

# ARACON 2007



# Disclaimer statement

This document contains forward-looking statements concerning the financial condition, results of operations and businesses of Royal Dutch Shell. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements. Forward-looking statements are statements of future expectations that are based on management's current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements. Forward-looking statements include, among other things, statements concerning the potential exposure of Royal Dutch Shell to market risks and statements expressing management's expectations, beliefs, estimates, forecasts, projections and assumptions. These forward-looking statements are identified by their use of terms and phrases such as "anticipate", "believe", "could", "estimate", "expect", "intend", "may", "plan", "objectives", "outlook", "probably", "project", "will", "seek", "target", "risks", "goals", "should" and similar terms and phrases. There are a number of factors that could affect the future operations of Royal Dutch Shell and could cause those results to differ materially from those expressed in the forward-looking statements included in this Report, including (without limitation): (a) price fluctuations in crude oil and natural gas; (b) changes in demand for the Group's products; (c) currency fluctuations; (d) drilling and production results; (e) reserve estimates; (f) loss of market and industry competition; (g) environmental and physical risks; (h) risks associated with the identification of suitable potential acquisition properties and targets, and successful negotiation and completion of such transactions; (i) the risk of doing business in developing countries and countries subject to international sanctions; (j) legislative, fiscal and regulatory developments including potential litigation and regulatory effects arising from recategorisation of reserves; (k) economic and financial market conditions in various countries and regions; (l) political risks, project delay or advancement, approvals and cost estimates; and (m) changes in trading conditions. All forward-looking statements contained in this presentation are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. Readers should not place undue reliance on forward-looking statements. Each forward-looking statement speaks only as of the date of this document. Neither Royal Dutch Shell nor any of its subsidiaries undertake any obligation to publicly update or revise any forward-looking statement as a result of new information, future events or other information. In light of these risks, results could differ materially from those stated, implied or inferred from the forward-looking statements contained in this document.

The United States Securities and Exchange Commission (SEC) permits oil and gas companies, in their filings with the SEC, to disclose only proved reserves that a company has demonstrated by actual production or conclusive formation tests to be economically and legally producible under existing economic and operating conditions. We use certain terms in this presentation, such as "oil in place" that the SEC's guidelines strictly prohibit us from including in filings with the SEC. U.S. Investors are urged to consider closely the disclosure in our Form 20-F, File No 1-32575 and disclosure in our Forms 6-K file No, 1-32575, available on the SEC website [www.sec.gov](http://www.sec.gov). You can also obtain these forms from the SEC by calling 1-800-SEC-0330.

# Shipping Emissions

## Critical decisions for a global industry

Shell's perspective as a Shipper and a Refiner

October 2007



# Shell

- Shell has 100+ years of experience in developing the technology & services that make us a leading provider of innovative and new fuels today
- Shell has one of the broadest fuel portfolios, as well as the capacity and commitment to help meet the transportation needs of customers and society now and in the future
- Shell is investing in technologies and technical partnerships that we hope will make us the leading provider of the next generation of fuel solutions
- Shell is a leading distributor of first generation biofuels and we're investing in second generation biofuels that offer greater benefits
- **Shell has been major participant in Shipping Industry for 100+ years**
  - Shell manages a significant fleet of crude, product & natural gas carriers
  - Shell is a leading manufacturer & supplier of marine fuels & lubricants worldwide
  - Shell is committed to work with governments, industry associations to contribute to sustainable development
  - Shell continually look for ways to reduce environmental impact of our operations, products and services

# Shipping is facing a new global challenge

## Shipping industry

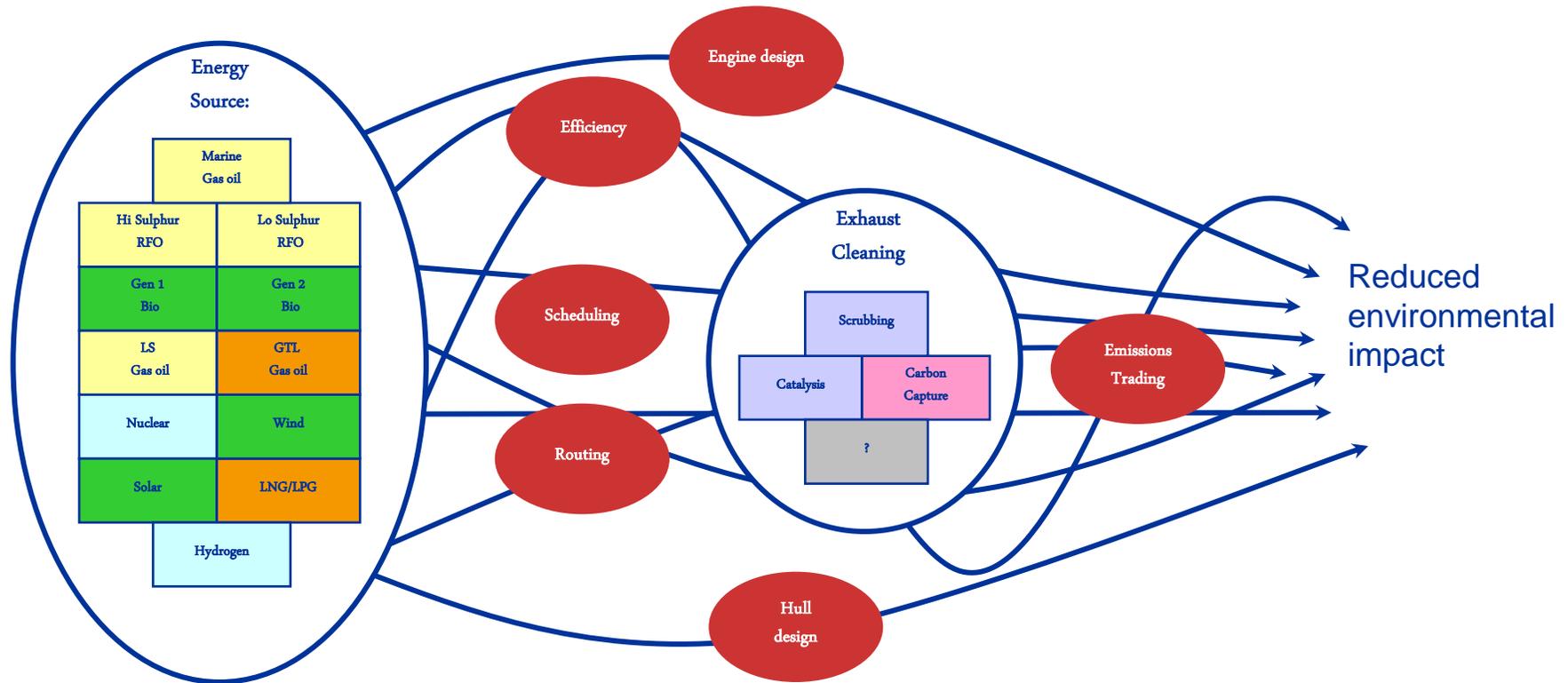
- Carries > 90% world trade
- Most cost & energy-efficient primary mode of transportation
- Strong growth will continue with potential to double by 2025

## Challenge

- How to continue to deliver this critical expansion while addressing environmental responsibility



# The path to the future is not straightforward

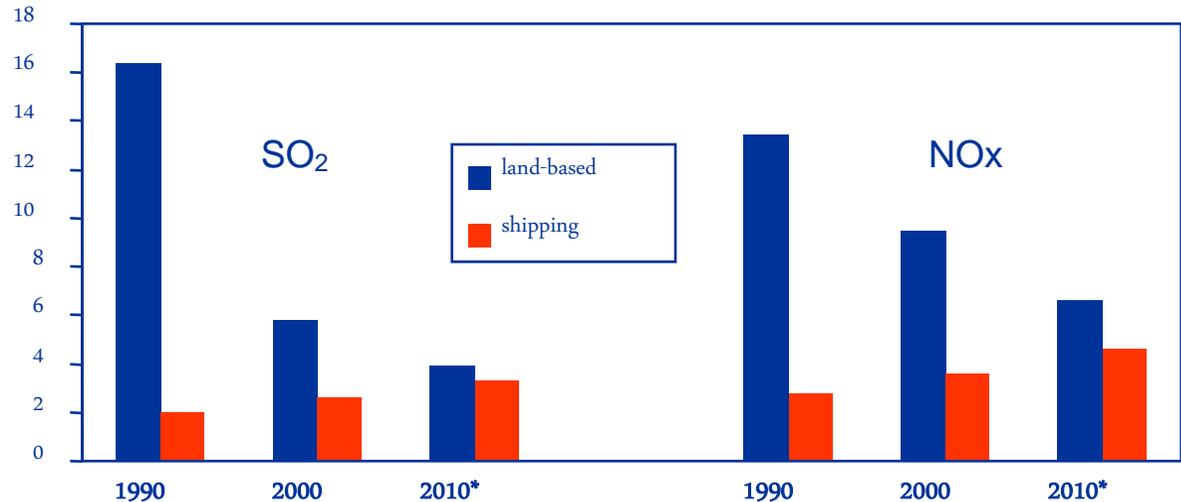


- Shell believes that efficient growth and reduced environmental impact is best achieved by pursuing a range of energy options and technological solutions
- Shell supports the use of market mechanisms such as emissions trading to drive cost effective solutions

# Shipping emissions regulations must be addressed

Shipping could soon become the largest source of Sulphur oxide ( $\text{SO}_x$ ) emissions

EU Emissions, million tonnes per annum



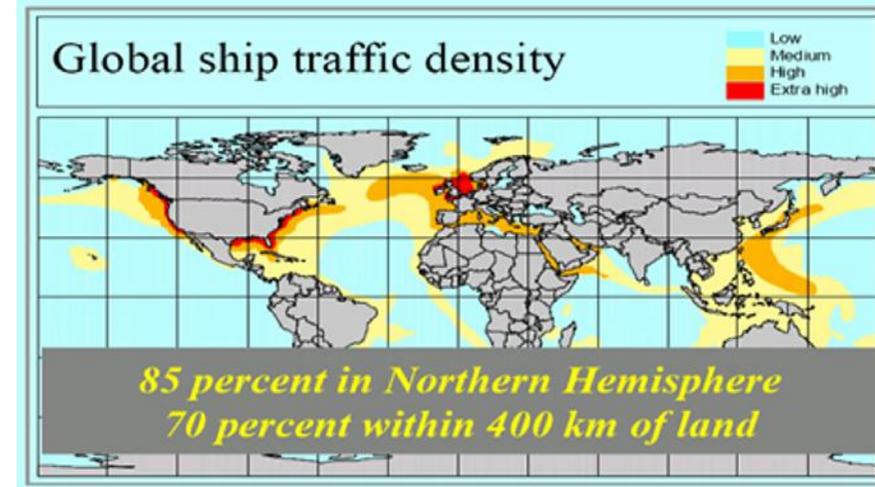
- Nitrogen oxide ( $\text{NO}_x$ ), particulates &  $\text{CO}_2$  are being targeted as well as  $\text{SO}_x$
- International Maritime Organization (IMO) is reviewing alternatives to tighten global legislation to reduce marine emissions
- If the IMO does not act soon countries and regions could take unilateral action – resulting in a proliferation of different legislation and standards being introduced

\* Assuming EU directive on national emission ceilings for land-based, annual growth of 3 per cent for shipping

Source: Shipping emissions: Entec (2002), Land-based emissions: UN ECE (2002)

# Location & impact of shipping emissions is key

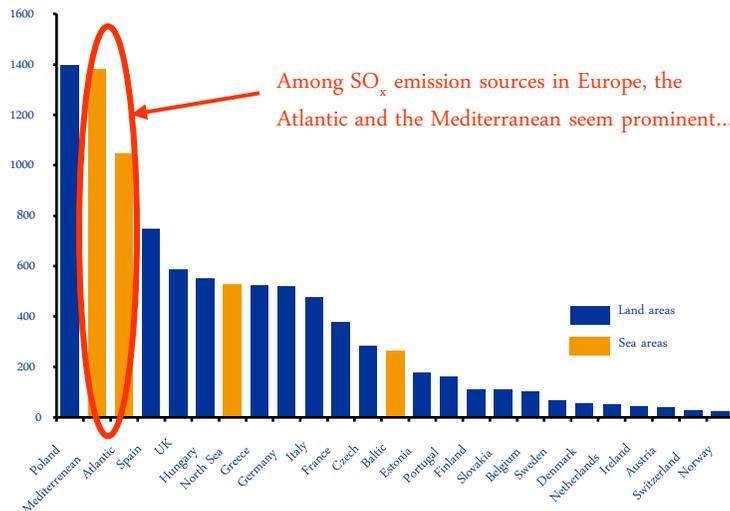
- Emissions are concentrated in busier sea-lanes
- Impact is greatest in coastal areas where emissions from ships combine with those from land based sources
- Although emissions from ships are high in Mediterranean & Atlantic, only a small amount falls on land areas



Source: IMO Study on Greenhouse Gas Emissions from Ships, MEPC 45(8), 2000

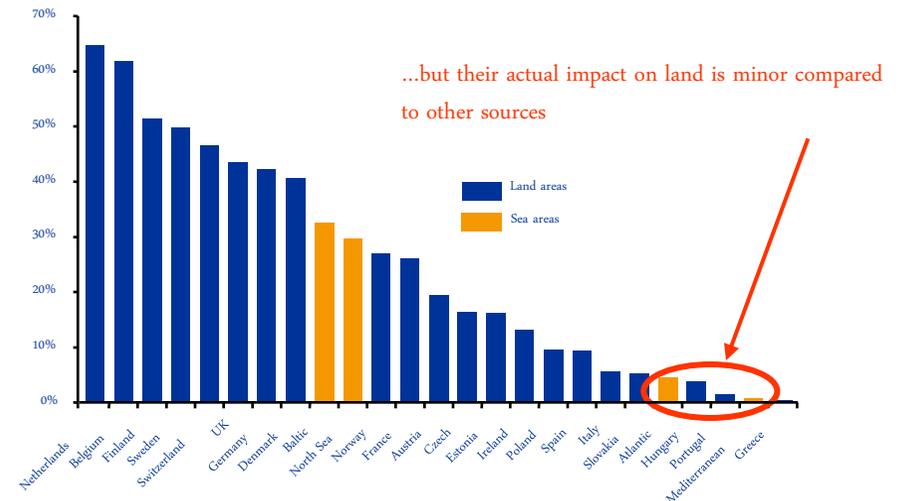
## Emissions kt SO<sub>x</sub> in 2010

Data source: CONCAWE



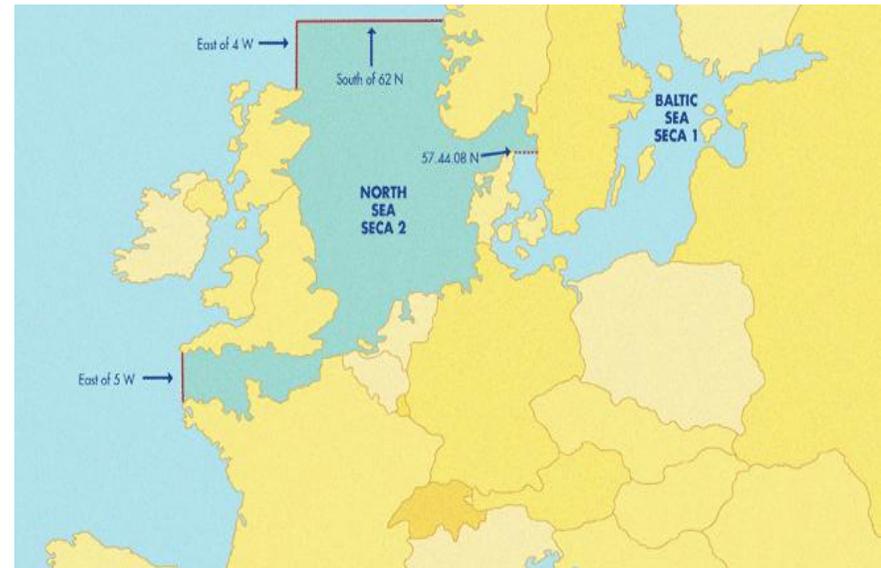
## Ratio Deposition to Emissions %

Data source: CONCAWE



# Emission controls can be targeted for maximum impact

- **Existing MARPOL Annex VI treaty**
  - Legislation passed in May 2005
  - Represents significant change in environmental legislation
  - Global 4.5% m/m sulphur cap
  - SO<sub>x</sub> Emission Control Area (SECA) 1.5% m/m sulphur limit
- **Allows prioritised targeting of emissions**
  - Where there are possible significant environmental consequences
- **First SECAs under new IMO legislation**  
Baltic (May 2006), North Sea (November 2007)
  - Other SECAs can be created within framework of existing treaty at the same level of 1.5% m/m sulphur



**It is proposed changes to this treaty that are now being considered by the IMO...**

# Options being considered by the IMO

- a. Current MARPOL Annex VI Sulphur levels, noting this allows for the creation of additional SECA's with a cap at 1.5% sulphur in fuel **[Reference case]**
- b. As above, with tighter sulphur constraints in SECA's cap (e.g. from current 1.5% sulphur to 1% in 2010 and 0.5% S in 2015) and lower global cap
- c. Switch from residual to distillate fuels for global use with 1% sulphur in 2012 and 0.5% by 2015 **[Intertanko proposal]**
- c2) As c), but with possibility to continue with residual fuels provided vessels fitted with appropriate on board abatement technologies (scrubbers)
- d. New control areas to replace SECA's, (e.g. 200 miles from coast), by 2011, in which emissions are limited to 0.4 g SO<sub>x</sub>/kWh. This could be achieved by fuel quality (equates to distillate fuel with <0.1% sulphur) or by scrubbing. Also includes regulation of particulate matter emissions. Emissions outside control areas could also tighten **[US Proposal]**
- e. Global cap to be gradually reduced to 3% by 2012 and then 1.5% in 2016. Scrubbing allowable as an alternative to fuel quality. Distillates to be specified for SECA's, ports and estuaries, limit 1% S in 2011 and 0.5% in 2015 **[BIMCO Proposal]**

# Shell's view on the Options

## All Options:

- Represent a comprehensive range for evaluation
- Represent significant change for the Shipping industry
- Offer opportunity for major improvement in environmental performance

**Proper evaluation is critical** – to achieve a robust solution that balances prioritised benefits with cost to the industry. Evaluation must be:

- Based on “sound science” and environmental impact assessment
- Cost-effective compared to alternative means of reducing impact of emissions
- Let the market find the optimal solutions to a specified goal
- Implementable and enforceable within a realistic timeframe
- Assessed for their full impact on both local & global air quality standards
- Clear, fair and globally enforceable legislative framework

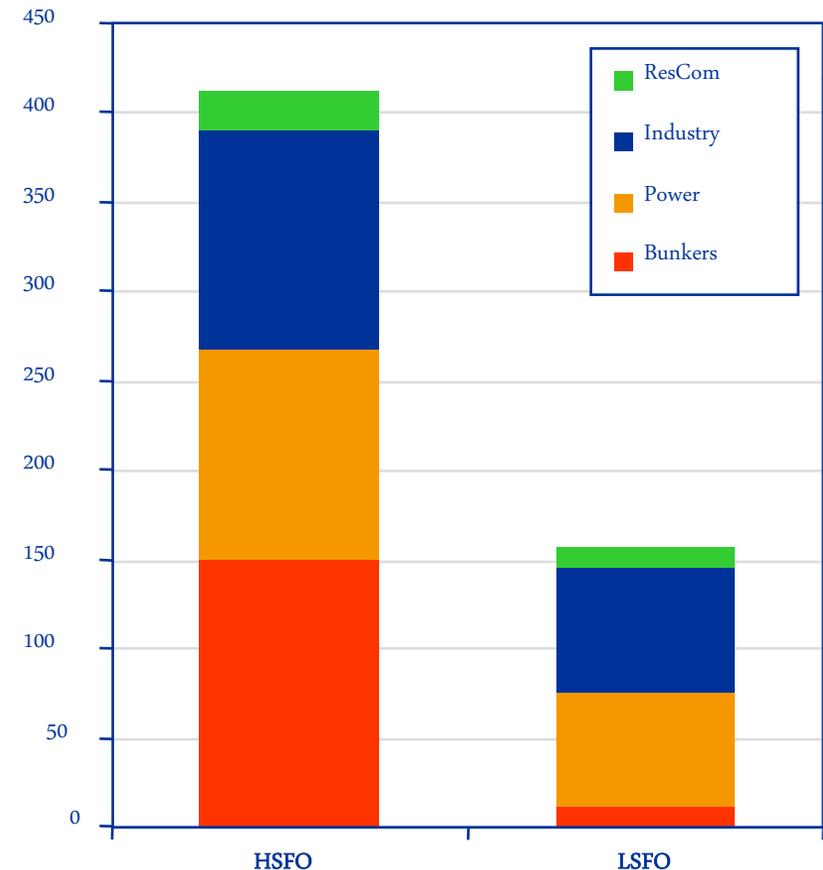


# Shell's view on Low Sulphur (LS) Bunkers Option

- Global production of heavy fuels ~ 600m tpa
- Marine bunkers ~ 30% of total Fuel Oil (FO) demand
- LS (<1.5%) Fuel Oil is ~ 30% of world fuel oil production
- Limited flexibility within existing refinery configurations to increase LSFO production
- Alternative to refinery desulphurisation would be investment in residual conversion to produce distillate fuels for road transport use. This could be more attractive to refiners
- Vessels need to switch fuel between SECA and non SECA
- Need to switch between lubrication oils if using LSFO for a longer time
- Older vessels may need to increase number of tanks to carry different types of FO

Global Demand for HSFO & LSFO

million ton / year



Source: Shell derived data for 2004

# Shell's view on switch to distillates

- Simplifies onboard operations
- Has the potential to reduce emissions, but:
  - $\text{SO}_x$  /PM: depends of sulphur spec'
  - $\text{NO}_x$ : no discernable impact as not fuel related
- Switch to distillates discourages innovation in the other Options
- Insufficient refining capacity available to meet the incremental 200m tpa of distillate demand
- Refinery investment required to convert residue feedstocks into distillates estimated to be \$126 billion globally (EnSys report)
- Facility development could take many years (beyond 2015) due to lack construction industry capacity
- Environmental implications linked to distillate fuel switch are significant.
  - Global refinery CO2 emissions would rise at least 109m tpa \*
  - CO2 benefits from ships offsets impact at refineries, but net increase in global CO2 emissions expected to be at least 44m\*



\* *Assumes that additional coke production backs out coal use so no additional CO2 emissions from this source*

# Summary: Shell's Perspective

- Shell supports the IMO review - we need to keep the world moving, but do it responsibly
- Internationally agreed (rather than regionally decided) standards are critical to maintain competition and ensure all stakeholders in the industry can take sound long-term decisions
- The options under consideration must be evaluated carefully, the industry must remain focussed on the objective of reducing environmental impact whilst allowing continued growth to deliver the benefits of a growing world economy
- The eventual solution must be feasible, and should allow the market the flexibility to determine the optimum means of achieving clear goals
- Rather than a single point solution, Shell believes that proposals for differentiating fuel quality in identified geographies with scrubbing as an alternative (e.g. recently implemented MARPOL Annex VI structure, US and BIMCO proposals) allow for prioritisation and targeting of pollution.
- Setting single global fuel specifications will prevent the development of more effective and efficient means of meeting the environmental objectives – and could prove unfeasible in a reasonable timeframe



