59.044	180.574	414.202
18 Miscellaneous	35.245	41.404	26.239	73.748	176.636
<b>TOTAL</b>	<b>54.122.962</b>	<b>57.931.819</b>	<b>45.235.888</b>	<b>22.336.244</b>	<b>179.626.912</b>

Table I.5 : Projection of CO2 emissions per type of ship on EU related routes

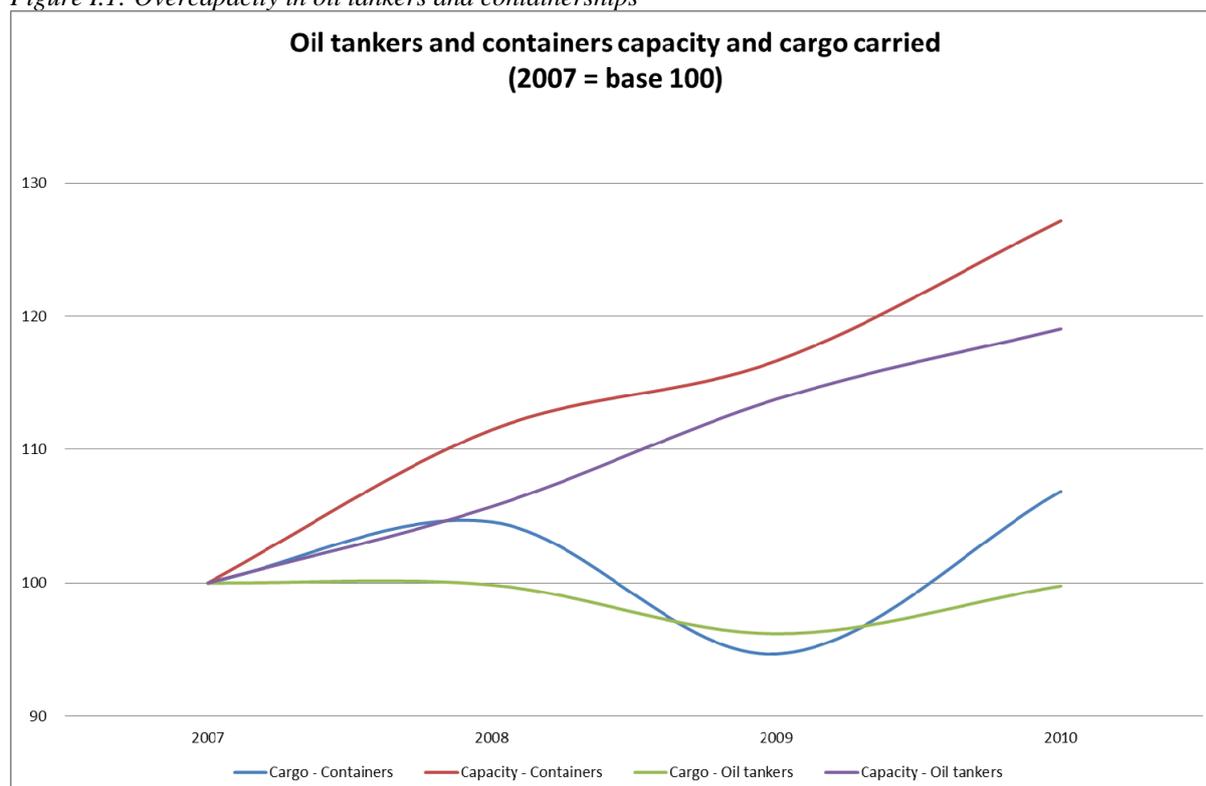
	2005	2010	2020		2030		2050	
	MtCO2	MtCO2	MtCO2	% / 2005	MtCO2	% / 2005	MtCO2	% / 2005
Liquid bulk	44.926.957	39.587.426	40.557.367	-10%	39.669.218	-12%	38.619.315	-14%
Dry bulk	26.276.027	22.281.786	26.948.113	3%	29.354.200	12%	35.922.703	37%
General cargo	23.612.709	18.180.172	22.630.302	-4%	25.093.387	6%	29.812.802	26%
Container	55.391.337	55.162.536	67.662.971	22%	72.897.514	32%	94.763.227	71%
Roro & Vehicle roro	14.121.212	11.906.432	13.832.126	-2%	14.847.546	5%	20.256.208	43%
Ferry	22.694.635	19.860.014	23.862.420	5%	26.237.304	16%	32.056.787	41%
Non-cargo	8.367.176	12.648.546	14.283.027	71%	15.311.497	83%	19.197.403	129%
<b>TOTAL</b>	<b>195.390.053</b>	<b>179.626.912</b>	<b>209.776.325</b>	<b>7%</b>	<b>223.410.666</b>	<b>14%</b>	<b>270.628.444</b>	<b>39%</b>

Table I.6: Projected fuel efficiency (Mtoe/Mtonnes carried) under the baseline scenario

		2010	2015	2020	2025	2030
Fuel consumption	Mtoe	59,44	63,30	66,12	70,92	77,13
Seaborne trade	Mt	2234,31	2515,14	2737,18	2972,34	3229,06
Fuel efficiency	Mtoe/Mt	0,027	0,025	0,024	0,024	0,024
Improvement compared to 2010		-	-5%	-9%	-10%	-10%

c. Overcapacity

Figure I.1: Overcapacity in oil tankers and containerships



Source: Word fleet monitor 2011

## ANNEX II - SMEs IN THE SHIPPING SECTOR

According to EU recommendation n°2003/361, an SME can be defined according to the following criteria:

Company category	Employees	Turnover	or	Balance sheet total
Medium-sized	< 250	≤ € 50 m		≤ € 43 m
Small	< 50	≤ € 10 m		≤ € 10 m
Micro	< 10	≤ € 2 m		≤ € 2 m

These ceilings apply to the figures for individual firms only. A firm which is part of larger grouping may need to include employee/turnover/balance sheet data from that grouping too.

According to the table below and considering the threshold mentioned above, 97% of maritime transport enterprises can be considered as SMEs<sup>4</sup>.

Table II.1: turnover, number of enterprises and turnover per enterprise per size of enterprises

Nb of employees	Total	>250	50-249	20-49	10-19	2-9	1
<b>Turnover (M€)</b>							
Sea and coastal passenger transport	c	11962,78	2329	1312,11	c	630,77	707,77
Sea and coastal freight transport	c	47329,89	17161,24	5416,93	c	4833,92	7163,22
<b>Nb of enterprises</b>							
Sea and coastal passenger transport	5481	51	92	141	222	1990	2985
Sea and coastal freight transport	5672	53	216	414	589	2000	2400
<b>turnover / enterprises</b>							
Sea and coastal passenger transport	n/a	235	25	9	n/a	0	0
Sea and coastal freight transport	n/a	893	79	13	n/a	2,4	3,0
SME threshold (turnover/enterprise)			50	10	10	2	2

Source: Eurostat, 2010; (c): confidential data

These statistics include all companies operating ships, including for example a company operating a single route to a small island close to the coast. However, the size of a company is linked to the size of ships operated by the company and a ship of more than 400 GT requires more than 9 people to be operated. This means that, as the regulation intends to apply to ships above 400GT at the lowest, 87% of SMEs in the shipping sector will not be concerned by the regulation. If the size threshold is set at 5000GT<sup>5</sup>, at least 99% of SMEs in the shipping sector will not be concerned by the regulation.

<sup>4</sup> According to the turnover threshold, only maritime freight transport enterprises with less than 50 employees can be considered as SMEs

<sup>5</sup> As a ship above 5000GT will require more than 50 people to be operated.

*Example of ferry of around 4000GT*



*Example of ferry around 400GT*



Having said that, the thresholds used to define SMEs may not be relevant to define a small enterprise in maritime transport. The number of ships is a more relevant indicator to consider the size of the company. In 2010, around 8000 ships above 400GT<sup>67</sup> were operated by 1778 EU enterprises. This means that on average, each enterprise operates 4 to 5 ships. However, the top 5 container vessels operators operated together more than 1756 ships in 2010. So, without considering these enterprises, the number of ship per EU operator is between 3 to 4 ships.

Operating 3 to 4 ships only does not mean that the ship operator comply with the SME definition mention above. For example, SeaFrance, a former ferry company, had 4 ships, but 1850 employees due to the size of its ships (mainly above 30,000GT).

For that reason, the administrative burden mentioned in annex XIII have been calculated on a ship basis, having in mind that, if a company operates several ships, it can benefit from economies of scale.

The fuel savings and the increase of investment and capital costs mentioned in section 5 of the impact assessment are not related to the size of the companies. The abatement technologies considered are related to the type of ships and not to the size of ship operators. Having said that, the fewest the number of ships is operated by an enterprise, the more reluctant this enterprise will be to implement innovative low carbon technology. Indeed, a company operating a small number of ships cannot afford to test technologies on one of its ships, facing the risk to jeopardize the operation of this ship and the overall profitability of the company. In this context, getting accurate information on the abatement potential of low technology and the operational impacts of each of these technologies are key to ensure their uptake.

---

<sup>6</sup> IHS Fairplay 2010

<sup>7</sup> Note that, in 2010, 18400 ships above 400GT have called in EU ports.

**ANNEX III - SUMMARY OF RESULTS OF THE ON-LINE CONSULTATION**

**Public consultation on  
"Including maritime transport emissions in the EU's greenhouse  
gas reduction commitment"**

**Summary of the contributions received**

**11 February 2013**

Please note that this summary of the consultation does not express the position of the Commission.

## Table of Contents

1	Introduction .....	92
2	Structure of the questionnaire .....	92
3	Characterisation of the respondents .....	92
4	Results of the on-line consultation .....	93
4.1	General context.....	93
4.2	Scope of a possible proposal .....	95
4.3	Reliance on shipping at a local or regional level.....	97
4.4	Evasion .....	97
4.5	Policy options .....	97
4.6	Choice of policy options.....	104
4.7	General comments .....	106
5	General conclusions .....	107

## 1. INTRODUCTION

As part of the preparation of the impact assessment of a possible Commission proposal to address GHG emissions of the maritime sector<sup>8</sup>, the Commission ran an internet public consultation for 12 weeks from 19 January until 12 April 2012.

This consultation sought opinions from stakeholders and experts in the field of shipping and climate change with a view to getting additional information on the shape of a possible Commission proposal. All European citizens, organised stakeholders, industries, institutions, NGOs and public authorities of EU countries were invited to contribute to this consultation.

This consultation supplements several stakeholders meetings held throughout 2011, including 3 two-day meetings in the context of a working group (WG6) established under the European Climate Change Program II (ECCPII)<sup>9</sup> and 3 meetings in the context of a High Level Platform co-chaired by Vice President Kallas and Commissioner Hedegaard. The outcome of these stakeholder meetings was used as input for the on-line consultation. All documents from the ECCP meetings are available on the Commission's website<sup>10</sup>.

## 2. STRUCTURE OF THE QUESTIONNAIRE

The questionnaire used open questions or multiple choice questions. With the exception of certain selected questions, answers were not mandatory. The questionnaire reflected the discussion with stakeholders at the time of its preparation. Emphasis on specific issues may have happened after the publication of the questionnaire.

## 3. CHARACTERISATION OF THE RESPONDENTS

All in all, 139 contributions were received either directly online or through the support mail address ([CLIMA-ECCP-SHIPS@EC.EUROPA.EU](mailto:CLIMA-ECCP-SHIPS@EC.EUROPA.EU)). Some contributors sent multiple submissions. The most represented contributors were companies or professional associations (37%), followed by non-governmental organisations (28%), individuals (17%) and public authorities or public administrations (14%).

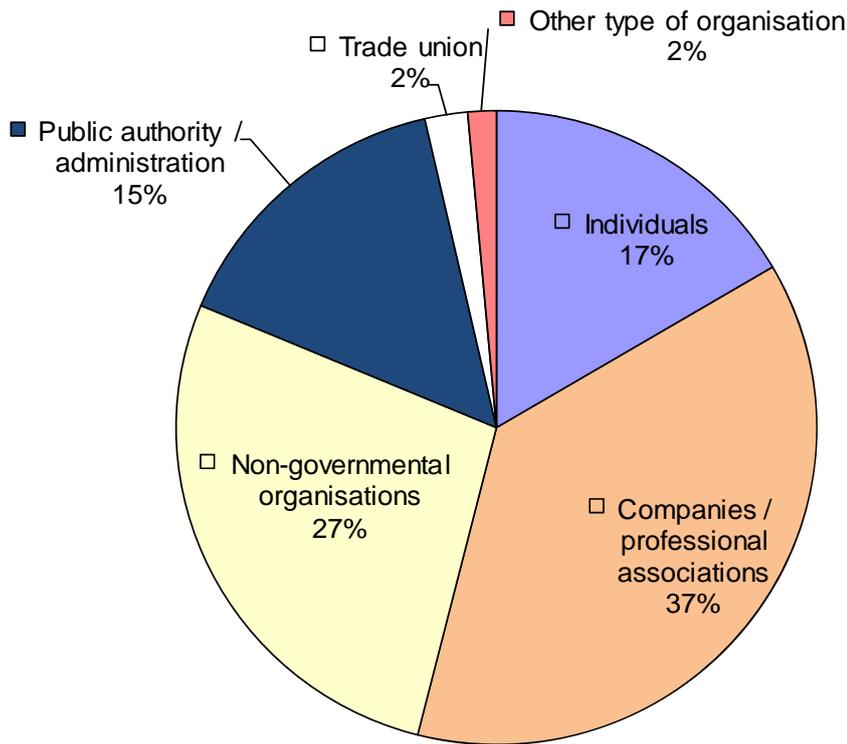
---

<sup>8</sup> [http://ec.europa.eu/atwork/programmes/index\\_en.htm](http://ec.europa.eu/atwork/programmes/index_en.htm)

<sup>9</sup> [http://ec.europa.eu/clima/policies/eccp/second/stakeholder/index\\_en.htm](http://ec.europa.eu/clima/policies/eccp/second/stakeholder/index_en.htm)

<sup>10</sup> [http://ec.europa.eu/clima/policies/transport/shipping/index\\_en.htm](http://ec.europa.eu/clima/policies/transport/shipping/index_en.htm)

## Respondent profile



It is noted that some ship-owners or ship-operators associations were registered as non-governmental associations and some ports were registered as public authorities. The table below gives an overview of the contributors, grouped in accordance to their field of competency:

	Number	% of total
Ship-owners*	36	26%
Charterers/ Ship operators*	13	9%
Shippers	12	9%
Service providers/ Equipment manufacturers	9	7%
Ports	6	4%
Trade Unions	3	2%
EU Regional public authority	4	3%
EU National public authority	9	6%
Non-EU National public authority	4	3%
Environmental and social NGO	29	21%
Individuals	23	17%
Others	1	1%

\* 10 entities considered as ship-owners can also be considered as ship-operators.

15 respondents requested confidentiality for their responses, i.e. no publication on the Commission's website, while 24 respondents authorised publication on the Commission's website in an anonymous format.

## 4. RESULTS OF THE ON-LINE CONSULTATION

## 4.1. GENERAL CONTEXT

### 4.1.1. *Equal treatment of all sectors of the European economy*

54% of respondents consider that the maritime sector should contribute to the European emission reduction efforts as other sectors, whereas 39% felt sector contributions not necessary. 7% of the respondent had no opinion on the matter. The arguments developed under this question by the respondents demonstrate a full range of opinion from a strong support to an equal treatment of all sectors of the European economy to a strong opposition to an inclusion of the maritime sector into the EU commitments.

All respondents considered that the maritime sector should take actions to reduce its greenhouse gas emissions. All respondents also felt that an agreement should be reached at the IMO level. There were however some differences of opinions on the timing and on the added value of EU action.

More precisely, 21 respondents considered that the IMO is moving forward at a sufficient pace, especially as result of the adoption of the Energy efficiency design index for new ships (EEDI) and the Ship Energy Efficiency Management Plan (SEEMP). Accordingly this group considered that EU action may interfere with the IMO work. Another larger group (24 respondents) considered that the IMO had not delivered sufficient measures (i.e. no market-based measure nor inclusion of shipping emission in reduction commitments) and that EU action would help the IMO move forward faster, especially by providing a strong base for a global action.

There were also different views on the urgency of regulating the GHG emissions on shipping. On the one hand, most ship-owners and ship-operators considered that shipping is a minor source of emissions and felt that as the most efficient mode of transport maritime sector should not be the immediate focus of policy action and priority should rather be on other sectors. Most NGO contributions considered that shipping is one of the fastest growing sources of emissions and therefore emissions from shipping should be addressed urgently.

Regarding competitiveness, all respondents agree that the key issue is to ensure a level playing field. However, the responses to this question reflected the different understanding of the associated dimensions. All NGOs and a majority of individuals (38 respondents in total), underlined that the maritime sector is the only sector of the European economy not included in the EU commitments, emphasising the intra-European perspective. According to them, this creates a market distortion compared to other sectors of the EU economy. 13 other participants, especially from ship-owners and ship-operators, claimed that the maritime sector is global and therefore EU action could risk triggering a market distortion in the maritime sector with other regions in the world.

Equal treatment of all sectors of the European economy was also felt to have the potential to provide a clear signal for technology improvement in the maritime sector. Almost 20 participants stressed that there is potential in the maritime sector to reduce its GHG emissions. The up-taking of this potential could result social benefits by stimulating growth and job creation due to the retrofitting of ships and the development of new equipment. However, one equipment manufacturer said that, even if the potential is there, the question of affordability of such emission reduction should be assessed carefully. On the technological improvement of ships, a ship-owner mentioned the difficulties of reselling a vessel outside the EU, as the

improvement of energy efficiency required by the EU may not be considered of value by stakeholders outside the EU.

While all NGOs supported equal treatment of all sector of the European economy, 15 NGOs stressed the need to avoid negative effects on the poorest countries, especially on least developed countries. All NGOs requested a contribution of the maritime sector to global climate action.

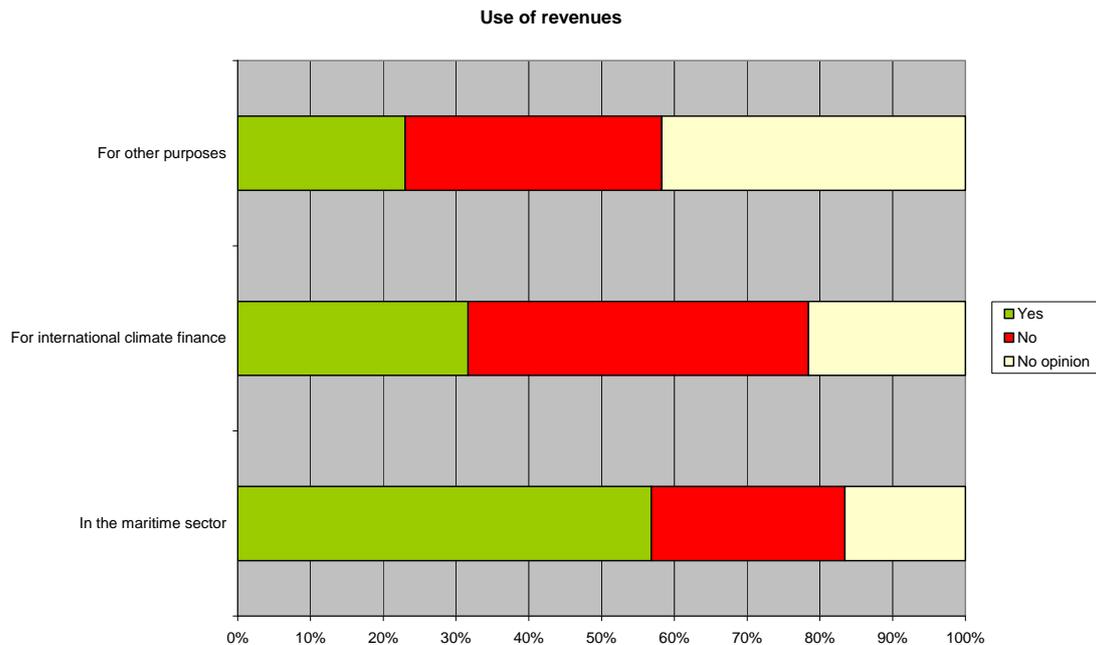
10 respondents, especially ship-operators, also stressed the issue of modal shift, especially for short sea shipping, and evasion.

#### *4.1.2. Use of revenues*

A majority of respondents (57%) considered that revenues generated by a market-based measure should be used to tackle climate change and support investments to reduce emissions in the maritime sector, e.g. by improving energy efficiency of the fleet, especially through research and development or by removing market barriers in the maritime sector, especially due to split incentives. One service provider stressed that recycling of revenues in the maritime sector may weaken the polluter pays principle if the revenues are going back to the polluters.

Regarding the use of revenues primarily for international climate change finance, there is no clear prevailing view. The responses varied between 37% in favour and 47% against. However, all NGOs are in favour and they proposed to use at least 50% of the revenues for this purpose, especially for the poorest countries. Moreover, even those respondents which are against primary use for international climate finance recognise the need to use revenues for developing countries in the event of there being a global scheme. The use of revenues from a global scheme for international climate change finance was also seen by 13 respondents as a way to help the IMO to move forward.

Furthermore, the use of revenues for other purposes than tackling climate change and supporting investments to reduce emissions in the maritime sector or financing the international climate change funds, was only supported by 23% of respondents. The respondents in favour argued that the revenues could be used to lower labour taxes or to use for the poorest households who are dealing with increase of energy prices.



More generally, it was stressed that the revenues should be used in accordance with the IMO principle of "no more favourable treatment". 29 respondents considered that the revenues generated from either a regional or global system should be centralised to a single entity (collection point) in charge of its use. Furthermore, even if it is not directly related to an EU measure, 5 respondents underlined that a 'double charge' (i.e. a contribution to the IMO and one to the UNFCCC) should be avoided.

## 4.2. SCOPE OF A POSSIBLE PROPOSAL

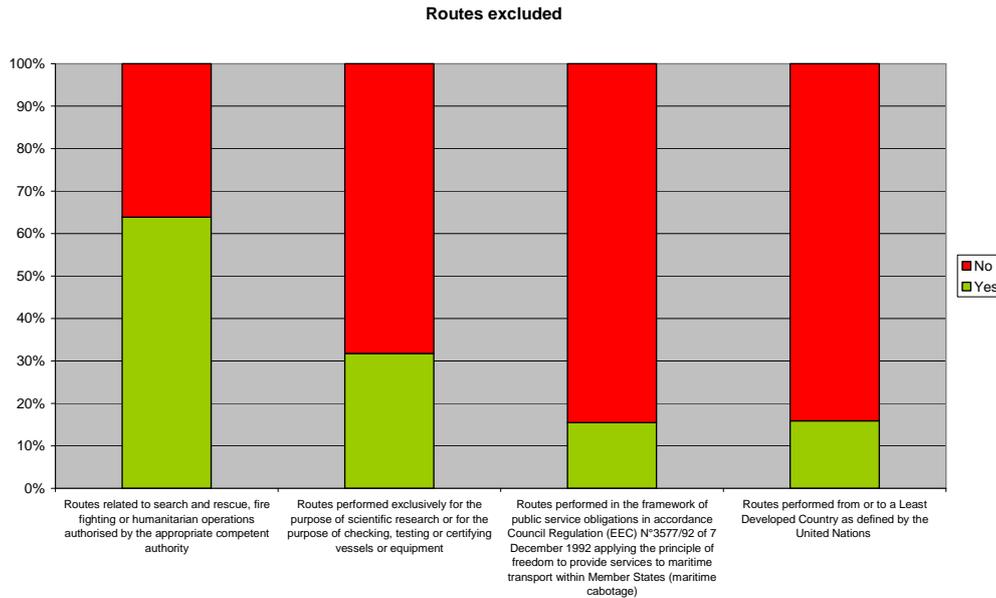
### 4.2.1. Route coverage

More than 70% of respondents considered that no route to or from European ports should be excluded from the scope, except routes related to search and rescue, fire fighting or humanitarian operations authorised by the appropriate competent authority. Indeed, 37 respondents consider that the exclusion of routes may potentially create market distortions and encourage activity seeking avoidance of the scheme.

3 respondents concerned with short sea shipping urged consideration of either exemption of routes performing public services obligations or exemption of routes in competition with land based transport to avoid modal shift. Respondents from short sea shipping also highlighted that, at present, some routes cannot be performed in the most efficient way regarding GHG emissions as the infrastructure on ports is not yet available, especially as regards LNG, or as the weather conditions are not optimal (e.g. need for ice-breakers).

12 respondents, especially NGOs, also indicated their view that the exclusion of routes from least developed countries makes no sense as some goods coming from least developed countries may transit by other countries. Therefore, the impact on trade of goods should be assessed.

11 respondents took the view that only routes within the EU should be covered by an EU scheme.



#### 4.2.2. Ships covered

The responses to the questionnaire indicated that European policy action for regulating CO<sub>2</sub> emissions from maritime transport should be applied to all types of vessels or some main types of vessels, such as general cargo, tankers, containers, bulk carriers, refrigerated ships, passenger ships, ferries, fishing ships and military, customs or police ships.

75% of respondents to this question considered that no other categories should be added. 54% of respondents to this question considered that no categories should be excluded. 18 respondents indicated a preference for small emitters to be excluded. The threshold for exclusion suggested was 400 GT (to fit MARPOL requirements), 500 GT or 5000 GT. 5 respondents, especially ship-owners and ship-operators, indicated that the size threshold should be carefully assessed to avoid potential distortion of competition within the categories.

The 46% of respondents considered that some categories of ships should be excluded, and all agreed that fishing ships and military, customs and police ships should be excluded. The exclusion of service vessels and yachts (and more generally all private vessels) was also proposed. Finland mentioned that the specificity of ice-breakers should be taken into consideration.

### 4.3. RELIANCE ON SHIPPING AT A LOCAL OR REGIONAL LEVEL

The consideration of the reliance on shipping at local or regional level gave balanced results: 52% were in favour of taking the reliance into account, whereas 48% were opposed to the idea. Quite markedly, all local, regional and national public authorities were in favour of taking into consideration the reliance on shipping at local or regional level.

One third of respondents in favour stated that the reliance on shipping of isolated regions, like islands, overseas territories and EU peripheral regions should be considered. 7 respondents, especially NGOs, considered that the level of development of the region should be taken into account, especially for least developed countries and small island developing states. It was

also proposed to define the regions according to the risk of modal shift of their trade. One respondent proposed to solve the issue of reliance on shipping by providing grants and loans to local actors.

#### 4.4. EVASION

53% of respondents provided comments on the question of evasion. 39% of respondents considered that there is an important risk of evasion especially in the Baltic sea, in the Mediterranean Sea (and especially around the Strait of Gibraltar) and in the Black sea. 19% of respondents contested the link between the implementation of a regional environmental policy and the loss of competitiveness for maritime actors, which would trigger evasion. One ship-operator stressed that the risk of evasion is pending on the level of the carbon cost, the extra fuel burnt and, eventually on the level of additional port dues and on the cost of transshipment. Two NGOs indicated that evasion would not occur if the charge of the carbon constraint was put on ports, which is an option that has been proposed by Jamaica in the IMO.

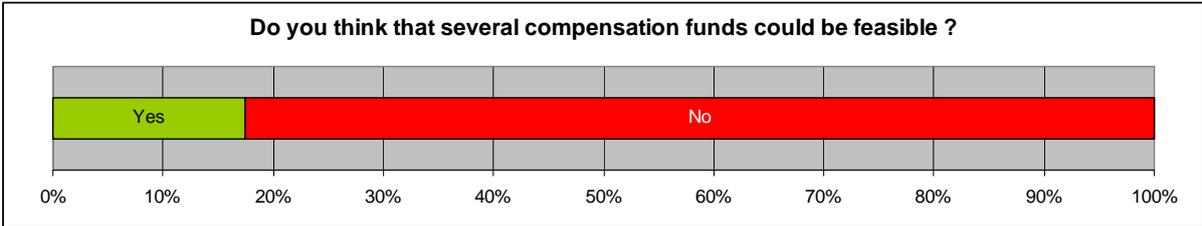
#### 4.5. POLICY OPTIONS

##### 4.5.1. Compensation fund

###### Management of a compensation fund

68% of respondents considered that any compensation fund should be managed by a public entity. 42% of respondents recommended the IMO or an EU public body. 5% of respondents also recommended management by the industry, but this option raised opposition from the NGOs. The management by national authorities, by the UNFCCC, by a group of stakeholders (industry, EU and Members States) were also mentioned. 16% of respondents underlined the general principle that the fund should be managed by an independent entity. 22% of respondents stressed that the management of the fund should be transparent and independent from political interest. 3 respondents indicated that the management of a fund should depend on the purpose of the fund, in term of revenue recycling. .

###### Implementation of several compensation funds

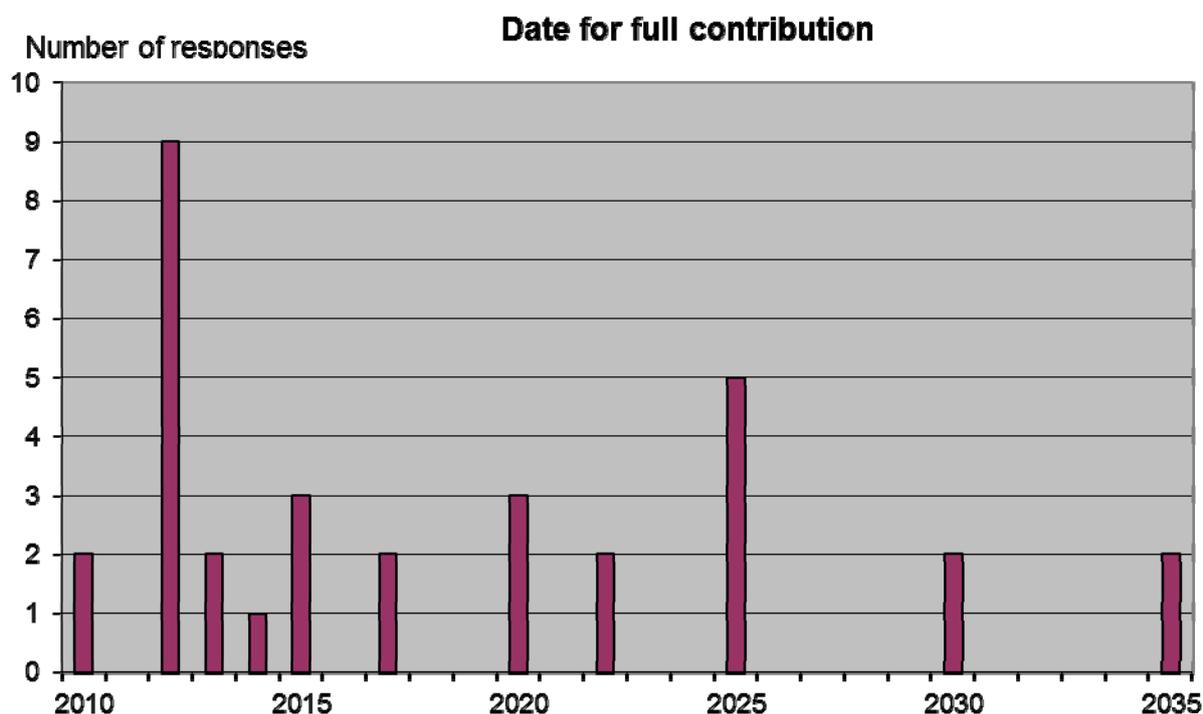


Around 82% of respondents took the view that the existence of several compensation funds would not be feasible. The rationale they mentioned was built from the notion that several compensation funds may create an important administrative burden and market distortions. It was also stated that this could increase the risk of fraud and carbon leakage. The respondents in favour of several compensation funds felt that such a set up could give flexibility to the sector. This group of respondents also recommended to set different funds according to ship types.

### Option 1: Contribution-based approach

Under option 1, a contribution has to be paid for each ton of CO<sub>2</sub> emitted falling under the responsibility of the compensation fund. The level of the contribution is driving the level of reduction.

There was no strong majority in favour or against a rebate of the contribution to a compensation fund, in the initial years. 22% are in favour, 33% are against and 45% of the respondents did not answer. Among the respondents in favour of a rebate, there was no strong differences between those preferring a reduction to be based on a percentage of a certain carbon price (75% in favour) or by pre-set levels of contribution in financial terms (60% in favour). Regarding the end of the rebate, there was no clear preference for a particular precise date for reaching a full contribution, and timings between 2010 and 2035 were proposed.



### Option 2: Target-based approach

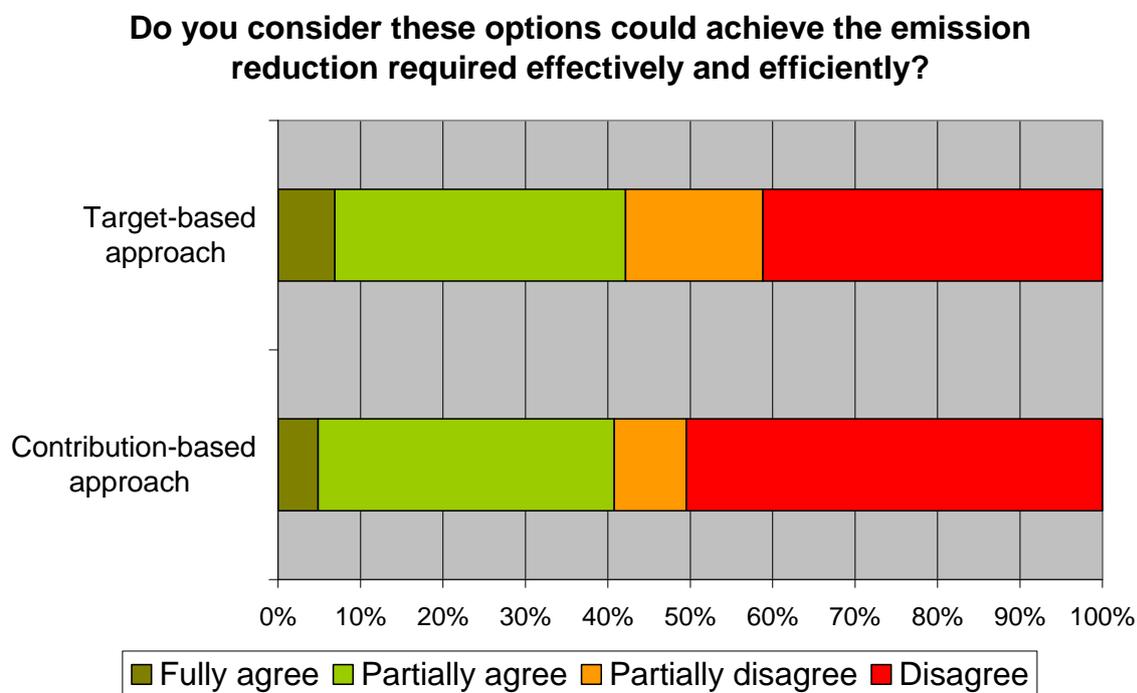
13 respondents considered that penalties should be paid for emissions above the target to ensure compliance. 11 respondents proposed also to use offsets or financial guarantee.

2 respondents indicated that setting a target according to historical emissions is not suitable, as this does not take into account the variability of the shipping emissions due to the variation of trade or due to the weather conditions.

All NGOs stressed that the compliance mechanism has to be robust and ensure environmental integrity. They proposed that a third party controls the achievement of the target. Some shippers mentioned that any such system should foresee benefits for being in compliance. Regarding monitoring, one NGO proposed to use fuel tank monitoring and another participant proposed fuel sellers as the monitoring entity. The Norwegian NO<sub>x</sub> Fund was mentioned as an example to use for a possible EU measure.

## Comparison of option 1 and 2

As shown in the graph below, majority of respondents considered that neither a contribution based compensation fund, nor a target based compensation fund could achieve the emission reduction effectively or efficiently.



### 4.5.2. Mandatory emission reduction per ship

The replies to the questionnaire indicated that a target corresponding to a mandatory emission reduction compared to historical transport performance or emissions could be set for each ship calling into in-scope ports. The mandatory emission reduction target could be set as percentage of historical baseline (option 1) or in comparison with an index, such as the Energy Efficiency Design Index (EEDI, option 2).

More than 60% of respondents considered that neither a mandatory emission reduction target set as percentage of an historical baseline (option 1), nor a mandatory emission reduction target set in comparison with an index such as the EEDI (option 2) could achieve the emission reduction effectively or efficiently.

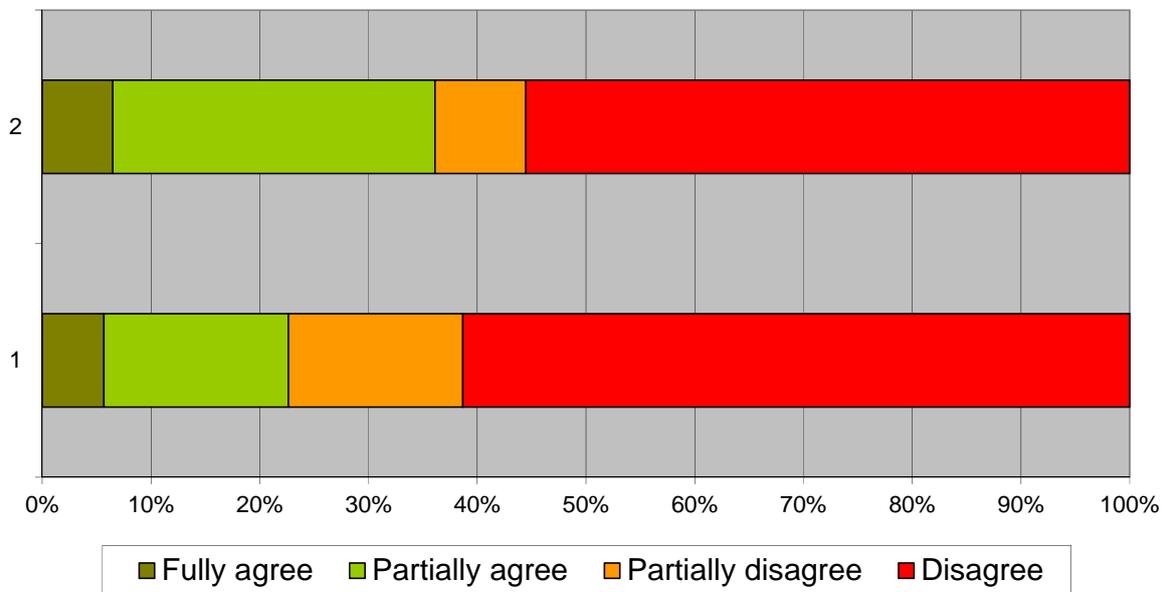
The rationale is that a baseline is considered very hard or costly to define. Indeed, most of the respondents are against the use of the EEDI<sup>11</sup> or the Energy Efficiency Operational Indicator (EEOI). Moreover, the administrative burden of setting a baseline is considered as very high due to the number of ships and the multiple parameters, like loading conditions, weather conditions, etc. to be considered.

<sup>11</sup> After the publication of the on-line consultation, the MEPC 63 agreed that the EEDI should not be applied to existing vessels.

Some concerns were also raised about the environmental effectiveness of such an option, as no absolute target is set and as the environmental integrity could be challenged by the increase of ships in case of a baseline based on historical emissions.

16 respondents, especially NGOs, also raised the issue that mandatory emission reductions per ship do not generate revenues.

Do you consider that these options could achieve the emission reduction required effectively or efficiently ?



62% of the respondents considered that the baseline cannot be set on another basis than the two options suggested in the questionnaire, even if some respondents proposed to use speed as a baseline or to consider the Environmental Ship Index.

65% of respondents agreed that a mechanism to reward early movers should be foreseen. It was proposed to consider a differentiation to the pricing of emissions for early movers or some financial incentives (e.g. tax reductions, special grants, etc.). 6 respondents suggest using ETS as a compliance mechanism to trigger benefits for early movers. It was also proposed to differentiate the target according to speed.

Furthermore, 73% of respondents consider that a mechanism that creates incentives to go beyond the mandatory emission reduction should be explored. 16 respondents proposed to develop a baseline and credit emission trading scheme for this purpose. 35 respondents proposed to set the baseline according to speed. 10 respondents proposed to introduce financial incentives, either through reductions in the pricing of emissions or of ports dues, or through special grants, while 16 respondents proposed to introduce energy efficiency labelling.

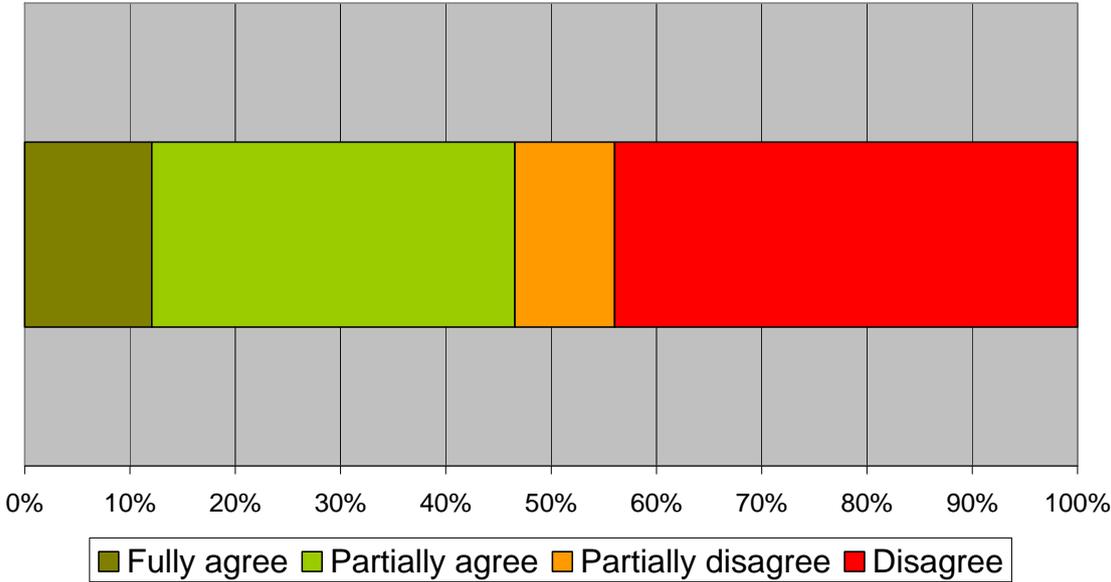
#### 4.5.3. ETS

Regarding the effectiveness and the efficiency of an ETS to achieve the emission reduction required, the opinion of respondents is balanced. 46% of respondents considered that an ETS

can provide the right signal to reduce GHG emissions from shipping if using an absolute cap. Those respondents also stressed that ETS gives flexibility to achieve the emission reduction. 44% of respondents, especially from ship-operators and ship-owners, were concerned at the perceived administrative burden of an ETS. The same group of respondents also mentioned that a regional ETS may not be internationally well-received. Regarding the cost of an ETS, shippers expected pass-through of costs even in a case there were free allocations given. 27% of respondents from various categories considered that the ETS is the least costly mechanism if emission reductions need to be made.

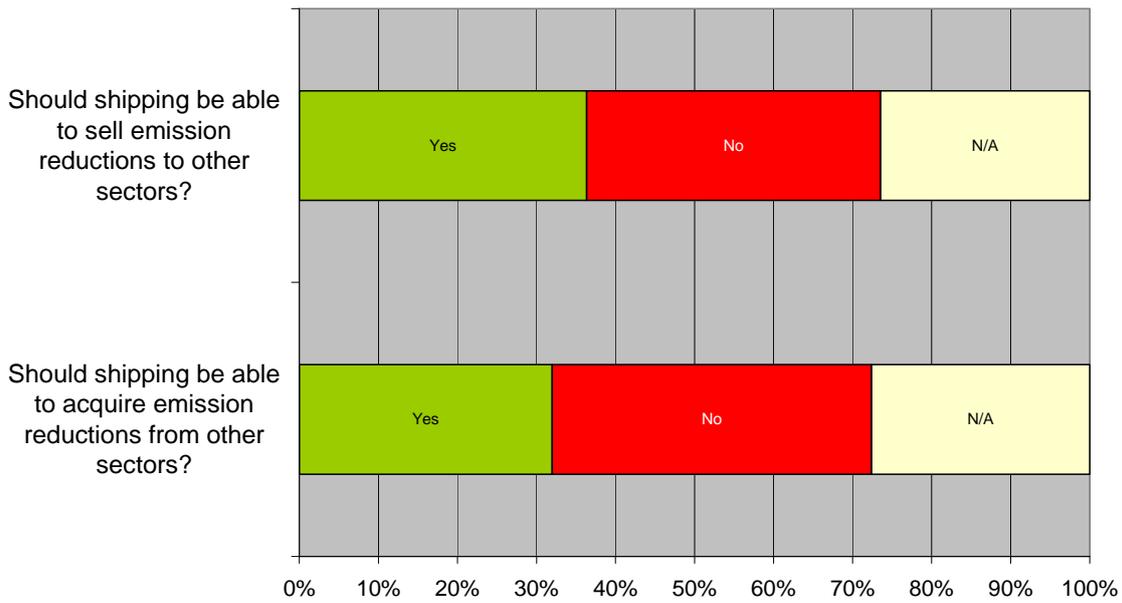
15 respondents, especially NGOs and individuals, noted that the environmental outcome of an ETS depends on the level of the cap. It was stressed that a reliable monitoring and reporting scheme was needed, as well as a mechanism to ensure effective compliance.

**Do you consider that an ETS could achieve the emission reduction required effectively and efficiently?**



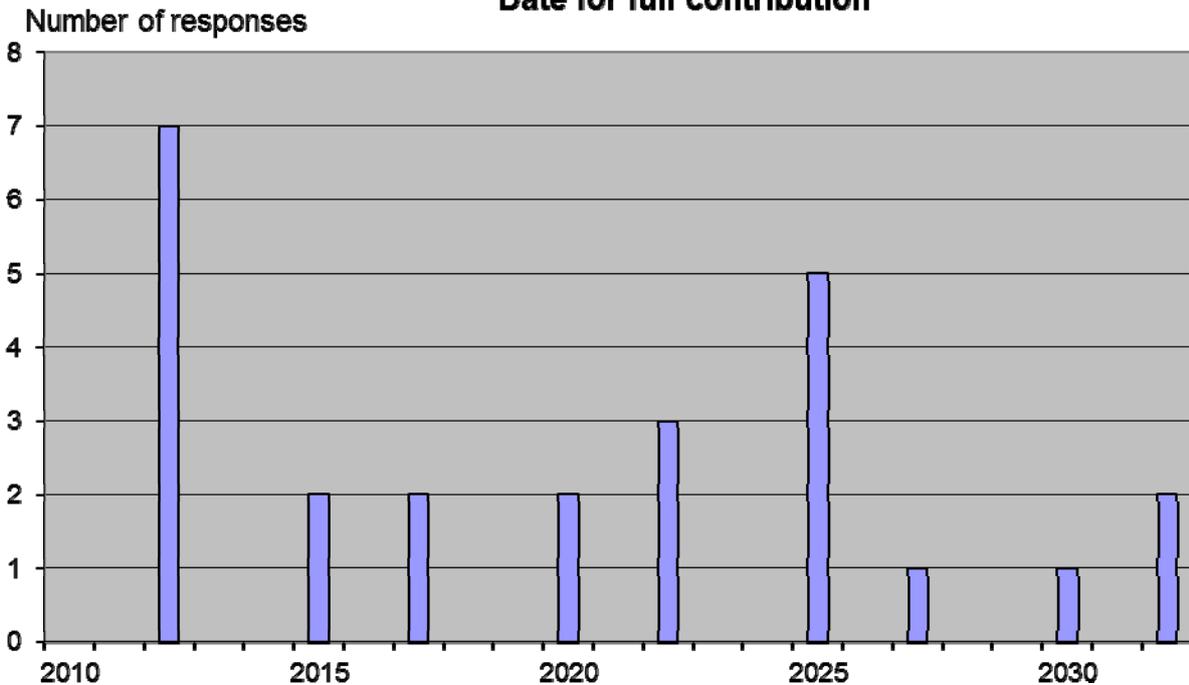
Regarding potential linking with other sectors, the responses were fairly evenly split. On the one hand, 43% of respondents, especially from ship-owners and ship-operators, supported the linking of a maritime ETS with other sectors, as it would enable access to cheaper emissions reductions, ensure equal contributions with other sectors and allowing shipping activity to grow even where this leads to an increase in absolute emissions (as reductions can be bought from other sectors). On the other hand, 45% of respondents, especially NGOs, considered that emission reduction should be done in-sector as the maritime sector can implement measures with negative abatement costs. Potential variation of carbon price worried 16 respondents. 2 respondents mentioned that the ETS should be designed to avoid windfall gains for specific categories of vessels. Some NGOs highlighted that the use of CDM should not be unrestricted.

### Linking with other sectors



Regarding potential financial support to the shipping industry (either directly as free allowances or some of the revenue generated from allowances) by an emission trading system, the replies in favour or against were evenly split: 29% were in favour, 29% were against and 42% of the respondents did not answer. Regarding the end of potential financial support to the shipping industry, there was no clear preference on a precise date for full contribution, with dates for reaching a full contribution spanning between 2012 and 2032.

### Date for full contribution



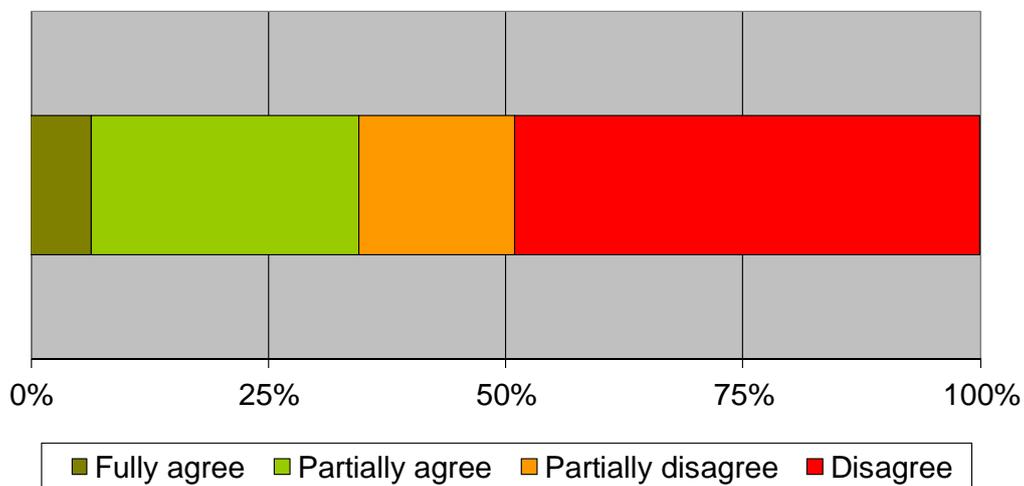
#### 4.5.4. Tax

##### Tax on fuel

71% of respondents considered that the evasion risk regarding the implementation of a tax on fuel at a regional level cannot be avoided. 16 respondents in favour of a tax on fuel considered that it could be applied as a measure directed to the smallest ships, as a supplementary policy instrument of an ETS or a compensation fund. 4 respondents stressed that this option would be fully applicable if it were possible to be applied globally.

49% of respondents indicated that a tax on fuel could not achieve the emission reduction required effectively and efficiently. The main concern raised was related to the fact that no revenues of a taxation system would be earmarked for any purpose. Moreover, the environmental output is highly uncertain, especially regarding the risk of evasion, but also due to the fact that there is no cap on emissions. Furthermore, 12 respondents from various categories expressed their doubts regarding the economical effectiveness. In particular, it was mentioned that some competition distortion could be triggered if different levels of taxes are set by Member States or if the level of the tax triggers some modal shift. One service provider indicated that the effectiveness could be solved by the introduction of progressivity (the tax should be high when the fuel price are low and low when the fuel prices are high). One individual mentioned that if a tax on fuel was introduced the type of fuel should be considered (biofuel/fossil fuel/blended).

##### **Do you consider that a tax on fuel could achieve the emission reduction required effectively and efficiently ?**

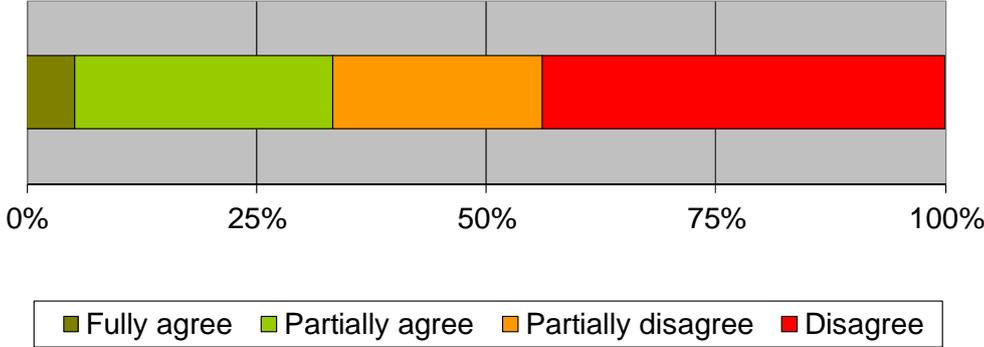


##### Tax on emissions

44% of respondents indicated that a tax on emissions could not achieve the emission reduction required effectively and efficiently. 31 respondents from various categories considered that the risk of evasion is lower for a tax on emissions than for a tax on fuel. However, 15 respondents from various categories indicated that the administrative burden may be higher for the ships and the public authorities. Two NGOs indicated that a tax on

emissions should avoid adverse effects on least developed countries. One individual mentioned that ships operating in specific weather conditions should be taken into account.

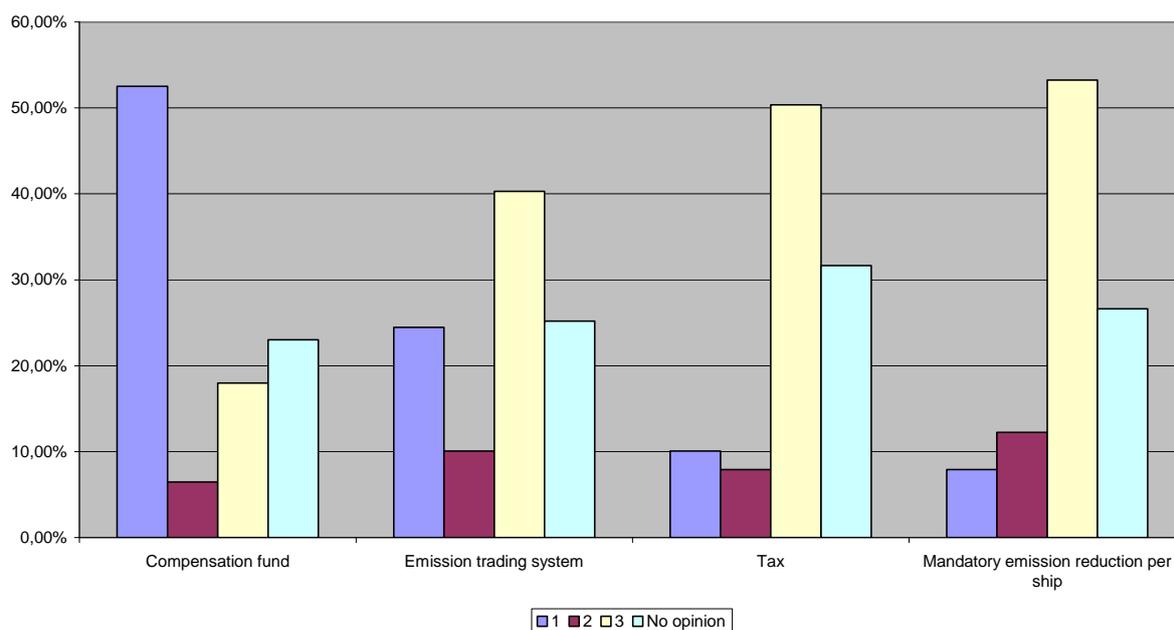
**Do you consider that a tax on emissions could achieve the emission reduction required effectively and efficiently?**



**4.6. CHOICE OF POLICY OPTIONS**

Regarding the promotion of progress at the IMO, a measure comprising a "compensation fund" received the highest support, with 53% of respondents ranking this option as the most preferred one. An ETS measure was considered as the most preferred option by 24% of respondents, while a tax was considered as the most preferred option by 10% and mandatory emission reduction per ship was considered as the most preferred option by only 8%. As a consequence, the tax option and the mandatory emission reduction per ship were considered as less preferred options by more than 50% of the respondents. The level of respondents with no opinion is almost the same for any option.

Which of these options for an EU proposal could be better to promote progress at the IMO (rank from 1 (preferred) to 3) ?



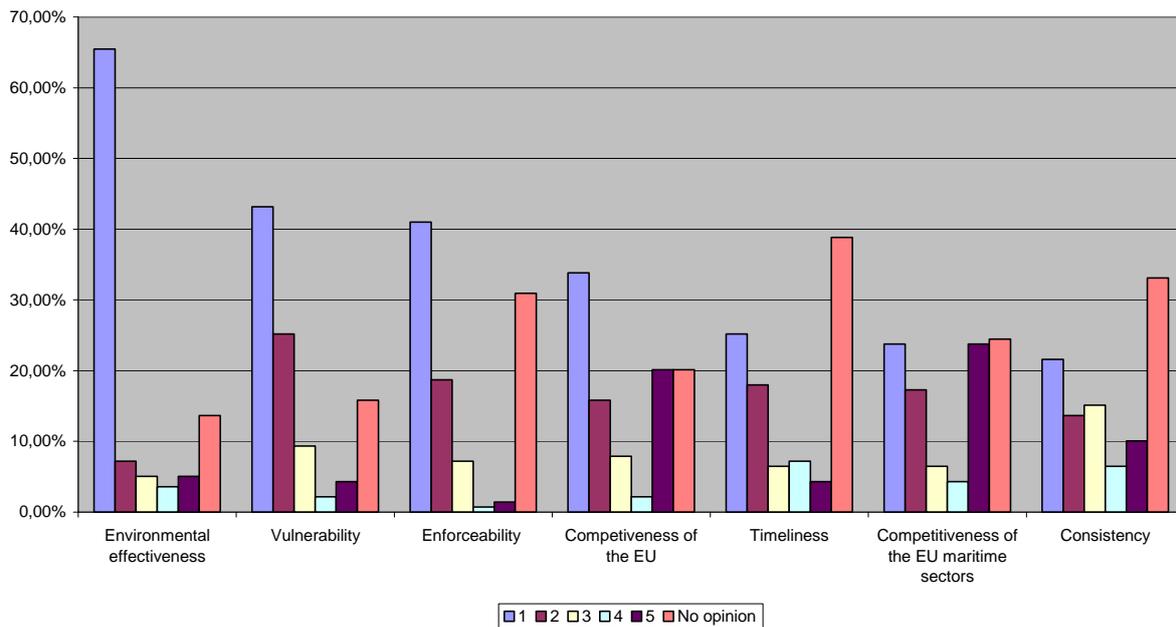
The questionnaire identified the following criteria that could be taken into account for the evaluation of possible EU measures:

- Environmental effectiveness (ensure effective emission reduction in line with the 2°C objective)
- Maintaining and enhancing competitiveness
- Maintain competitiveness of the EU maritime sectors through both first mover advantage and by providing incentives to increase fuel efficiency
- Enforceability (Ensure appropriate monitoring, reporting and verification while keeping administrative burden to the minimum)
- Consistency with the related EU policies
- Vulnerability: Exposure to/Risk of evasion
- Timeliness (Consistency with timing of application of measures and interaction with policy progress in international fora)

The environmental effectiveness of a possible EU measure was considered the most relevant criterion by 65% of the respondents. Other criteria to determine the choice of the policy option considered as most relevant or relevant by a majority of respondents were the vulnerability of the legislation, its enforceability and the impact on competitiveness of the EU economy.

The other proposed criteria (timeliness, competitiveness of the EU maritime sector and consistency with the related EU measures) were regarded as less important for the choice of the policy option.

**Evaluation criteria**  
**1 (most relevant) to 5 (less relevant)**



46% of respondents considered that other criteria should be used to choose the policy option and 44% had no opinion on this. The additional criteria mentioned were the ability to generate revenues, the effects on least developed countries, the ability to provide a stepping stone to an effective global carbon pricing arrangement, the affordability to vessels operators/owners and the risk of modal shift. Regarding revenue generation, the contribution to the international climate finance is proposed to be between 2.7% and 50% or more of the revenues.

29 respondents, especially ship-owners and ship-operators, recalled the nine principles agreed by IMO to define a market based measures and indicated that an EU proposal should be assessed against these criteria. One respondent indicated that the criteria proposed in the questionnaire were sufficient as the nine principles of the IMO are included in.

Regarding the potential use of international credits (e.g. from the Clean Development Mechanism) for compliance, the opinions were split as 50% of respondents were in favour and 50% against. 22 respondents, especially from NGOs, indicated that they were not in favour of offsets, as some measures with negative abatement costs are available in the maritime sector. However, 13 others indicated that it could give flexibility for the maritime sector to achieve its target.

Regarding the same approach to use of the international credits as for other sectors, views were evenly split (49% of respondents for, 51% against). A key issue mentioned was related to the quality of international credits.

#### 4.7. GENERAL COMMENTS

Under this section, many respondents reiterated their strong support or their strong opposition to regional EU action. As could be anticipated, many of the ship-owners and ship operators took the view that the IMO deliveries, i.e. the EEDI and the SEEMP, are sufficient or felt confident that the IMO would be able to deliver an MBM in the 'short term'. In such context,

this group of respondents were of the opinion that the EU should not act. One ship-owner representative proposed that there should be a sunset provision under an EU regulation. On the contrary, many equipment manufacturers, the environmental NGOs and some ship-owners and ship-operators considered that an EU proposal would be a desirable stepping stone for further action at global level.

The importance of ensuring the same level playing field for all maritime actors was emphasised by the bulk of the respondents. 16 respondents further mentioned that any future scheme should be designed in a way that would provide predictability for planning future economic actions. The option of basing a future scheme on incentives and not on penalties was also put forward by 3 respondents in this section.

Many NGOs emphasised that revenues should be provided from shipping for international climate finance and especially for least developed countries. On the contrary, most ship-owners, ship-operators and equipment manufacturers took the view that the revenues raised should be used to finance research and development in the maritime sector and to implement new green technologies.

One port and one individual were of the opinion that the maritime sector was already struggling due to the implementation of the MARPOL Annex VI related to sulphur content of fuels.

Some international partners (US, Canada and Japan) indicated their strong desire to accelerate discussions in IMO, and to work together with the EU and preferred the EU postponing market-based measures and focussing efforts on a common global proposal.

## **5. GENERAL CONCLUSIONS**

The responses to the consultations carried out clearly illustrate that respondents agree that a global agreement in the IMO remains the best long term option to achieve GHG emissions reduction of the shipping sector. The views on the contribution of an EU proposal to this process differ. In the event of a European measure, there appears to be general agreement that securing a level playing field for all ships using ports in the EU should be a central priority.

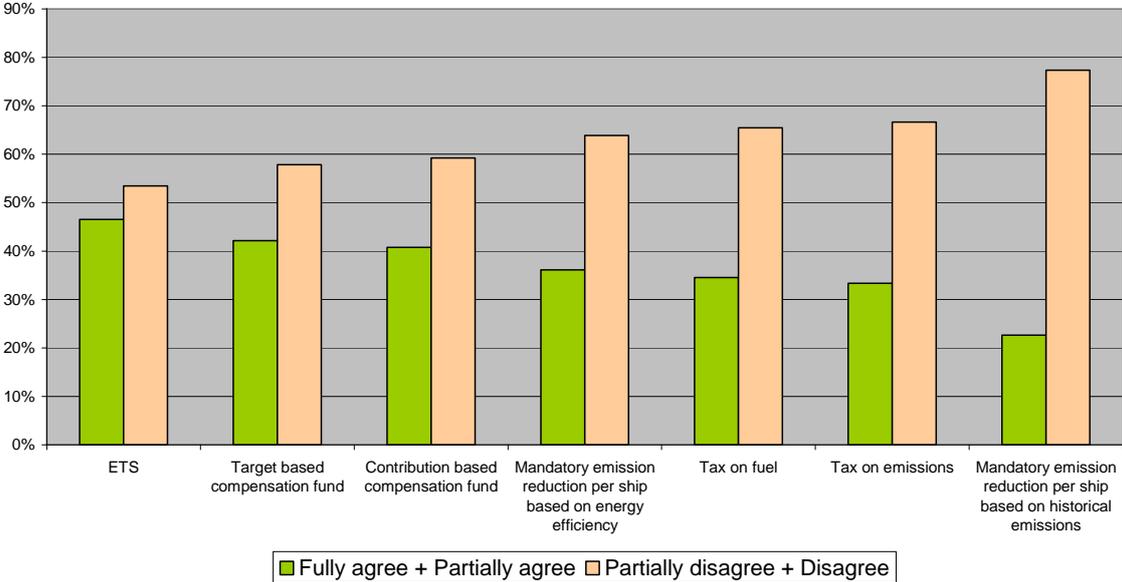
Views also converge in so far that any market-based measure, whether adopted at EU or IMO level and whether it is a tax, a compensation fund or an ETS, should have transparent and robust monitoring of emissions. It was further felt that the monitoring approach to be applied should avoid undue administrative burdens and ensure accurate reporting results.

In general, the position taken by the respondent groups reflected their expected interests. Shippers raised concerns about a possible pass-through of cost even if there were free allocations or other subsidy measures, which could lead to an increase of freight rates; representatives of the short sea shipping focused on the risk of modal shift; ship-owners and ship-operators stressed primarily the issue of affordability; the equipment manufacturers mentioned the benefits for the implementation of green technologies. Public authorities generally wish to limit administrative burden. NGOs indicated that the use of revenues from maritime was an important way to provide climate change funding to the least developed countries.

Regarding the different options proposed, respondents indicated that the two most preferred ones would be the compensation fund (with the target- and contributions-based sub-options)

and the ETS. An ETS was considered as the most effective and efficient option to achieve the emission reduction required, with a compensation funds considered the second most effective and efficient policy measure in this context. Establishing a compensation fund was considered as being better to promote progress at the IMO, while the establishment of an ETS was considered as the second most effective option to promote progress at the IMO.

**Do you consider that these options could achieve the emission reduction required effectively and efficiently?**



The feedback on the effectiveness and efficiency of the policy options confirmed that a number of ship owners and operators, making up the majority of the respondents, are sceptical regarding all market-based measures.

This consultation provides an input to the Commission's impact assessment work.

## **ANNEX IV - MINUTES OF THE ECCP MEETINGS**

1<sup>st</sup> Meeting

---

### **REDUCING GREENHOUSE GAS EMISSIONS FROM SHIPS**

#### **MINUTES OF THE FIRST MEETING OF THE SHIPS WORKING (WG Ships) GROUP 6**

**HELD ON 8 & 9 February 2011**

**at the Albert Borschette Building, BRUSSELS**

These minutes summarise the discussions in the first meeting of the ECCP Working Group on ships. The group was set up to provide input to the Commission in its work to develop and assess options for the inclusion of international maritime transport in the EU's GHG reduction commitment should there be no sufficient international agreement addressing these emissions. The ECCP brings together all relevant stakeholders, to discuss and prepare the further developments of the EU and the modalities of reducing GHG emissions from ships.

This meeting is the first of a series of three meetings foreseen to consider a list of topics important to the maritime sector and focused on scope, monitoring and enforcement.

All presentations referred to below are available, as well as a list of organisations represented in the group at: [http://ec.europa.eu/clima/documentation/eccp/second\\_stakeholder\\_en.htm](http://ec.europa.eu/clima/documentation/eccp/second_stakeholder_en.htm)

**These minutes record the views expressed by representatives present in the Group.**

#### **For the next ECCP**

It was requested that the background material be sent earlier (BE, DE, DK, NL, INTERTANKO) and that the dates of the second ECCP be changed to avoid overlap with IMO and UNFCCC meetings. FI suggested that the 3rd meeting be held after MEPC 62. WSC and others requested a set of scope scenarios to discuss. IETA also requested additional time to discuss reporting, verification and enforcement (before evasion). Commission Representatives agreed that a number of issues such as scope could be re-opened at a subsequent session.

#### **Shipping GHG emissions and the IMO**

The majority of participants stated that the priority should be to aim for a global agreement reached at the IMO level (FI, DE, NL, GR, INTERTANKO, ECSA, SE, T&E, WSC, CY, ESC, UK, ECC, Seas at risk, DK, MT, FR, IMO, CESA, NO, IR). The Commission also stated its strong preference for an effective global agreement and stated clearly that an IMO or UNFCCC measure should be adopted which includes maritime transport emissions in reduction commitments. The ECCP forum is a way for stakeholders to express their views at a level of detail that will help measures to make sense, whatever the fora for their implementation.

NGO T&E stressed the need to cover maritime emissions, as aviation emissions will soon be fully covered by the EU ETS. T&E also called upon the 5 EU MS that have not ratified MARPOL Annex VI to do so ASAP (T &E, NO) and with regards the Energy Efficiency Design Index (EEDI), to strengthen the EU voice behind its adoption.

## Views on regional action

Following an initial presentation, participants made the following points regarding the specificities of any potential regional measure:

- Consistent with 9 IMO principles (DK, ECC, NL)
- Based on existing IMO tools and documentation as this will facilitate expansion into a global scheme (ECC, NL, MT, CESA, BIMCO, NO, EMSA)
- Importance for 'expandability' into an IMO scheme. A replicable regional measure would mean that different measures adopted in various parts of the world could fit together. (SE, CY)
- Flag neutral & avoid distortion of competition (BIMCO, WSC, NL, DK, MT)
- Minimum administrative burden (ESC, NL)
- Favouring incentives rather than sticks (ESC)
- Be adopted fast (NL)
- Start with a phase-in approach (IMO, NL, NO, EMSA)
- Cover a large volume of emissions (SE, Sea at risk)
- Fair and equitable measures which will not impact negatively on competitiveness (FR, ESC) and will prevent evasion (DE, NL) as well as carbon leakage (FR)

## Scope Discussion

After an opening presentation, stakeholders exchanged views on the different aspects of scope:

Type of GHG emissions - the IMO Secretariat, NL and FI proposed to cover CO<sub>2</sub> (initially – NL, FI). NGO T&E stressed the importance to cover black carbon, a potent GHG and NO<sub>x</sub> emissions as these cause major eutrophication problems. Even though extensive efforts have gone into targeting NO<sub>x</sub> emissions from land based sources, no efforts have gone into addressing those coming from shipping. On this point, Commission representatives explained the planned revision of the Sulphur Directive.

Geographical Scope - NGO Seas at Risk, as well as SE, argued for the largest coverage possible to avoid market distortion (DE). MT stressed the importance to study this topic more extensively.

The WSC, CY and NO, suggested that an EU measure should rely on a port entry based system, rather than a time or distance based one (CY, NO). The WSC explained that a time based measure would be difficult to apply in practice and that more analysis on the workability of such an approach is needed (WSC, BE, UK). Similarly, the distance based scheme has difficulties but precedents are available (WSC).

IE suggested a hybrid scheme covering ships that bunker in the EU vs. all other ships. MT suggested different measures for different scope boundaries in a staggering manner. Similarly, Business Europe favoured various instruments for intra EU, inland and outside EU shipping.

Liable entity responsible for covering emissions – Different views were expressed as to who should be the liable entity. CY suggested the registered owner and for non EU flagged vessels the use of Internal Safety Management Code (ISM Code) manager; CY will provide written

comments to all participants with explanations. IE suggested the registered operator rather than the owner. SE suggested a hybrid scheme, with an upstream and downstream approach for ships not buying emissions by covered suppliers. MT suggested considering a combination of measures applicable differently to intra-EU shipping and ships going/coming from third countries.

EUROPIA had a different opinion and expressed its preference for a downstream approach, stating that marine fuel suppliers should not be involved. EUROPIA suggested that the liable entity be the one responsible and/or having an influence on emissions reductions. This was also supported by FI and SE. ECSA suggested using the management company and the use of compliance documents showing the person in charge of safety.

Type of Ships – Different views were expressed with regards which type of ships should be covered.

NL suggested the coverage of as many ships as possible but stated the need for further information and analysis. Similarly, SE explained that smaller ships should not be exempted to protect intra-EU shipping competition, but also because relatively small ships are large emitters. A hybrid system was suggested (upstream for smaller ships, and downstream for larger one). EMSA also supported the hybrid approach suggested by SE.

A large group of participants was in favour of covering larger ships above a certain threshold.

The WSC, the IMO Secretariat and SI proposed to target large ships at first, as covering small ships could be extremely burdensome (WSC, IETA) and could lead to modal shift (IMO, ECSA). Also, by addressing larger ships first, it will be possible to assess the scheme's monitoring capabilities/difficulties (SI). A different measure could then be developed for smaller ships (BIMCO). The IMO Secretariat proposed the use of a high tonnage threshold and BIMCO suggested the IMO thresholds (thereby making the system expandable into a global measure). The UK added that the '*de minimis*' threshold should not compromise the environmental effectiveness of the scheme – for instance a 500Gt threshold could be used, as stated in the CE DELFT report, 97% of emissions in 2006 were produced by ships above 500Gt. Commission representatives noted that 80% of emissions come from ships above 5000gt. EMSA also suggested the use of IMO thresholds including MARPOL and SOLAS.

However, a threshold based system could incentivise shipbuilders to build ships below that threshold (WSC). Also, IACS expressed their concern about underpowered ships being produced: there is a need to be able to keep going in heavy weather.

Legal aspects – certain participants raised concerns regarding the legal aspects of a regional scheme, especially if based on port entry (UK, BIMCO, WSC, BE, CY). However, NGO Seas at Risk and CY stated that most legal issues could be overcome. They gave some example such as the US Oil Pollution Act (OPA). Commission representatives observed that partial coverage of industry was precedent. In a recent ECJ case (Arcelor case C-127/07), the Court ruled that provided the regulator extends coverage over time, a portion of the sector may be covered at first.

Speed Limit Approach – NGOS were very supportive of this approach versus the industry which raised many concerns.

NGO Seas at Risk suggested the need for a speed limit imposed as a mandatory requirement to port entry, and as a potential complementary measure to a MBM. Slow steaming would help ships meet their operational EEDI and lead to actual in-sector reductions. This view was supported by NGO T&E confirming that slow steaming leads to immediate emissions reductions. Even though more ships might be required, the CO<sub>2</sub> gain will remain significant. Seas at Risk is currently organizing a study looking at speed limits, regionally, globally, and at contract and chartering aspects.

IE and FI explained their heavy reliance on shipping for imports and exports (95% of trade to Ireland is via ships). In this context, they both expressed their dislike towards this approach. FI explained that the increase in ships needed to compensate for the slower steaming, in combination with the heavy winter conditions, would increase GHG emissions significantly. The ECC explained that in addition to the increase in emissions, the need for more ships would mean additional crew would be required; currently the market lacks maritime crew. BIMCO added that slow steaming impacts the logistics chain negatively and that it is already done during fuel price increases. ECSA's concern was that a speed limit would lead to modal shift to aviation. SE explained that a speed limit could not be applicable on RORO and passenger ships as these are designed to run on specific schedules that allow a specific amount of trips per day. The ESC expressed concerns over resulting lower lead times. ESC therefore proposed that slow steaming be applied on a voluntary basis only (ESC, BIMCO).

MBM, technical or operational measures - NGO T&E stated that shipping should explore every possible avenue for emissions reductions (technical, operational and MBM). They urged the Commission to keep considering all possibilities and that a technical measure could influence the IMO members to act prompter. T&E also suggested fuel taxation in Europe. For a regional scheme, the IMO Secretariat favoured an MBM stating that it would be more difficult to introduce operational and technical measures regionally. For example, the implementation of an operational measure requires a change of culture on board the ship – this is more difficult than to require ship operators to pay a fee. Similarly, it is more difficult to regulate the construction and design of ships regionally. The IMO Secretariat concluded that technical conditions could be set but these would certainly be less straightforward than an MBM.

Many other participants also agreed that all technical regulatory aspects should be dealt with by the IMO (NO, INTEMANAGER, OCIMF, MT). The importance of technology was also stressed by CESA, stating that as shown by DNV and the IMO studies, technological and operational measures combined provide net benefits to the operator. IACS added that any technical measure should be solely technically based and not politically driven (i.e. double hull).

Need for additional data - Many participants stated the need for additional data and examination of data. Data is needed about the composition of ship size/fraction/thresholds within Europe and segregate who comes from trans-oceanic voyages (WSC). FI requested that COM provides more information at the next meeting on the distribution of emissions (intra-EU / domestic / third countries) and per type of shipping (FI, Business Europe). This will also help determine which types of ships should be covered (IETA). (NB. The COM is intending to provide such information to the second ECCP meeting)

## Concluding comments by the Chair

### Stakeholders

- Accept the urgent need to tackle climate change
- Strongly prefer a global solution
- Suggest building on existing scope/categories rather than reinventing the wheel
- Suggest focus on CO<sub>2</sub> initially
- Strongly support a flag neutral application
- Suggest port state control as a possible way of administering/enforcing
- Suggest a MBM is more appropriate for regional action than technical or operational measures

### Monitoring

Following the EEA's presentation, Commission representatives made a brief presentation on monitoring and stressed its importance for ensuring successful implementation. FI supported this statement by quoting an IMO expert group report stating that "the integrity of an MBM depends on robust monitoring".

Two monitoring options were examined:

- Option 1 - Inventory control based on the log books or Bunker Delivery Notes (hereafter BDN). Use of emissions factors. 5% margin of error.
- Option 2: A direct measurement approach with a fuel consumption monitoring system.

The following points were then made by the stakeholders:

Data availability - NL stated that fuel consumption data is simple to gather as the crew normally measure and report fuel consumption on a daily basis. NL explained that the data may be inaccurate at times but that all technical issues preventing accurate data collection could be tackled. It was added that if the EEDI became adopted, ship operators would be very keen to have accurate information.

ECSA stated that there are many possible ways to monitor emissions but these are time consuming. From the technological/hardware side, CESA and INTERMANAGER confirmed that fuel consumption can be measured precisely. CESA explained that ship operators operating their own ship, are very keen in investing in monitoring equipment and that the uncertainties in the data originate from the lack of legal requirements and enforcement. In this context, SI expressed its contentment over the industry acknowledging full technical possibility to monitor its emissions and added that in combination with political will, progress could be made. For the dredging sector, fuel consumption depends on the activity and is straightforward to measure (what goes in, goes out). However, with the emissions, alterations are common depending on engine performance (EUDA).

The method to gather data - INTERMANAGER stated that from an operational point of view many indicators could be used for monitoring (data that gives indication on the tuning of the engines). This should be considered, as many factors (wind, waves etc) influence fuel consumption data and create uncertainties and inaccuracies. EMSA suggested the use of

existing EU monitoring tools. Moreover that the EU Member States could as a condition to port entry, require data reporting.

IBIA explained that inaccuracies are common in fuel consumption data and therefore suggested emissions monitoring rather than fuel. Finally, the question of how precise we would want to be was raised (IBIA, IETA). The UK favoured the use of current available data and stated that a 5% margin for error sounds acceptable (Option 1). In the context of Option 1, BIMCO added that the IMO emissions factors should be used, as the industry is familiar with them and knows how they work. With the Fuel Quality Directive, upstream CO<sub>2</sub> emissions are known for the power sector. It is however complicated to track the emissions based on marine fuel supply distribution. EUROPIA therefore favoured emissions calculation based on factor emissions (Option 1).

The IMO Secretariat favoured Option 2 (direct measurement) and added that a ship calling regularly at an EU port, when subject to an emissions reduction measure, might choose to invest in a reliable emissions monitoring equipment. A ship that rarely calls at an EU port may prefer to pay a standard fee.

Entity responsible for reporting fuel consumption - SE stated that the shipowner should report fuel consumption by providing a declaration, i.e. like the Norwegian tax which has a declaration system and makes use of the BDNs and the log books; ships prove they emitted less than the benchmark (IMO). EMSA added that with such a system which looks at the level of the single ship, the declaration data could then be compared with the bunker fuel sale statistics.

Reporting of fuel consumption - The IMO Secretariat explained that there is no legal requirement for ships to report their emissions. A 2008 IMO Secretariat proposal to introduce mandatory reporting of fuel consumption was turned down by the IMO Member States at the time. While it was recognized that fuel consumption data could be seized on every ship, IMO Member States objected to data collection for two main reasons:

- the resulting burden for management companies and the large flag states
- commercial confidentiality issues.

There is no plan by the IMO to raise this proposal again in the foreseeable future (IMO).

ECSA mentioned a voluntary reporting exercise which was carried out in Hamburg. Help/info could be requested from them. To minimise administrative burden, SE proposed that ships which run frequently between two ports, only report their fuel consumption once a month. Moreover, incentives could be offered to enhance accurate reporting and compliance. For the other ships (whether the scheme be route based or time based) a default value/price could be set.

EUDA suggested looking at the work of DG Enterprise on technical aspects. Moreover, EUDA requested that any measure adopted, create durable modification of the maritime market which will require all maritime stakeholders to change. DG CLIMA asked how the data collected at ship level could be consolidated and accurately reported for verification.

Verification - IETA pointed out the difference between the term verification when used in relation to GHG inventories and when used in relation to technology. Technological verification is done differently.

Upstream or Downstream - SE favoured an upstream approach in which shipowners would declare if the emissions bought were bought from a covered company. T&E explained that 50% of EU shipping emissions come from intra EU shipping and suggested ships be divided between the 'blue ships' which would be subject to an upstream charge and the 'red ships' (travelling outside the EU).

The WSC stated that an upstream system would be ideal if the market were closed; being open, a downstream system is most appropriate. Nevertheless, the WSC stated that a downstream system would still be very complicated to monitor and would impact the level playing field. The following questions were raised: How would you minimise under-reporting? Is it difficult to segregate how much fuel suppliers have supplied and to whom? How do you verify that data? This view was supported by the IMO secretariat.

#### Concluding Comments by the Chair

- There appears to be lots of monitoring already being done for commercial reasons – but no standard approach.
- Monitoring creates efficiencies and is beneficial for shipowners
- An adequate level of data accuracy is available
- The question is how much accuracy do we want
- Verification and reporting needs further discussing
- The definition of verification should be well defined when talked about

### **Enforcement**

Following an initial presentation, EMSA mentioned the complementarities of the port State control and the flag State controls in enforcing measures applicable to ships. It highlighted the distinction should be made between controls in ports and Port State Controls which rely on the Paris Memorandum of Understanding (Paris MOU). The following points were made by the stakeholders:

Scope of enforcement - MT stressed the important link between scope and enforcement, and the need to have a clear understanding of who will fall within the scope of enforcement. Reference was made to the aviation sector, for which according to MT, the identification of whether an operator fell within the scope or not was a complex exercise. Also, MT does not favour exemptions as this makes the above mentioned exercise more complicated.

WSC stressed that the context of what we are enforcing matters greatly and that knowing the context of the scheme would make it easier for the stakeholders to give feedback on enforcement. The following questions were raised:

- Whether the Commission is envisaging enforcement through a single enforcement unit or whether the Member States will be responsible
- Whether the Commission is envisaging recording fuel consumption or making calculations based on specific fuel consumption over specific distance
- Whether it will be required for ships to account for emissions occurring outside the EU

CMIA asked whether it would be possible to have a different enforcement scopes for intra EU shipping vs. international shipping. Many recalled that intra-EU is also partly international (voyages between EU MS). CMIA also expressed preference for an open sector approach, in which shipping would be allowed to trade allowances with other sectors – there would otherwise be a risk that the carbon price suffers of spikes.

Enforcement mechanisms - MT and BIMCO suggested the use of existing documentation (threshold certificates – BIMCO), regimes and proceedings (MT). MT and the IMO Secretariat both favoured a prescriptive approach, with clearly defined roles of who should do what. MT also suggested the hybrid approach. The ECC stated that ships should not be delayed because of the enforcement checks. NL proposed a risk based enforcement system with checks on a random basis (IMO).

In this context, it was mentioned that an advantage of a MBM is that it places fewer burdens on the industry than a Command and Control measure. The UK requested a linkable enforcement system, consistent and compatible to other systems.

EUDA favoured strong compliance incentives rather than bans (IE). The ECC asked whether early adopters could receive rewards.

IE favoured a sophisticated enforcement regime and suggested the use of SafeSeaNet (Maritime platform for exchange of information between designated authorities). Similarly to EUDA, IE does not favour banning procedures. Ships could give a 24h notice before nearing the port and confirm whether they are in compliance or not. If not, entry will not be allowed. This type of enforcement will be simple and won't require any physical intervention.

Commission representatives explained with the current EU ETS registry system, compliance and enforcement are straightforward. Once a year operators have to report their emissions in the registry. Those then have to be verified by the verifier, who is also in the registry. In the case of shipping, the verifier could look at the BDN which wouldn't add an extra requirement in itself. The operator would then have to surrender allowances based on the emissions reported and verified.

This system makes it easy for the regulator to see who complies and who doesn't; this information is then also publicly available, which creates an extra incentive for compliance due to the naming and shaming effect.

The IMO Secretariat suggested that each participating ship have its own account and that checks be done on a random basis. EMSA referred to a 'virtual wallet' attached to the ship identification number (IMO number). Amendments of the BDNs will be necessary, before these could be used for enforcement purposes. New enforcement tools, documentation but also new skills will be needed, if the system will not be purely paper based. For verification purposes SafeSeaNet could be very useful (but it would depend on the design of the system). The option of establishing a new entity for enforcement should be considered in further detail. For the use of the Long Range Identification & Tracking System (LRITS), the SOLAS convention would need to be amended to make sure LRIT could be used in that way. However, it is more likely that it could be used in the context of a global scheme than in a regional scheme.

IETA explained that verifiers could look at all BDNs associated with a ship, the quality of the fuel going on board and the effectiveness of the equipment. It could also be feasible to ask for calibration certification for the bunker barge. Bunker notes should be the basis of monitoring. The WSC stressed the need to have a MBM that will affect the price signal and push the industry to reduce emissions. The Norwegian NOx tax has elements of interest which could be used when designing an EU scheme (NO). FI mentioned the Sulphur Directive for which similar enforcement issues arise.

The IMO Secretariat made a closing comment and pressed Member States to ratify MARPOL Annex VI and vote for the adoption of the EEDI in July 2011. Finally, the IMO Secretariat asked DG CLIMA to strengthen its outreach policy and use its diplomacy, to push third countries with a view to adopting a global IMO led measure.

---

### List of acronyms and abbreviations

BIMCO	Baltic and International Maritime Council
CEFIC	European Chemical Industry Council
CESA	Community of European Shipyards Association
CLECAT	European Association for Forwarding, Transport, Logistics and Customs Services
CMIA	Carbon Markets and Investors Association
DG ENTR	Directorate-General for Enterprise and Industry. European Commission.
DG MARE	Directorate-General for Maritime Affairs and Fisheries. European Commission.
DG MOVE	Directorate-General for Mobility and Transport. European Commission.
ECC	European Cruise Council
ECSA	European Community Shipowners' Associations
EMEC	European Maritime Equipment Council
EMSA	European Maritime Safety Agency
ESC	European Shippers Council
ESPO	European Sea Ports Organisation
EUDA	European Dredging Association
EUROCHAMBRES	European Association of Chambers of Commerce and Industry
EUROPIA	European Petroleum Industry Association
FEPOR	Federation of European Private Port Operators
IACS	International Association of Classification Societies
IBIA	International Bunker Industry Association
ICS	International Chamber of Shipping
IETA	International Emissions Trading Association
IMO	International Maritime Organization
INTERTANKO	International Association of Independent Tanker Owners

INTERMANAGER	International Ship Managers Association
MIF	Maritime Industries Forum
OCIMF	Oil Companies International Marine Forum
T & E	Transport and Environment
UNFCCC	United Nations Framework Convention on Climate Change

### Participants

<b>National Administrations</b>		
1	BE - Belgium	DECLERCK Ruth
2	BG - Bulgaria	ATANASOVA-STOYCHEVA Irina
3	CY - Cyprus	ATALIANIS Christos Dr.
4	DE - Germany	HEINEN Falk
5	DE - Germany	MÖLLENKAMP Sabine Dr.
6	DK - Denmark	NIELSEN, Stefan Krüger
7	DK - Denmark	HASSELAGER Lars Olsen
8	DK - Denmark	MONDRUP Gitte
9	EL - Greece	KOUROUNIOTIS Ioannis Commander
10	EL - Greece	GRYLLIA Artemis Mrs
11	EL - Greece	KALLIPOLITOU Venetia Mrs
12	FI - Finland	ERIKSSON Lolan
13	FR - France	SIMIU Diane Mlle
14	IE - Ireland	SNELGROVE James
15	IT - Italy	RAMPAZZO Daniele
16	IT - Italy	RICCI Angelo
17	LV - Latvia	RIMSA Helena
18	LV - Latvia	LEJA Linda
19	MT - Malta	VASSALO Saviour
20	MT - Malta	SAMMUT Christopher
21	NL - The Netherlands	DEKKERS Chris
22	NL - The Netherlands	DIJKSTRA Wieger
23	NL - The Netherlands	HASSING Sibrand
24	NORWAY	ALMKLOV Lars
25	NORWAY	KORSVOLL Marie
26	PL - Poland	BANAS Panel
27	PL - Poland	WERKOWSKI Maciej
28	RO - Romania	DRAGU Violeta
29	RO - Romania	TARASILA Florin
30	SE - Sweden	KÄGESON Per
31	SI - Slovenia	GASPERIC Matej
32	SI - Slovenia	TUSAR Petra
33	SI - Slovenia	ZABUKOVEC Ales
34	UK - United Kingdom	PHILPOTT Alex
<b>EU Shipping Organizations &amp; Associations</b>		
35	CESA	LÜKEN Reinhard
36	CLECAT	BEUCK Niels
37	ECC	ASHDOWN Rob
38	ECSA	PETERSEN Hans Henrik
39	ECSA	LOICQ Benoit

40	EMEC	LANCELLOTTI Paola
41	EMEC	CUNNINGHAM Douwe
42	ESC	VAN DER JAGT Nicolette
43	ESC	VAN DOESBURG, Joost
44	ESPO	MICHAIL Antonis
45	EUDA	SANSOGLOU Paris
46	FEPOR	TEURELINCKX Diego
47	FEPOR	KRÖGER Martin
48	MIF	BRODDA Joachim
<b>International Shipping Organizations &amp; Other Associations</b>		
49	BIMCO	LUND Michael
50	IACS	WRIGHT Colin
51	IBIA	ADAMS Ian
52	IBIA	Ms EGAN Charlotte
53	IMO	VAGSLID Eivind
54	INTERMANAGER	SORLIE Svein
55	INTERTANKO	FUGLESANG Kristian
56	OCIMF	PROCTOR Cliff
57	WSC	WOOD-THOMAS Bryan
<b>Other Associations</b>		
58	BUSINESS EUROPE	FAURE-FEDIGAN Christine
59	CEFIC	VERLINDEN Jos
60	CMIA	STUART Graham
61	EUROCHAMBERS	HAAS Regina
62	IETA	LUNSFORD David
63	IETA	WARRIS Anne-Marie, replacer
64	EUROPIA	CHEVALLIER Franck
65	UNFCCC SECRETARIAT	VLADU Florin
<b>NGOs</b>		
66	SEAS AT RISK	MAGGS John
67	T&E	HEMMINGS Bill
68	T&E	HOLYOAKE David
69	SURFRIDER FOUNDATION EUROPE	BRETON Véronique
<b>European Commission – EEA – EMSA - European Parliament</b>		
77	DG CLIMA	CHAPUIS Laure, DELIYIANNIS Chrysostomos, DUGGAN Jill, KIZZIER Kelly, KREMLIS Mariella, MAJOR Mark, MEADOWS Damien
78	DG ECFIN	MIGUEL Cabeza Mercedes
79	DG ENTR	HEHN Wolfgang / MITOV Martin
80	DG MARE	VOPEL Ronald
81	DG MOVE	BUTLER Victoria
82	DG MOVE	LESOVICI Roxana
83	EEA - European Environment Agency	VAN AARDENNE John
84	EMSA	LEROY Arnaud
85	Assistant MEP	RAPTIS Sotirios

**REDUCING GREENHOUSE GAS EMISSIONS FROM SHIPS**

**MINUTES OF THE SECOND MEETING OF THE SHIPS WORKING (WG Ships)  
GROUP 6**

**22 & 23 June 2011**

**at the Albert Borschette Building, BRUSSELS**

These minutes summarise the discussions in the second meeting of the ECCP Working Group on ships. The ECCP WG was set up to provide input to the Commission in its work to develop and assess options for the inclusion of international maritime transport in the EU's GHG reduction commitment should there be no sufficient international agreement addressing these emissions. The ECCP brings together relevant stakeholders, to discuss and prepare the further developments of the EU and the modalities of reducing GHG emissions from ships. This meeting was the second in a series of three meetings foreseen to consider a list of topics important to the maritime sector and focused on available data, use of revenues and evasion. All presentations referred to below are available, as well as a list of organisations represented in the group at: [http://ec.europa.eu/clima/documentation/eccp/second\\_stakeholder\\_en.htm](http://ec.europa.eu/clima/documentation/eccp/second_stakeholder_en.htm)

**These minutes record the views expressed by representatives present in the Group.**

Introduction

The European Commission (COM) introduced the meeting by providing an overview of the agenda on maritime emissions issues, especially regarding the next IMO meeting in July, which will be important for the adoption of an Energy Efficiency Design Index (EEDI). COM presented the objective set in the new Transport White Paper, i.e. a reduction of at least 40% of EU shipping CO<sub>2</sub> emissions (50% if feasible) in 2050 (from 2008 levels). As requested in the first ECCP meeting, data was provided regarding the number of port calls in Europe by COM and IHS Fairplay. COM pointed out that the terms of reference of the impact assessment are available on the Commission's website (request of FI and UK).

For the next ECCP meeting

FI, RO and DE underlined to need to analyze the legal issues and challenges that could arise when implementing a regional system, especially those linked to evasion. On this note NGO Climate Earth informed the stakeholders about their study on the legal aspects related to EU unilateral action which will be available. Finally, DE and FR requested the COM to clarify open legal questions especially as to the compatibility of a regional scheme with the international law of the sea and with WTO rules. DE further requested the Commission to look in how far a policy measure could combine high environmental effectiveness with low evasion risks.

Regarding the Impact Assessment, T&E requested the Commission to look at all the regulatory options and assess them on the basis of their potential to create substantial emissions cuts and cuts quickly within the sector.

There was strong interest in the COM's selected Impact Assessment contractors presenting to the next ECCP meeting.

In the beginning of the meeting, many stakeholders underlined that a global measure is preferable over a regional scheme.

### **Slow steaming**

After the presentations made by Seas at Risk and the National Technical University of Athens (NTUA), an intensive debate raised the following different issues.

Most of the stakeholders agreed that reducing speed can contribute to GHG emission reductions. Several stakeholders also considered that slow steaming is a part of the solution to reduce GHG emission, but it cannot be considered as a single option (Sea at Risks, BE, DE, Öko Institute) and it has to be considered at a global level (DE, FI, UK, FR).

Seas at Risk underlined that speed reduction is the most cost-effective way to reduce emissions and that the adoption of an EDDI is not the solution for short term action. Reducing speed is also considered by some stakeholders (Öko Insitute, BE) as inefficient to ensure absolute emission reduction, contrary to an MBM. Seas at risk expressed the idea that an MBM and speed limits could be combined, for example by creating a system that forces actors to pay for going faster.

Several stakeholders (BIMCO, ESC, ICS, ESCA, WSC, FR, FI, ECC) are against a mandatory scheme and underlined the need to differentiate between ship types. If speed limits are introduced, flexibility is required for its implementation (SE, ESC, ECSA, FI, FR).

It was argued that there is no correlation between fuel prices and speed (WSC, Öko Insitute, BIMCO). The WSC explained that the important increase in the price of fuel between 1990 and 2007 had a limited effect on the speed of ships and that a fuel levy, would have no stronger impact. A mechanism should be found which will drive improvements within the sector itself (WSC).

Others (Seas at Risk, NTUA) considered that increasing the fuel price will have a direct effect on speed but the NTUA and ESC recognized that the speed of ships is not only driven by fuel prices, but also by market requirements.

The safety issue was also pointed out by the UK and ICS. UK considered that traffic congestion in ports due to slow steaming would be a major safety concern. FI raised the 'land bridge' issue: countries highly dependent on shipping will be penalized by a reduction of speed. EL supported this view as well. Sea at risks recognized that this issue has to be discussed.

Several stakeholders (NW, SE, NL, Intermanager, DE, ESCA, FR) requested more analysis on this topic. The Seas at Risk study final report will be available in October 2011. Several stakeholders (FI, UK, BE, DE, ECSA, ICS) were of the opinion that a flexible measure, which gives incentives to a broad range of CO<sub>2</sub>-reduction options, is preferable.

### **Regional tax/ Hybrid system**

Two presentations were made by T&E, on the one hand, presenting a solution based on a regional tax and by the Center for Transport Studies, on the other hand, presenting a solution that combined a tax based on fuel consumption for small vessels and a cap and trade scheme for large vessels. This hybrid system is designed to involve progressively all actors and non-EU/EEA countries.

T&E also underlined that the emissions reduction has to be done in the shipping sector. WSC shared the view that the reduction must be internal. However, he pointed out that the increase of fuel price in the 90's had a major effect on the fleet efficiency.

Seas at Risk considered that whatever the system will be, it have to provide absolute emission reduction.

Several delegations (UK, NW, WSC) considered that a regional tax could be very complex to implement, especially due to the administrative burden.

BE expressed their preference for an MBM, and others specified that an MBM should be seen as transitory measure (ECC). ECSA stated its preference for a global bunker levy but shared the view of the ECC, that an MBM would be necessary to achieve absolute reductions and achieve the 40% emissions reduction target set in the White Paper, to complement technical and operational measure.

It was questioned whether an MBM is able to create multiple accelerators to provide incentives to improve the efficiency of the sector (ECC). ECC explained that emissions reductions could not be achieved with zero cost, especially in the cruise industry. If this was the case, the cruise industry would have done so already. However, some stakeholders (CESA, T&E, Seas at Risks,) considered that some measures could cost nothing. CESA pointed out that 35% reductions without any cost are possible.

ESC considered that a tax would not bring any substantial emission reduction.

CY is against any regional system, including a system capped. EL does not support a regional measure. It called for the EU MS and IMO to achieve an international solution. It stated that in developing a regional measure, the EU should pay particular attention on how it will affect certain MS, in particular Greece, where it is essential to keep shipping services between islands. EL will submit their comments on this issue in writing.

Several stakeholders (ICS, BE, DE, FI, UK, FR, EMEC, CY) raised the risk of evasion by implementing a regional system. However, DE, UK and FI stressed the need to analyze any solution that can lead to a global system. ICS consider that if a regional system exists, it must be flag-neutral.

Öko Intitut underlined the need of equity between the modes of transport and therefore all sectors need to contribute to the GHG emission reduction.

### **Use of Revenues**

The following views were expressed by the stakeholders after the two presentations (Use of Revenues by COM – the Norwegian NOx Fund by NO).

Some stakeholders reaffirmed the need to have a global solution as opposed to a regional one (ICS). ICS was positive about the ability of the IMO to come forward with a solution after the go ahead from the UNFCCC.

A question on how compliance is ensured in the context of the NOx Fund was raised, due to the fact that contributions are made on a voluntary basis by the industry. NO explained that compliance was ensured by the “participant agreement” between the government and the industry and penalty processes.

The benefits of LNG were raised by SE. LNG creates greater CO<sub>2</sub> emission reductions compared to the traditional bunker fuels (SE, NO). It reduces CO<sub>2</sub> emissions by 20% (ICS, SE), NO<sub>x</sub> emissions by 90% and sulphur emissions very close to zero (SE). According to ICS, LNG seems like an attractive solution but could create important damages in the case of a leakage (even 1%) as LNG is predominantly comprised of methane, a potent global warming gas.

NO stated the need to look into all possible options so as to achieve the 2 degrees target and stated that all sectors would have to incur costs to reach that target. T&E encouraged COM to look into solutions to handle NO<sub>x</sub> emissions from ships, in conjunction with DG ENV.

### Distribution of revenues to third countries

SE noted the interest of the EU to use revenues differently over time and keep those within the European Union in the short term. When expanding the regional system, the revenues could be distributed on a larger scale, thereby considering the Common but Differentiated Responsibility (CBDR) principle.

According to Oxfam international, any EU regional system should include financial obligations to set aside revenues to a green fund or channel funds directly to developing

countries for climate action, especially on adaptation, in accordance with the pledge of Copenhagen made by the EU. ICS agreed in that part of the revenues should indeed be spent on mitigation and adaptation in developing countries. ECSA expressed its concern about the use of revenues that should not be hypothecated for mitigation.

When developing a global system within the UNFCCC and IMO the distribution of revenues to developing countries for climate action would be an absolute condition (T&E). However, according to T&E, in the context of a regional measure, it would be expected that the revenues would not all go back to the industry, as is the case for road transport. The Commission recognises that, if the EU is forced to take regional measure, the use of revenues can be useful to build a global system.

#### Distribution of revenues to the sector

Other stakeholders stated that the revenues should be kept within the sector (BIMO, ECC, CMIA, CESA) – and shared their concern about the shipping industry becoming a ‘cash cow’ (BIMCO).

Any regional MBM should be designed primarily to reduce emissions (ECC, UK, BIMCO), the shipping industry should not pay for a measure which does not reduce emissions. There should be a strong link between CO<sub>2</sub> emission reductions and the raising of revenues (ECC). The revenues gained should be used for efficiency improvements (ICS). By keeping revenues within the sector, distortion of competition could be minimised (CESA): CESA reiterated that ‘cleaner’ shipping would be beneficial for the industry and that the expenses incurred to reach more efficient levels, should be seen as investments rather than costs. If non EEA flagged ships were to be covered as well, these should then also have access to the funds (BIMCO).

DE has no final position on the use of revenues. DE currently earmarks auction revenues from the EU-ETS in a fund for national and international energy and climate projects. As a preliminary view, it was stated that for any instrument, the shipping industry would have to have access to revenues generated and that a fair distribution of revenues for land locked countries would need to be ensured. DE stressed that it put forward a submission to the IMO in which it lay down three possible uses of revenues generated by a worldwide ETS: Compensation of economic impacts on developing states; R&D and technological support to promote mitigation and adaptation in the maritime sector and contribution to international climate finance.

DK mentioned the CO<sub>2</sub> tax which is recycled in process intensive companies as long as those have an energy management plan.

NO explained that in that in the case of the NO<sub>x</sub> Fund, the government introduces the tax but the earmarking is happening in the industry. CMIA stated that the revenues should not be given to the Member States and mentioned the NER 300<sup>12</sup>, which constitutes a good example of money being set aside to help finance industry project developments. The UK was attracted by the example of the NO<sub>x</sub> Fund, particularly as it avoids the hypothecation of revenues.

FR does not have a final view on how the revenues should be used as of yet – part of the revenues should be used to prevent carbon leakage.

---

<sup>12</sup> The NER 300 will be funded from the sale of 300 million emission allowances held in the New Entrants Reserve (NER) of the EU Emissions Trading System (ETS). It aims to encourage private sector investors and EU Member States to invest in commercial low-carbon demonstration projects.

For more information please refer to the following link

[http://ec.europa.eu/clima/policies/lowcarbon/ner300\\_en.htm](http://ec.europa.eu/clima/policies/lowcarbon/ner300_en.htm).

ECSCA asked the Commission about its position regarding the States aids. The Commission mentioned that free allocation is not considered as State aids. However, this issue has to be further analysed depending on the use of revenues.

### **Avoiding Evasion**

The following views and concerns were expressed after COMs introductory presentation. According to the IMO, an EU system would inevitably create more evasion risks than a global scheme.

The ECC requested the Commission to refer to the act of legally evading the applicability of a measure as avoidance, rather than evasion.

Several stakeholders considered that the risk of evasion is highly dependent on the geographical scope of the scheme (ESPO, SE, FI) and of the type of instrument (ESPO, ICS, Oko Institut). ESPO noted that as the scope would be reduced, a loss in terms of environmental effectiveness would inevitably occur. ESPO does not currently have a position on which scope would be the most suitable. DE considered that evasion could be avoided by setting the largest scope as possible.

According to IETA, long lasting port inspections and bill of lading confirmations could delay the whole supply chain – this should be looked at in further detail.

RO considered that the risk of avoiding the EU Port should be well analysed, especially in the Black Sea. FR raised the evasion possibilities in the North African ports.

RO, supported by BE, also considered that there is a risk of evasion of the industry, not only the logistics.

The infrastructure and the ability of states to quickly develop their infrastructure (esp. concerning ports and transport from and to ports) in the third country States is also an important issue to analyse when discussing on evasion (UK, DE, FR). A regional measure could serve as an incentive for further port developments and thus could increase the risk of evasion over time. This has to be taken into consideration when studying the impact of a regional scheme (DE).

The avoidance of evasion is a priority for the UK: the environmental effectiveness of the system should be ensured and distortion of competition should be minimised. Credibility of the system should be preserved. The bill of lading could be useful to check compliance.

FR informed the stakeholder that she is carrying out a study on evasion that will be available at the end of year. FR underlined the need to take foreign countries on board of an EU instrument to avoid evasion. The Commission pointed out that regional partnerships, such as EuroMed, are helpful in this context.

SE requested further analysis on how much money would be lost because of evasion.

### **List of acronyms and abbreviations**

BIMCO	Baltic and International Maritime Council
CEFIC	European Chemical Industry Council
CESA	Community of European Shipyards Association
CLECAT	European Association for Forwarding, Transport, Logistics and Customs Services
CMIA	Carbon Markets and Investors Association
COM	European Commission.
ECC	European Cruise Council
ECSCA	European Community Shipowners' Associations
EMEC	European Maritime Equipment Council

ESC	European Shippers Council
ESPO	European Sea Ports Organisation
EUDA	European Dredging Association
EUROCHAMBRES	European Association of Chambers of Commerce and Industry
EUROMOT	European Association of Internal Combustion Engine Manufacturers
EUROPIA	European Petroleum Industry Association
FEPOT	Federation of European Private Port Operators
IACS	International Association of Classification Societies
IBIA	International Bunker Industry Association
ICS	International Chamber of Shipping
IETA	International Emissions Trading Association
IMO	International Maritime Organization
INTERMANAGER	International Ship Managers Association
INTERTANKO	International Association of Independent Tanker Owners
NTUA	National Technical University Athens
OCIMF	Oil Companies International Marine Forum
T & E	Transport and Environment
UNFCCC	United Nations Framework Convention on Climate Change
WSC	World Shipping Council

### Participants

National Administrations		
1	BE - Belgium	CLERICK Liesbeth
2	BE - Belgium	MILLE Walter
3	CY – Cyprus	CHRISTOFI G.
4	CY - Cyprus	EFSTRATIOU Ioannis.
5	DK - Denmark	HASSELAGER Lars Olsen
6	DK - Denmark	LODRUP Jesper
7	DK - Denmark	NIELSEN Stefan Krüger
8	DE - Germany	MÖLLENKAMP Sabine Dr.
9	DE - Germany	SÖKER Meike
10	EL - Greece	KOUROUNIOTIS Ioannis Commander
11	FI - Finland	ERIKSSON Lolan
12	FR - France	SIMIU Diane
13	FR - France	BAILLY-MAITRE Marie-Laure
14	FR – France	NIKOV Dimitar
15	LV - Latvia	RIMSA Helena
16	LV - Latvia	OZOLA Liene
17	MT – Malta	CHETCUTI Nathalie
18	MT - Malta	KERR David
19	MT - Malta	MUSCAT David
20	MT - Malta	SAMMUT Christopher
21	NL – part of the NL delegation	DEKKERS Chris
22	NL - The Netherlands	DIJKSTRA Wieger
23	NL - The Netherlands	HASSING Sibrand
24	NORWAY	KROPELIEN Knut F.
25	NORWAY	OFTEDAL Sveinung

26	PL - Poland	BANAS Panel
27	RO - Romania	TARASILA Florin
28	SE - Sweden	KÄGESON Per
29	SI - Slovenia	GASPERIC Matej
30	UK - United Kingdom	PHILPOTT Alex
<b>EU Shipping Organizations &amp; Associations</b>		
31	CESA	BENEDETTI Lanfranco
32	CESA	LÜKEN Reinhard
33	CLECAT	BEUCK Niels
34	ECC	ASHDOWN Rob
35	ECSA	LAFFINEUR Ludovic
36	ECSA	BALSTON David
37	ECSA	LOICQ Benoit
38	ECSA	PLÖTZKE Matthias
39	EMEC	ANDSAGER Charlotte
40	EMEC	ANINK David
41	EMEC	LANCELOTTI Paola
42	ESC	Van der Jagt Nicolette
43	ESC	WIESEHAHN Marco
44	ESPO	MICHAIL Antonis
45	EUDA	MINK Erik
46	ICS	TONGHE David
<b>International Shipping Organizations &amp; Associations</b>		
47	IBIA	ADAMS Ian
48	IBIA	EGAN Charlotte
49	IMO	HUGHES Edmund
50	INTERMANAGER	SORLIE Svein
51	INTERTANKO	FUGLESANG Kristian
52	OCIMF	PROCTOR Cliff
53	WSC	WOOD-THOMAS Bryan
<b>Other Associations</b>		
54	BIMCO	LUND Michael
54	BUSINESS EUROPE	FAURE-FEDIGAN Christine
55	CEFIC	VERLINDEN Jos
56	CMIA	AUSTIN Miles
57	ENVIRONMENTAL DEFENSE FUND	COOPER Jenny
58	EUROCHAMBRES	PAPASHINOPOULOU Mary
59	EUROMOT	ZEPF Paul
60	EUROPIA	CHEVALLIER Franck
61	IETA	MOTTY Monique
62	IETA	WARRIS Anne-Marie, replacer
63	OXFAM INTERNATIONAL	CRAEYNES Lies
64	SEAS AT RISK	LINDSTAD Haakon
65	SEAS AT RISK	MAGGS John
66	SURFRIDER FOUNDATION EUROPE	BRETON Véronique
67	T&E	HEMMINGS Bill
68	T&E	KEDZIERSKI Antoine

69	T&E – Client Earth	O'LEARY Aoife
<b>ACADEMIA</b>		
70	NTUA	PSARAFTIS Harilaos
71	ÖKO-Institut Berlin	SEUM Stefan
Council Secretariat - European Commission – EEA – EMSA - European Parliament		
72	Council Secretariat	VARFIS Katerina-Zoi
73	DG CLIMA	DEBAISIEUX Nicolas, DUGGAN Jill, KIZZIER Kelly, KREMLIS Mariella, MAJOR Mark, MEADOWS Damien, TOVSAK PLETESKI Mary Veronica
74	DG ENTR	HEHN Wolfgang / MITOV Martin
75	DG MARE	VOPEL Ronald
76	DG MOVE	BUTLER Victoria
77	DG MOVE	LESOVICI Roxana
78	EEA - European Environment Agency	VAN AARDENNE John
79	EMSA – European Maritime Safety Agency	LEROY Arnaud
80	MEP Assistant	RAPTIS Sotirios
Guest / Speaker		
81	IHS Global Insight	PALSSON Chris

3<sup>rd</sup> Meeting

---

**REDUCING GREENHOUSE GAS EMISSIONS FROM SHIPS**

**Draft MINUTES OF THE THIRD MEETING OF THE SHIPS WORKING (WG Ships)  
GROUP 6**

**15 & 16 November 2011**

**at the Charlemagne Building and the Management Centre Europe, Brussels**

These minutes summarise the discussions in the third meeting of the ECCP Working Group on ships. The ECCP WG was set up to provide input to the Commission in its work to develop and assess options for the inclusion of international maritime transport in the EU's GHG reduction commitment should there be no sufficient international agreement including these emissions in reduction commitments by the end of 2011. The ECCP brings together relevant stakeholders, to discuss and prepare the further developments of the EU and the modalities of reducing GHG emissions from ships.

This meeting was the last in a series of three two day meetings foreseen to consider a list of topics important to the maritime sector. At this meeting, the possible policy options and the Impact Assessment Study were presented. The meeting also considered the appropriate emission reduction level and the potential for emission reductions in shipping, the question of offsetting, as well as the relevant legal framework. The issue of short-lived climate forcers and the question of how regional action could serve as a platform for broader action were also addressed.

All presentations referred to below are available, as well as a list of organisations represented in the group at : [http://ec.europa.eu/clima/events/0047/index\\_en.htm](http://ec.europa.eu/clima/events/0047/index_en.htm)

These minutes record the views expressed by representatives present at the meeting.

### Introduction and Review of ECCP I and II and IMO Developments at MEPC 62

The European Commission (COM) opened the meeting by providing an overview on the previous ECCP meetings and by outlining the main developments within IMO, in particular the adoption of the Energy Efficiency Design Index (EEDI) at IMO's Marine Environment Protection Committee (MEPC) meeting in July 2011. COM noted that the EEDI was adopted through a vote and that the EEDI in itself did not sufficiently address the GHG emissions from international maritime transport as it only applies to new ships. COM noted that although it considered the ideal solution to be a global solution and therefore would continue to support the progress within IMO on market-based measures (MBM), COM is investing time and effort into developing and assessing options for the inclusion of international maritime transport in the EU's GHG reduction commitment. It was also highlighted that a possible COM proposal tabled next year would have no effect on the ground before 2017/2018 allowing for more time for the development of a global solution. A COM proposal could serve as an accelerator in the IMO discussions.

### Support Contract for EC Impact Assessment

AEA Technology introduced, as the leader of the consortium of the support contract for the EC impact assessment, their methodology and the planning of their work. The launch of the impact assessment process was welcomed by several delegations (DE, ESC, FI). DE stressed the importance of the impact assessment of measures and referred to the inclusion of aviation into the EU-ETS.

ICS, supported by ECSA, called for transparent assumptions. In this context, WSC noted that the MACC curves have to be taken into account carefully. Several precise concerns were raised such as the risk of modal split (ESC, ECSA), the need to take into account the diversified circumstances, such as winter conditions, within the EU (FI), the use of revenues to tackle climate change globally (DE, Oxfam) or to help the sector to reduce its emissions (WSC), the impact on fuel and commodities prices (WSC, IMO) and the consideration of existing regulation on sulphur, NOx and others (ECSA).

The effects of the EU measures globally was stressed by DE, Oxfam and the IMO. DE recommended starting the analysis with the intra-EU option. In addition it may be useful to

analyse in depth only those options which are feasible. The IMO indicated that developing countries might be affected by a regional measure.

AEA Technology pointed out that the model used, TIMES, is a global model that integrate most of the concerns, especially the consideration of existing regulation, the recycling of revenues and the modal split. A methodology to select relevant commodities to be assessed will be set.

COM underlined its openness to discuss with stakeholders the assumptions made for the impact assessment. COM agreed to consider the possibility of involving experts in the impact assessment process.

### Main Policy Options

COM introduced the possible policy options to be analysed in the impact assessment.

BIMCO, supported by NL, SAR, EDF, stressed that the key issue is the effectiveness to address climate change.

All stakeholders indicated their preference for a global scheme. However, all Members states who took the floor (DE, FI, NO, NL, DK, SE) indicated their openness to elaborate and/or discuss a regional measure in parallel with the IMO process with the goal to serve as a basis for or advance a global scheme. The IMO indicated that for some policy options, a regional measure cannot serve as precursor for a global scheme. NGOs (SAR, EDF, T&E) encouraged the EU to take action. ICS, ECSA and Intermanager are not in favour of an EU measure.

Regarding an ETS, some stakeholders (BIMCO) considered the administrative efforts as an issue, whereas NL considered that it is mainly an issue for public authorities. The risk of evasion (BIMCO) was raised. The openness of an ETS was also discussed. Stakeholders (BIMCO) and Member States (DE, EL) considered that a closed ETS would be problematic. DE, SE, NO, UK, IETA, Transport and Environment supported an ETS. UK indicated that they preferred an ETS with 100% auctioning and no earmarking. EL expressed its opposition to an ETS.

Regarding a compensation fund, the issue of setting carbon price was raised by FR. The possibility to raise revenues for global climate change finance was also mentioned (FR). Regarding an industry managed compensation fund, several Member States asked for clarity to identify who will manage the fund (FR, UK). FI, EL supported the compensation fund option.

Regarding mandatory emission reductions per ship, several stakeholders (BIMCO, WSC) considered that there is a risk of stopping trade if the emission of each ship is capped on historical performance. Taking into consideration the efficiency of the ship, such as the one set by the EEDI or the EEOI, is clearly preferred by several stakeholders and Member States (DE, WSC). Regarding the EEDI, CESA indicated that its opposition to apply this on existing ships. The feasibility at the EU level was also questioned (DE, WSC).

Regarding the tax, DE stressed the importance of the legal issues and in particular its compatibility with the energy tax directive. EUROPIA is opposed to any system applying to fuel suppliers.

Several Member States and stakeholders agreed that the responsible entity should be the ship (DE, FI, NO, IMO). However, CE Delft indicated that it is possible to leave this choice open.

Seas at Risks recalled the sensitivity to the maritime sector on the fuel price and called for a range of measures and not only one. They reiterated the preference for speed limits.

EDF, supported by IETA, indicated the need of a robust compliance mechanism.

The IMO stressed that the issue of ships calling once into EU ports should be addressed, such as the flexibility in the design of the scheme. Building a scheme on historical emissions seems to be challenging according to the IMO.

DK underlined the importance of flag neutrality.

COM reiterated its wish to achieve a global agreement in the IMO. In this context, the Commission underlined that, if a proposal is made next year, it will take several years to be implemented at the EU level and therefore the IMO has still time to deliver. Any EU measure will also be fully compatible with international laws.

### Legal Issues

After presentations by the European Maritime Safety Agency (EMSA) and ClientEarth setting out the international legal framework of relevance to the inclusion of international maritime transport in the EU's GHG reduction commitment, no participant underlined a possible incompatibility of the considered policy options with international law. Some were of the view that all considered policy options could be designed in a manner that is compatible with international law (T&E, DE, CY, WSC). DE pointed out that DE had analysed possible legal issues as well as the opportunities and barriers created by international law to a global MBM before making an ETS proposal to IMO and that preference should be given to the option that is most environmentally effective whilst being legally compatible. DE also remarked that parts of the Advocate General Kokott's Opinion in case C-366/10 on the compatibility with international law of the inclusion of aviation in the EU ETS were of relevance for shipping. Finally, DE insisted that the role of bilateral agreements with third countries on shipping also had to be considered.

When questioned why they preferred a "port entry"-based measure, ClientEarth responded that in terms of scope, port-entry raised less legal issues than a system based on distance or time for reasons of proportionality, although the evasion risk was lower in a distance/time-based scheme. ClientEarth also clarified that outgoing ships could be covered by a "port entry"-based scheme if allowances had to be surrendered on an annual basis by the ship, as liability would arise the next time the ship would return to the port.

The Commission's Legal Service highlighted that under UNCLOS and WTO law, continuous international efforts to reach agreement should and are being undertaken. Moreover, the Legal Service recalled that a future EU measure should be compatible with a system adopted at international level. Any risk of double regulation could be more easily avoided in a "port entry"-based scheme than in a scheme based on distance or time.

### Generating Offsets through a Sector Based MBM/Access to Reductions in Other Sectors – International Credits

Several Member States and stakeholders stressed the need to strike the right balance between in-sector and out of sector reductions/offsetting. DK, ICS and WSC highlighted a perceived need for offsetting to enable the shipping sector to achieve its reduction targets cost-effectively, as there might be technical and operational limits to the reductions that are possible in the shipping sector. Others emphasised the wish to limit offsetting to encourage in-sector reductions (DE, SE).

### Level of Reductions

The EC introduced a synthesis of the studies made on MACC curves in perspective of the EU objectives, followed by a presentation of DNV on the possible level of reduction achievable in the maritime sector and a presentation by ECSA on what the sector can deliver.

ECSA indicated that the shipping sector is committed to reduce its GHG emissions. However, shipping is the servant of the world trade and is the most effective mode of transport. ECSA recognised that the work in the IMO has been slow due to its political background. A reduction of 50% by 2050 compared to 2005 is achievable, as well as a relative reduction of 20% by 2020 compared to business as usual. To this end, EEDI and SEEMP are not sufficient. Regarding global climate change finance, the shipping sector will contribute, but it should not be the only one. ECSA also stressed the risk of modal split and evasion in case of regional measure. ECSA also indicated that the majority of ship owners is in favour of a global compensation fund.

The issue of market barriers was raised by several participants (CE Delft, DE).

Regarding the EU objectives, DE recalled that the Council objective was made in the context of Copenhagen and stated that for shipping a cap of – 50 % until 2050 compared to 2005 levels might be feasible.

Regarding the risk of modal split, SE considered that will not happen in most cases, as road and rail are facing similar pressure. SE, supported by ECSA, called for incentives to support the maritime industry to overcome market barriers.

The IMO stressed that the EU emissions reduction is linked to the delocalisation of its industry to other parts of the world and therefore the increase of emissions of the shipping sector may be linked to this development.

CESA, supported by EMEC, stressed that, even if shipping is the most effective mode of transport, the current fleet is not efficient and, taking a lifecycle approach, 97% of CO<sub>2</sub> emissions of a ship is emitted during its operation.

EMEC noted that even though shipping is the most efficient way of global transport – emitting about 4 % of the global CO<sub>2</sub> emissions, transporting in excess of 95% of global transport – there is room for improvement; the most effective driver is cost saving through energy/fuel saving.

WSC stressed that ship operator have a limited leverage over the ship design.

#### Short Lived Climate Forcers

Transport and Environment made a presentation on the work they have done on short lived climate forcers. The IMO informed that work has begun on this issue at the global level. Several participants recalled that existing regulation have an impact on black carbon, such as the EEDI (ICS) and the sulphur rules (SE). DE indicated that we already have a good enough knowledge of black carbon to know that it is a concern.

#### Market Barriers

COM highlighted that different studies undertaken by the IMO, DNV, CE Delft and IMarEST had revealed the great potential to reduce GHG emissions from shipping at low or negative abatement costs. Nevertheless, GHG reduction measures are not being taken up widely by the industry, possibly due to market barriers to the introduction of abatement solutions.

Following a presentation by Maddox Consulting outlining their intended workplan to conduct a COM-financed market barriers study, SE encouraged Maddox Consulting to also consider parallels in other sectors such as market barriers to eco-driving in long-distance

truck freight/road voyage. BIMCO considered that market barriers related to the questions of who is the owner, who pays the fuel bill and who benefits from the measures, as well as the fact that retrofitting is expensive. CESA assumed that behavioural market barriers were of greater importance than technological market barriers and proposed the development of criteria to be taken into account by banks when deciding whether to finance ships.

EMEC asked the question as to how the maturity of the technologies to be studied by Maddox Consulting will be measured. This needs to be considered carefully as many of the longer term technology developments which have a large potential to reduce GHG emissions are relatively immature and may not be available for widespread use in the timescales assumed in many forecasts.

ICS expressed concerns about the study being too generic and preferred targets being imposed on the industry rather than measures/solutions.

ECSCA emphasised that surveys undertaken by the Danish Shipowners' Association had revealed that measures to reduce GHG emissions in the maritime transport sector are being taken up and said that the relevant data was publicly available on the website of the Danish Shipowners' Association.

IMO said that in an ideal MBM, part of the revenues generated through the measure should go back to the industry as in the MBM proposal by Japan to IMO since this would lead to the fastest emission reductions. Making part of the revenues available for R&D and for improving port and sea infrastructure in developing countries could also lead to reductions, while a general compensation scheme for developing countries might not result in (fast) reductions from the shipping sector. CESA stated that it would only be possible under a regional and not an international scheme to return all revenues to industry and that the most important emission reductions were possible in a system in which 100% of the revenues would go back to the industry.

#### Regional Action as a Platform for Broader Action

For a possible EU measure to be perceived as successful by COM, it would have to stimulate other states, regions and international organisations (IMO and UNFCCC) to adopt measures to reduce emissions from the shipping sector.

Several Member States and stakeholders insisted that for a possible EU measure to serve as a platform for broader action, it would have to be compatible with international law (NO) and promote IMO action (ES, FR, NL, NO). NL noted that the COM/EU would have to be active in the IMO debate to ensure compatibility with possible IMO action. Some participants argued that the EU system/systems would also have to allow for gradual linking with other compatible systems (FR) and that close cooperation, in particular with neighbouring states, was essential to avoid evasion (FR, SE). T&E considered the use of part of the revenues generated by the EU measures as crucial to promote broader action and FR suggested using some of the revenue to encourage linking and cooperation with neighbouring states. It was also highlighted that good communication was crucial to support broader action (NL, SE). ECSCA noted that a COM proposal could help the EU to speak with one voice in future MBM debates within IMO and thus positively contribute to the IMO discussions by helping narrowing down the MBM proposals.

SE insisted that to facilitate expansion of the regional system to other states/regions it might be better to keep the shipping scheme separate from the existing ETS.

### Summary and Close of ECCP Process

COM closed the ECCP process by thanking all Member States and stakeholders for their valuable contributions, which will be taken into consideration by COM in its future work on the inclusion of international maritime transport in the EU's GHG reduction commitment. Stakeholders can provide further input through written submissions or by participating in an online consultation on "Your Voice in Europe".

COM highlighted the consensual view that a global solution to tackle GHG emissions from maritime transport was the preferred option. It is COM's intention to continue being closely involved in the IMO process and to engage with neighbouring countries and other third states. COM stressed the existing obligations under EU legislation, requiring COM to act on maritime emissions. A proposal for including maritime transport emissions in the EU's GHG reduction commitment is foreseen in the Commission Work Programme for 2012. COM stressed that a proposal tabled next year would not be likely to have effects on the ground before 2017/2018, leaving considerable time for global action to be taken forward. A future COM proposal would address issues of distortion of competition and evasion, be compatible with international law and strike the right balance between in-sector reductions and offsetting. Any EU action should serve as a platform for broader action.

IMO invited COM to submit the outcome of relevant studies to pertinent IMO bodies as they could be useful also in the context of global regulations.

ANNEX V - PARTICIPANTS AND CONCLUSIONS FROM THE TECHNICAL WORKSHOP HOLD BY **AEA**  
**TECHNOLOGY IN LONDON ON 9 MARCH 2012**

- **Delegates:** 17 participants attended:
- Antoine Person, LDA (ferries)
  - Didier Vandeveld, MSC (containers)
  - Julien Topenot, CMA-CGM (containers)
  - Paul Altena, Speilthoff (bulkiers)
  - John Rogan, Shell (tankers)
  - Robert Ashdown, European Cruise Council, on the behalf of Tom Strang, Carnival (cruise)
  - Eija Kanto, Finnish shipowner association
  - Sara Skold, Clean Shipping Index
  - Fabien Becquelin, ShortSea on the behalf of Jean-Louis Cambon, Michelin (shippers)
  - Jorgen Clausen, DK Group (equipment manufacturer)
  - Ernst Karchhasrt, Siemens (equipment manufacturers)
  - Robert Derksen, Swiss Climate (service provider)
  - Herman-Josef Mannes, Meyer Werft (shipyard)
  - Jan Huebner, Germanisher Lloyds (verifier)
  - Didier Chaleat, Bureau Veritas (verifier)
  - Geir Hoybe, NOx Fund
  - Andreas Arvanitakis, Point Carbon (ETS expert)
  - Edmond Hughes, from the IMO
- **Summary of discussion on policy options**

*Emissions trading*

---

**Enforcement** Regarding enforcement measures, the escalation to detention of a ship was highlighted that this would incur a cost to Port Authorities, particularly if the owner chose to abandon the ship. Denial of entry is considered a strong measure. Delays to a ship would generate huge costs.

There is competition between ports and a need for a level playing field. In the case of an operator with a large fleet, it was asked whether it would be appropriate to detain any ship in that fleet.

**Level of the penalty** It was suggested that penalties should take several factors into account, including whether non-compliance was intentional, and the level of non-compliance. One suggestion was that port fees could be differentiated such that a discount is awarded to ships that are compliant.

**Conclusions** Maritime experts agreed that penalties should be scaled in proportion to the level of non-compliance. This could be enforced through differentiation of port fees. Additional consideration would need to be given to determine the level of underreporting that would trigger penalties.

Whatever the option, it was suggested that the compliance could be ensured thanks to a compliance certificate held on ships.

### *Mandatory compensation fund*

---

**Membership** It was felt that the fund should have open membership. Given the dynamic nature of the industry, it would be helpful to have some flexibility over membership. It was questioned as to whether the membership should be owner-specific or ship-specific. The length of membership was also discussed – from the point of view of the industry, a period of 5-8 years is considered to be long, but it was also recognised that periods of this length would be needed to produce meaningful emission reduction targets.

**Penalties** In terms of appropriate penalties, the system used in the Norwegian NOx fund was offered as a possible solution. Companies are obliged to pay a form of tax if they miss their targets by a certain threshold (e.g. 10%). However, it was suggested that the system currently proposed by the project team (in the background document, i.e. the payment of a refundable deposit) for the CO<sub>2</sub> regulation could be easier to manage, given the much larger number of ships that would be involved.

It would be important for tax/port authorities to police the systems, so it is not up to the Fund to enforce measures. This allows the Fund to concentrate on emission reductions. The money would go to industry but they would have to report to an authority. However, there would need to be an EU regulation to confer this power; at which point, it could be argued that it would not be an industry-only scheme.

**Payment into the Fund** The idea of a returnable deposit received some support – if the deposit were set lower than the obligations imposed on those outside of the system. It was felt that the level of membership fee should be low, although this would reduce the size of the fund. Another suggestion was for a basic rate of membership, but with optional incentives that could be selected, or a form of bonus/malus

**Conclusions** The Norwegian NOx fund was felt to be a good model; however, careful considerations would be needed if expanding to an EU-level measure, as the number of ships would be much greater.

### *Industry managed compensation fund*

---

**Discussion of competent authority** The idea of existing industry associations was suggested (e.g. BIMCO, INTERTANKO). However, these associations would not capture all vessels, so there would need to be a default fund for vessels that were not represented. Giving a mandate to EMSA to play the role of competent authority was also suggested.

The importance of good communication to stakeholders about the different options was highlighted.

It would be important to give Funds the right to evict members who are not complying.

**Conclusions** In general the idea of the industry-managed fund is considered to be the best option by many of the maritime experts.

The idea of funds by type of vessel was viewed positively by most experts. However, the way that targets would be set would have to be considered carefully.

Some calculations would be needed to work out the relative size of the Funds, and whether they would have large enough membership to generate significant revenues.

### *Mandatory emission reductions*

---

**Indicator** Maritime experts pointed out that a good indicator would allow efficient ships to differentiate themselves and allow best practice sharing. This would only be possible through transparency.

A product called the “Eco toolbox” to manage all environmental aspects e.g. water ballast, cargo etc. was discussed. It has had positive effects on operational efficiency when used in the container sector. However, it could be very difficult for the existing world fleet to rely on these measures.

It was pointed out that the EEDI does not apply to all ships. The EEOI was not considered to be a feasible indicator as it would not work for tramp shipping because have no control over their EEOI. It was generally agreed that the EEOI cannot form a reliable indicator for the shipping sector.

**Conclusions** Maritime experts were of the opinion that there is no indicator that could be applicable to the shipping sector. They felt that this option would not be feasible.

### ➤ Administrative aspects

**Fuel measurement technologies** The only existing mandatory instrument to measure fuel supply is the bunker delivery note. Many schemes advocate the use of it, but over time other measures could be introduced. Even the bunker delivery note would be inaccurate as it wouldn't take into account measures onboard. Maritime experts pointed out that not every ship has a flow meter (even if, the largest the ship is, the most they have a flow meter), and they need to be calibrated accurately to the fuel type. This would impact the cost calculations. It would be possible to detect gross mis-reporting through use of several different measures.

There would need to be some back-up system for all circumstances – for example, if a ship's flow meter broke.

Monitoring using a particular recommended technology could be voluntary for an introductory period, during which incentives would be offered to ships that fit this technology. However, there is a risk that ships will have to pay twice if a global system comes into force that was to require a different technology.

Uncertainties would be smaller for big companies (<2%), whereas smaller operators would have lower accuracy. Manual measurements are not reliable either. There are no international standards.

The IMO cited some data on ship thresholds: ships >5,000 GT = 22,000 vessels, and would account for 99% of vessels. For ships >2,000 GT would account for 96%

**Administrative burden** It was suggested that it would be difficult to ask the crew to do additional tasks because they already have a high workload. In general, the view was that it was possible to monitor fuel consumption, and it would not place undue additional burdens on the crew. The regional scope would add some complexity. There was much discussion about sophisticated electronic monitoring that is currently in use of larger/modern ships. With respect to smaller ships, it could be possible to amend the oil record book to reflect how much fuel consumption occurred within the scope of the scheme. Every ship must have an oil record book and the data quality is very good. There are particular codes for different operations. Another line could be created with a new code that indicates when a ship enters the scope, and another line that records when it leaves. Based on this data it would be possible to calculate the amount of fuel consumed in the EU. However, there are still issues that would need further consideration, such as who would control its application and ensure correctness.

Some maritime experts felt that the public sector should pay for the verification, and the industry should not bear the cost of this.

**Verification** In terms of verification, it was felt that auditors should be able to certify the *processes* used to monitor fuel consumption, and that this could be done in the back offices. In some cases, it may be necessary to board the ship, but that would be possible as it is already done (e.g. low sulphur regulations). It was suggested that class societies would be able to approve monitoring plans. At a high level it would be possible to use AIS data to check consistency and plausibility of reported emissions.

**Monitoring guidelines** In terms of defining monitoring guidelines, it was recommended that a matrix should be created that identifies the pros and cons of each technology for each sector. It could be better to have a common methodology to ensure uniformity, otherwise ships would use the method that gives them the least emissions.

**Conclusions** The cost for larger vessels would be a much smaller percentage of overall costs. If the IMO figures are correct, then it makes sense to focus on larger ships, who would find compliance easier in any case.

Focussing on larger ships initially would also allow the rest of the sector to learn.

➤ **Other business**

- Freight rates are very sensitive to competition
- Stakeholders pointed out that the fuel prices presented by the project team are based on a very old source and that the figures for 2010 are not accurate.
- The prices of MDO/MGO will increase in the future.
- In general, it was felt that the fuel prices were rather low
- It is expected that the sulphur regulations are more likely to be realised in 2025, rather than 2020
- LNG as a retrofit was not considered to be a feasible option at present. If it does penetrate the fleet it would probably happen only gradually
- Prices of fuels are different in different regions of the world
- The elasticities also vary by region. It is very difficult to come up with reliable figures.

## ANNEX VI - METHODOLOGY FOR MODELLING

### 1. GENERAL ASSUMPTIONS

If bunker fuel sold in the EU was considered, there would be a gap between the volume of bunker fuel sold in the EU and the volume of bunker fuel consumed on EU routes. As the purpose of the measure is to address EU GHG emissions of ships, the environmental, social and economic impact assessment is based on bunker fuel consumed. Considering the bunker fuel sold in the EU will not lead to an exhaustive assessment of the impacts of GHG emissions of ships in the EU (e.g. a ship calling into the EU ports will have an impact on EU local air quality, even if it purchased its fuel outside of the EU), but it can trigger impacts outside of the EU. However, the administrative burden and the risk of avoidance of an internalisation of climate externalities based on bunker fuel sold in the EU are nevertheless duly assessed.

The assessment of the impacts has been estimated considering the compliance entity is the ship. The measure intends to have a direct effect on CO<sub>2</sub> emissions from ships. However, other compliance entities may be chosen triggering an indirect effect on CO<sub>2</sub> emissions from ships, which may mitigate the impacts mentioned hereafter.

### 2. GENERAL ASSUMPTIONS OF THE BASELINE SCENARIO<sup>13</sup>

The baseline scenario was established according to a trade model, the IHS Global Redesign Scenario, integrating strong underlying assumptions related to interalia geopolitics, monetary issues, environmental issues or economical policies. In particular the global redesign scenario is considering:

- Strong, sustainable expansion in emerging markets.
- Monetary policy gradually adjusted in line with growth prospects. Asia starts tightening first, followed by the United States and Europe/Japan.
- Inflation is kept at bay.
- Large developed economies adopt measures to reduce budget deficits.
- After shrinking in 2009, US trade deficits widen again.
- As consumer demand expands in emerging markets a process of global rebalancing begins.
- Trade liberalization continues, but troubled by occasional disagreements and conflicts.
- US dollar depreciates mostly against emerging markets currencies, especially the renminbi.
- By 2030 China's economy accounts for a significant share of global trade, including key commodities and manufactured goods.
- The relative change in real GDP per capita is much quicker in the emerging markets than in the developed countries.

Figure 1 illustrates the compound annual growth rate (CAGR) of the developed world (US, W Europe, Japan) in the 20 years leading up to the great recession. The CAGR was 2.3%. In the Global Redesign scenario the CAGR for the years following the recession up to 2030 is forecasted to be lower, 2.1%.

---

<sup>13</sup> Source: IHS Fairplay, 2012

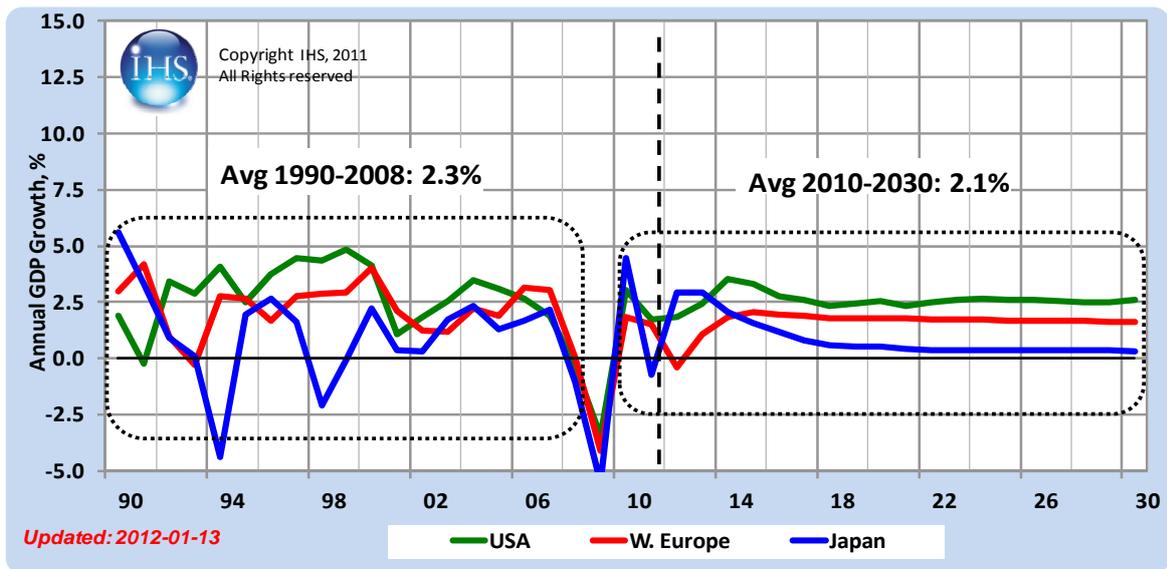


Figure 1: GDP growth in the developed regions

Figure 2 shows how the CAGR for three of the leading emerging market economies is expected to be lower in the forecast years compared to the two decades before the recession.

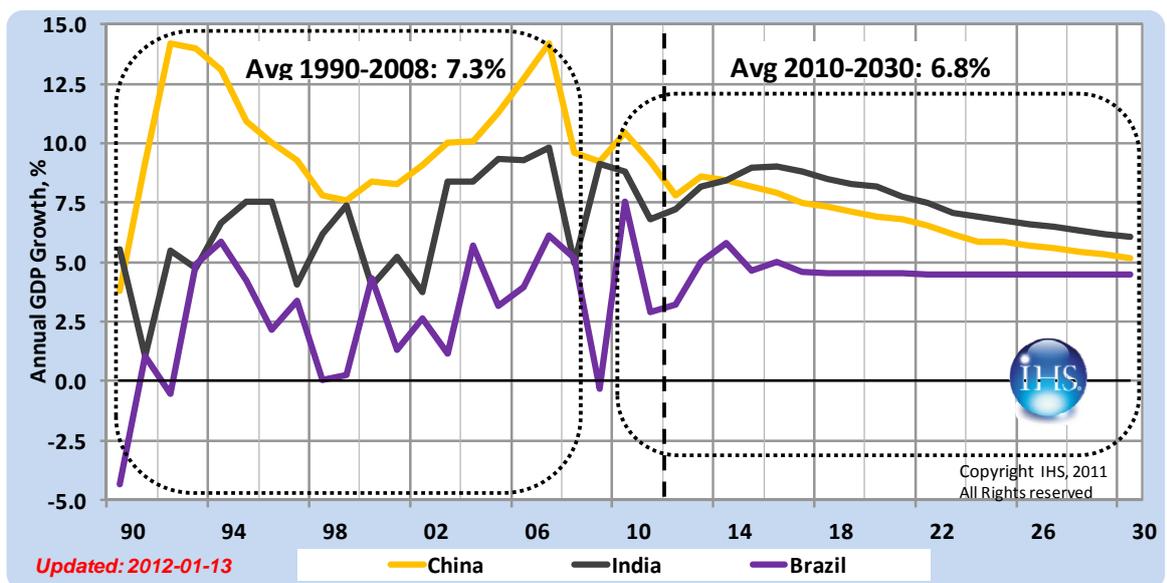


Figure 2: GDP growth in key emerging markets

As a result the world total CAGR for GDP increases as displayed in Figure 3. This is a consequence of the still higher growth in the emerging markets which gain market share each and every year and thereby lifts the world total. Figure 4 shows the absolute numbers behind the development, where the share of the world GDP of the Asian emerging markets continuously increases over the period on the expense of the developed regions' share.

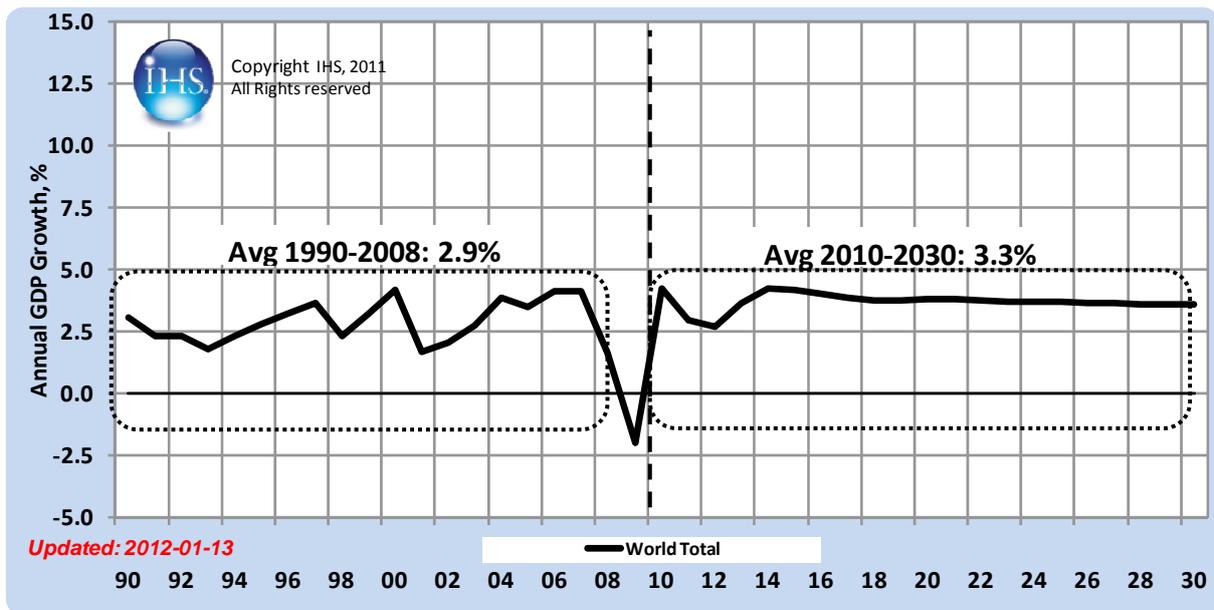


Figure 3: Global GDP growth

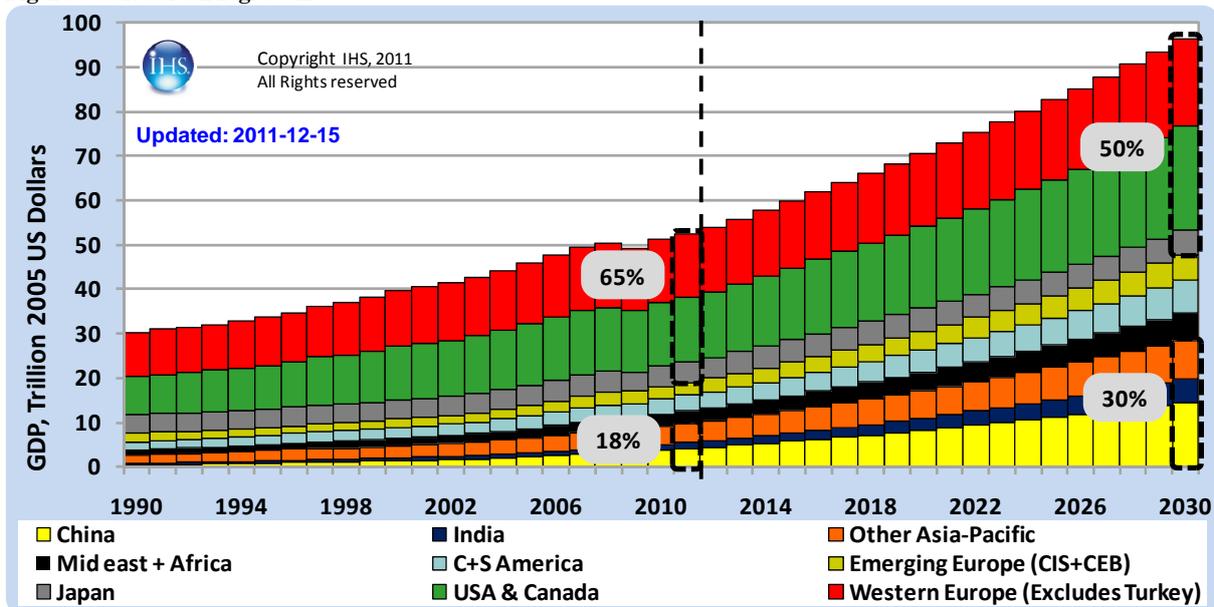


Figure 4: Global GDP, trillion 2005 US dollar

### 3. DESCRIPTION OF THE MODEL

#### 1. Overview

From a model perspective, the key points of interest relate to the costs of policy options, the emissions abatement profile over time, and the cost effectiveness (Euro per tonne CO<sub>2</sub> abated) of taking action in this area. Additional areas of interest include the extent to which shipping routes may change in response to policy action, the potential for modal shift as a policy response, and the extent of in-sector abatement versus out-of-sector abatement. AEA Technology, who provided support for the impact assessment, developed a model based on the TIMES model architecture. This model is built on three

building blocks: (i) a representation of shipping activity, (ii) a representation of vessels and (iii) cost assumptions.

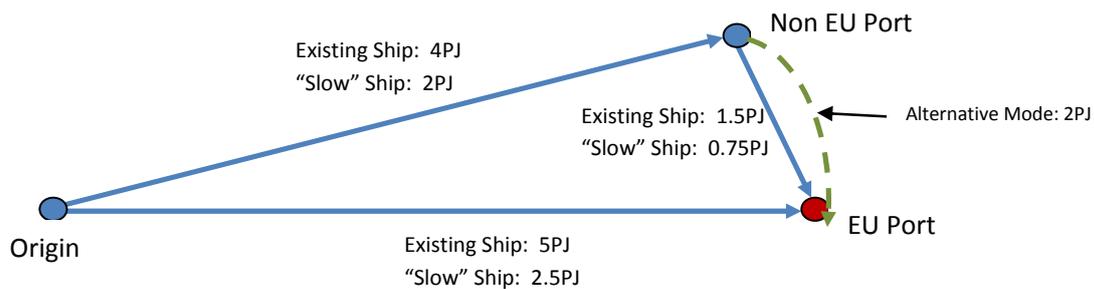
## 2. Representation of shipping activity

The model integrates the available routes into/out of Europe and available technological and logistical choices to 2050. Key amongst these are:

- the ability for ships to stop at a port just outside the EU,
- the ability to divert freight to alternative modes via a port just outside the EU, or for intra-EU trade,
- the possibility for technology change in the shipping fleet (i.e. new ships and/or efficiency measures).
- the option for ships to slow down and thus reduce emissions.
- the possibility for fuel switching in the shipping fleet.

Therefore, in addition to standard TIMES energy system model functionality, a network model is required depicting the various routes and modes for goods currently shipped into and out of Europe. The model includes the flexibility to switch between these routes and modes.

**Figure VI.5: Hypothetical Network & Technology Model Showing Routes of Fuel Consumption<sup>14</sup>**



Trade data for cargo categories, including historical data and projections up to 2050 were provided by IHS World Trade Service. Extra-EU data was available by the region of trade and commodity type.

The regions within the TIMES model were defined according to those used by the IHS World Trade Service to report the trade data. There are two EU regions: EU Northern/Baltic and EU South/Mediterranean, and 13 extra-EU regions. Distances between regions were defined in order to calculate fuel consumption on each route. For this purpose, a representative port was defined in each extra-EU region, and two ports for each EU region. The distances in nautical miles were calculated between these representative ports using <http://www.portworld.com/map/>.

For each origin/destination pair (e.g. "Demand of North African crude oil in EU South"), one or two types of movements are defined. One of them is direct movement, e.g. from supply to demand region. The other type of movement defined is one that assumes a stopover on the way to/from Europe. In this case, a ship is assumed to stop in Port Said or Casablanca on its way to/from Europe. The CO<sub>2</sub> emissions are split to represent the two journey legs. Only one movement type is defined for shorter routes, such as Intra-European trade.

<sup>14</sup> Note: "Slow" ships require double the capacity of the existing fleet to serve an equivalent demand

The TIMES model can allow for modal shift of cargo on intra-EU journeys. The costs are sourced from the DG Environment-funded project from 2010 entitled COMPetitiveness of EuropeAn Short-sea Shipping (COMPASS) report.

### 3. Representation of vessels

A summary of ship sizes/types is shown here. For each of these categories of ships, several parameters, such as daily financial costs, daily operational costs, fuel consumption, CO<sub>2</sub> emissions per tnm, etc. were defined

**Table VI.1: Summary of ship sizes and types**

Type	Size
Dry Bulk	Dry bulk Capesize 120'+
	Large Dry Bulk carrier (80' +)
	Medium Dry bulk carrier (35' - 85')
	Small Dry Bulk carrier (<35')
General Cargo	General Cargo 15'++
	RoRo 35'-++
	GEN long avg of GEN 15'++ and RoRo 35' ++
	RoRo 15' - 35'
	GEN short avg of GEN 0-15' and Reefer 0-15'
Container ships	Container 8500 TEU +
	Container 5500 - 8500 TEU
	Container 2000-5500TEU
	Containers 1000-2000TEU
	Container 0 - 1000 TEU
Oil (and product) tankers	Crude oil tanker 120'++
	Crude oil tanker 120' + , Product tanker 75' +
	Crude oil tanker 75-120', products 15-75'
	Crude oil tanker 0-75'and Products 0-15'
Liquid bulk (Chemical, LNG, LPG tankers)	Chemical 40'-++, LNG 60'++

Type	Size
	Chemical tanker 40' ++ and LPG 45'++
	Chemical tanker and LPG 15-40'
	LNG tanker 0'-15' and Chemical 0 - 15'
Passenger vessels	Ships carrying up to 1000 passengers

Source: size thresholds based on categories used in data provided by Marintek, IHS and IMO sources

#### 4. Cost assumptions

##### *Abatement technologies*

A range of possible emissions abatement options (technological and operational) have been identified and included in the modelling framework. The investment costs, operational costs and CO<sub>2</sub> reduction potentials of the abatement technologies were sourced from MEPC 61 INF. 18<sup>15</sup>, an IMO-funded study on the reduction of GHG emissions from ships. These costs are variable depending on the ship size and type. Changes were made to the data sourced from MEPC 61 INF.18 in only three areas: speed reduction, optimisation of hull & superstructure (new ships), LNG costs (investment cost and operational cost), as updated data were available from Marintek.

##### *Fuel types and costs*

A generic maritime fuel was assumed to be used in existing cargo ships, rather than defining ships that run on residual fuel (HFO) and distillate marine fuel (MDO/MGO) separately. This assumption was used in order to keep the model compact and facilitate the interpretation of results. A new alternative technology is included in future years, i.e. ships that use liquefied natural gas (LNG) as fuel.

Wholesale fossil fuel price projections were sourced from the PRIMES model crude oil price and natural gas price projections developed for the Commission's 2011 Energy Roadmap (as obtained from the EC). There are three price scenarios: Reference, Current Policy Initiatives, and Decarbonisation. While the prices under the Reference Scenario and Current Policy Initiatives are similar in the years 2010 and 2015, the Decarbonisation Scenario projects significantly lower fossil fuel prices throughout the time horizon.

All three of the PRIMES crude oil price projections were used as the basis for developing price projections for maritime fuels. The impacts of sulphur regulations on prices were calculated using results from the Purvin & Gertz (2009) report to the Commission on the impacts of IMO fuel specification changes and included in the fuel price scenario.

<sup>15</sup> [http://www.rina.org.uk/hres/mepc%2061\\_inf\\_18.pdf](http://www.rina.org.uk/hres/mepc%2061_inf_18.pdf)

**Table VI.2: Maritime bunker fuel price projections (EUR/tonne)**

	2010	2015	2020	2025	2030	2035	2040	2045	2050
Reference (Central prices)	328	375	606	710	755	808	861	909	977
Current policy initiatives (CPI)	386	418	636	745	791	847	903	954	1024
Decarbonisation	328	373	548	575	539	539	533	520	512

The CPI scenario was used as a reference for the impact assessment, as it reflects the current policy initiatives scenario.

#### *Administrative costs*

Additional administrative costs included in the model assume a minimum of five days investigation time (at €500 per day), with additional costs of 5% of the investment cost of the measure.

#### **4. IN-SECTOR REDUCTION TRAJECTORY**

It has been analysed how to achieve the objectives defined in the White Paper on Transport, namely a 40% reduction in GHG emissions by 2050 compared to 2005, through only action within the maritime sector. It has been assumed for this trajectory that the sector has no access to “flexibilities” such as the possibility to substitute in-sector emission reduction by purchasing offsets (carbon credits) or emission allowances (EUA). This trajectory could be achieved by setting up a closed ETS for the maritime sector only.

International fossil fuel price assumptions do not presuppose significant global climate action and thus follow global baseline projections, i.e. 791€/t by 2030 and 1024€/t by 2050.

The trajectory was set by trying to minimise cost subject to the constraint of the in-sector emission reduction of 40%. The results show emissions reduce from 2015 onwards, reaching -10% by 2030 compared to 2005.

**Table VI.3: In-sector reduction trajectory**

	2015	2020	2025	2030	2035	2040	2045	2050
Business as usual	199	210	217	223	233	244	255	271
Reference in-sector reduction trajectory for the Impact Assessment								
In-sector reduction trajectory	199	195	184	176	162	145	131	119
Reduction compared to 2005 emissions	2%	0%	-6%	-10%	-17%	-25%	-33%	-40%

*Source: AEA Technology 2012*

It is worth to recall that if the domestic GHG reduction milestones of the Roadmap for Moving to a Competitive Low Carbon Economy in 2050<sup>16</sup> are achieved, demand for fossil fuels in the EU may be reduced significantly, reducing also the need for shipping these fossil fuels. To illustrate the possible impact of reduced demand for shipping, a sensitivity analysis was carried out assuming that the same in-sector reduction trajectory is applied. The reduction of transport activity due to decreasing shipping of fossil fuels necessarily leads to higher emissions reductions than the reference in-sector reduction scenario mentioned in table VI.3.

**Table VI.4: Sensitivity analysis assuming a decarbonisation of the EU economy**

	2015	2020	2025	2030	2035	2040	2045	2050
In-sector reduction trajectory	199	190	176	167	152	134	119	109
Reduction compared to 2005 emissions	2%	-2%	-10%	-14%	-22%	-31%	-39%	-44%

*Source: AEA Technology 2012*

Moreover, a sensitivity analysis was carried out assuming that administrative costs related to the uptake of technology were higher than 5% of the investment cost of the measures. A threshold of 10% was chosen. However, this increase did not lead to a significant change in the uptake of technology: the CO<sub>2</sub> emissions remain similar to the internal optimal reduction trajectories, even if the total costs increase by 0.04%.

A sensitivity analysis was also carried out assuming low bunker fuel prices, which is associated with a global decarbonisation scenario.

**Table VI.5: Internal optimal reduction trajectories according to different fuel prices**

		2015	2020	2025	2030	2035	2040	2045	2050
Emissions (MtCO <sub>2</sub> )	High fuel price	199	195	184	176	162	145	130	119
	Low fuel price	199	197	187	180	168	147	132	119
Reduction compared to 2005	High fuel price	2%	0%	-6%	-10%	-17%	-25%	-33%	-40%
	Low fuel price	2%	1%	-4%	-8%	-14%	-25%	-32%	-40%

*Source: AEA Technology and others 2012*

The in-sector reduction trajectory is not expected to vary significantly, even if the emission reduction may be delayed. Regarding the costs, even if there is a significant difference (around 7%) between the total costs of the in-sector reduction trajectory using high fuel prices and low fuel prices, this

difference is mainly due to fuel costs. Indeed, others costs do not vary significantly (less than 1% difference for investment costs and even lower for operational costs). So, the impacts on policy options assessed should not significantly differ regarding fuel prices.

## 5. SCENARIO ASSESSED

The policy analysis only considers the time period up to 2030 to look at concrete policy proposals. Taking into account the in-sector reduction trajectory to achieve the long term goal of -40% by 2050, a reduction goal of -10% is set for 2030 to assess the different potential policy instruments to achieve such a goal.

The modelling simulates two types of policy instruments, i.e. a levy and an emission trading system (ETS). Any policy option assessed, except the option on monitoring and reporting based on fuel consumed (option 2), can be linked with these policy instruments. In particular, due to similar mechanisms, the contribution based compensation fund was assessed considering a levy with full recycling on revenues and the target based compensation fund was assessed based on an ETS with full auctioning and full recycling of revenues. The option on monitoring and reporting based on fuel consumed was assessed using academic studies, in particular the Maddox study, and stakeholder consultations.

The impacts associated with different levels of the levy are assessed. For the ETS the impact of a stand-alone system or a system linked to other trading systems is assessed, assuming different options for free allocation and auctioning.

The scenarios that look at impacts of different policy instruments up to 2030 apply a number of assumptions in order to allow results to be compared:

- The assessment of the impacts of the internalisation of climate externalities is based on the assumption of no evasion or avoidance of the system, as any regulation must be designed in such way to minimize avoidance.
- Private discount rates are applied and the model assumes efficient implementation of possible mitigation options, with no market barriers.
- Global oil prices are as listed in table VI.2
- Shipping of fossil fuels is not reduced due to climate action in the EU.

The model is a partial equilibrium model focused on the shipping sectors. Therefore macro-economic impacts, including potential double dividend benefits from raising revenue through auctioning or a levy are not estimated in this model.

The results focus on the impacts on the costs of shipping itself. For options that include a certain amount of free allocation, it is assumed that ship operators will not incorporate the opportunity costs of these free allowances in its price setting. This specific assumption therefore might underestimate the cost increasing impact on shipping prices and underestimate the windfall profits that might materialise for shipping operators if free allocation is applied.

### 5. Levy

Three scenarios were assessed based on the level of the levy:

- Internal reduction scenario: A level of levy that would ensure that emissions reduce by 10% by 2030 within the shipping sector

- Levy high ETS prices: A level of levy that corresponds to the carbon prices required achieve the 2030 milestone from the 2050 Low Carbon Economy Roadmap<sup>17</sup>.
- Levy low ETS prices: A level of levy that corresponds to the carbon prices with no additional action on climate change in the EU beyond policies already implemented<sup>18</sup>.

The table below shows the level of the levy marginal abatement costs of achieving an emission reduction of 10% by 2030 compared to 2005.

**Table VI.6: Level of levy considered**

(2010 prices)	2020	2025	2030
Internal reduction scenario <sup>19</sup>	19.73	137.62	470.61
Levy high ETS prices	25.0	34.2	50.9
Levy low ETS prices	9.13	21.37	35.55

If all emissions are reduced internally, carbon prices would need to increase considerably, to levels above € 400 by 2030. It does not appear economically efficient for the level of the levy to be set at such level, as the marginal abatement costs of other sectors is likely to be lower (e.g. 50.9€/tCO<sub>2</sub> considering the EU ETS prices in case of a step up of ambition in line with the 2050 Roadmap). In other words, this demonstrates that the in-sector reductions in line with the cost-effective reduction trajectory of the economy as a whole (as shown in the Low Carbon Economy Roadmap) would be lower: at around 5% by 2030, as opposed to the 10% in-sector reduction in line with the reference trajectory mentioned in table VI.3.

**Table VI.7: Comparison between the level of the levy and the emissions**

		2020	2025	2030
Emissions (MtCO <sub>2</sub> )	Levy low ETS prices	194,2	185,9	186,7
	Levy high ETS prices	193,9	185,7	186,4
	Internal reduction scenario	194,8	180,8	176,1
Reduction compared to the baseline	Levy low ETS prices	-7%	-14%	-16%
	Levy high ETS prices	-7%	-15%	-17%

<sup>17</sup> The carbon prices used are those equivalent to the low carbon scenario in SEC(2011) 288 final (Table 31), achieving 80% reductions in the EU by 2050, using effective technologies with fragmented global action on climate and reference fossil fuel prices.

<sup>18</sup> The carbon prices used are those equivalent to the reference scenario in SEC(2011) 288 final, assuming policies at EU and national level already implemented, with fragmented global action on climate and reference fossil fuel prices. These carbon prices would see emission only reduce by 40% by 2050, well short of the -80% as projected in the 2050 low carbon Roadmap scenarios.

<sup>19</sup> AEA Technology and others, 2012

	Internal reduction scenario	-7%	-17%	-21%
Reduction compared to 2005	Levy low ETS prices	-1%	-5%	-5%
	Levy high ETS prices	-1%	-5%	-5%
	Internal reduction scenario	0%	-8%	-10%

Source: AEA Technology and others, 2012

The assessment of costs also shows that a scenario using a a levy set at low ETS prices (i.e. 35.55 €/tCO<sub>2</sub> in 2030) delivers significant net savings of 23.6 bn €. It should also be noted that applying a levy that corresponds to the carbon prices required achieve the 2030 milestone from the 2050 Low Carbon Economy Roadmap (i.e. 50.9 €/tCO<sub>2</sub> in 2030) achieve similar emissions reduction as the Levy low ETS price still at negative total costs for the sector.

Table VI.8: Additional costs up to 2030 compared to the baseline, €bn

	Internal reduction scenario	Levy high ETS prices	Levy low ETS prices
Costs <sup>20</sup> (excluding levy costs)	-47,6	-52,7	-52,7
Levy costs	203,5	47,8	29,1
Total costs	156,0	-1,8	-23,6

Source: AEA Technology and others, 2012

The level of a levy depends on the contribution requested from the maritime transport sector as part of the transition to the low carbon economy. As this contribution is not set yet for the short and medium term, only the impacts associated with a levy set at low ETS prices (i.e. 35.55 €/tCO<sub>2</sub> in 2030) is assessed further to analyse the environmental, economic and social impacts.

#### 6. Free allocation and auctioning

For the assessment of impacts under the ETS options, all scenarios assume an allocation to the sector equal to the emission profile as projected in section 3 to achieve the long term in-sector reduction trajectory, resulting in a 2030 target equal to -10% compared to 2005.

Two scenarios have been assessed: a free allocation scenario (i.e. all allowances up to the cap are given for free) and an auctioning scenario (i.e. each allowance has to be purchased).

It should be noted that the scenarios are stylised. No sensitivity was performed on allocating to the sector a cap higher than the target of -10% compared to 2005. But a tighter cap, in a system that is linked to a large external trading system, would be similar from the point of view of the sector, to a scenario with more auctioning. As such the extreme scenarios of full auctioning and full free allocation give a range of potential impact on the sector, also for more ambitious targets.

<sup>20</sup> Including additional investment costs, additional operational costs and fuel savings.

The ETS scenarios assume that there is a link to external carbon market mechanisms, resulting in an equalisation of prices. In the scenario it is assumed prices equalise to a level equal to the low and the high ETS prices as used in the Levy example. As such this assessment gives a potential range of impacts that strongly will be determined by the available supply of allowances from for instance the ETS or credits from CDM, sectoral trading mechanisms or other carbon market mechanisms. The assessment does not look into potential sources of this supply and the impact of the potential demand from the maritime sector on these sources of supply.

No closed ETS scenario has been specifically assessed but the closed ETS with full auctioning would largely correspond to a levy that achieves the reductions fully internally.

**Table VI.9: In-sector emissions under the open ETS option (MtCO<sub>2</sub>), Sources: AEA Technology and others 2012**

		2020	2025	2030
Emissions (MtCO <sub>2</sub> )	ETS link, high ETS prices	194.6	185.9	186.7
	ETS link, low ETS prices	194.6	185.7	186.4
Reduction compared to the baseline	ETS link, high ETS prices	-7%	-14%	-16%
	ETS link, low ETS prices	-7%	-15%	-17%
Reduction compared to 2005	ETS link, high ETS prices	-0,2%	-5%	-5%
	ETS link, low ETS prices	-0,2%	-5%	-5%

**Table VI.10: Comparison between the level of the levy and the emissions by 2030(MtCO<sub>2</sub>), Source: AEA Technology and others, 2012**

	Internal reduction scenario	Levy high ETS prices	Levy low ETS prices
ETS link, high ETS prices	10.6	0.3	0
ETS link, low ETS prices	10.3	0	0.3

This table shows that the difference in terms of in sector CO<sub>2</sub> emissions is not significant up to 2030.

#### 7. Impacts on the EU-ETS in case of a linking with the maritime ETS

In case of linking with the EU-ETS, the maritime sector would be expected to be a net buyer of up to 10 million of EUAs<sup>21</sup> by 2030. This represents less than 0.5% of the total EUAs by 2030 and therefore, it can be assumed that the linking of a maritime ETS with the EU-ETS will have no significant impacts on the EU-ETS.

However, as mentioned previously, the impact assessment has been carried out assuming that there is no comprehensive global agreement on climate change and therefore no significant decrease of the trade of fossil fuels. In the event that there is a global decarbonisation of the

<sup>21</sup> European Union Allowances

economy, the maritime sector could be a net seller of 14 million of allowances. This represents around 0.5% of the total EUAs by 2030 and therefore it can be assumed that there is no major risk of disturbance of the EU-ETS in case of linking with a maritime ETS.

## **ANNEX VII - IDENTIFIED REGIONS RELIANT ON SHIPPING**

### **1. SPECIFIC REGIONS HEAVILY DEPENDENT ON FREIGHT ACTIVITY**

The Member States most reliant<sup>22</sup> on shipping are Ireland, the Netherlands, Malta, the UK, Sweden and Finland. These countries are expected to be the most sensitive to an EU regulation that places price on emissions. Austria, Czech Republic, Hungary, Poland, Slovakia and Slovenia do not have a significant seaborne trade activity and, therefore, are not expected to be as sensitive to any policy.

Apart from these two groups of countries, the following groups can be considered:

- more than 50% of the port calls (excluding port calls from passenger vessels) in Bulgaria, Estonia, Latvia, Lithuania, Denmark and Romania are done by bulk carriers (excluding tankers) and general cargo; these categories of ships are carrying low added value goods and, therefore, according to the different policy options considered, the greatest the savings will be, the greatest the benefits will be for these Members States;
- almost 50% of the port calls (excluding port calls from passenger vessels) in Germany, Belgium, Cyprus, Spain and the EU overseas territories are done by container vessels; this category of ship is the most sensitive to avoidance and, therefore, this issue is a key issue for these Member States;
- the port calls in France, Italy, Portugal and Greece are balanced and the sensitivity to the EU regulation should be close to the EU average. Luxembourg can be considered as part of this group too.

At NUTS<sup>23</sup> level, the main regions reliant on shipping are heavily linked with the location of major EU ports. According to the share of freight activity by sea, these regions are: Zuid Holland (Rotterdam - NL), Antwerpen (BE), Hamburg (DE), Haute-Normandie (FR), Noord-Holland (NL), Andalucia (SP), Provence Alpes Cote d'Azur (FR), East Yorkshire and Northern Lincolnshire (UK), Liguria (IT), Sicily (IT), Västsverige (SE), Cataluna (SP), Comunidad Valenciana (SP), Etelä-Suomi (FI), Bremen (DE), Puglia (IT), Nord-Pas-de-Calais (FR) and Romania South East region (RO).

The impacts previously assessed should be more visible for these regions.

### **2. SPECIFIC REGIONS HEAVILY DEPENDENT ON PASSENGER ACTIVITY**

In 2009, 403 million passengers embarked and disembarked in EU 27 ports from passenger vessels. Italy and Greece are the focus of this activity, together accounting for 44% of all passengers. This is followed, with significantly smaller numbers, by North Sea countries (Denmark, Sweden, Germany, UK and France).

---

<sup>22</sup> The reliance on shipping is defined according to seven indicators: the export as % of GDP, the share of exports done by sea, the imports as % of GDP, the share of imports done by sea, the extra-EU exports as % of GDP, the share of extra-EU exports done by sea, the extra-EU imports as % of GDP, the share of extra-EU imports done by sea and the trade volume in tonnes per capita.

<sup>23</sup> Nomenclature of Territorial Units

Malta, Denmark, Greece, Estonia, Sweden, Finland and Italy have a share of passenger embarked/disembarked per inhabitant higher than the EU average. So, these countries, and especially Italy, Greece and Denmark, will be the most affected by any option addressing passenger ships.

At NUTS2 level, the most reliant regions are: Åland (FI), Ceuta (SP), Sjælland (DK), Sydsverige (SE), Notio Aigaio (GR), Malta, Nordjylland (DK), Sardinia (IT), Stockholm (SE), Calabria (IT), Hovedstaden (DK), Ionia Nisia (GR).

### **3. SPECIFIC ISSUE FOR REGIONS WITH SPECIAL WINTER CONDITIONS**

It can also be stressed that regions with special winter conditions, especially in the Baltic Sea, will be more sensitive to a regulation that address GHG emissions from fuel consumed. Indeed, ice-strengthened ships use more fuel oil in ice conditions and also in open water, due to their special design and engine power compared to ships designed only for open water conditions.

Ice-strengthened ships have more expensive investment costs than ships designed only for open water conditions, because ice-strengthening increases the steel weight of the ship hull and also the weight of the propulsion machinery. In addition to the cost of ice-strengthening of the hull, also the additional engine power increases the investment costs of ice-going ships.

Therefore, even if most policy options intend to reduce GHG emissions from ships effectively at negative costs, the investment costs and the fuel savings may be lower for ice-strengthened ships and, as a consequence, regions dependent on routes performed by ice-strengthened ships may be affected. As a consequence, this concern has to be addressed when implementing the policy option.

### **4. SPECIFIC ISSUE FOR REGIONS DEPENDENT ON SHIPBUILDING**

Although the EU's market share of shipbuilding in terms of volumes has declined over the years, the EU has succeeded in retaining a position by building more complex ships with a relatively higher value added, while the production of more standard mass production ships moved to other countries, especially in Asia. The EU also has a relatively strong position in the ship repair market and in the marine equipment sector which supplies ship construction. Indeed, it is a net exporter.

At the European level, while shipbuilding may be declining, it still remains an important source of jobs and economic activity in the regions where it does take place. The main concentrations of large ship yards are in Germany, Croatia and Romania, followed by Finland, the UK and Spain.

A measure to address GHG emissions of ships will lead to an increase of demand of retrofitting, as well as of high value marine equipment. Therefore, any policy option should lead to net benefits for regions dependent on shipbuilding. The highest net benefits would be provided by policy options with the highest in-sector emission reduction required.

## **ANNEX VIII - ANALYSIS OF POSSIBLE TECHNICAL SCOPE OF AN EU MEASURE**

All existing technical regulations for ships define a threshold for the size of ships covered. Main criteria for the definition of such threshold should be maximising of the amount of emissions covered by the measure (to ensure its environmental effectiveness) and the proportionality of the measure, in particular the minimisation of the administrative burden mainly for industry.

For the purpose of this Impact Assessment, two possible thresholds have been analysed:

1. 400 GT: this size limit is commonly applied under MARPOL and has been used for proposals in the IMO
2. 5000 GT: SOLAS uses 5000 GT as a threshold for certain technical equipment requirements. In addition, the 1992 International Convention on Civil Liability for Oil Pollution Damage uses 5000 GT as the floor for Article V liability.

As the absolute administrative burden of a market-based measure (including monitoring, reporting and verification and internalisation of climate externalities) seems to be to a large extent independent of the size or type of ship (in the order of 7000 – 8000 € per ship and year, see Annex XIII and AEA study), this burden is expected to be insignificant for large ships, but relatively high for smaller vessels.

Overall, the total annual administrative costs for industry in case of a 5000 GT threshold have been estimated at 148 M€ and at 82 M€ for a 400 GT threshold (see Annex XIII for detailed results). Costs for public authorities are also lower in case of a 5000 GT threshold (see annex XIII for different scenarios).

Furthermore, the size threshold impacts on the coverage of the MRV system regarding SMEs in the shipping sector: A 400 GT threshold would exclude 87% of the SMEs whereas a 5000 GT threshold would exclude 99% of the SMEs (see Annex II for more information).

It can be concluded that a 5000 GT threshold has to be regarded as more proportional than a lower threshold as both the total administrative costs for the sector and the coverage of SMEs can be minimised.

To ensure the effectiveness of the measure, the effect of the exclusion of certain vessel types and smaller ship categories on the amount of emissions covered has been analysed. This analysis could support a decision on the technical scope of a measure addressing maritime GHG emissions.

For the analysis, 2010 emission data from the AEA study have been used. Overall, almost 20,000 vessels equipped with Automatic Identification System (AIS) transponders and with EU port calls in 2010 are covered.

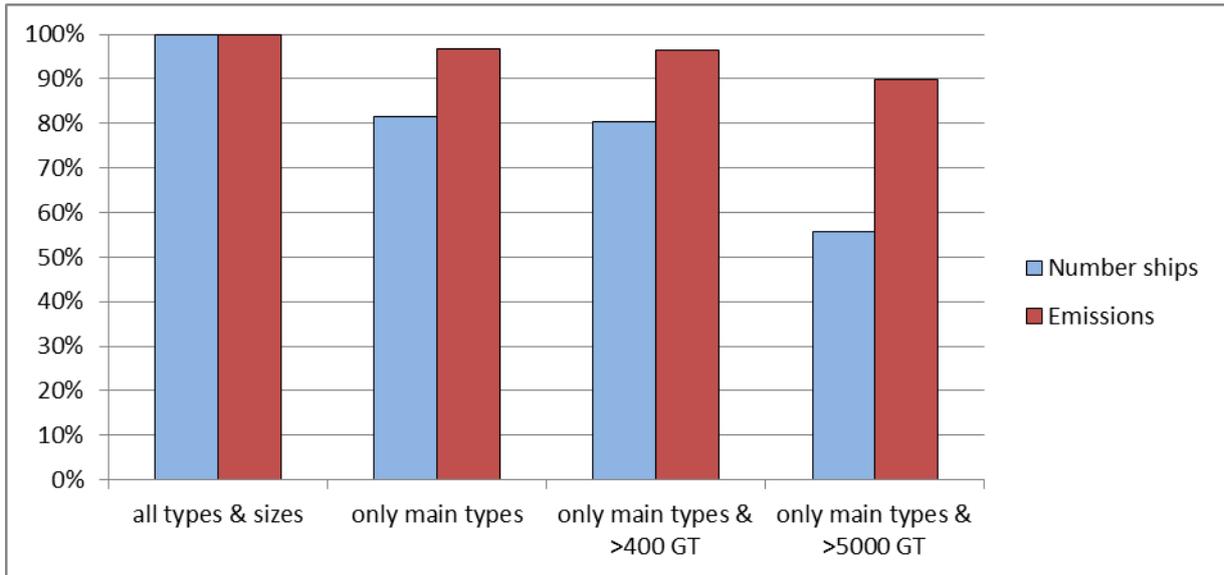
Table VIII.1: Number of ships and CO2 emissions in 2010 for EU scope per ship type and size

VesselType	VesselSize/Group	Vessels	CO2 emissions [t]
01 Oil tanker	A - GT < 300	11	<b>1.930</b>
01 Oil tanker	B - 300 <= GT < 400	20	<b>6.169</b>
01 Oil tanker	C - 400 <= GT < 500	19	<b>5.826</b>
01 Oil tanker	D - 500 <= GT < 5000	239	<b>315.429</b>
01 Oil tanker	E - 5000 <= GT	1208	<b>15.404.869</b>
02 Chemical tanker	C - 400 <= GT < 500	6	<b>2.485</b>
02 Chemical tanker	D - 500 <= GT < 5000	513	<b>1.839.139</b>
02 Chemical tanker	E - 5000 <= GT	1577	<b>13.971.459</b>
03 LPG	A - GT < 300	1	<b>414</b>
03 LPG	C - 400 <= GT < 500	1	<b>780</b>
03 LPG	D - 500 <= GT < 5000	130	<b>570.398</b>
03 LPG	E - 5000 <= GT	210	<b>1.668.018</b>
04 LNG	E - 5000 <= GT	163	<b>5.220.857</b>
05 Other tanker	B - 300 <= GT < 400	3	<b>893</b>
05 Other tanker	C - 400 <= GT < 500	2	<b>643</b>
05 Other tanker	D - 500 <= GT < 5000	45	<b>100.519</b>
05 Other tanker	E - 5000 <= GT	19	<b>322.459</b>
06 Bulker	A - GT < 300	1	<b>277</b>
06 Bulker	C - 400 <= GT < 500	1	<b>669</b>
06 Bulker	D - 500 <= GT < 5000	126	<b>295.112</b>
06 Bulker	E - 5000 <= GT	2732	<b>21.940.872</b>
07 General cargo	A - GT < 300	9	<b>767</b>
07 General cargo	B - 300 <= GT < 400	16	<b>2.393</b>
07 General cargo	C - 400 <= GT < 500	25	<b>4.841</b>
07 General cargo	D - 500 <= GT < 5000	3158	<b>5.876.285</b>
07 General cargo	E - 5000 <= GT	1349	<b>7.583.619</b>

<b>VesselType</b>	<b>VesselSize/Group</b>	<b>Vessels</b>	<b>CO2 emissions [t]</b>
08 Other dry	B - 300 <= GT < 400	1	<b>462</b>
08 Other dry	C - 400 <= GT < 500	3	<b>1.156</b>
08 Other dry	D - 500 <= GT < 5000	145	<b>290.648</b>
08 Other dry	E - 5000 <= GT	394	<b>4.277.142</b>
09 Container	D - 500 <= GT < 5000	64	<b>285.627</b>
09 Container	E - 5000 <= GT	1964	<b>54.565.733</b>
10 Vehicle	D - 500 <= GT < 5000	2	<b>10.692</b>
10 Vehicle	E - 5000 <= GT	438	<b>5.591.435</b>
11 Roro	D - 500 <= GT < 5000	34	<b>68.615</b>
11 Roro	E - 5000 <= GT	356	<b>6.137.373</b>
12 Ferry	A - GT < 300	155	<b>320.221</b>
12 Ferry	B - 300 <= GT < 400	49	<b>152.251</b>
12 Ferry	C - 400 <= GT < 500	82	<b>246.061</b>
12 Ferry	D - 500 <= GT < 5000	311	<b>2.217.155</b>
12 Ferry	E - 5000 <= GT	488	<b>16.888.627</b>
13 Cruise	A - GT < 300	5	<b>1.177</b>
13 Cruise	B - 300 <= GT < 400	4	<b>2.215</b>
13 Cruise	C - 400 <= GT < 500	3	<b>1.761</b>
13 Cruise	D - 500 <= GT < 5000	33	<b>66.249</b>
13 Cruise	E - 5000 <= GT	173	<b>6.209.402</b>
14 Yacht	A - GT < 300	74	<b>27.102</b>
14 Yacht	B - 300 <= GT < 400	81	<b>47.167</b>
14 Yacht	C - 400 <= GT < 500	147	<b>130.178</b>
14 Yacht	D - 500 <= GT < 5000	265	<b>540.787</b>
14 Yacht	E - 5000 <= GT	13	<b>123.603</b>
15 Offshore	A - GT < 300	49	<b>23.155</b>
15 Offshore	B - 300 <= GT < 400	23	<b>14.008</b>

VesselType	VesselSize/Group	Vessels	CO2 emissions [t]
15 Offshore	C - 400 <= GT < 500	25	<b>24.482</b>
15 Offshore	D - 500 <= GT < 5000	618	<b>1.122.327</b>
15 Offshore	E - 5000 <= GT	145	<b>701.982</b>
16 Service	A - GT < 300	483	<b>285.312</b>
16 Service	B - 300 <= GT < 400	356	<b>288.537</b>
16 Service	C - 400 <= GT < 500	210	<b>201.886</b>
16 Service	D - 500 <= GT < 5000	474	<b>878.640</b>
16 Service	E - 5000 <= GT	93	<b>572.357</b>
17 Fishing	A - GT < 300	55	<b>11.026</b>
17 Fishing	B - 300 <= GT < 400	27	<b>8.582</b>
17 Fishing	C - 400 <= GT < 500	35	<b>15.574</b>
17 Fishing	D - 500 <= GT < 5000	248	<b>276.232</b>
17 Fishing	E - 5000 <= GT	25	<b>110.212</b>
18 Miscellaneous	A - GT < 300	13	<b>2.508</b>
18 Miscellaneous	B - 300 <= GT < 400	2	<b>551</b>
18 Miscellaneous	C - 400 <= GT < 500	6	<b>1.633</b>
18 Miscellaneous	D - 500 <= GT < 5000	45	<b>28.637</b>
18 Miscellaneous	E - 5000 <= GT	44	<b>140.280</b>
<b>Total</b>		<b>19.844</b>	<b>178.047.885</b>

The ships covered by the analysis emitted around 180 Mt CO<sub>2</sub> in the EU scope (journeys from and to EU ports). The results are summarised in the following figure:



COVERAGE OF NUMBER OF SHIPS AND CO<sub>2</sub> EMISSIONS DEPENDING ON THE COVERAGE OF SHIP TYPES AND SIZES, 2010 DATA FOR EU SCOPE

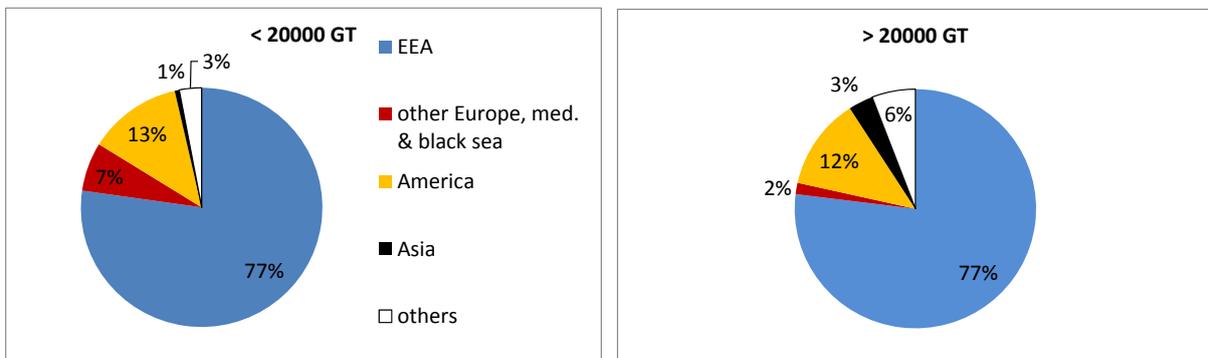
If for the 13 main ship types, only vessels with at least 400 GT are considered. As result, the number of ships is reduced to 81% of the total still covering 97% of the total emissions.

If only the 13 main ship types and vessels of at least 5000 GT are covered by a measure, the number of ships goes down to about 11,000 (56% of the total number) representing 160 Mt CO<sub>2</sub> emitted (90% of the total amount).

A size threshold higher than 5000 GT would not lead to such high level of emissions covered and would therefore not ensure the environmental effectiveness of the measure.

People could also argue that the introduction of a size threshold may create a distortion of trade competition, as short sea shipping would not be covered by the measures as much as deep sea shipping. However, short sea shipping and deep sea shipping are not serving the same market.

Another analysis has been carried out to identify a possible correlation between the size and the flag of ships calling into EU ports. In case of a strong correlation, a size threshold might lead to different relative coverage of ships flying different flags.



SHARE OF EU PORT CALLS BY FLAG, SOURCE: IHS FAIRPLAY 2011

Available data only allow differentiating between ships smaller and larger than 20000 GT. The analysis shows that the share of port calls by EEA flagged ships is 77% for both groups. Out of the remaining 23% port calls, the second largest groups are port calls by ships flying American flags (mainly Panama and Bahamas) with 13% respectively 12% of the port calls (smaller/ larger than 20000 GT). This analysis provides no evidence of correlation between size and European/ non-European flags. As a consequence, the size threshold should not lead to a significant different coverage of EU/ EEA flagged ships.

In conclusion, the number of ships covered by a measure to reduce maritime GHG emissions can be reduced significantly if certain categories and in particular smaller vessels are excluded. A higher threshold of 5000 GT as used under SOLAS would reduce the estimated administrative costs for the shipping sector from 148 to 82 M€ per year while covering 90% of the total emissions. No impacts have been identified on the coverage of different flags.

## ANNEX IX - LIST OF IMO PROPOSALS (24 MAY 2011)

Proposed market-based measures	Proponent(s)	Mechanism for GHG reduction	
		In-sector emission reductions	Out-of-sector emission reductions
An International Fund for Greenhouse Gas emissions from ships (GHG Fund)	Cyprus, Denmark, the Marshall Islands, Nigeria and IPTA (MEPC 60/4/8, GHG-WG 3/2/1 GHG WG 3/3/4)	Price incentive on fuel use	Prescribed purchase of out-of-sector project offset credits by a fund;  Potential for supplementary reductions from use of remaining proceeds
Consolidated proposal of the Efficiency Incentive Scheme (EIS) based on the Leverage Incentive Scheme (LIS) and the Vessel Efficiency System (VES)	Japan & World Shipping Council (MEPC 60/4/37 MEPC 60/4/39 GHG-WG 3/3/2)	Mandatory EEDI;  Existing ship standard with fuel-based charge  Leveraged refund incentive	Potential for supplementary reductions from use of remaining proceeds
Port State arrangements utilizing the ship traffic, energy and environment model, STEEM (PSL)	Jamaica (MEPC 60/4/40)	Price incentive on fuel use	Potential for supplementary reductions from use of remaining proceeds
Ship Efficiency and Credit Trading (SECT)	US (MEPC 60/4/12 MEPC 61/5/16 MEPC 61/INF.24)	Mandatory EEDI;  Efficiency trading	
Global Emission Trading System (ETS)	Norway, United Kingdom, France & Germany (MEPC 60/4/22 MEPC 60/4/26 MEPC 60/4/41 MEPC 60/4/54 GHG-WG 3/3/5 GHG-WG 3/3/6 GHG-WG 3/3/8)	Price incentive on fuel use	Purchase out-of-sector project offset credits by shipping sector;  Potential for supplementary reductions from use of remaining proceeds
How technical and operational measures are the only direct and effective means to deliver cuts in CO <sub>2</sub> emissions	Bahamas (MEPC 60/4/10, GHG-EG 3/2)	Mandatory emission reduction target	
A Rebate Mechanism (RM) for a market-based instrument for international shipping	IUCN (MEPC 60/4/55 MEPC 61/5/33)	Price incentive on fuel use	Prescribed purchase of out-of-sector project offset credits by a fund;  Potential for supplementary reductions from use of remaining proceeds

## ANNEX X - DESCRIPTION OF MARKET BARRIERS

Work by the International Maritime Organisation (IMO) and other organisations<sup>24</sup> have indicated that there are significant negative or low marginal abatement cost opportunities to reduce GHG emissions in the maritime transport sector, i.e. the fuel cost savings would almost or entirely exceed the cost of the measures. The use of such opportunities would lead to reductions in GHG emissions and in transport costs. However, a number of market barriers are contributing to prevent their implementation.

Three main categories of market barriers exist. As these categories sometimes overlap, it can be difficult to distinguish between different types of barriers. Moreover, the different categories are not mutually exclusive, in other words several categories of barriers may impact the adoption of one solution. Market failure barriers are the most widespread.

### 1. Market failures barriers

#### *a. Split of incentives*

This market failure occurs when the commercial shipping market does not have the ability to implement a cost effective solution because the maritime transport actor (e.g., the ship owner) making the investment in a solution does not realise the benefit (e.g., fuel saving) of the investment.

In other words, the people benefiting from energy efficiency are not the people paying for it.<sup>25</sup> In the shipping industry, it occurs when there is a disconnect between the vessel owner, who controls investment spending and energy conservation efforts, and the operator, who is responsible for fuel cost. This primarily occurs when vessels – especially bulk carriers, tankers, and containerships – are hired under contract for a time charter or bare boat charter.<sup>26</sup> In such cases, it is the charterer who pays for fuel but the ship owner who is responsible for any investment in energy-efficiency equipment. Another “split incentive” issue is that shipowners do not typically expect to own a vessel for its entire life, or are uncertain of how long they want to own the vessel. It is not guaranteed that shipowners can obtain a premium for a ship in a second hand sale that has better than expected fuel efficiency.<sup>27</sup>

Moreover, commercial practises in the maritime industry hinder the implementation of a cost effective solution. For example, in a spot charter, a ship will be compensated through demurrage if the terminal is not ready to take the vessel when it arrives. However, if the ship

---

<sup>24</sup> CE Delft Study "Technical support for European action to reducing Greenhouse Gas Emissions from international maritime transport"; European Commission Joint Research Centre Reference Report "Regulating Air Emissions from Ships", the "Second IMO GHG Study 2009", the submission to the IMO "Marginal abatement costs and cost effectiveness of energy-efficiency measures" (MEPC 61/INF.18) and the master thesis "Unlocking the potential for CO<sub>2</sub> abatement in ships arriving and departing from UK ports" by Jenny Hill of Imperial

<sup>25</sup>Jaff et al, 1994

<sup>26</sup>Wijnolst et al, 1997

<sup>27</sup>Brealey et al, 2005

slows down (thereby reducing GHG emissions) to arrive at a later time when the terminal is available, the ship is not compensated for the extra voyage time incurred.

Furthermore, shipping cycles also prevent the uptake of efficient technology. Large changes in vessel charter rates over different shipping cycles mean that when rates are high, vessel owners are unwilling to take any time out of service (e.g. to install an energy efficiency solution). When charter rates are low, vessel owners may not have the funds required to make an investment in an energy efficiency improvement.

#### *b. Lack of information*

This market failure relates to the lack of accurate information on the energy efficiency of existing vessels, specifically the lack of accurate fuel consumption information.

It also generates technological barriers. For a specific technology, a lack of confidence in the technology because of a lack of operational data/experience can prevent the adoption of efficient technologies. For example, there are concerns regarding the ability of marine diesel engines to efficiently and safely operate for extended periods at low speeds. This can hinder implementation of the speed reduction solution.

Furthermore, small shipping companies may lack the staff to analyse, make the decision, and oversee the implementation of a solution. The marine industry is extremely diverse and has a large number of small companies that may not have the management time or expertise needed to evaluate and implement GHG solutions. This may be further complicated by the use of third-party ship managers that serves to remove the ship owner – from whom the impetus for energy efficiency improvements is typically expected – from day-to-day operational issues involving their ships.

#### *c. Access to finance*

Even when an investment is profitable, it may not be possible for an owner or operator to get access to finance for this investment. This can occur for various reasons:

- Uncertainty over future fuel prices represents an economic barrier to virtually all solutions involving an installation cost (e.g., waste heat recovery). Uncertainty over the magnitude of fuel reductions for a given solution can also adversely impact the investment decision.
- Furthermore, shipping business cycles also prevent the uptake of efficient technology. Large changes in vessel charter rates over different shipping cycles mean that when rates are high, vessel owners are unwilling to take any time out of service (e.g. to install an energy efficiency solution). When charter rates are low, vessel owners may not have the funds required to make an investment in an energy efficiency improvement, as the risks become higher for financiers.
- When solution is only marginally economic at the current fuel price, the expected rate of return can be too low to compensate for the investment risk taken.

Moreover, a cost effective solution may not implemented due to management issues, such lack of staffing or time to implement a technology. However, the ability of shipping company to increase their staff is highly dependent on the freight rates variations.

## **2. Operational or Physical Barriers**

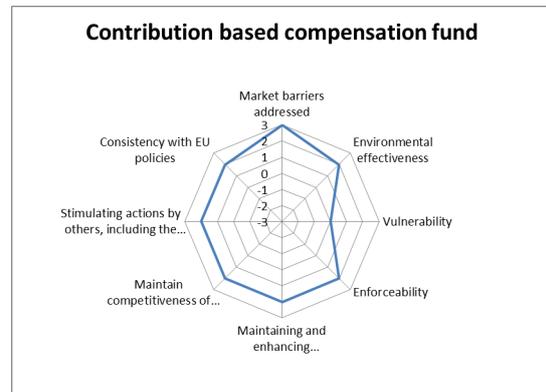
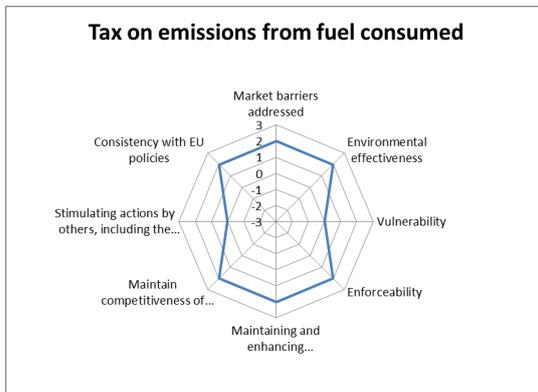
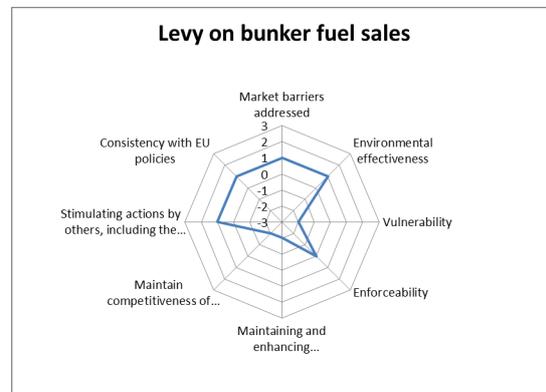
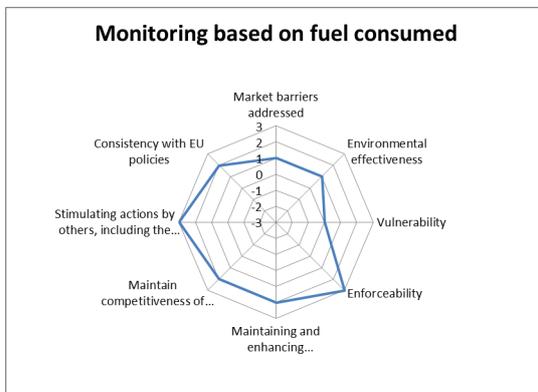
Operational or physical barriers occur when a solution cannot be utilised on a specific vessel due to physical space constraints or other matters that impact vessel operations. Examples of this include:

- Waste heat recovery on a small vessel. The vessel may not have the physical room to install the waste heat recovery heat exchanger in the funnel.
- Solar cells: On a container ship, the ability to put a large array of solar cells is problematic given the use of deck space for container stowage. Similarly, bulk carriers require removable hatch covers that would complicate the use of deck mounted solar arrays.
- Proposals to install and deploy sails may be problematic on vessels with limited deck space such as bulkers and containerships.

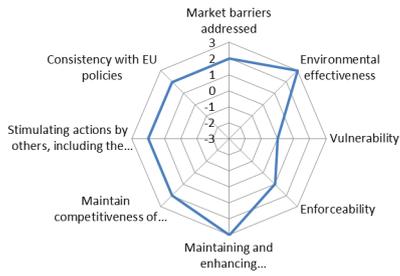
## **3. Regulatory Barriers**

Regulatory barriers are based on concerns over (existing and potential future) regulations that impact the implementation of a given solution. There is a range of different types of regulatory barriers, such as competition regulation; domestic, regional or international law prohibiting certain activities or limitations in the legislative authority and legislative processes. For example some abatement solutions such as hull cleaning and propeller polishing are prohibited in certain ports due to local regulations that prohibit the release of the cleaning residues in local waters.

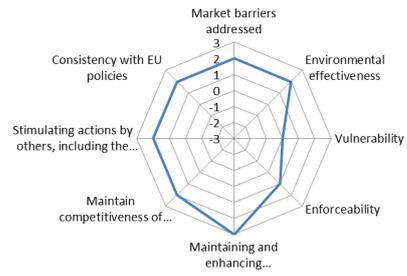
## ANNEX XI - GRAPHICAL REPRESENTATION OF THE COMPARISON OF THE POLICY OPTIONS



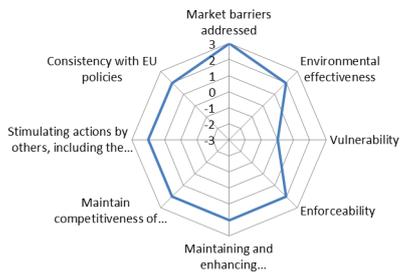
### Closed ETS with free allocation



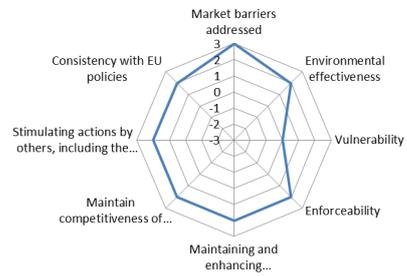
### Open ETS with free allocation



### Open ETS with full auctioning



### Target based compensation fund



## ANNEX XII - ANNUAL COMPLIANCE CYCLE FOR MONITORING, REPORTING AND VERIFICATION OF EMISSIONS

### 1. General remarks

As regards the geographical scope, the following routes will in principle be covered in a non-discriminatory manner for all ships regardless their flag:

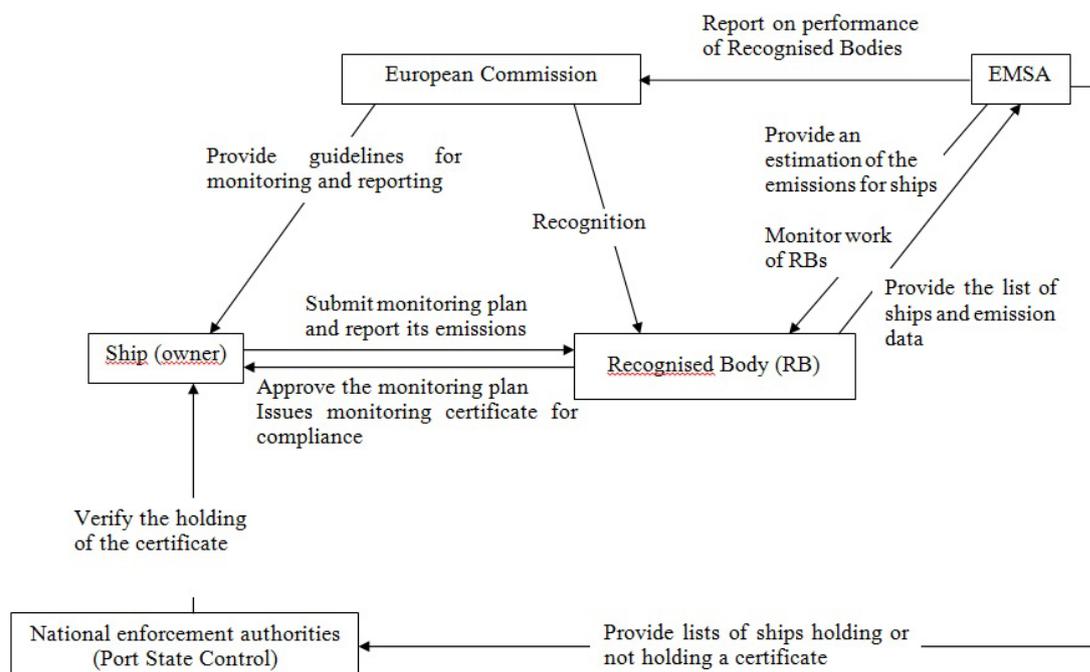
- intra-EU journeys
- journeys from the last non-EU port to the first EU port of call (incoming journeys)
- journeys from an EU port to the next non-EU port of call (outgoing journeys)

Tasks related to the check of monitoring plans, emission reports, communication with ship owners and operators and the issuance of certificates would be ensured by recognised bodies or other accredited independent third parties. Such bodies, in particular Recognised Organisations, already have extensive experience and play an important role for maritime safety.

Enforcement of the MRV obligations would be ensured by Member States, more concretely by Port Authorities under the existing Port State Control regime.

The proposed MRV measure should take the form of a Regulation. For the implementation of the proposed MRV system, delegated acts would be needed to determine the necessary technical details. Guidance documents will be developed to facilitate the implementation.

### 2. Compliance cycle



**ANNEX XIII - ADMINISTRATIVE COSTS AND ADMINISTRATIVE BURDEN**

Source: AEA Technology and others, 2012

**1. ENFORCEMENT BY NATIONAL COMPETENT AUTHORITIES (FOR ALL OPTIONS EXCEPT OPTION 3A - LEVY ON BUNKER FUEL)**

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	5	40	€1.660,00	0,1	€166,00	€0,00	€0,00	0	€166	€166	€4.482	€4.482
Verification		11	86	€3.569,00	1	€3.569,00	€0,00	€0,00	0	€3.569	€3.569	€96.363	€96.363
<b>Total</b>							<b>€3.735,00</b>	<b>€0,00</b>			<b>€3.735</b>	<b>€3.735</b>	<b>€100.845</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	5	40	€1.660,00	0,1	€166,00	€0,00	€0,00	0	€166	€166	€4.482	€4.482
Verification		7	53	€2.199,50	1	€2.199,50	€0,00	€0,00	0	€2.200	€2.200	€59.387	€59.387
<b>Total</b>							<b>€2.365,50</b>	<b>€0,00</b>			<b>€2.366</b>	<b>€2.366</b>	<b>€63.869</b>

For option 3a, the enforcement is considered as part of the compliance check done by the national competent authorities in charge of compliance.

**2. MONITORING BASED ON FUEL CONSUMED (OPTION 2)**

- For ship owners and ship operators

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per vessel (man-days)	Time per vessel (hours)	Price (per vessel)	Frequency (per year)	Price (per vessel & per year)	Outsourcing costs (per vessel & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per vessel & per year)	Total administrative burden (per vessel & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	24	192	€7.968,00	0,1	€796,80	€0	0	€797	€797	18400	€14.661.120	€14.661.120
Preparation of the monitoring plan		6	48	€1.992,00	0,1	€199,20	€0	0	€199	€199	18400	€3.665.280	€3.665.280
Retrieving relevant information from existing data		3	24	€996,00	1	€996,00	€0	80	€996	€199	18400	€18.326.400	€3.665.280
Adjusting existing data		3	24	€996,00	1	€996,00	€0	0	€996	€996	18400	€18.326.400	€18.326.400
Filling in forms and tables, including recordkeeping		1	8	€332,00	1	€332,00	€0	0	€332	€332	18400	€6.108.800	€6.108.800
Verification		2	16	€664,00	1	€664,00	€3.750	0	€4.414	€4.414	18400	€81.217.600	€81.217.600
Submitting the information		1	8	€332,00	1	€332,00	€0	0	€332	€332	18400	€6.108.800	€6.108.800
<b>Total</b>							<b>€4.316,00</b>	<b>€3.750,00</b>		<b>€8.066</b>	<b>€7.269</b>		<b>€148.414.400</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per vessel (man-days)	Time per vessel (hours)	Price (per vessel)	Frequency (per year)	Price (per vessel & per year)	Outsourcing costs (per vessel & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per vessel & per year)	Total administrative burden (per vessel & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	20	160	€6.640,00	0,1	€664,00	€0	0	€664	€664	11400	€7.569.600	€7.569.600
Preparation of the monitoring plan		5	40	€1.660,00	0,1	€166,00	€0	0	€166	€166	11400	€1.892.400	€1.892.400
Retrieving relevant information from existing data		2	16	€664,00	1	€664,00	€0	80	€664	€133	11400	€7.569.600	€1.513.920
Adjusting existing data		2	16	€664,00	1	€664,00	€0	0	€664	€664	11400	€7.569.600	€7.569.600
Filling in forms and tables, including recordkeeping		1	8	€332,00	1	€332,00	€0	0	€332	€332	11400	€3.784.800	€3.784.800
Verification		2	16	€664,00	1	€664,00	€3.750	0	€4.414	€4.414	11400	€50.319.600	€50.319.600
Submitting the information		1	8	€332,00	1	€332,00	€0	0	€332	€332	11400	€3.784.800	€3.784.800
<b>Total</b>							<b>€4.486,00</b>	<b>€3.750,00</b>		<b>€7.236</b>	<b>€6.705</b>		<b>€82.490.400</b>

- For public authorities

- o For national competent authorities controlling the compliance

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	50	400	€16.600,00	0,1	€1.660,00	€0,00	€0,00	0	€1.660	€1.660	27	€44.820	€44.820
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200.000	€0,00	0	€7.653	€7.653	1	€206.640	€206.640
Informing the subjected entities		680	5440	€225.760,00	0,1	€22.576,00	€0,00	€0,00	0	€22.576	€22.576	27	€609.552	€609.552
Verification of the information submitted		340	2720	€112.880,00	1	€112.880,00	€0,00	€0,00	0	€112.880	€112.880	27	€3.047.760	€3.047.760
<b>Total</b>							<b>€43.756,00</b>	<b>€200.000,00</b>	<b>€0,00</b>		<b>€44.769</b>	<b>€44.769</b>		<b>€3.908.772</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	50	400	€16.600,00	0,1	€1.660,00	€0,00	€0,00	0	€1.660	€1.660	27	€44.820	€44.820
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200.000	€0,00	0	-	-	1	€206.640	€206.640
Informing the subjected entities		420	3360	€139.440,00	0,1	€13.944,00	€0,00	€0,00	0	€13.944	€13.944	27	€376.488	€376.488
Verification of the information submitted		210	1680	€69.720,00	1	€69.720,00	€0,00	€0,00	0	€69.720	€69.720	27	€1.882.440	€1.882.440
<b>Total</b>							<b>€91.964,00</b>	<b>€200.000,00</b>	<b>€0,00</b>		<b>€85.324</b>	<b>€85.324</b>		<b>€2.510.388</b>

- o For EU competent authority controlling the compliance

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Total administrative costs (per year)	Total administrative burdens (per year)	
Familiarizing with the information obligation	€57,00	50	400	€26.800,00	0,1	€2.680,00	€0	€0,00	0	€2.680	€2.680	27	€72.210	€72.210
Designing information material		200	1600	€107.200,00	0,1	€10.720,00	€200.000	€0,00	0	€210.720	€210.720	1	€210.720	€210.720
Informing the subjected entities		13800	110400	€7.396.800,00	0,1	€739.680,00	€0	€0,00	0	€739.680	€739.680	27	€19.961.360	€19.961.360
Verification of the information submitted		4600	36800	€2.465.600,00	1	€2.465.600,00	€0	€0,00	0	€2.465.600	€2.465.600	27	€66.571.200	€66.571.200
<b>Total</b>							<b>€3.218.680,00</b>	<b>€200.000,00</b>	<b>€0,00</b>		<b>€3.418.680</b>	<b>€3.418.680</b>		<b>€70.705.530</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Total administrative costs (per year)	Total administrative burdens (per year)	
Familiarizing with the information obligation	€57,00	50	400	€26.800,00	0,1	€2.680,00	€0	€0,00	0	€2.680	€2.680	27	€72.210	€72.210
Designing information material		200	1600	€107.200,00	0,1	€10.720,00	€200.000	€0,00	0	€210.720	€210.720	1	€210.720	€210.720
Informing the subjected entities		8550	68400	€4.582.800,00	0,1	€458.280,00	€0	€0,00	0	€458.280	€458.280	27	€12.354.540	€12.354.540
Verification of the information submitted		2850	22800	€1.527.600,00	1	€1.527.600,00	€0	€0,00	0	€1.527.600	€1.527.600	27	€41.245.200	€41.245.200
<b>Total</b>							<b>€3.999.280,00</b>	<b>€200.000,00</b>	<b>€0,00</b>		<b>€4.199.280</b>	<b>€4.199.280</b>		<b>€54.582.670</b>

### 3. LEVY ON BUNKER FUEL SALES (OPTION 3A)

- For bunker fuel suppliers

Actions required	Tariff (per hour)	Time per fuel supplier (man-days)	Time per fuel supplier (hours)	Price (per fuel supplier)	Frequency (per year)	Price (per fuel supplier & per year)	Outsourcing costs (per fuel supplier & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per fuel supplier & per year)	Total administrative burden (per fuel supplier & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)	
Familiarizing with the information obligation	€41,50	10	80	€3.320,00	0,1	€332,00	€0,00	0	€332	€332	1200	€398.400	€398.400	
Designing information material		20	160	€6.640,00	0,1	€664,00	€0,00	100	€664	€0	1200	€796.800	€0	
Retrieving relevant information from existing data		30	240	€9.960,00	1	€9.960,00	€0,00	100	€9.960	€0	1200	€11.952.000	€0	
Adjusting existing data		30	240	€9.960,00	1	€9.960,00	€0,00	100	€9.960	€0	1200	€11.952.000	€0	
Filling in forms and tables, including recordkeeping		5	40	€1.660,00	1	€1.660,00	€0,00	100	€1.660	€0	1200	€1.992.000	€0	
Verification		4	32	€1.328,00	1	€1.328,00	€4.000,00	100	€5.328	€0	1200	€6.393.600	€0	
Submitting the information		1	8	€332,00	1	€332,00	€0,00	100	€332	€0	1200	€398.400	€0	
Paying the tax		1	8	€332,00	1	€332,00	€0,00	0	€332	€332	1200	€398.400	€398.400	
<b>Total</b>							<b>€4.568,00</b>	<b>€4.000,00</b>		<b>€8.568</b>	<b>€64</b>		<b>€24.281.600</b>	<b>€796.800</b>

- For national competent authorities

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	10	80	€3.320,00	0,1	€332,00	€0,00	0	€332	€332	27	€8.964	€8.964
Controlling the payment of the contribution		11	88	€3.652,00	1	€3.652,00	€0,00	0	€3.652	€3.652	27	€8.604	€8.604
<b>Total</b>						<b>€3.984,00</b>	<b>€0,00</b>		<b>€3.984</b>	<b>€3.984</b>		<b>€107.568</b>	<b>€107.568</b>

#### 4. TAX ON EMISSIONS FROM FUEL CONSUMED (OPTION 3B)

- For ship owners and ship operators

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per vessel (man-days)	Time per vessel (hours)	Price (per vessel)	Frequency (per year)	Price (per vessel & per year)	Outsourcing costs (per vessel & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per vessel & per year)	Total administrative burden (per vessel & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	24	192	€7.968,00	0,1	€796,80	€0	0	€797	€797	18400	€14.661.120	€14.661.120
Preparation of the monitoring plan		6	48	€1.992,00	0,1	€199,20	€0	0	€199	€199	18400	€3.665.280	€3.665.280
Retrieving relevant information from existing data		3	24	€996,00	1	€996,00	€0	80	€996	€996	18400	€18.326.400	€3.665.280
Adjusting existing data		3	24	€996,00	1	€996,00	€0	0	€996	€996	18400	€18.326.400	€18.326.400
Filling in forms and tables, including recordkeeping		1	8	€332,00	1	€332,00	€0	0	€332	€332	18400	€6.108.800	€6.108.800
Verification		2	16	€664,00	1	€664,00	€3.750	0	€4.414	€4.414	18400	€1.217.600	€1.217.600
Submitting the information		1	8	€332,00	1	€332,00	€0	0	€332	€332	18400	€6.108.800	€6.108.800
Paying the tax		1	8	€332	1	€332,00	€0,00	0	€332	€332	18400	€6.108.800	€6.108.800
<b>Total</b>							<b>€4.648,00</b>	<b>€3.750,00</b>		<b>€3.398</b>	<b>€7.601</b>		<b>€154.523.200</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per vessel (man-days)	Time per vessel (hours)	Price (per vessel)	Frequency (per year)	Price (per vessel & per year)	Outsourcing costs (per vessel & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per vessel & per year)	Total administrative burden (per vessel & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	20	160	€6.640,00	0,1	€664,00	€0	0	€664	€664	11400	€7.569.600	€7.569.600
Preparation of the monitoring plan		5	40	€1.660,00	0,1	€166,00	€0	0	€166	€166	11400	€1.892.400	€1.892.400
Retrieving relevant information from existing data		2	16	€664,00	1	€664,00	€0	80	€664	€133	11400	€7.569.600	€1.513.920
Adjusting existing data		2	16	€664,00	1	€664,00	€0	0	€664	€664	11400	€7.569.600	€7.569.600
Filling in forms and tables, including recordkeeping		1	8	€332,00	1	€332,00	€0	0	€332	€332	11400	€3.784.800	€3.784.800
Verification		2	16	€664,00	1	€664,00	€3.750	0	€4.414	€4.414	11400	€5.031.960	€5.031.960
Submitting the information		1	8	€332,00	1	€332,00	€0	0	€332	€332	11400	€3.784.800	€3.784.800
Paying the tax		1	8	€332	1	€332,00	€0,00	0	€332	€332	11400	€3.784.800	€3.784.800
<b>Total</b>							<b>€3.818</b>	<b>€3.750</b>		<b>€7.568</b>	<b>€7.037</b>		<b>€66.275.200</b>

- For public authorities
  - For national competent authorities

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	60	480	€19.920,00	0,1	€1.992,00	€0,00	€0,00	0	€1.992	€1.992	27	€53.784	€53.784
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200,000	€0,00	0	€7.653	€7.653	1	€206.640	€206.640
Informing the subjected entities		680	5440	€225.760,00	0,1	€22.576,00	€0,00	€0,00	0	€22.576	€22.576	27	€609.552	€609.552
Verification of the information submitted		340	2720	€112.880,00	1	€112.880,00	€0,00	€0,00	0	€112.880	€112.880	27	€3.047.760	€3.047.760
Controlling the payment		170	1360	€56.440,00	1	€56.440,00	€0,00	€0,00	0	€56.440	€56.440	27	€1.523.880	€1.523.880
<b>Total</b>						<b>€200.528,00</b>	<b>€200.000,00</b>	<b>€0,00</b>		<b>€201.541</b>	<b>€201.541</b>		<b>€5.441.616</b>	<b>€5.441.616</b>

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	60	480	€19.920,00	0,1	€1.992,00	€0,00	€0,00	0	€1.992	€1.992	27	€53.784	€53.784
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200,000	€0,00	0	€7.653	€7.653	1	€206.640	€206.640
Informing the subjected entities		420	3360	€139.440,00	0,1	€13.944,00	€0,00	€0,00	0	€13.944	€13.944	27	€376.488	€376.488
Verification of the information submitted		210	1680	€89.720,00	1	€89.720,00	€0,00	€0,00	0	€89.720	€89.720	27	€1.882.440	€1.882.440
Controlling the payment		105	840	€34.860,00	1	€34.860,00	€0,00	€0,00	0	€34.860	€34.860	27	€941.220	€941.220
<b>Total</b>						<b>€127.156,00</b>	<b>€200.000,00</b>	<b>€0,00</b>		<b>€128.169</b>	<b>€128.169</b>		<b>€3.460.572</b>	<b>€3.460.572</b>

o For EU competent authority

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Total administrative costs (per year)	Total administrative burdens (per year)	
Familiarizing with the information obligation	€67,00	55	440	€29.480,00	0,1	€2.948,00	€0,00	€0,00	0	€2.948	€2.948	27	€79.596	€79.596
Designing information material		200	1600	€107.200,00	0,1	€10.720,00	€200,000	€0,00	0	€210.720	€210.720	1	€210.720	€210.720
Informing the subjected entities		13800	110400	€7.396.800,00	0,1	€739.680,00	€0,00	€0,00	0	€739.680	€739.680	27	€19.961.360	€19.961.360
Verification of the information submitted		4600	36800	€2.465.600,00	1	€2.465.600,00	€0,00	€0,00	0	€2.465.600	€2.465.600	27	€66.571.200	€66.571.200
Controlling the payment of the tax		2300	18400	€1.232.800,00	1	€1.232.800,00	€0,00	€0,00	0	€1.232.800	€1.232.800	27	€33.285.600	€33.285.600
<b>Total</b>						<b>€1.451.748,00</b>	<b>€200.000,00</b>	<b>€0,00</b>		<b>€1.651.748</b>	<b>€1.651.748</b>		<b>€103.854.496</b>	<b>€103.854.496</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Total administrative costs (per year)	Total administrative burdens (per year)	
Familiarizing with the information obligation	€67,00	55	440	€29.480,00	0,1	€2.948,00	€0,00	€0,00	0	€2.948	€2.948	27	€79.596	€79.596
Designing information material		200	1600	€107.200,00	0,1	€10.720,00	€200,000	€0,00	0	€210.720	€210.720	1	€210.720	€210.720
Informing the subjected entities		8550	68400	€4.582.800,00	0,1	€458.280,00	€0,00	€0,00	0	€458.280	€458.280	27	€12.373.560	€12.373.560
Verification of the information submitted		2850	22800	€1.527.600,00	1	€1.527.600,00	€0,00	€0,00	0	€1.527.600	€1.527.600	27	€41.245.200	€41.245.200
Controlling the payment of the tax		1425	11400	€763.800,00	1	€763.800,00	€0,00	€0,00	0	€763.800	€763.800	27	€20.682.600	€20.682.600
<b>Total</b>						<b>€7.63.348,00</b>	<b>€200.000,00</b>	<b>€0,00</b>		<b>€9.63.348</b>	<b>€9.63.348</b>		<b>€77.192.676</b>	<b>€77.192.676</b>

## 5. CONTRIBUTION BASED COMPENSATION FUND (OPTION 3C)

### ➤ Private based compensation fund

- For ship owners and ship operators

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per vessel (man-days)	Time per vessel (hours)	Price (per vessel)	Frequency (per year)	Price (per vessel & per year)	Outsourcing costs (per vessel & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per vessel & per year)	Total administrative burden (per vessel & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	24	192	€7.968,00	0,1	€796,80	€0	0	€97	€97	18400	€14.661.120	€14.661.120
Preparation of the monitoring plan		6	48	€1.992,00	0,1	€199,20	€0	0	€199	€199	18400	€3.665.280	€3.665.280
Retrieving relevant information from existing data		3	24	€996,00	1	€996,00	€0	80	€996	€199	18400	€18.326.400	€3.665.280
Adjusting existing data		3	24	€996,00	1	€996,00	€0	0	€996	€996	18400	€18.326.400	€18.326.400
Filling in forms and tables, including recordkeeping		1	8	€332,00	1	€332,00	€0	0	€332	€332	18400	€6.108.800	€6.108.800
Verification		2	16	€664,00	1	€664,00	€3.750	0	€4.414	€4.414	18400	€1.217.600	€1.217.600
Submitting the information		1	8	€332,00	1	€332,00	€0	0	€332	€332	18400	€6.108.800	€6.108.800
Setting up the fund (central)				€0,00	0,1	€0,00	€70,00	0	€70	€70	18400	€1.288.000	€1.288.000
Setting up the fund (work by affiliated members)				€373,50	0,1	€37,35	€0,00	0	€37	€37	18400	€687.240	€687.240
Contribution to the fund administration			0	9	€373,50	1	€373,50	€373,50	0	€747	€747	18400	€13.744.800
<b>Total</b>						<b>€4.727</b>	<b>€4.194</b>		<b>€8.920</b>	<b>€8.124</b>		<b>€64.134.440</b>	<b>€49.473.320</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per vessel (man-days)	Time per vessel (hours)	Price (per vessel)	Frequency (per year)	Price (per vessel & per year)	Outsourcing costs (per vessel & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per vessel & per year)	Total administrative burden (per vessel & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	20	160	€6.640,00	0,1	€664,00	€0	0	€664	€664	11400	€7.569.600	€7.569.600
Preparation of the monitoring plan		5	40	€1.660,00	0,1	€166,00	€0	0	€166	€166	11400	€1.892.400	€1.892.400
Retrieving relevant information from existing data		2	16	€664,00	1	€664,00	€0	80	€664	€133	11400	€7.569.600	€1.513.920
Adjusting existing data		2	16	€664,00	1	€664,00	€0	0	€664	€664	11400	€7.569.600	€7.569.600
Filling in forms and tables, including recordkeeping		1	8	€332,00	1	€332,00	€0	0	€332	€332	11400	€3.784.800	€3.784.800
Verification		2	16	€664,00	1	€664,00	€3.750	0	€4.414	€4.414	11400	€50.319.600	€50.319.600
Submitting the information		1	8	€332,00	1	€332,00	€0	0	€332	€332	11400	€3.784.800	€3.784.800
Setting up the fund (central)				€0,00	0,1	€0,00	€70,00	0	€70	€70	11400	€798.000	€798.000
Setting up the fund (work by affiliated members)				€373,50	0,1	€37,35	€0,00	0	€37	€37	11400	€425.790	€425.790
Contribution to the fund administration			0	9	€373,50	1	€373,50	€373,50	0	€747	€747	11400	€8.515.800
<b>Total</b>						<b>€3.897</b>	<b>€4.194</b>		<b>€8.090</b>	<b>€7.559</b>		<b>€92.229.990</b>	<b>€86.174.310</b>

The administrative burden under a privately managed compensation fund is similar to the administrative burden under option 3b (tax on emissions).

➤ *Public based compensation fund*

- For ship owners and ship operators

The administrative burden under a publicly managed compensation fund is similar to the administrative burden under option 3b (tax on emissions).

- For public authorities
  - For national competent authorities

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	55	440	€18.260,00	0,1	€1.826,00	€0,00	€0,00	0	€1.826	€1.826	27	€49.302	€49.302
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200.000	€0,00	0	€7.663	€7.663	1	€206.640	€206.640
Informing the subjected entities		680	5440	€225.760,00	0,1	€22.576,00	€0,00	€0,00	0	€22.576	€22.576	27	€609.552	€609.552
Verification of the information submitted		340	2720	€12.880,00	1	€12.880,00	€0,00	€0,00	0	€12.880	€12.880	27	€3.047.760	€3.047.760
Setting up the fund			191000	€12.797.000,00	0,1	€1.279.700,00	€0,00	€0,00	0	€1.279.700	€1.279.700	1	€1.279.700	€1.279.700
Fund administration	€7,00		204000	€13.668.000,00	1	€13.668.000,00	€0,00	€0,00	0	€13.668.000	€13.668.000	1	€13.668.000	€13.668.000
Informing the subjected entities		440	3520	€235.840,00	1	€235.840,00	€0,00	€0,00	0	€235.840	€235.840	1	€235.840	€235.840
<b>Total</b>													<b>€19.096.794</b>	<b>€19.096.794</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	55	440	€18.260,00	0,1	€1.826,00	€0,00	€0,00	0	€1.826	€1.826	27	€49.302	€49.302
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200.000	€0,00	0	€206.640	€206.640	1	€206.640	€206.640
Informing the subjected entities		420	3360	€39.440,00	0,1	€3.944,00	€0,00	€0,00	0	€3.944	€3.944	27	€376.488	€376.488
Verification of the information submitted		210	1680	€69.720,00	1	€69.720,00	€0,00	€0,00	0	€69.720	€69.720	27	€1.882.440	€1.882.440
Setting up the fund	€67,00		119000	€7.973.000,00	0,1	€797.300,00	€0,00	€0,00	0	€797.300	€797.300	1	€797.300	€797.300
Fund administration			126000	€8.442.000,00	1	€8.442.000,00	€0,00	€0,00	0	€8.442.000	€8.442.000	1	€8.442.000	€8.442.000
Informing the subjected entities		220	1760	€117.920,00	1	€117.920,00	€0,00	€0,00	0	€117.920	€117.920	1	€117.920	€117.920
<b>Total</b>													<b>€1.872.090</b>	<b>€1.872.090</b>

o For EU competent authority

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	55	440	€18.260,00	0,1	€1.826,00	€0,00	€0,00	0	€1.826	€1.826	€1.826	€1.826
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200.000	€0,00	0	€206.640	€206.640	€206.640	€206.640
Informing the subjected entities		13800	110400	€4.581.600,00	0,1	€458.160,00	€0,00	€0,00	0	€458.160	€458.160	€458.160	€458.160
Verification of the information submitted		4600	36800	€1.527.200,00	1	€1.527.200,00	€0,00	€0,00	0	€1.527.200	€1.527.200	€1.527.200	€1.527.200
Controlling the membership	€67,00	2300	18400	€763.600,00	1	€763.600,00	€0,00	€0,00	0	€763.600	€763.600	€763.600	€763.600
Setting up the fund			191000	€12.797.000,00	0,1	€1.279.700,00	€0,00	€0,00	0	€1.279.700	€1.279.700	€1.279.700	€1.279.700
Fund administration			204000	€13.668.000,00	1	€13.668.000,00	€0,00	€0,00	0	€13.668.000	€13.668.000	€13.668.000	€13.668.000
Informing the subjected entities		440	3520	€235.840,00	1	€235.840,00	€0,00	€0,00	0	€235.840	€235.840	€235.840	€235.840
<b>Total</b>						<b>€2.757.426,00</b>	<b>€200.000,00</b>			<b>€18.140.966</b>	<b>€18.140.966</b>	<b>€18.140.966</b>	<b>€18.140.966</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	55	440	€18.260,00	0,1	€1.826,00	€0,00	€0,00	0	€1.826	€1.826	€1.826	€1.826
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200.000	€0,00	0	€206.640	€206.640	€206.640	€206.640
Informing the subjected entities		8550	68400	€2.838.600,00	0,1	€283.860,00	€0,00	€0,00	0	€283.860	€283.860	€283.860	€283.860
Verification of the information submitted		2850	22800	€946.200,00	1	€946.200,00	€0,00	€0,00	0	€946.200	€946.200	€946.200	€946.200
Controlling the membership	€67,00	1425	11400	€473.100,00	1	€473.100,00	€0,00	€0,00	0	€473.100	€473.100	€473.100	€473.100
Setting up the fund			119000	€7.973.000,00	0,1	€797.300,00	€0,00	€0,00	0	€797.300	€797.300	€797.300	€797.300
Fund administration			126000	€8.442.000,00	1	€8.442.000,00	€0,00	€0,00	0	€8.442.000	€8.442.000	€8.442.000	€8.442.000
Informing the subjected entities		220	1760	€117.920,00	1	€117.920,00	€0,00	€0,00	0	€117.920	€117.920	€117.920	€117.920
<b>Total</b>						<b>€1.711.626,00</b>	<b>€200.000,00</b>			<b>€11.268.846</b>	<b>€11.268.846</b>	<b>€11.268.846</b>	<b>€11.268.846</b>

## 6. CLOSED ETS (OPTION 4A)

- For ship owners and ship operators

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per vessel (man-days)	Time per vessel (hours)	Price (per vessel)	Frequency (per year)	Price (per vessel & per year)	Outsourcing costs (per vessel & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per vessel & per year)	Total administrative burden (per vessel & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	55	440	€18.260,00	0,1	€1.826,00	€0,00	0	€1.826	€1.826	18400	€33.598.400	€33.598.400
Preparation of the monitoring plan		6	48	€1.992,00	0,1	€199,20	€0,00	0	€199	€199	18400	€3.665.280	€3.665.280
Retrieving relevant information from existing data (MRV)		3	24	€996,00	1	€996,00	€0,00	80	€996	€996	18400	€18.326.400	€18.326.400
Adjusting existing data (MRV)		3	24	€996,00	1	€996,00	€0,00	0	€996	€996	18400	€18.326.400	€18.326.400
Filling in forms and tables, including recordkeeping (MRV)		1	8	€332,00	1	€332,00	€0,00	0	€332	€332	18400	€6.108.800	€6.108.800
Verification (MRV)		2	16	€664,00	1	€664,00	€3.750	0	€4.414	€4.414	18400	€81.217.600	€81.217.600
Submitting the information (MRV)		1	8	€332,00	1	€332,00	€0,00	0	€332	€332	18400	€6.108.800	€6.108.800
Surrendering allowances		1	8	€332,00	1	€332,00	€0,00	0	€332	€332	18400	€6.108.800	€6.108.800
Purchasing allowances		1	8	€332,00	1	€332,00	€0,00	0	€332	€332	18400	€6.108.800	€6.108.800
Designing information material		6	48	€1.992,00	0,1	€199,20	€0,00	0	€199	€199	18400	€3.665.280	€3.665.280
Retrieving relevant information from existing data (benchmarks)		3	24	€996,00	0,1	€99,60	€0,00	80	€100	€100	18400	€1.832.640	€366.528
Adjusting existing data (benchmarks)		3	24	€996,00	0,1	€99,60	€0,00	80	€20	€20	18400	€1.832.640	€366.528
Filling in forms and tables, including recordkeeping (benchmarks)		1	8	€332,00	0,1	€33,20	€0,00	0	€33	€33	18400	€10.880	€10.880
Verification (benchmarks)		2	16	€664,00	0,1	€66,40	€375,00	0	€441	€441	18400	€8.121.760	€8.121.760
Submitting the information (benchmarks)		1	8	€332,00	0,1	€33,20	€0,00	0	€33	€33	18400	€10.880	€10.880
<b>Total</b>							<b>€6.540</b>	<b>€4.125</b>		<b>€10.665</b>	<b>€9.709</b>		<b>€96.243.360</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per vessel (man-days)	Time per vessel (hours)	Price (per vessel)	Frequency (per year)	Price (per vessel & per year)	Outsourcing costs (per vessel & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per vessel & per year)	Total administrative burden (per vessel & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	55	440	€18.260,00	0,1	€1.826,00	€0,00	0	€1.826	€1.826	11400	€20.816.400	€20.816.400
Preparation of the monitoring plan		5	40	€1.660,00	0,1	€166,00	€0,00	0	€166	€166	11400	€1.892.400	€1.892.400
Retrieving relevant information from existing data (MRV)		2	16	€664,00	1	€664,00	€0,00	80	€664	€133	11400	€7.569.600	€1.513.920
Adjusting existing data (MRV)		2	16	€664,00	1	€664,00	€0,00	0	€664	€664	11400	€7.569.600	€7.569.600
Filling in forms and tables, including recordkeeping (MRV)		1	8	€332,00	1	€332,00	€0,00	0	€332	€332	11400	€3.784.800	€3.784.800
Verification (MRV)		2	16	€664,00	1	€664,00	€3.750	0	€4.414	€4.414	11400	€50.319.600	€50.319.600
Submitting the information (MRV)		1	8	€332,00	1	€332,00	€0,00	0	€332	€332	11400	€3.784.800	€3.784.800
Surrendering allowances		1	8	€332,00	1	€332,00	€0,00	0	€332	€332	11400	€3.784.800	€3.784.800
Purchasing allowances		1	8	€332,00	1	€332,00	€0,00	0	€332	€332	11400	€3.784.800	€3.784.800
Designing information material		5	40	€1.660,00	0,1	€166,00	€0,00	0	€166	€166	11400	€1.892.400	€1.892.400
Retrieving relevant information from existing data (benchmarks)		2	16	€664,00	0,1	€66,40	€0,00	80	€66	€13	11400	€756.960	€151.392
Adjusting existing data (benchmarks)		2	16	€664,00	0,1	€66,40	€0,00	80	€66	€13	11400	€756.960	€151.392
Filling in forms and tables, including recordkeeping (benchmarks)		1	8	€332,00	0,1	€33,20	€0,00	0	€33	€33	11400	€378.480	€378.480
Verification (benchmarks)		2	16	€664,00	0,1	€66,40	€375,00	0	€441	€441	11400	€5.031.960	€5.031.960
Submitting the information (benchmarks)		1	8	€332,00	0,1	€33,20	€0,00	0	€33	€33	11400	€378.480	€378.480
<b>Total</b>							<b>€5.744</b>	<b>€1.125</b>		<b>€9.869</b>	<b>€9.231</b>		<b>€12.502.040</b>

- For public authorities
  - For national competent authorities

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)	
Familiarizing with the information obligation	€1,50	55	440	€18.260,00	0,1	€1.826,00	€0,00	€0,00	0	€1.826	€1.826	27	€49.302	€49.302	
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200.000	€0,00	0	€7.663	€7.663	1	€206.640	€206.640	
Informing the subjected entities		680	5440	€225.760,00	0,1	€22.576,00	€0,00	€0,00	0	€22.576	€22.576	27	€609.552	€609.552	
Verification of the information submitted		340	2720	€112.880,00	1	€112.880,00	€0,00	€0,00	0	€112.880	€112.880	27	€3.047.760	€3.047.760	
Controlling of the surrendering		10	80	€3.320,00	1	€3.320,00	€0,00	€0,00	50	€3.320	€3.320	27	€89.640	€89.640	
Familiarizing with the information obligation (benchmarks)		50	400	€16.600,00	0,1	€1.660,00	€0,00	€0,00	0	€1.660	€1.660	1	€1.660	€1.660	
Designing information material (benchmarks)		200	1600	€66.400,00	0,1	€6.640,00	€0,00	€0,00	0	€6.640	€6.640	1	€6.640	€6.640	
Informing the subjected entities (benchmarks)		13800	110400	€4.581.600,00	0,1	€458.160,00	€0,00	€0,00	0	€458.160	€458.160	1	€458.160	€458.160	
Verification of the information submitted (benchmarks)		4600	36800	€1.527.200,00	0,1	€152.720,00	€0,00	€50.000,00	0	€202.720	€202.720	1	€202.720	€202.720	
Delivering the free allocations		2300	18400	€763.600,00	0,1	€76.360,00	€0,00	€0,00	0	€76.360	€76.360	1	€76.360	€76.360	
<b>Total</b>														<b>€1.748.434</b>	<b>€1.703.614</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)	
Familiarizing with the information obligation	€1,50	55	440	€18.260,00	0,1	€1.826,00	€0,00	€0,00	0	€1.826	€1.826	27	€49.302	€49.302	
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200.000	€0,00	0	€206.640	€206.640	1	€206.640	€206.640	
Informing the subjected entities		420	3360	€139.440,00	0,1	€13.944,00	€0,00	€0,00	0	€13.944	€13.944	27	€376.488	€376.488	
Verification of the information submitted		210	1680	€69.720,00	1	€69.720,00	€0,00	€0,00	0	€69.720	€69.720	27	€1.882.440	€1.882.440	
Controlling of the surrendering		10	80	€3.320,00	1	€3.320,00	€0,00	€0,00	50	€3.320	€1.660	27	€89.640	€4.820	
Familiarizing with the information obligation (benchmarks)		50	400	€16.600,00	0,1	€1.660,00	€0,00	€0,00	0	€1.660	€1.660	1	€1.660	€1.660	
Designing information material (benchmarks)		200	1600	€66.400,00	0,1	€6.640,00	€0,00	€0,00	0	€6.640	€6.640	1	€6.640	€6.640	
Informing the subjected entities (benchmarks)		8550	68400	€2.838.600,00	0,1	€283.860,00	€0,00	€0,00	0	€283.860	€283.860	1	€283.860	€283.860	
Verification of the information submitted (benchmarks)		2850	22800	€946.200,00	0,1	€94.620,00	€0,00	€50.000,00	0	€144.620	€144.620	1	€144.620	€144.620	
Delivering the free allocations		1425	11400	€473.100,00	0,1	€47.310,00	€0,00	€0,00	0	€47.310	€47.310	1	€47.310	€47.310	
<b>Total</b>														<b>€3.088.600</b>	<b>€3.043.780</b>

- For EU competent authority

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	55	440	€18.260,00	0,1	€1.826,00	€0	€0,00	0	€1.826	€1.826	1	€1.826	€1.826
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200.000	€0,00	0	€7.663	€7.663	1	€206.640	€206.640
Informing the subjected entities		13800	110400	€4.581.600,00	0,1	€458.160,00	€0	€0,00	0	€458.160	€458.160	1	€458.160	€458.160
Verification of the information submitted		4600	36800	€1.527.200,00	1	€1.527.200,00	€0	€0,00	0	€1.527.200	€1.527.200	1	€1.527.200	€1.527.200
Controlling of the surrendering		10	80	€3.320,00	1	€3.320,00	€0,00	€0,00	50	€3.320	€1.660	1	€3.320	€1.660
Familiarizing with the information obligation (benchmarks)		50	400	€16.600,00	0,1	€1.660,00	€0,00	€0,00	0	€1.660	€1.660	1	€1.660	€1.660
Designing information material (benchmarks)		200	1600	€66.400,00	0,1	€6.640,00	€0,00	€0,00	0	€6.640	€6.640	1	€6.640	€6.640
Informing the subjected entities (benchmarks)		13800	110400	€4.581.600,00	0,1	€458.160,00	€0,00	€0,00	0	€458.160	€458.160	1	€458.160	€458.160
Verification of the information submitted (benchmarks)		4600	36800	€1.527.200,00	0,1	€152.720,00	€0,00	€50.000,00	0	€202.720	€202.720	1	€202.720	€202.720
Delivering the free allocations		2300	18400	€763.600,00	0,1	€76.360,00	€0,00	€0,00	0	€76.360	€76.360	1	€76.360	€76.360
<b>Total</b>														<b>€2.942.686</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	55	440	€18.260,00	0,1	€1.826,00	€0	€0,00	0	€1.826	€1.826	1	€1.826	€1.826
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200.000	€0,00	0	€206.640	€206.640	1	€206.640	€206.640
Informing the subjected entities		8550	68400	€2.838.600,00	0,1	€283.860,00	€0	€0,00	0	€283.860	€283.860	1	€283.860	€283.860
Verification of the information submitted		2850	22800	€946.200,00	1	€946.200,00	€0	€0,00	0	€946.200	€946.200	1	€946.200	€946.200
Controlling of the surrendering		10	80	€3.320,00	1	€3.320,00	€0,00	€0,00	50	€3.320	€1.660	1	€3.320	€1.660
Familiarizing with the information obligation (benchmarks)		50	400	€16.600,00	0,1	€1.660,00	€0,00	€0,00	0	€1.660	€1.660	1	€1.660	€1.660
Designing information material (benchmarks)		200	1600	€66.400,00	0,1	€6.640,00	€0,00	€0,00	0	€6.640	€6.640	1	€6.640	€6.640
Informing the subjected entities (benchmarks)		8550	68400	€2.838.600,00	0,1	€283.860,00	€0,00	€0,00	0	€283.860	€283.860	1	€283.860	€283.860
Verification of the information submitted (benchmarks)		2850	22800	€946.200,00	0,1	€94.620,00	€0,00	€50.000,00	0	€144.620	€144.620	1	€144.620	€144.620
Delivering the free allocations		1425	11400	€473.100,00	0,1	€47.310,00	€0,00	€0,00	0	€47.310	€47.310	1	€47.310	€47.310
<b>Total</b>														<b>€1.925.936</b>

#### 7. OPEN ETS WITH FREE ALLOCATION (OPTION 4B)

The administrative costs and administrative burden under this option are equal to option 4a (closed ETS)

#### 8. OPEN ETS WITH FULL AUCTIONING (OPTION 4C)

- For ship owners and ship operators

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per vessel (man-days)	Time per vessel (hours)	Price (per vessel)	Frequency (per year)	Price (per vessel & per year)	Outsourcing costs (per vessel & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per vessel & per year)	Total administrative burden (per vessel & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	29	232	€9.628,00	0,1	€962,80	€0	0	€963	€963	18400	€17.715.520	€17.715.520
Preparation of the monitoring plan		6	48	€1.992,00	0,1	€199,20	€0	0	€199	€199	18400	€3.665.280	€3.665.280
Retrieving relevant information from existing data (MRV)		3	24	€996,00	1	€996,00	€0	80	€996	€199	18400	€18.326.400	€3.665.280
Adjusting existing data (MRV)		3	24	€996,00	1	€996,00	€0	0	€996	€996	18400	€18.326.400	€18.326.400
Filling in forms and tables, including recordkeeping (MRV)		1	8	€332,00	1	€332,00	€0	0	€332	€332	18400	€6.108.800	€6.108.800
Verification (MRV)		2	16	€664,00	1	€664,00	€3.750	0	€4.414	€4.414	18400	€81.217.600	€81.217.600
Submitting the information (MRV)		1	8	€332,00	1	€332,00	€0	0	€332	€332	18400	€6.108.800	€6.108.800
Surrendering allowances		1	8	€332,00	1	€332,00	€0,00	0	€332	€332	18400	€6.108.800	€6.108.800
Purchasing allowances		1	8	€332,00	1	€332,00	€0,00	0	€332	€332	18400	€6.108.800	€6.108.800
<b>Total</b>							<b>€5.146</b>	<b>€3.750</b>		<b>€8.896</b>	<b>€8.099</b>		<b>€163.686.400</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per vessel (man-days)	Time per vessel (hours)	Price (per vessel)	Frequency (per year)	Price (per vessel & per year)	Outsourcing costs (per vessel & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per vessel & per year)	Total administrative burden (per vessel & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)
Familiarizing with the information obligation	€41,50	29	232	€9.628,00	0,1	€962,80	€0	0	€963	€963	11400	€10.975.920	€10.975.920
Preparation of the monitoring plan		5	40	€1.660,00	0,1	€166,00	€0	0	€166	€166	11400	€1.892.400	€1.892.400
Retrieving relevant information from existing data (MRV)		2	16	€664,00	1	€664,00	€0	80	€664	€133	11400	€7.569.600	€1.513.920
Adjusting existing data (MRV)		2	16	€664,00	1	€664,00	€0	0	€664	€664	11400	€7.569.600	€7.569.600
Filling in forms and tables, including recordkeeping (MRV)		1	8	€332,00	1	€332,00	€0	0	€332	€332	11400	€3.784.800	€3.784.800
Verification (MRV)		2	16	€664,00	1	€664,00	€3.750	0	€4.414	€4.414	11400	€50.319.600	€50.319.600
Submitting the information (MRV)		1	8	€332,00	1	€332,00	€0	0	€332	€332	11400	€3.784.800	€3.784.800
Surrendering allowances		1	8	€332,00	1	€332,00	€0,00	0	€332	€332	11400	€3.784.800	€3.784.800
Purchasing allowances		1	8	€332,00	1	€332,00	€0,00	0	€332	€332	11400	€3.784.800	€3.784.800
<b>Total</b>							<b>€1.449</b>	<b>€3.750</b>		<b>€8.199</b>	<b>€7.668</b>		<b>€93.466.320</b>

- For public authorities

- For national competent authorities

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)	
Familiarizing with the information obligation	€41,50	55	440	€18.260,00	0,1	€1.826,00	€0,00	€0,00	0	€1.826	€1.826	27	€49.302	€49.302	
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200.000	€0,00	0	€7.663	€7.663	1	€206.640	€206.640	
Informing the subjected entities		680	5440	€225.760,00	0,1	€22.576,00	€0,00	€0,00	0	€22.576	€22.576	27	€609.552	€609.552	
Verification of the information submitted		340	2720	€112.880,00	1	€112.880,00	€0,00	€0,00	0	€112.880	€112.880	27	€3.047.760	€3.047.760	
Controlling of the surrendering		10	80	€3.320,00	1	€3.320,00	€0,00	€0,00	50	€3.320	€1.660	27	€89.640	€44.820	
Auctioning allowances		60	480	€19.920,00	1	€19.920,00	€0,00	€100.000,00	50	€19.920	€9.960	27	€537.840	€1.618.920	
Managed the revenue generated		30	240	€9.960,00	1	€9.960,00	€0,00	€0,00	50	€9.960	€4.980	27	€268.920	€134.460	
<b>Total</b>														<b>€7.509.654</b>	<b>€5.711.454</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)	
Familiarizing with the information obligation	€41,50	55	440	€18.260,00	0,1	€1.826,00	€0,00	€0,00	0	€1.826	€1.826	27	€49.302	€49.302	
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200.000	€0,00	0	€7.663	€7.663	1	€206.640	€206.640	
Informing the subjected entities		420	3360	€139.440,00	0,1	€13.944,00	€0,00	€0,00	0	€13.944	€13.944	27	€376.488	€376.488	
Verification of the information submitted		210	1680	€69.720,00	1	€69.720,00	€0,00	€0,00	0	€69.720	€69.720	27	€1.882.440	€1.882.440	
Controlling of the surrendering		10	80	€3.320,00	1	€3.320,00	€0,00	€0,00	50	€3.320	€1.660	27	€89.640	€44.820	
Auctioning allowances		60	480	€19.920,00	1	€19.920,00	€0,00	€100.000,00	50	€19.920	€9.960	27	€537.840	€1.618.920	
Managed the revenue generated		30	240	€9.960,00	1	€9.960,00	€0,00	€0,00	50	€9.960	€4.980	27	€268.920	€134.460	
<b>Total</b>														<b>€6.111.270</b>	<b>€4.313.070</b>

- For EU competent authority

If all ships above 400GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)	
Familiarizing with the information obligation	€41,50	55	440	€18.260,00	0,1	€1.826,00	€0,00	€0,00	0	€1.826	€1.826	1	€1.826	€1.826	
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200.000	€0,00	0	€7.663	€7.663	1	€206.640	€206.640	
Informing the subjected entities		13800	110400	€4.581.600,00	0,1	€458.160,00	€0,00	€0,00	0	€458.160	€458.160	1	€458.160	€458.160	
Verification of the information submitted		4600	36800	€1.527.200,00	1	€1.527.200,00	€0,00	€0,00	0	€1.527.200	€1.527.200	1	€1.527.200	€1.527.200	
Controlling of the surrendering		10	80	€3.320,00	1	€3.320,00	€0,00	€0,00	50	€3.320	€1.660	1	€3.320	€1.660	
Auctioning allowances		60	480	€19.920,00	1	€19.920,00	€0,00	€2.000.000,00	50	€2.019.920	€1.009.960	1	€2.019.920	€1.009.960	
Managed the revenue generated		30	240	€9.960,00	1	€9.960,00	€0,00	€0,00	50	€9.960	€4.980	1	€9.960	€4.980	
<b>Total</b>														<b>€4.227.026</b>	<b>€3.210.426</b>

If all ships above 5000GT are included:

Actions required	Tariff (per hour)	Time per CA (man-days)	Time per competent authority (hours)	Price (per CA)	Frequency (per year)	Price (per CA & per year)	Equipment costs (per entity & per year)	Outsourcing costs (per CA & per year)	Business as usual costs (% of administrative costs)	Total administrative costs (per CA & per year)	Total administrative burden (per CA & per year)	Number of entities concerned	Total administrative costs (per year)	Total administrative burdens (per year)	
Familiarizing with the information obligation	€41,50	55	440	€18.260,00	0,1	€1.826,00	€0,00	€0,00	0	€1.826	€1.826	1	€1.826	€1.826	
Designing information material		200	1600	€66.400,00	0,1	€6.640,00	€200,000	€0,00	0	€206.640	€206.640	1	€206.640	€206.640	
Informing the subjected entities		8550	68400	€2.838.600,00	0,1	€283.860,00	€0,00	€0,00	0	€283.860	€283.860	1	€283.860	€283.860	
Verification of the information submitted		2850	22800	€946.200,00	1	€946.200,00	€0,00	€0,00	0	€946.200	€946.200	1	€946.200	€946.200	
Controlling of the surrendering		10	80	€3.320,00	1	€3.320,00	€0,00	€0,00	50	€3.320	€1.660	1	€3.320	€1.660	
Auctioning allowances		60	480	€19.920,00	1	€19.920,00	€0,00	€2.000.000,00	50	€2.019.920	€1.009.960	1	€2.019.920	€1.009.960	
Managed the revenue generated		30	240	€9.960,00	1	€9.960,00	€0,00	€0,00	50	€9.960	€4.980	1	€9.960	€4.980	
<b>Total</b>														<b>€3.471.726</b>	<b>€2.455.126</b>

### 9. TARGET BASED COMPENSATION FUND (OPTION 5)

The administrative costs and administrative burden under this option are equal to option 3c (contribution based compensation fund)

## **ANNEX XIV – SPECIFIC ELEMENTS OF OPTION 2 – MONITORING AND REPORTING BASED ON FUEL CONSUMED**

CO<sub>2</sub> emissions from ships relate to the emission factor associated (in CO<sub>2</sub> per tonnes of fuel) of the type of fuel consumed and the volume of fuel consumed (in tonnes).

Fuels used for maritime transport are much more diverse compared to those used in other transport modes. However, default values for emission factors (as e.g. provided by Decision 2007/589/EC based on IPCC 2006 figures for standard fuel types) can be used to lower administrative effort.

Fuel consumption on EU related routes required for the monitoring of emissions is already available for almost all ships. In this context, Regulation 18 of MARPOL Annex V already makes compulsory the availability of bunker delivery notes<sup>28</sup> for ships engaged in international transport over 400 GT. So, the global fuel consumption of a ship is already monitored. However, in order to get the fuel consumed on EU related routes, the global fuel consumption has to be split between different routes (at least for ships involved in routes related to third countries).

Regulation V/28 of SOLAS already require all ships of 500 GT and above, engaged on international voyages exceeding 48 hours, to submit a daily report to their company, to include ship's position, ship's course and speed. So, the fuel consumption per route can be monitored.

Several technical methods exist for the actual measurement of fuel consumption and this measurement is already done for commercial reasons. The choice of method depends on the available equipment on board a ship. There are no current international regulations mandating the use of specific equipment or a certain level of accuracy in the measurements. The particular method to measure fuel consumption need not be prescribed by a European scheme.

---

<sup>28</sup> The bunker delivery note includes the name and IMO number of the ship receiving the fuel, the port of bunkering, the marine bunker supplier contact information, fuel quantity and density.

## **ANNEX XV – SPECIFIC ELEMENTS OF OPTION 4 – EMISSIONS TRADING SCHEMES**

A link to external carbon market mechanisms will result in an equalisation of prices. The potential range of impacts will be strongly determined by the available supply of allowances from for instance the EU-ETS, sectorial trading mechanisms or other carbon market mechanisms. The assessment does not look into potential sources of this supply and the impact of the potential demand from the maritime sector on these sources of supply (see Annex VI).

New allowances created for the maritime sector can be allocated for free to the ship owners and ship operators or auctioned. The auctioning of allowances allows revenue generation that could inter alia be rechanneled in the sector to remove some market barriers. A central European entity could be in charge of auctioning allowances with full hypothecation.

The competent authority in charge of approving monitoring plans, receiving and validating verified emissions reports would be the Member States or a central EU competent authority. Moreover, the control of the surrendering of required allowances will also be done by the Member States, in accordance with existing provisions of Directive 2003/87/EC or by a central EU competent authority.