



Future of Marine Fuels

BP Marine

Adrian Daniels - Fuels Technical Manager

CIMAC Members Day – October 2006



Agenda



- What's happening today
 - Residual Fuel
 - Refining
 - Pricing
 - Legislation
- Intertanko's proposal
- Conclusion

Marine Market - today

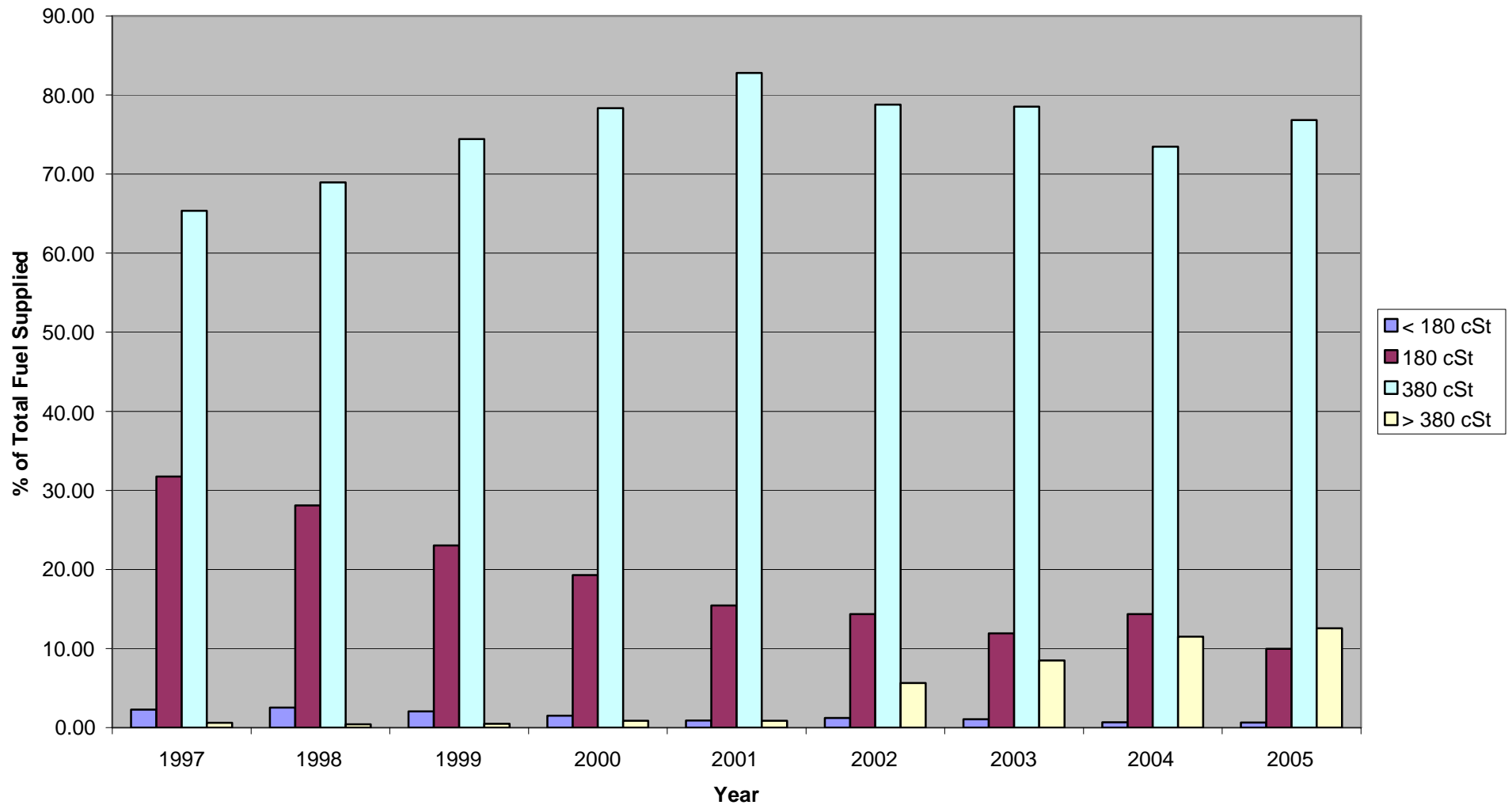


- Residual Fuel is the stable diet of the Marine Industry
 - Quantities estimated between 140 to 200 Million Tonnes per Annum
- Distillate Fuels estimated at 35 Million Tonnes per Annum

BP Marine Product Split - Residual Fuel



Fuel Product Split



Residual Fuel

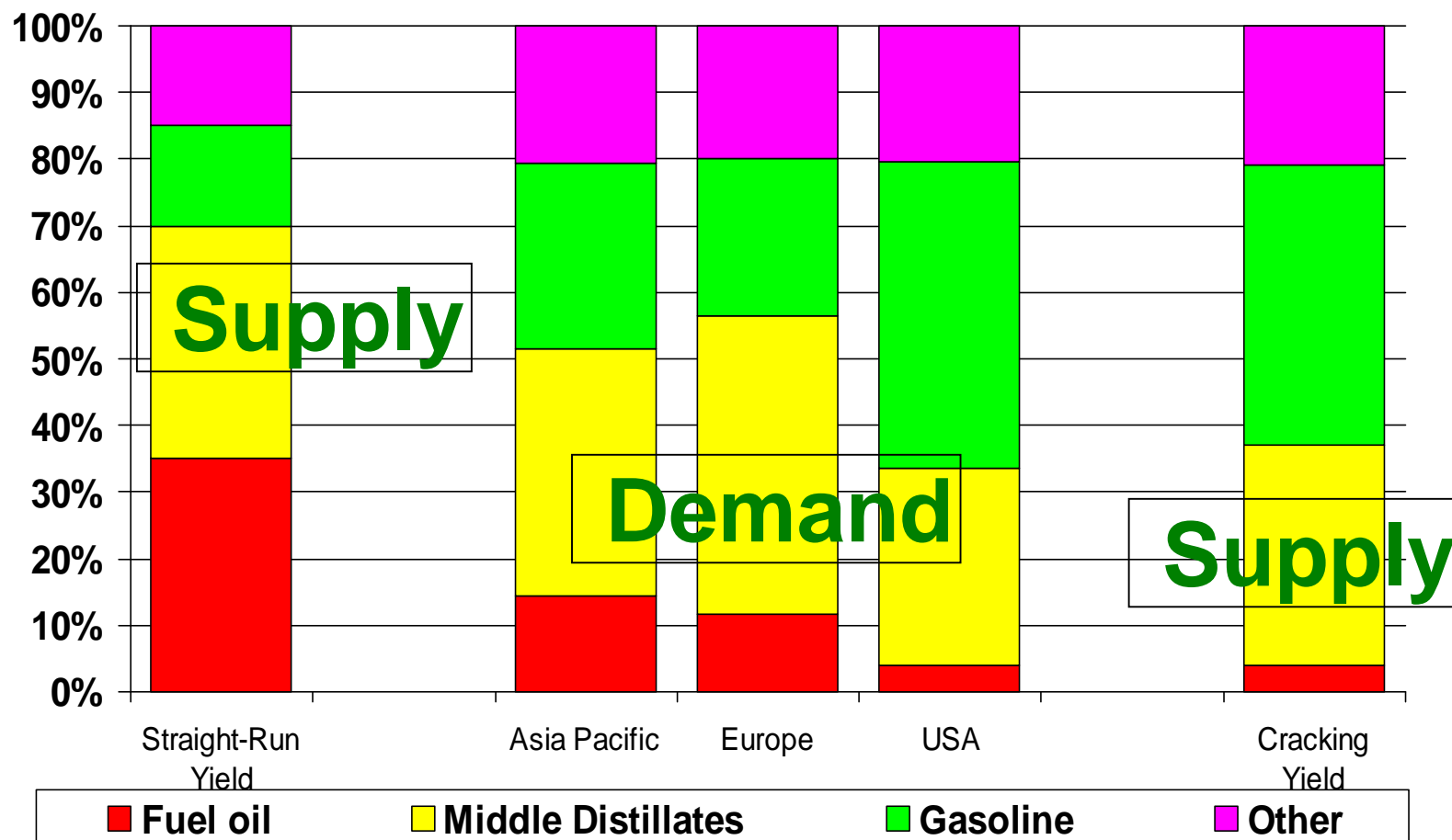


Refinerie

do not

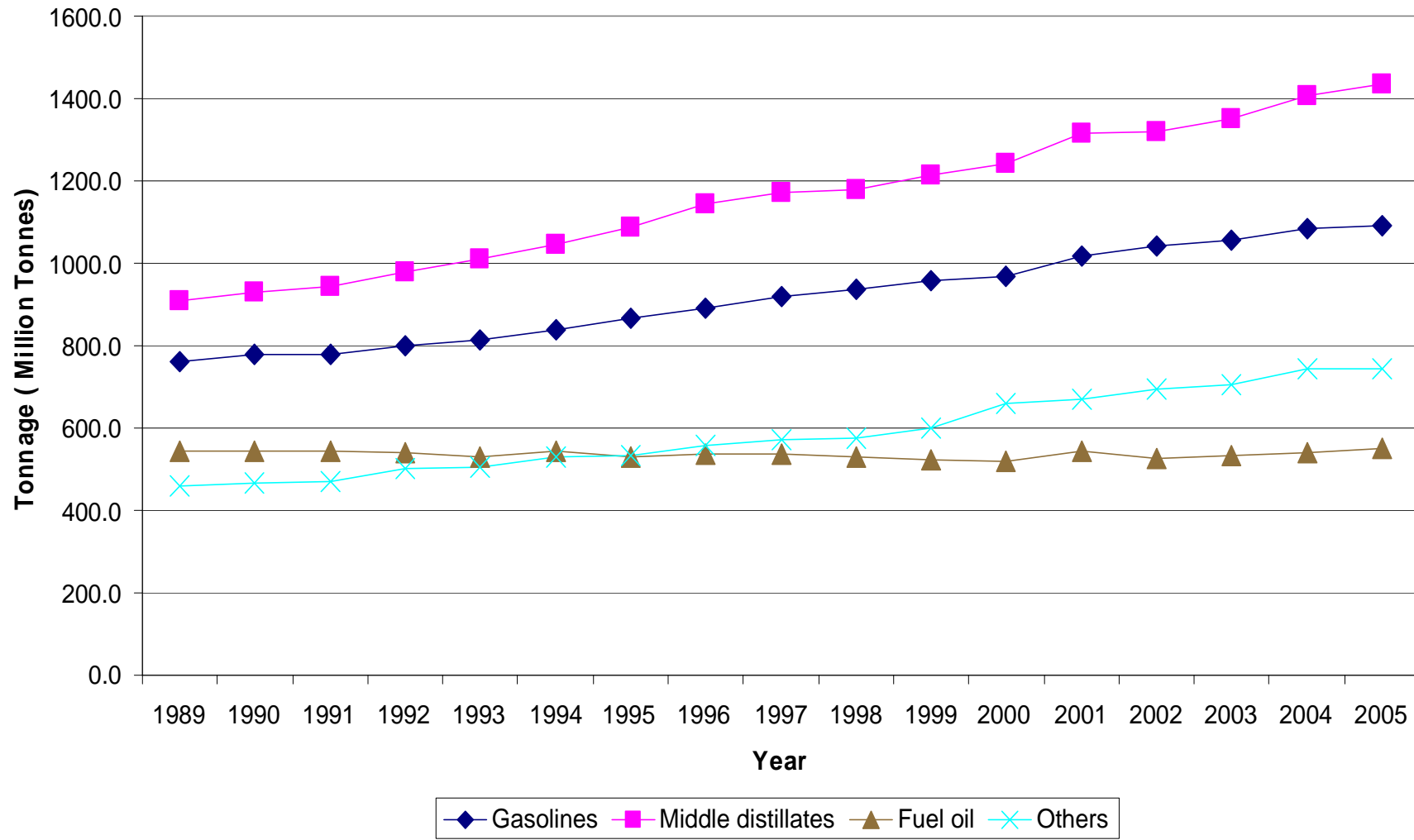
set out to produce residual fuel

Refined Product - Supply and Demand



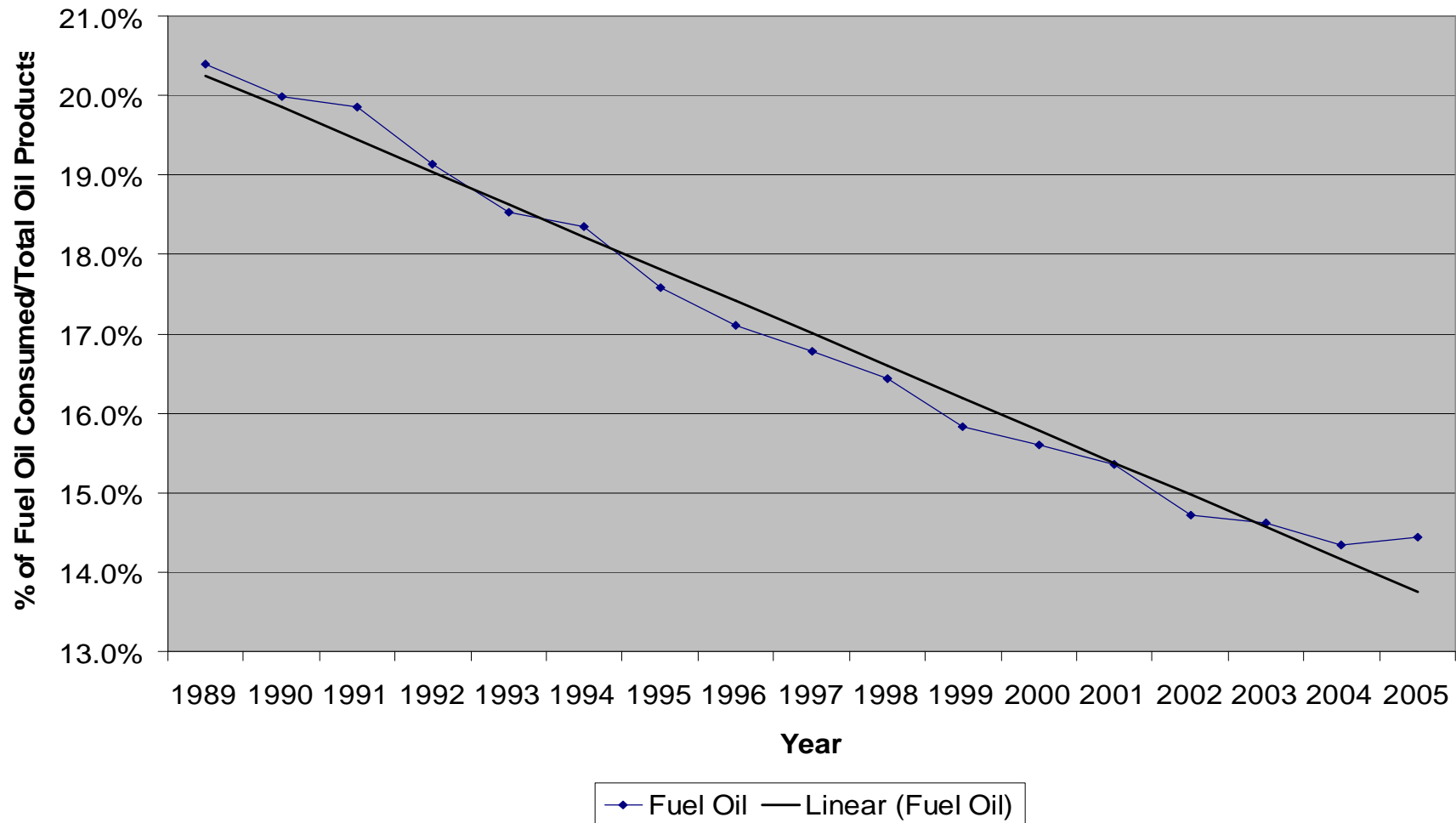
Data from bp statistical review 2005 (www.bp.com/centres/energy)

Oil Consumption – Worldwide



Data from bp statistical review 2006 (www.bp.com/centres/energy)

Fuel Oil as a % of all oil products

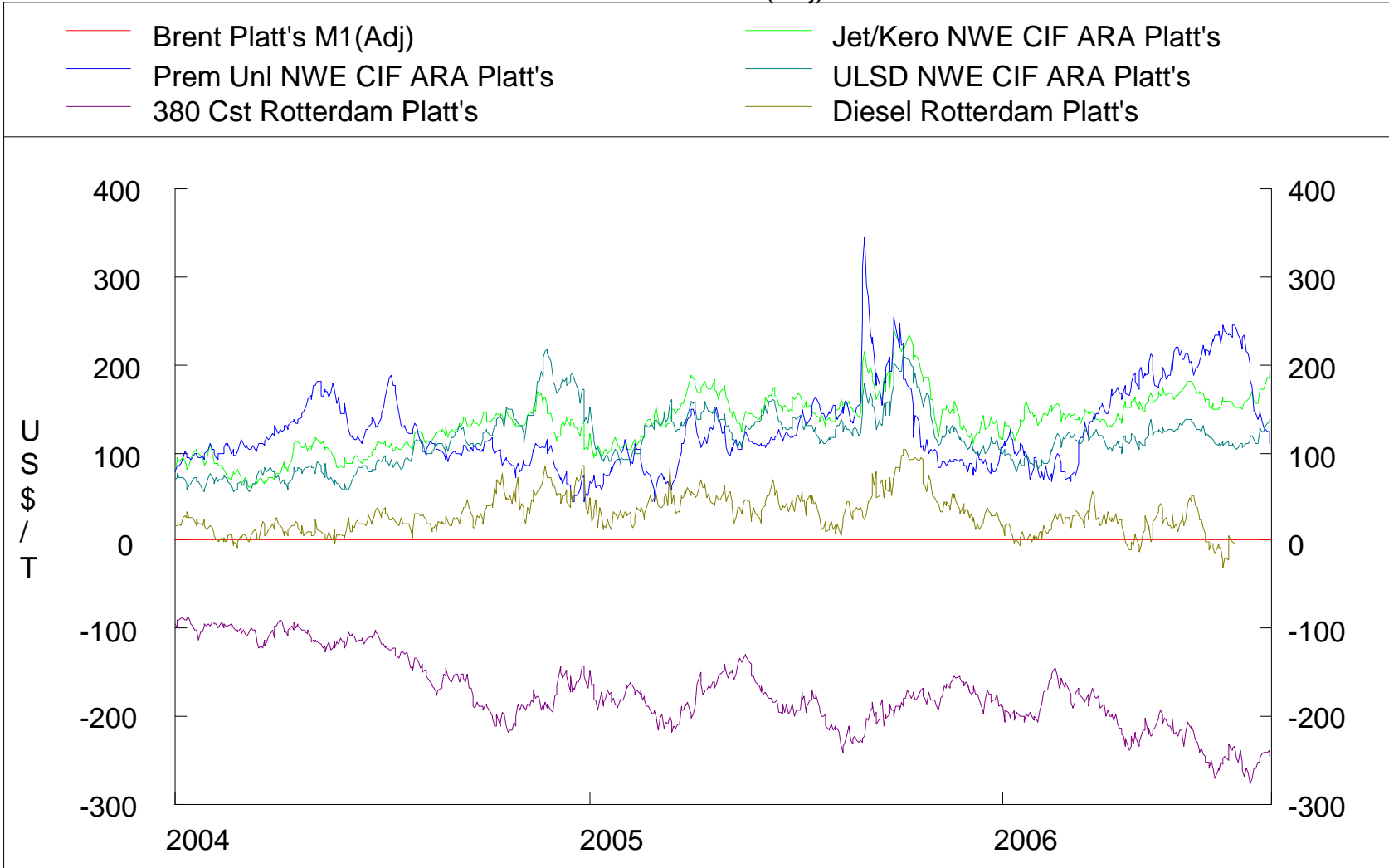


Data from bp statistical review 2006 (www.bp.com/centres/energy)

Energy Sources - Relative fuel costs



PAWS Differentials vs Brent Platt's M1(Adj) 29AUG06



Fuel Oil v Crude Oil Price Comparison



1H 2006 average

Crude Oil Price = 66.21 usd/barrel

Crude Oil Price = 503 usd/mt

Fuel Oil Price = 303 usd/mt

200

Currently (30/9/06)

Crude Oil Price = 60.2 usd/barrel

Crude Oil Price = 457 usd/mt

Fuel Oil Price = 271 usd/mt

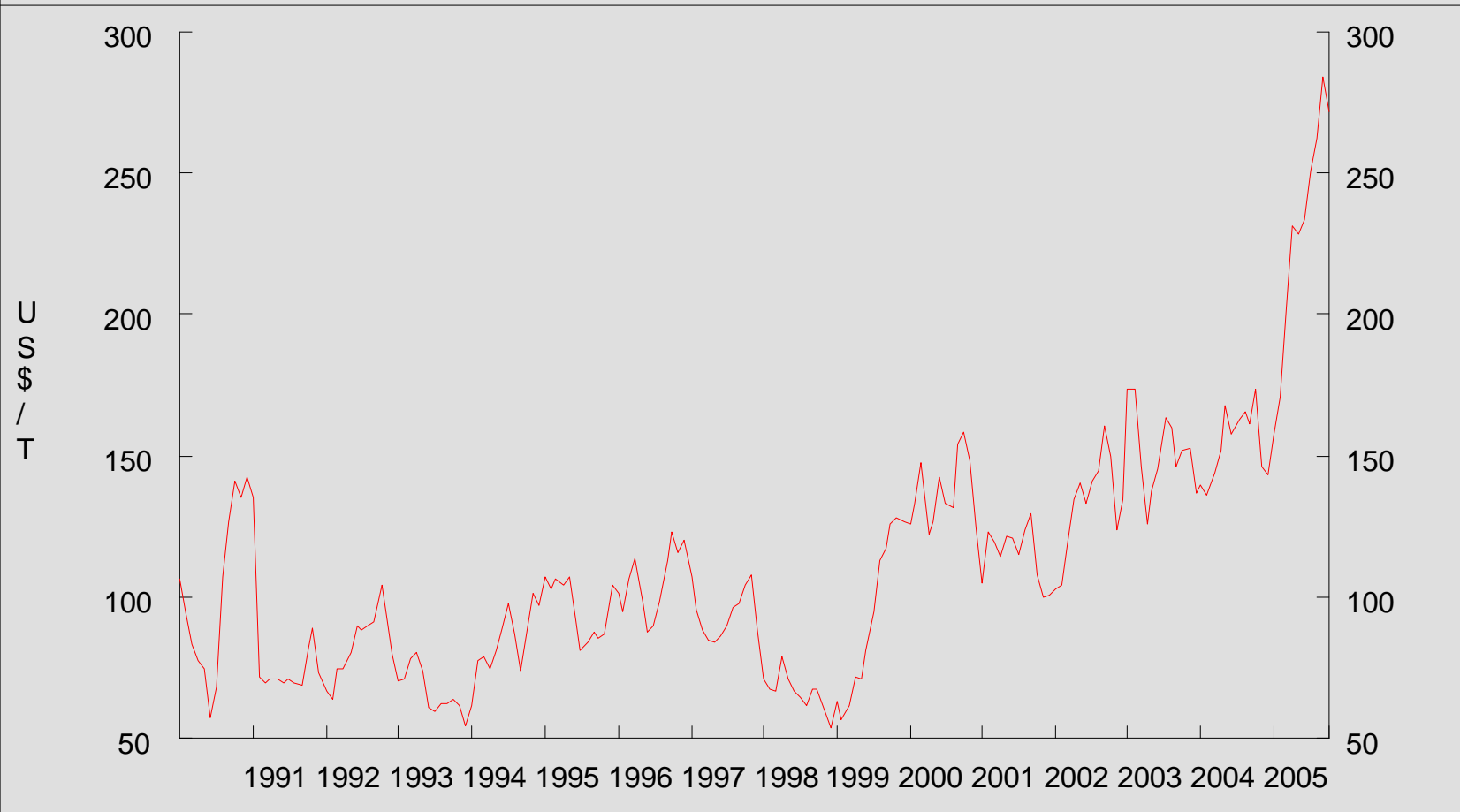
186

Fuel oil price volatility



PAWS 380 Cst Rotterdam Platt's 24OCT05

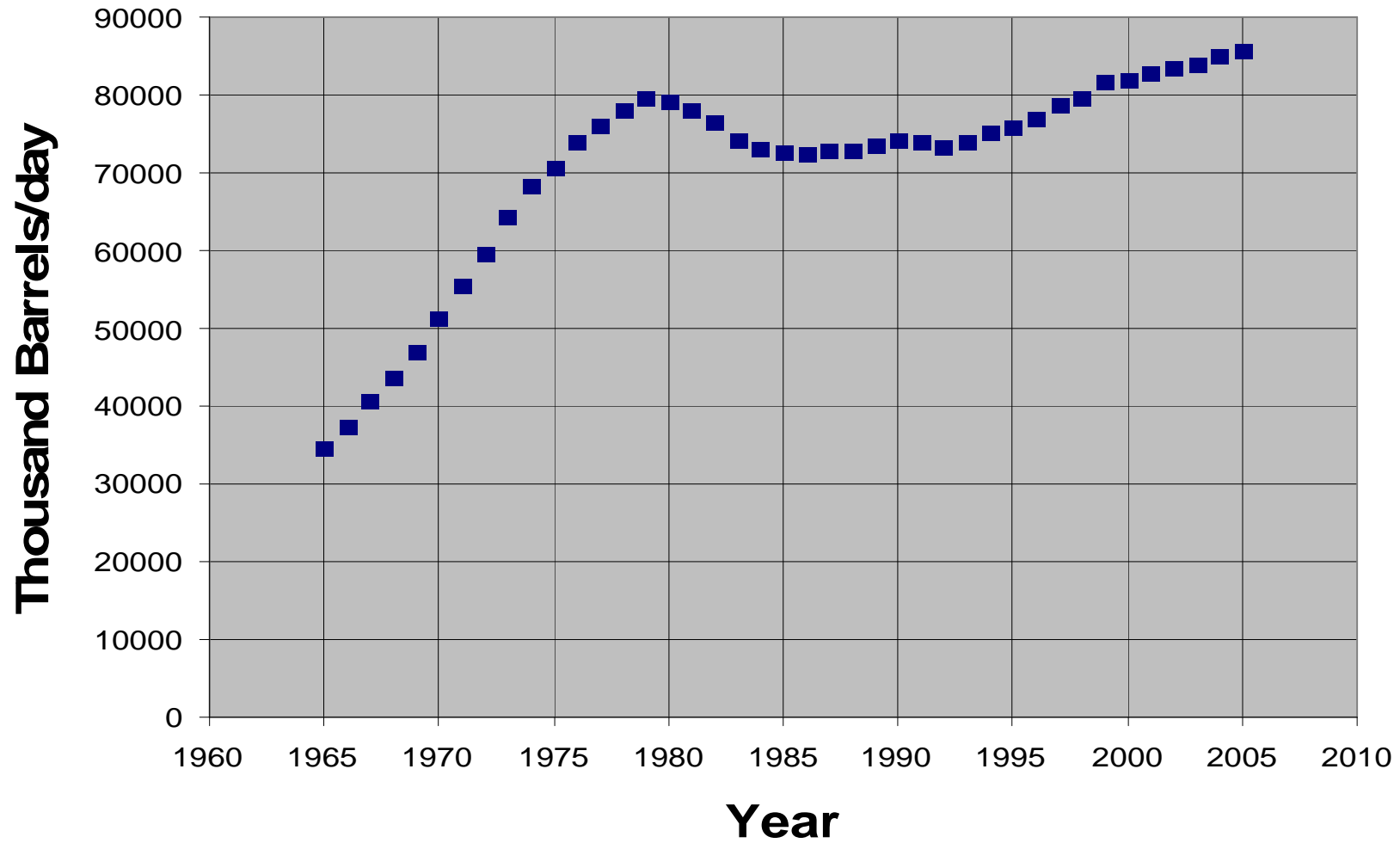
Max. 284.11 Min. 53.95 Mean 110.51 Std.Dev. 42.36 Last 271.75



BP UK

JAN90 to OCT05

Refinery Capacities



Crude oil reserves



● Proved reserves at end 2005:

Region	tonnes x10 ⁹	R/P	share%
North America	7.8	11.9	5.1
Asia Pacific	5.4	13.8	3.4
Europe & Eurasia	19.2	22.0	11.7
Middle East	101.2	81.0	61.9
South / Central America	14.8	40.7	8.6
Africa	15.2	31.8	9.5
TOTAL WORLD	163.6	40.6	100

R/P= Reserves/Production

- List in consumption order
- Data from bp statistical review 2006 (www.bp.com/centres/energy)

Crude oil



		North Africa	North Sea	Middle East	North America	Venezuela
Crude oil						
Density	kg/l	0.801	0.842	0.869	0.890	1.000
Sulphur	%wt	0.1	0.3	2.5	1.0	5.5
Vis at 50 C	cSt	1.2	3.5	7.0	9.4	5600
Pour point	deg C	- 51	0	-24	0	15
Gasoline Yield						
	%wt	8.8	5.8	4.7	2.4	0.1
Naphtha Yield						
	%wt	16.0	11.0	7.9	6.5	1.1
Kerosine Yield						
	%wt	26.3	18.6	16.4	15.6	4.4
Diesel fuel						
Yield	%wt	18.2	19.1	15.3	19.6	9.6
Sulphur	%wt	0.1	0.2	1.4	0.5	4.4
Cetane Index		55	53	58	45	30
Residue						
Yield	%wt	27.5	43.5	54.4	55.5	84.8
Sulphur	%wt	0.3	0.6	4.1	1.5	6.0
Vis at 50 C	cSt	74	103	545	370	120,000
Vanadium	ppm	2	8	50	25	1,415

Sulphur emissions implementation timing



G.P.⁽²⁾ ships entering a SECA are exempt from the requirements

(1) E.I.F. = Entry into Force
(2) G.P. = Grace Period

•19/05/06
•Baltic Sea SECA (Full Implementation)
•Scrubbers approved for use

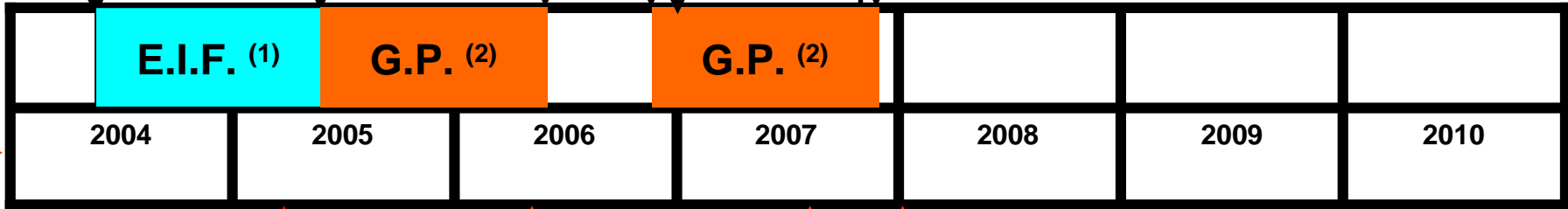
•19/05/05
•Worldwide 4.5%S limit
•Global use of BDN
•Baltic Sea SECA (Operational)

•21/11/06
•Channel & North Sea SECA (Operational)

•01/07 BLG to review Technology and need for a reduction of SO_x.
Justify and recommend future limits for SO_x emissions.
Submission Nov 06 for report to IMO April 07

Ratification
18/05/04

•21/11/07
•Channel & North Sea SECA (full implementation)



14/4/05
EU Parliament approves Amendments to Dir 99/32EC

Continued use of 0.2% S Gas oil in port & territorial waters

22/7/05
Publication of sulphur in fuels directive 2005/33/EC

11/08/07
North Sea & Channel designated 1.5% S fuel

Use of 0.1% S Gas oil in port & territorial waters

•Mandatory use of 0.1%S Marine Fuel in all EU ports
•Sale of DMX or DMA >0.1%S prohibited (compliance with at berth limit)

•11/08/06
•Baltic Sea designated 1.5% S fuel
•Mandatory max 1.5% S fuel for all EU passenger ferries and cruise ships to/from EU ports & territorial waters
•Use of approved exhaust aftertreatment
•Sale of DMB or DMC >1.5%S prohibited (compliance with SECA limit)

Directive 2005/33/EC

Sources of Low Sulphur Fuel



- Distillate Fuel:-
 - DMB and DMC with a sulphur content up to 1.5%
 - In Europe Limited/ No infrastructure to support “high” sulphur distillate fuel
 - Price about usd 300/mt above fuel oil price
- Residual Fuel:-
 - Low Sulphur Crudes
 - Blending
 - Residual Desulphurisation

Intertanko's Proposal



- Possibly in conjunction with other shipping associations (Intercargo)
- Nov 2006 Meeting of BLG (Bulk Liquids Group) of IMO, INTERTANKO will recommend:-
 - 2010 use of Distillate Fuels with a Global Sulphur Cap of 1%
 - 2015 use of Distillate Fuel with a Global Sulphur Cap of 0.5%
 - Restrict the spread of 0.1% sulphur when vessels are in port
- Reasoning
 - To achieve lower emissions
 - Simplify operational procedures

Intertanko's Proposal – Potential Problems



- Change to 1% Sulphur Distillate would require about 12 to 14% of Global Middle Distillate production to change to marine use.
 - Impact on price
 - Impact on availability
- Refineries in Europe produce very low sulphur distillate fuels
 - 50 ppm moving down to 10 ppm or Zero ppm
 - Cross contamination means that the production of “High” Sulphur distillate unlikely.
- Bio components appearing in Distillate fuels
- Price differential of about usd 300/mt between distillate and residual fuel
- What happens to the residual fuel?
 - Impact on production of all fuels

Intertanko's Proposal



- Is the Intertanko proposal a workable and cost effective solution?

Probably not:-

Sea Water Scrubbing and Emission Trading might provide a more cost effective solution

Conclusion



- Emission legislation will continue to impact on the Marine Industry
- In the short term Emission Legislation will increase the use of distillate fuels in the Marine Market
- Price will ensure that residual fuel remains the staple diet for the Shipping Industry
 - Residual Fuel is presently a very cheap source of energy
- Changing the whole industry to distillate fuel will cause disruption to oil supply
- Application of suitable technology will ensure that residual fuel can be successfully used in the future
 - Sea Water Scrubbing
 - Emission Monitoring and Trading

**Remembering that based on today's projections
30 years time there will be no Fuel Oil
40 years time there will be no Oil !!**

