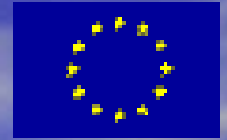


European perspectives – ship emissions across the pond

Presentation to
*A&WMA West Coast Region Conference on
Marine Port Air Quality Impacts*
Seattle, 22 April 2004

Nicola Robinson
European Commission
Directorate-General Environment
Unit C1 – Clean Air & Transport

EU political background – key facts & figures



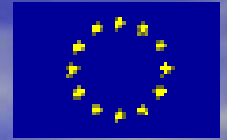
From 1 May, the European Union (EU) will have **25 Member States, 450m people & 30% of world shipping tonnage**.
90% of EU trade (by volume) is transported by ship.

The EU develops common policies and legislation, usually “directives”, through 3 main institutions:

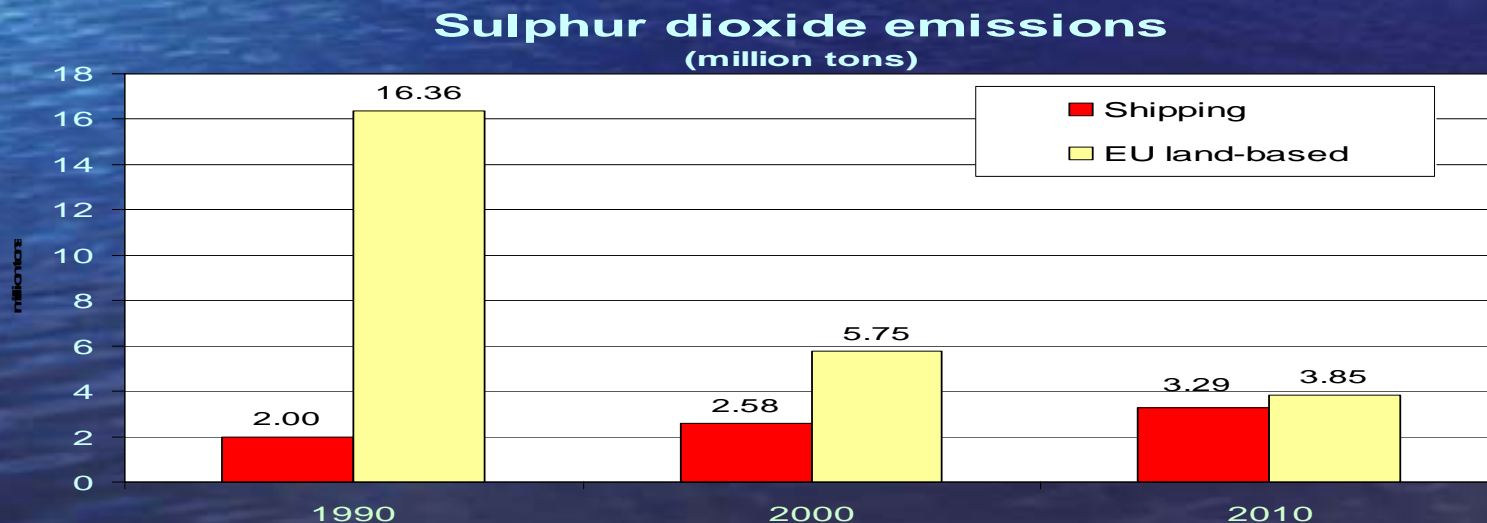
- **European Commission** – proposes policies, checks compliance
- **Council of Ministers** – national govt input; rotating Presidency
- **European Parliament** – local / political input; directly elected

The EU is not a member of the **International Maritime Organization** – but the Commission has observer status, and works with the Presidency to agree coordinated EU lines.

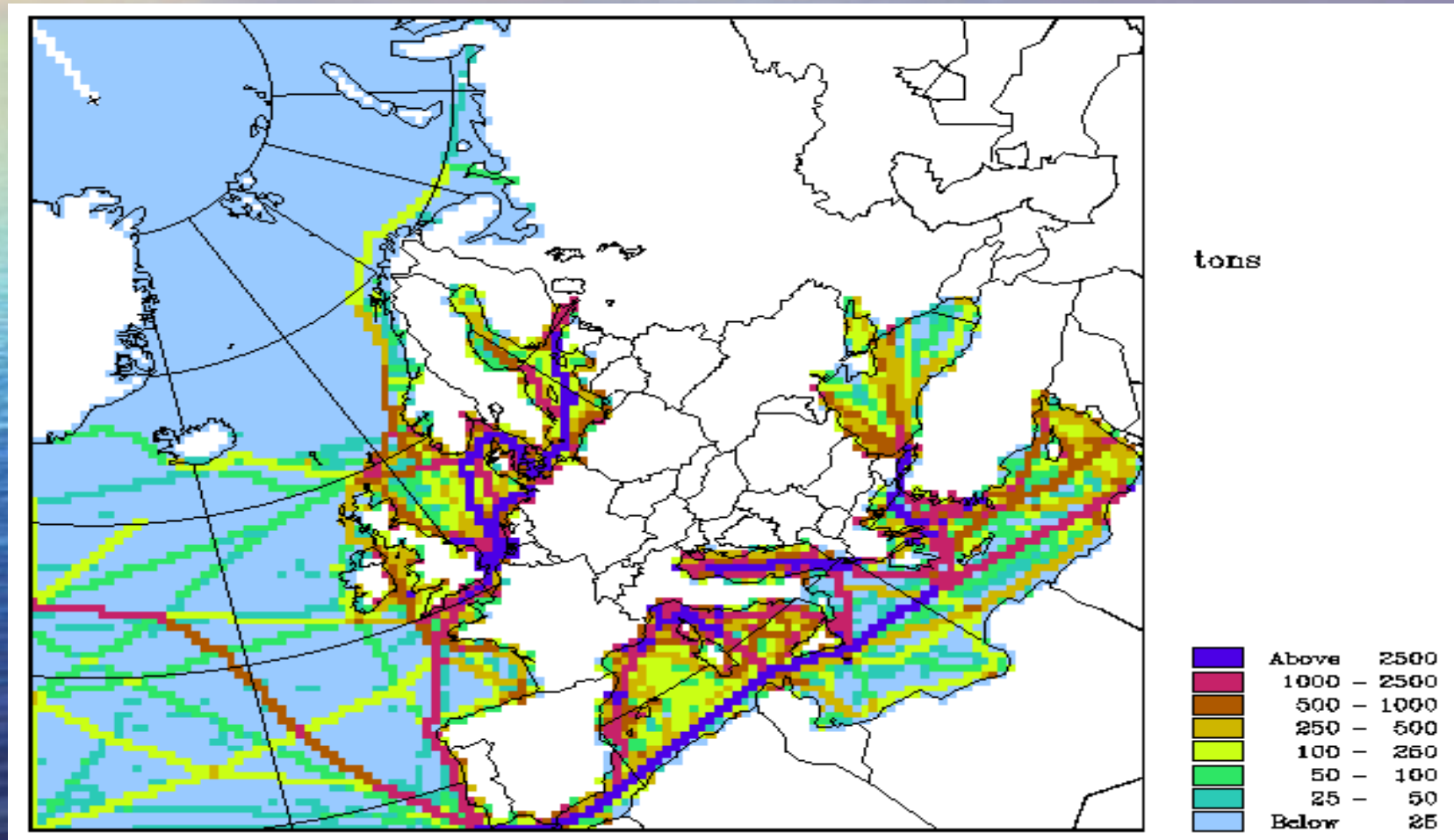
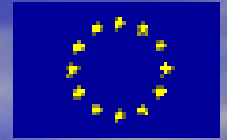
EU political background – why an EU ship emissions policy



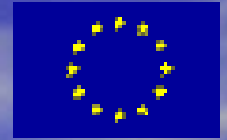
- Air emissions are a transboundary environmental problem
- Ships now the biggest source of air emissions in the EU...
 - As land-based sources are abated (to comply with 2010 National Emissions Ceilings), ship emissions are growing
 - Potential evolution 1990-2010 for sulphur dioxide:



EU study to quantify and map EU ship emissions

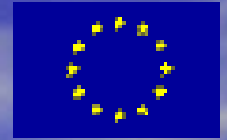


IMO Political background



MARPOL Annex VI & GHG strategy

- **MARPOL Annex VI is 1997 IMO air pollution convention:**
 - Defines SO_x Emission Control Areas where <1.5% S fuel must be used, or abatement applied. Originally only Baltic, but in 2000, EU countries worked together to designate North Sea.
 - NO_x limits for new ships (engine standards, not aftertreatment)
- Needs ratification by 15 states, 50% tonnage. Now 13, 55%.
- **IMO also acting on ship greenhouse gas emissions.** Assembly adopted a resolution last December – difficult negotiations particularly with “Non-Annex I” countries.
- **EU institutions now pressing Member States to ratify, and to work for tougher IMO NO_x rules & GHG actions**



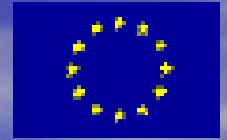
EU ship emissions strategy: COM(2002)595

Vol I Communication; Vol II Directive proposal

Emissions covered:

- Sulphur dioxide (SO₂ or SO_x)
- Particulate Matter (PM)
- Nitrogen oxides (NO_x)
- Volatile Organic Compounds (VOCs)
- Carbon dioxide (CO₂)
- Halon

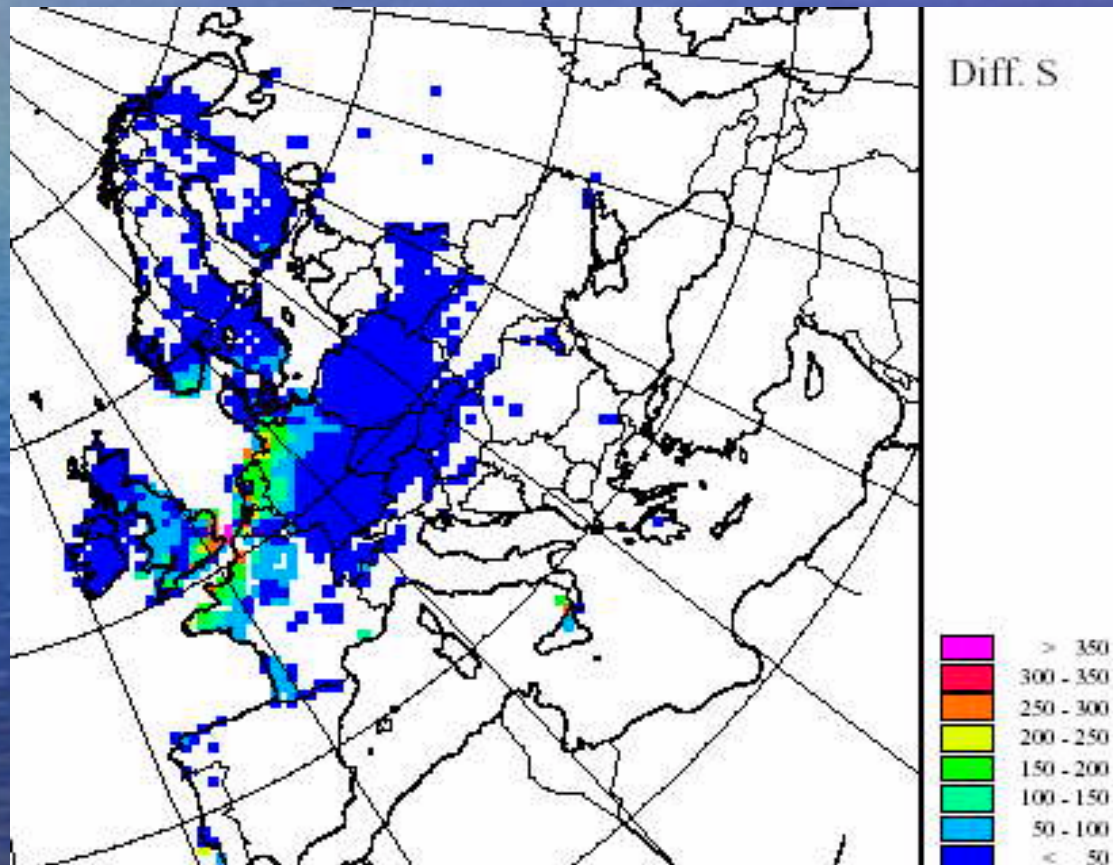
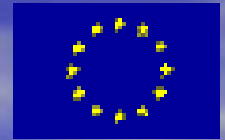
SO₂ and PM are our priorities for action



Key environmental impacts of EU ship emissions

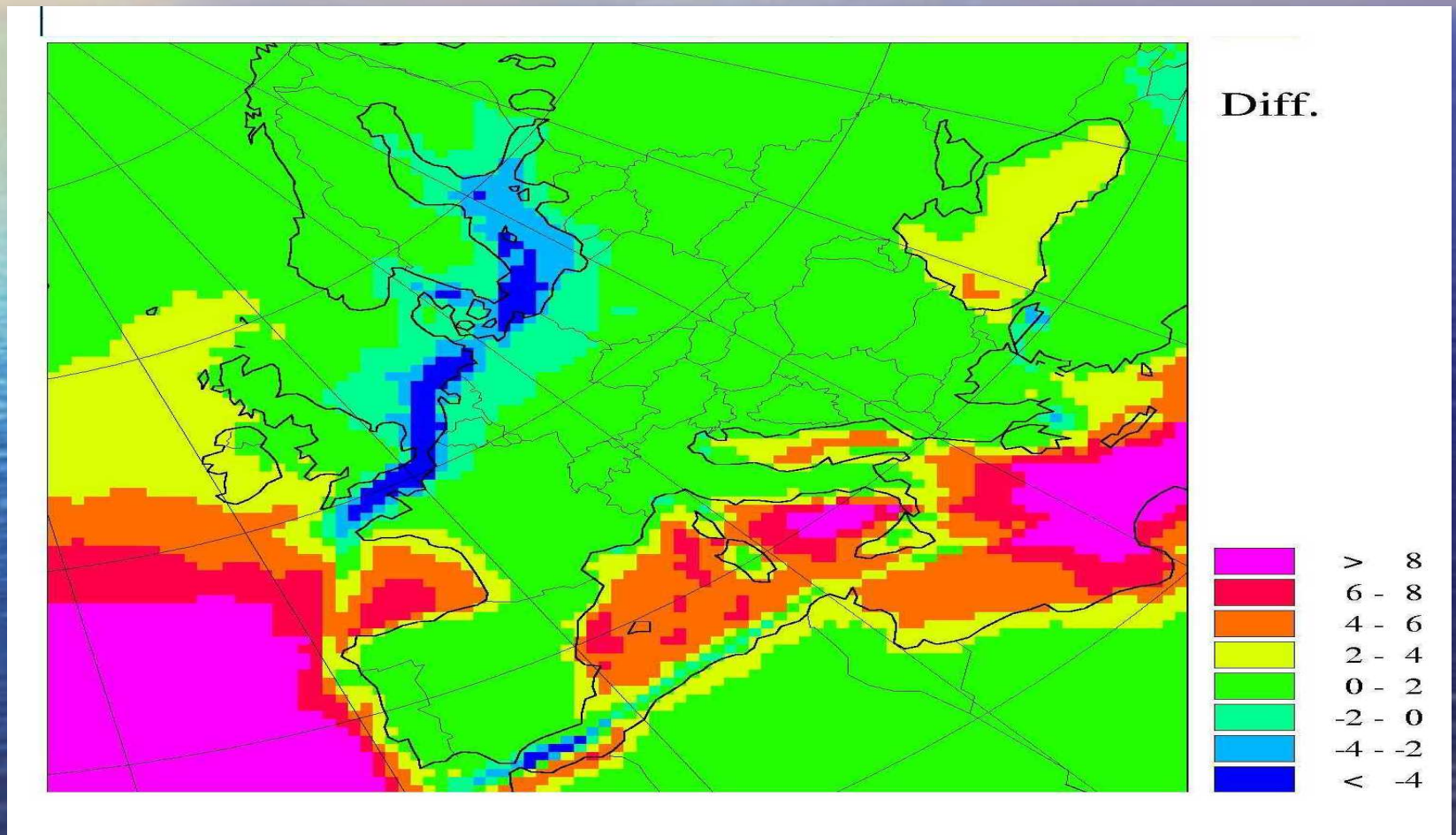
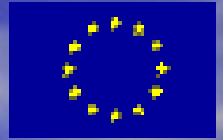
- SO_x & NO_x: cause **acidification**
 - harming lakes & forests
 - acidifying groundwater
 - eroding buildings
- SO_x & NO_x, along with ash and metals from fuel combustion: form **particulate matter (PM)**
 - causing respiratory illness
 - harming human health
- NO_x and VOC: react in sunlight to form **ground-level ozone** "smog", harming health & crops
- PM & ozone are the two biggest priorities for 2005 EU "Clean Air for Europe" programme (CAFE)

Map showing ships' contribution to EU acidification

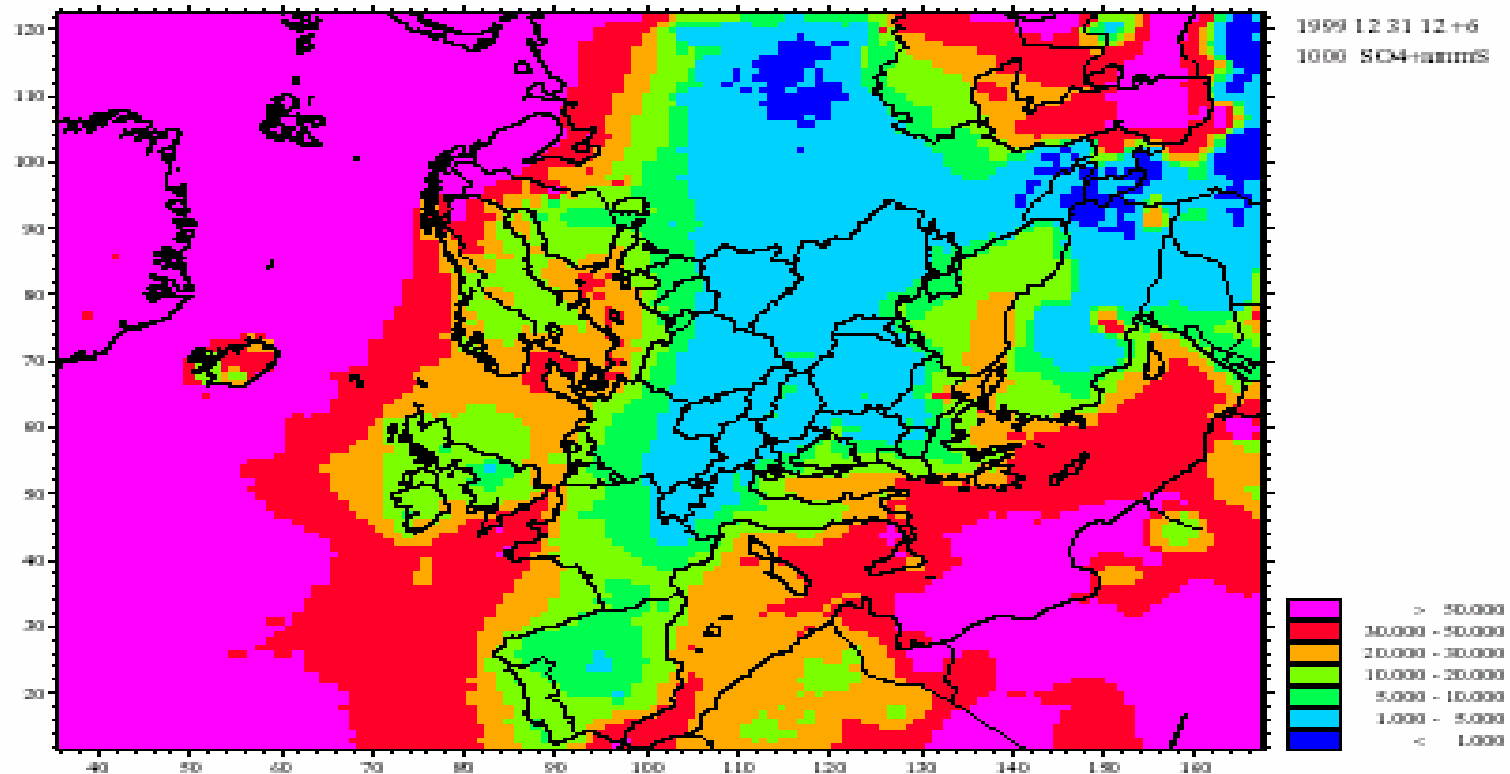
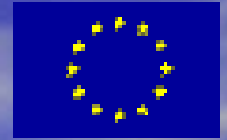


Source for this and subsequent maps: EMEP, 2000 (Co-operative Programme for Monitoring and Evaluation of the Long-Range Transmission of Air pollutants in Europe)

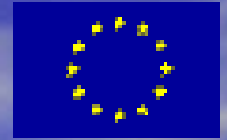
Map showing ships' contribution to ground-level ozone



Map showing ships' contribution to secondary PM



(a) Contributions from ship emissions to SLA.



EU strategy

Volume 1 - Communication

PUSH FOR TOUGHER GLOBAL STANDARDS

- Political pressure on EU Member States to work constructively at IMO. Threat of EU action if this fails, eg on NOx standards.

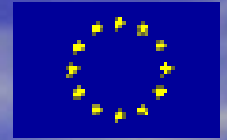
EU CLEAN MARINE AWARD SCHEME

- Launched with industry & NGOs to promote low-emission shipping and spread best practice. 3 categories: ships, shippers & ports. No pecuniary value.






MARKET-BASED INSTRUMENTS

- Recognize that market-based instruments could be effective, particularly for foreign ships, where regulation legally difficult. Commitment to explore possible approaches at EU level.

Market-based instruments – EU study findings (2004)



- US consultants National Economic Research Associates (NERA) awarded Commission contract to evaluate the feasibility of market-based approaches for shipping
- 14 approaches - **trading**: credit, benchmark, cap & trade
charging: taxation, en-route, differentiated dues
- 13 criteria - **environmental, economic, distributional, institutional**
- After workshop and consultations, arrived at three tentative recommendations (all initially voluntary):
 - Differentiated port dues
 - Consortium benchmarking
 - Rigorous credit-based trading

| Key | |
|---|-------|
|  | Best |
|  | Good |
|  | Fair |
|  | Poor |
|  | Worst |

Environmental

Economic Efficiency

Distributional

Institutional

Overall Emissions

Geographic Coverage

Cost Effectiveness

Dynamic Effects, Innovation

Tax Distortions

Shipowners Burden

Fuel Supplier Impacts

Port Impacts

Consumer/Labour Effects

Legal Feasibility

Political Feasibility

Administrative Feasibility

Feasibility of Monitoring

Economic Instrument

Credit

Simple

Rigorous

Benchmarking

Universal

Trading Consortia

Cap-and-Trade

Exchange Rates

Geographic Formula

Taxation/Charging

Tax at Point of Sale

Fuel-use Tax

Emissions Tax

En-Route

Trip-Based Charges

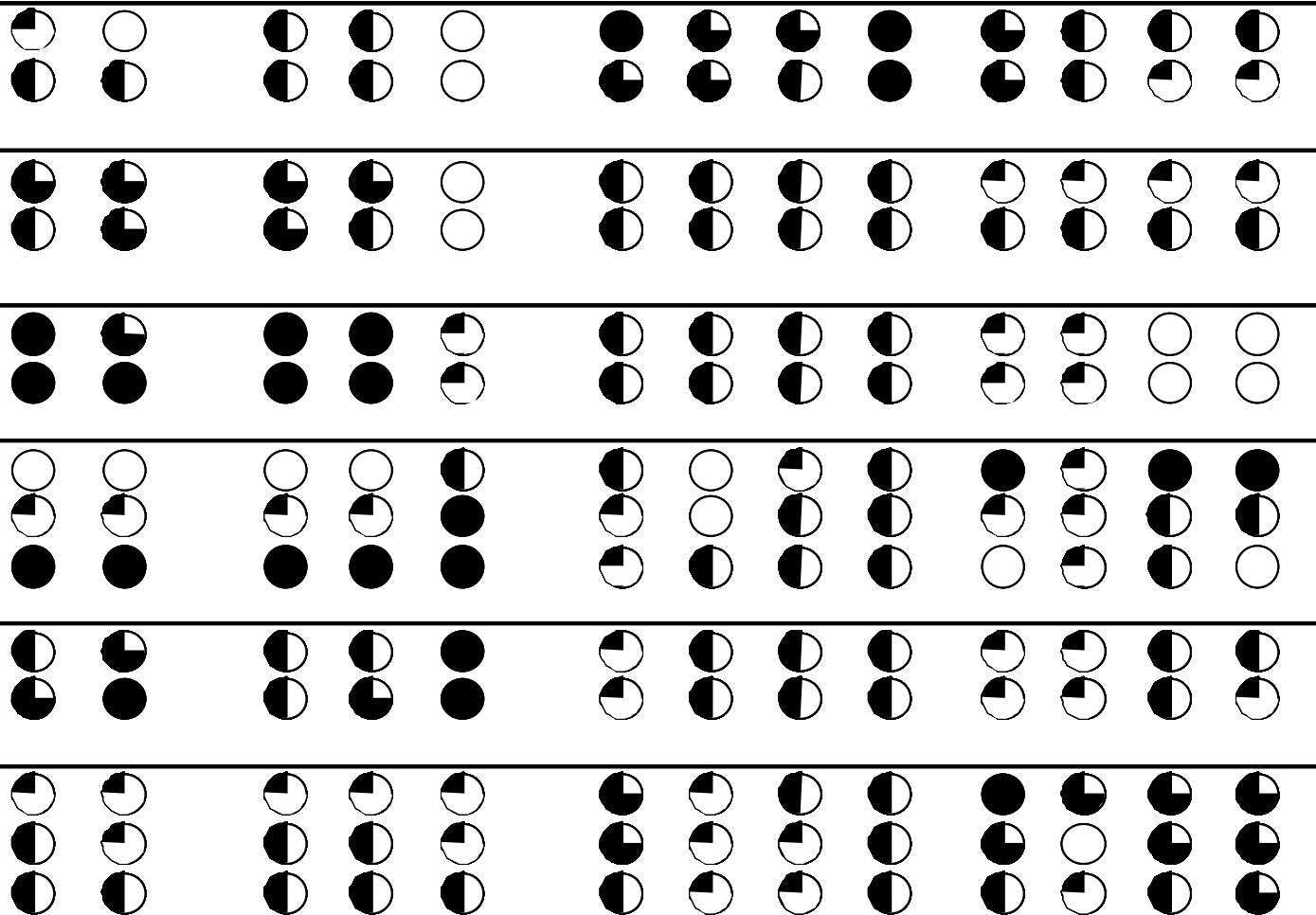
Distance-Based Charges

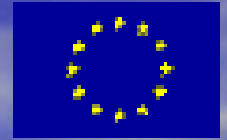
Differentiated Dues

Voluntary Port Dues

Mandatory Port Dues

Fairway Dues

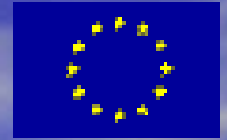




Volume 1 - Communication Politics & Next Steps

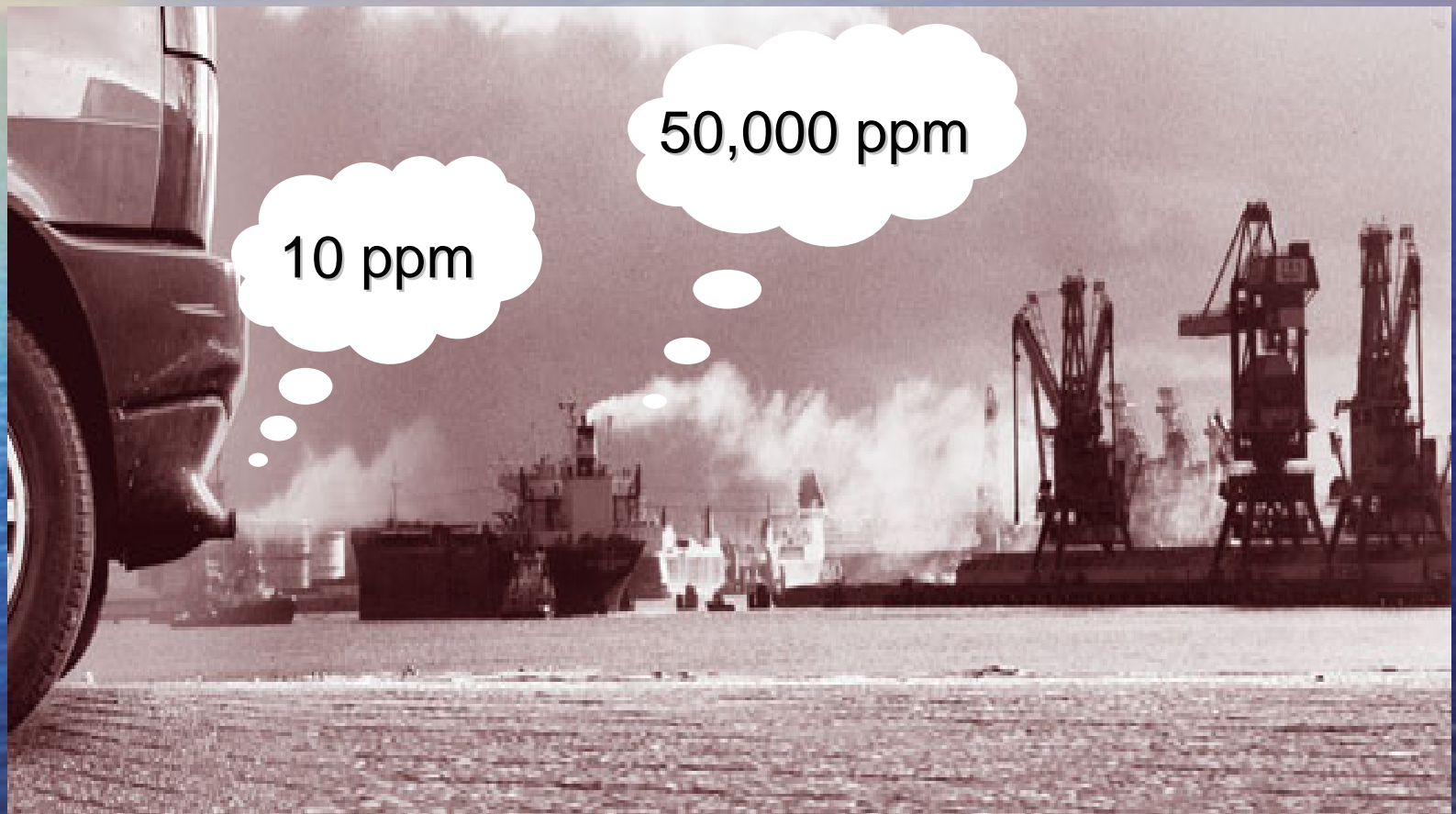
European Parliament and Council of Ministers endorsed the Communication last December, and called for more action. Commission follow-up this year includes

- New study project with 3 tasks:
 - Assign ship emissions to EU MS (to inform discussions on national emissions ceilings review & EU GHG policy)
 - Identify, explain & cost latest abatement technologies, particularly shore-side electricity
 - Develop practical details of the market-based approaches recommended by NERA and explore subsidy possibilities
- Clean Marine Award ceremony, 1 June

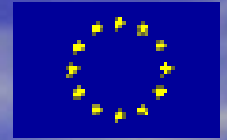


EU strategy

Volume 2 – marine fuel sulphur proposal



Room for improvement!



Main proposals

IN THE BALTIC, NORTH SEA & CHANNEL

- All ships to use <math><1.5\%</math> S fuel (date still negotiable)
 - to reduce acidification, by implementing the SO_x Emission Control Areas defined in the IMO's MARPOL Annex VI convention

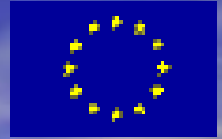
THROUGHOUT THE EU (eg also Mediterranean)

- All regular passenger vessels to use <math><1.5\%</math> S fuel by 2007
 - to improve air quality in coastal areas, maintain high standards for intra-EU regular vessels, and help ensure availability of 1.5% S fuel

IN ALL EU PORTS AND INLAND WATERWAYS

- All ships at berth and all inland vessels to use <math><0.2\%</math> S fuel (0.1% by 2008), ie switch to gasoil, same quality as land
 - to reduce health impacts by cutting local SO₂ and PM emissions

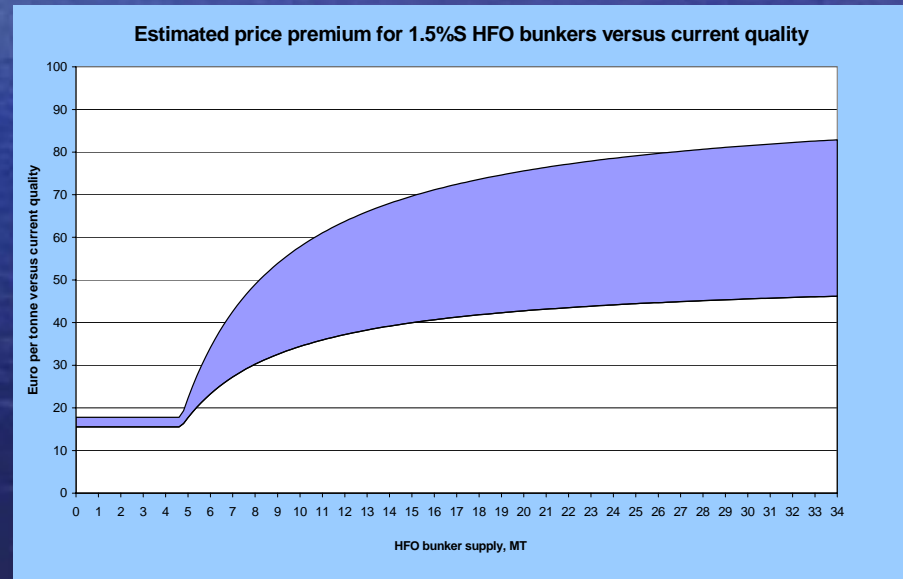
EU study to explore refinery issues & availability for low S fuel



(Beicip Franlab, 2002)

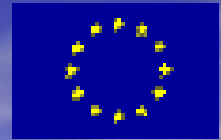
- Low sulphur marine heavy fuel can be provided by
 - 1 reblending
 - 2 lower S crude feedstock
 - 3 desulphurisation

- The more required, the more expensive it gets; reflected in price premium per/t



- 11 mt can be provided in EU at c €50 premium, first 5mt by reblending, most of the rest by lower S crude, but at least some residual desulphurisation probably needed.

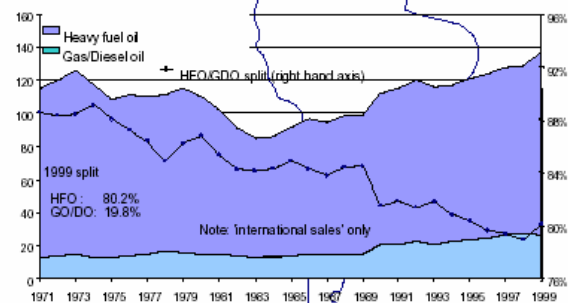
Global fuel availability



World bunker market

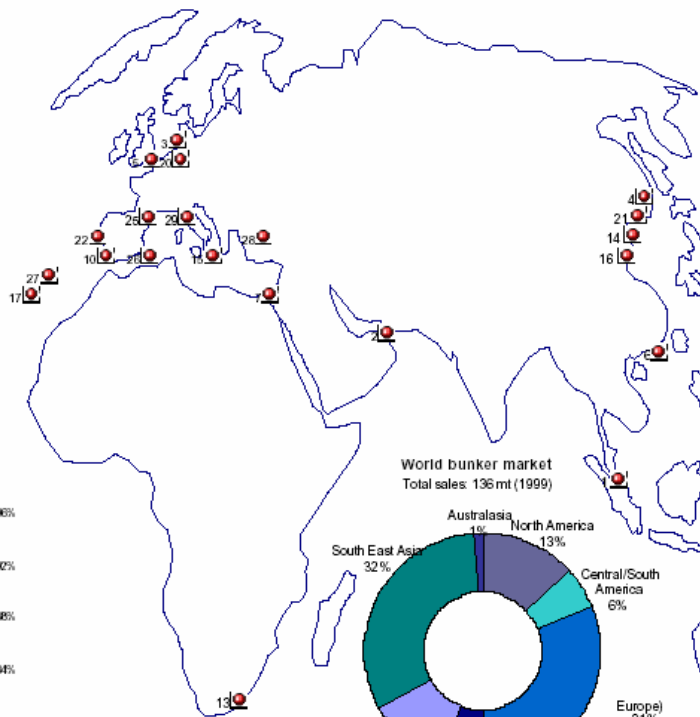


World bunker market
million tonnes

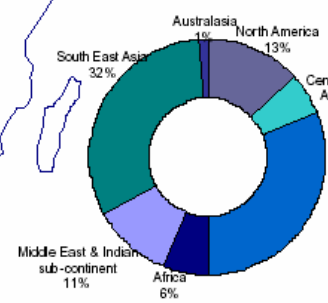


BEICIP-FRANLAB

- 34 -

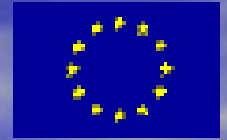


World bunker market
Total sales: 136 mt (1999)



April 2002

| World major bunkering ports | | mt/year |
|----------------------------------|---------------------------------|-------------|
| 1 | Singapore | 20.4 |
| 2 | Fujairah/Khor Fakkan/Kara (UAE) | 11.5 |
| 3 | Rotterdam | 9.0 |
| 4 | Busan (South Korea) | 6.9 |
| 5 | Antwerp | 3.6 |
| 6 | Hong Kong | 3.0 |
| 7 | Suez (Egypt) | 2.9 |
| 8 | Panama | 2.8 |
| 9 | Houston | 2.7 |
| 10 | Gibraltar | 2.5 |
| 11 | New Orleans | 2.5 |
| 12 | Los Angeles | 2.5 |
| 13 | Durban (South Africa) | 2.5 |
| 14 | Ulsan (South Korea) | 2.2 |
| 15 | Piraeus (Greece) | 2.0 |
| 16 | Incheon (South Korea) | 1.8 |
| 17 | Las Palmas | 1.6 |
| 18 | New York | 1.5 |
| 19 | Seattle | 1.5 |
| 20 | Amsterdam | 1.5 |
| 21 | Yosu/Kwangyang (South Korea) | 1.5 |
| 22 | Algeciras (Spain) | 1.4 |
| 23 | Philadelphia | 1.2 |
| 24 | San Francisco | 1.2 |
| 25 | Marseilles & Fos-s-Mer | 1.2 |
| 26 | Malta | 0.9 |
| 27 | Tenerife | 0.9 |
| 28 | Istanbul | 0.8 |
| 29 | Genoa | 0.8 |
| Total main European ports | | 24.7 |
| Total | | 94.8 |



Monetized benefits and costs

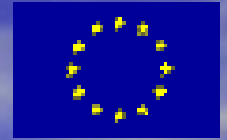
BENEFITS

- 507kt reduction in SO₂, 8 kt reduction in PM in ports
- 2000 fewer life years lost through long-term exposure
- Significant monetized benefits to health, materials & crops.

COSTS

- Likely to be borne by shipowners through fuel price premium
- Assumed a €50 premium for low S HFO; €75 for low S MGO

OVERALL MONETIZED BENEFITS OUTWEIGH COSTS
BY MORE THAN 2:1; IN-PORT MEASURES 8:1.



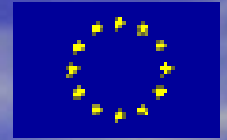
Other benefits and costs

BENEFITS

- Reduced acidification – main rationale, but cannot monetize
- Potential health value in big port cities could be much greater
- Potential reduction in engine maintenance costs for ships equating to €20 per tonne fuel (Wallenius Lines experience)

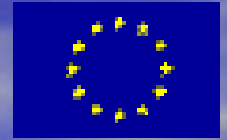
COSTS

- Capital costs for some shipowners to reconfigure fuel tanks, and potentially time costs for fuel switch. Varies significantly for different vessel types & routes so difficult to quantify.
- But unlikely to reverse positive cost-benefit ratio. And most would be required under Annex VI in any case.



Key issues in EU debate

- “Modal shift” objective
- Practicalities of fuel switching
- Shore-side electricity
- Exhaust gas cleaning
- Fuel availability and marketing
- CO₂ from refineries
- Monitoring and enforcement
- Implementation deadlines



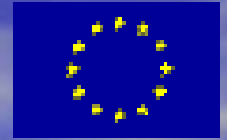
What's not there and why...

EU-WIDE BAN ON SALE OF HIGH S HEAVY FUEL ?

- Judged that cost would be disproportionate, and effects could be distorted because fuel still sold elsewhere

EMISSIONS TRADING ?

- Growing EU interest in air pollutant trading, and Commission asked consultants NERA to explore feasibility of market-based instruments for ships
- But trading not allowed by Annex VI, which proposal aims to enforce - and little appetite to amend Annex VI
- So for sulphur, start with regulatory approach to achieve 1.5% ceiling

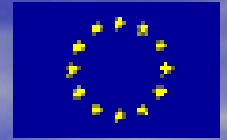


ABATEMENT TECHNOLOGIES

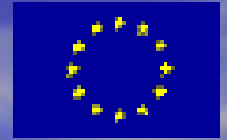
- **Annex VI allows exhaust gas cleaning** (scrubbing) subject to IMO guidelines, and port state environmental criteria.
- **Not everyone is enthusiastic** - because it transfers onus from refiners to ships, and could cause marine pollution.
- **Technology not widely available** (scrubbers or exhaust monitors), but first P&O trials results expected soon.
- In current negotiations, **considering a procedure to allow EU25 to jointly approve technologies and establish criteria.**
- But technology and IMO guidelines must first be developed and environmental performance proven.

Volume 2 – sulphur proposal

Politics & next steps



- Subject to “co-decision” with EP & Council.
- EP 1st reading amendments adopted in June 2003:
 - Tougher than Commission proposal, eg 0.5% S fuel in SECA and for ferries, 0.2% S fuel in territorial seas
- Commission accepted some EP amendments (not 0.5%)
- Council progress has been slow under Greek & Italian Presidencies, but better prospects under Irish & Dutch
- Economic / environmental / political concerns are different in different EU countries
- Timing still not clear. Early 2005? Deadlines negotiable...
- Political changes - accession of 10 new MS in May; EP elections in June; new Commission appointed in Nov



Future collaboration

The EU, US & Canada all have similar concerns about ship emissions, in port and at sea. Working together there are opportunities to:

- **press IMO** for tighter global emissions standards
- **share institutional knowledge** – studies, consultations, political considerations
- **share best practice in national / port policies** eg SECAs & market-based approaches
- **share industry best practice** in emissions control research, design, & operation



Thank you!

For more information, including links to
the Commission proposals,
Council & Parliament documents,
consultation proceedings,
background studies,
see our website:

<http://www.europa.eu.int/comm/environment/air/transport.htm#3>

Or contact me at env-ships@cec.eu.int