Threats to the Security of Oil Supplies – A Critical Analysis

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Geneva

Stakeholders Meeting on Oil, Gas and Coal
Paris, OME, November 26 2009

Deliverables

D5.1.1	The impact of resource nationalism, voluntary restriction of production and political instability on global oil supplies: quantitative analysis of historical experience.		GRCF	3.75	R	RE	17
D5.1.2	Domestic/international conflicts and terrorist activities inside and outside the Gulf region: scenarios and quantitative estimate of impact on global crude oil supplies.		GRCF	3	R	CO	17
D5.1.3	Restrictions of passage, accidents and oil transportation norms: scenarios of impacts on costs, global crude oil supplies and supply security.		GRCF	3	R	RE	19
D5.1.4a	Functioning of the international oil markets and security implications		GRCF	2	R	PU	19
D5.1.4b	Oil stocks and security implications		GRCF	2	R	PU	19
D5.1.4c	International norms deriving from international or regional compacts such as the IEA, the ECT, the Energy Community and all other relevant agreements in which the EU and/or its member countries are party		OME	2	R	PU	19
D5.1.5	International markets of oil products: impact of refinery localisation determinants and evolving oil products specifications on oil security of supply.		Ramboll	4	R	PU	21
D5.1.6	International security of supply regulations and policies: international norms, strategic stocks and producer/consumer cooperation.		Ramboll	3	R	RE	21
D5.1.7	Quantitative analysis of EU vulnerability to oil supply risks: modelling, risk estimates and discussion of optimal sizing of remedial actions.		OME	3	R	RE	27

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The impact of resource nationalism, voluntary restriction of production and political instability on global oil supplies: quantitative analysis of historical experience.

- Resources nationalism

  all policies undertaken by the national governments of the producing country which restrict access to resources to a subset of potential players, or create separation between the domestic and international market, or directly impose quantitative limitations to production and exports.

- Political instability

  meant to encompass changes in policies that are the result of changes in the structure of power, i.e. in the government in place; may be the outcome of constitutional processes or extra-constitutional transitions - coup d'état or revolution

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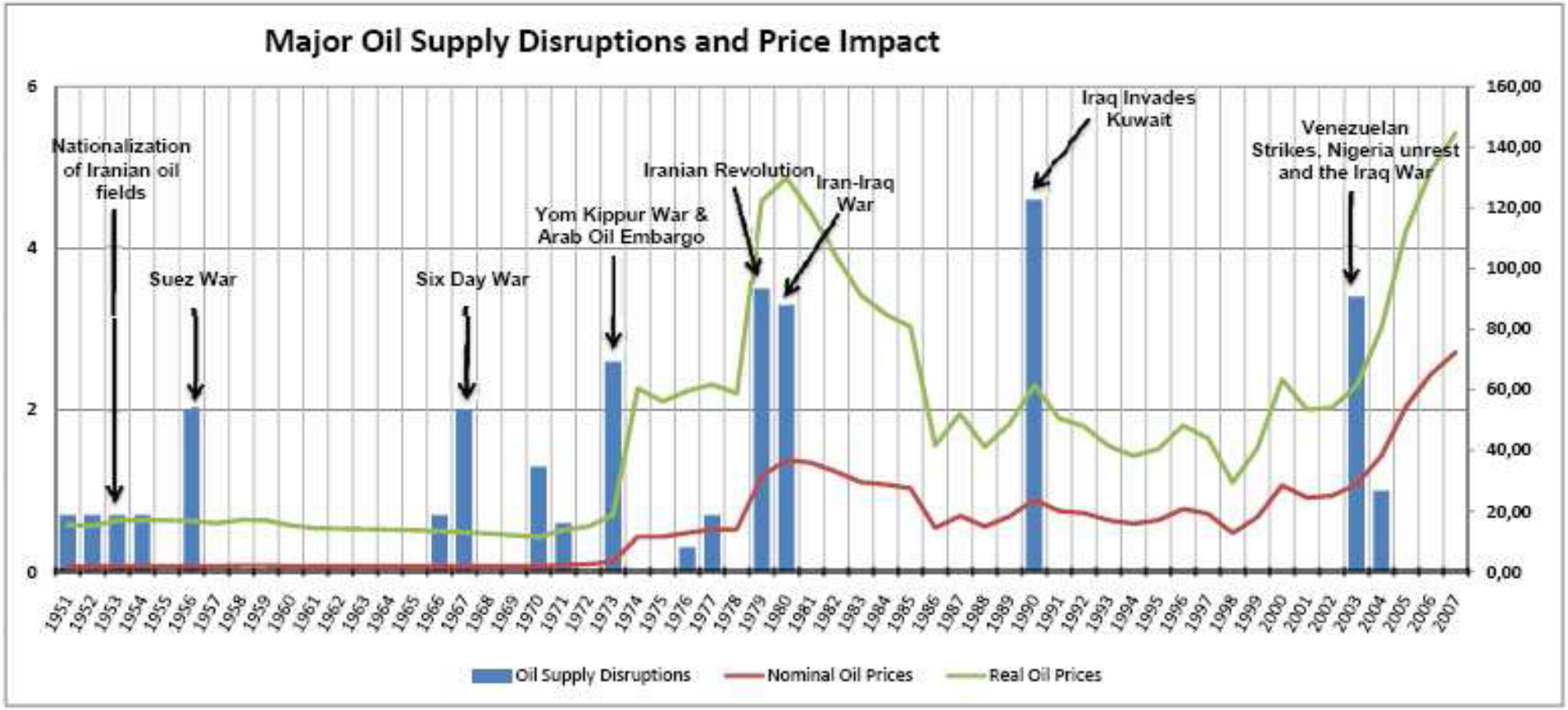

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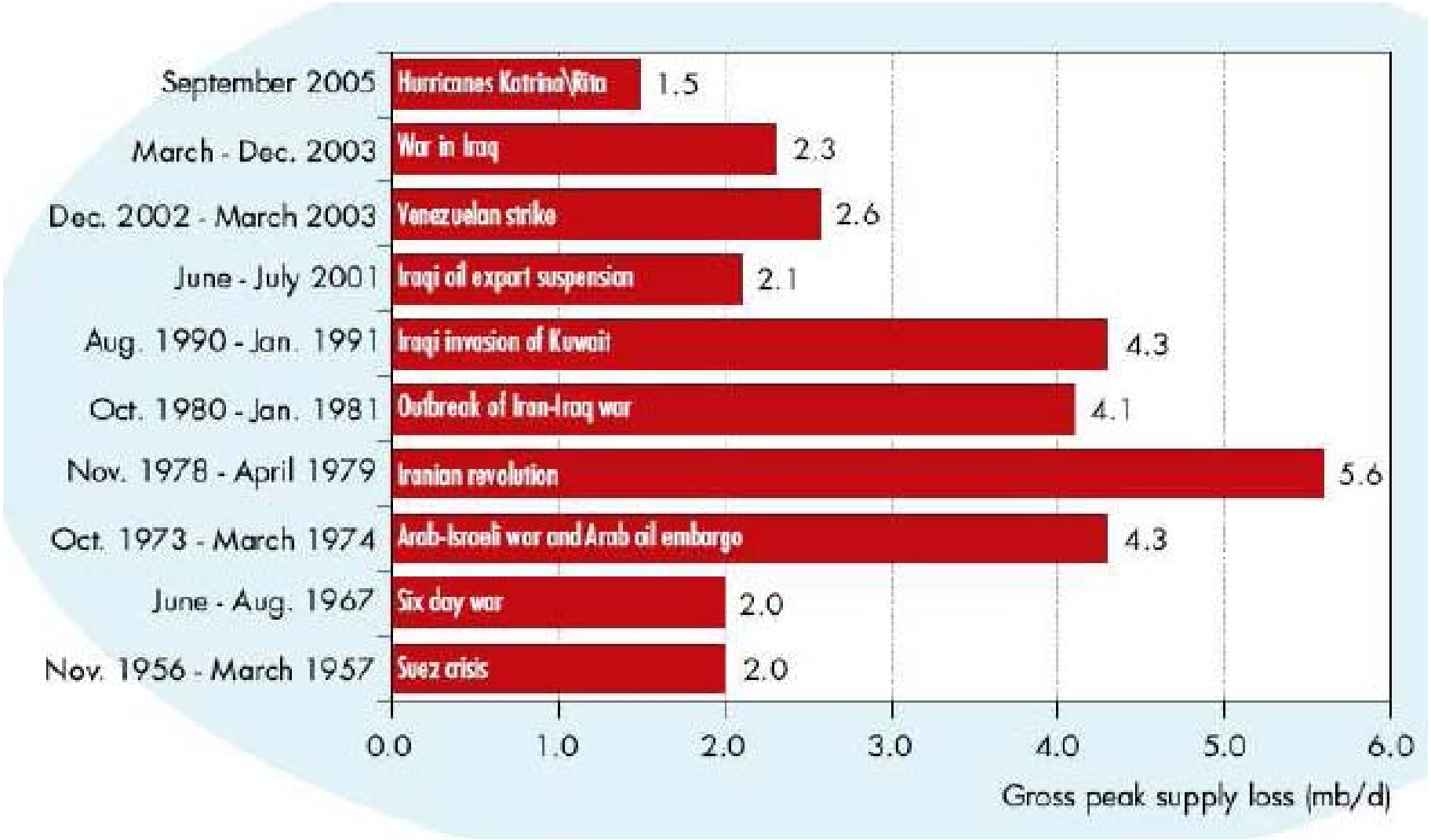

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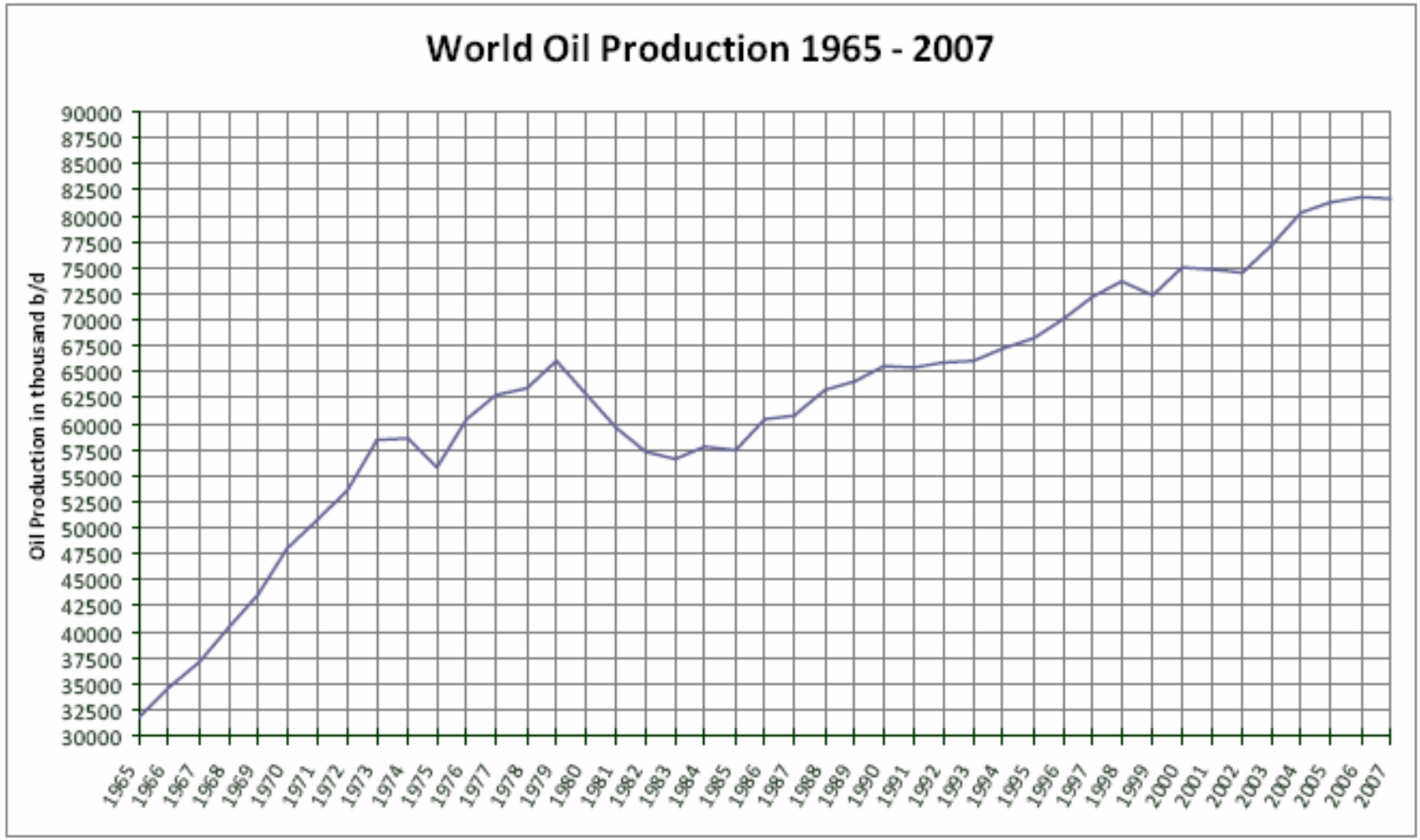
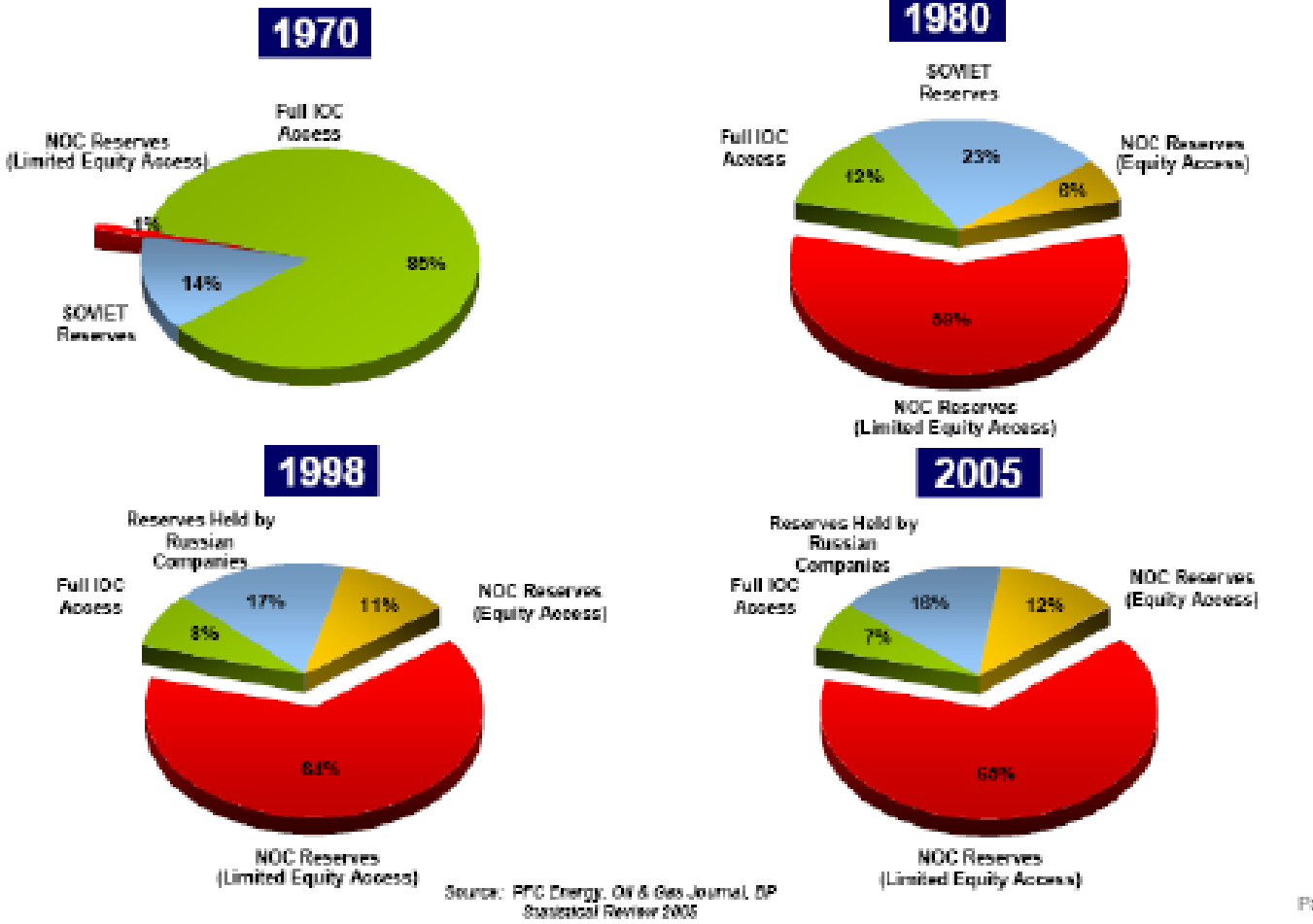


Worldwide Oil & Gas Reserve Access:
From IOCs to NOCs



Source: PFC Energy, Oil & Gas Journal, BP Statistical Review 2005

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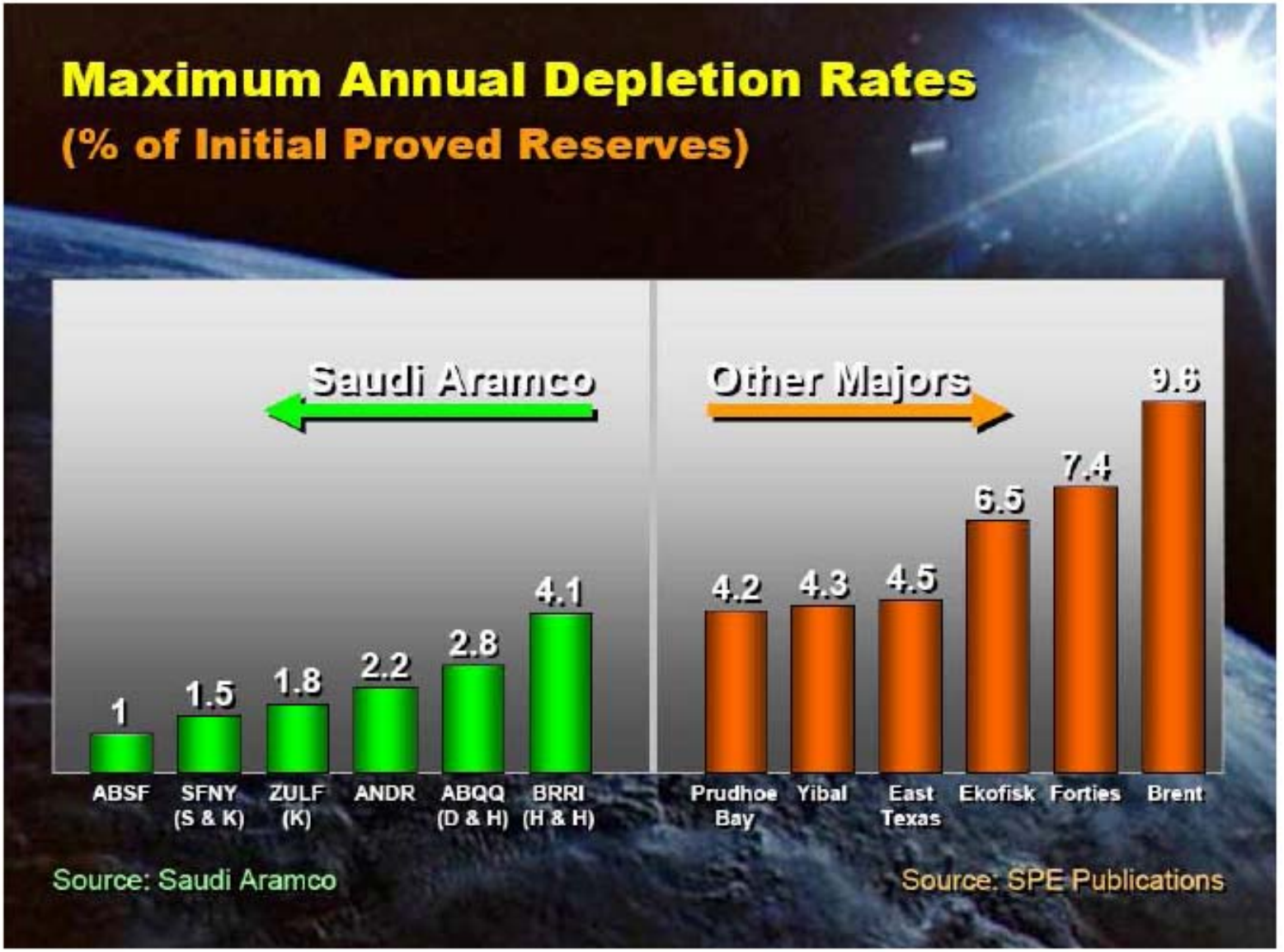

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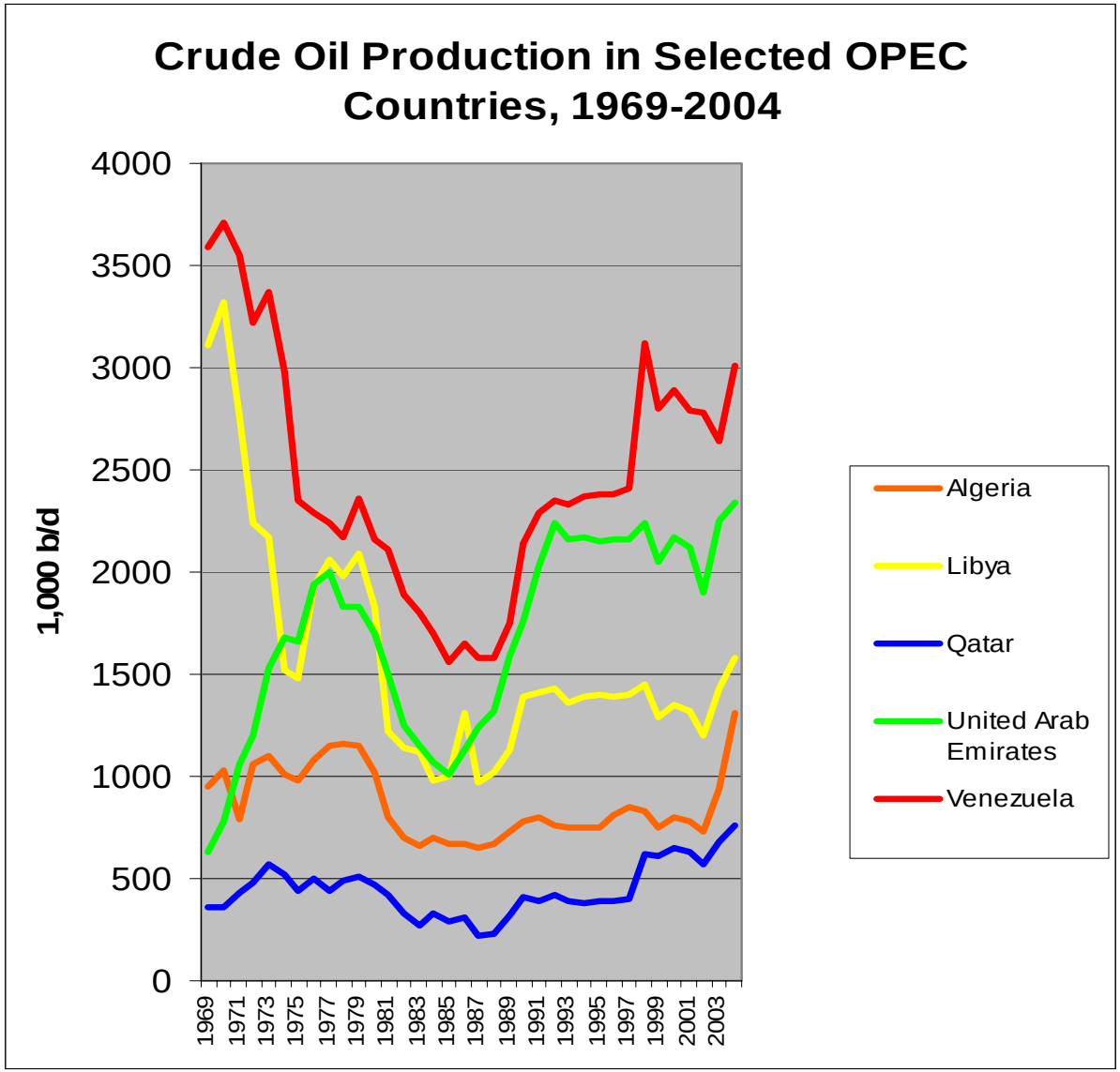


Russian Federation Oil Production
Million b/d
14000
12000
10000
8000
6000
4000
2000
0
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007

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Export restrictions

- Export prohibition (for gas)
- Export taxes
- Market (volume/price) policies
- Domestic pricing policies

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Political instability

1. the appointment of Mohamed Mossadegh as Prime Minister in Iran
2. the coup d'état which led to the demise of the same and the restoration of the power of the Shah
3. the collapse of the monarchy and the advent of General Qasim to power in Iraq
4. the collapse of the monarchy and the advent of Colonel Muammar Qaddafi in Libya
5. the Islamic Revolution in Iran
6. the collapse of the Soviet Union and the coming to power of Boris Yeltsin in Russia and other post-Soviet leaders in the key oil and gas producing former soviet republics (Azerbaijan, Kazakhstan, Turkmenistan)
7. the election of Hugo Chavez in Venezuela
8. the election of Vladimir Putin in Russia
9. the election of Evo Morales in Bolivia
10. the collapse of the Saddam Hussein regime in Iraq

Conclusions

- The discussion and analysis proposed in this deliverable has shown that there is no easy and immediate connection between resource nationalism or political instability and global supply of oil and gas.
- This is emphatically not because political developments are irrelevant for influencing oil and gas supplies, but because this influence is highly variable and unpredictable.
- Political instability and resource nationalism have been shown to have rarely been associated to acute supply crises or shortfalls. Their effect is rather gradual and normally compensated by action in other parts of the system.

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Domestic/international conflicts and terrorist activities inside and outside the Gulf region: scenarios and quantitative estimate of impact on global crude oil supplies.

- Interstate war
- Civil war
- Terrorism/banditry
- in a civil war the state may lose access to some oil resources, while in the case of violent non-state action the state may not be able to avoid damage to oil installation, but maintains access to the same

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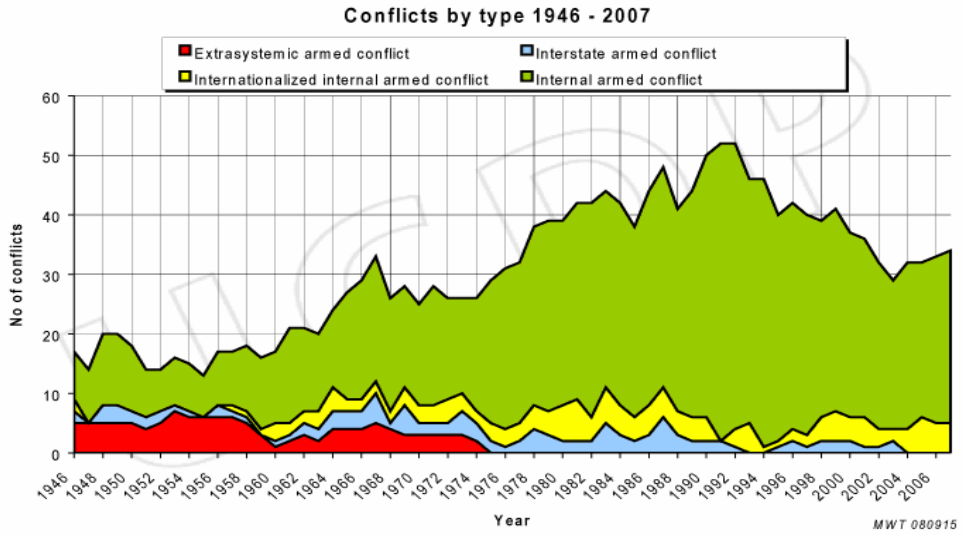

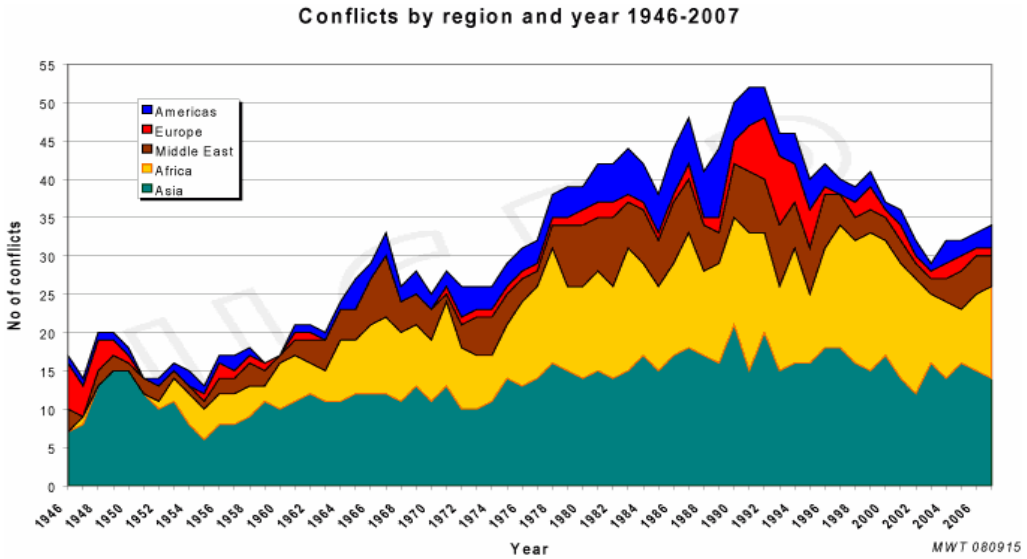

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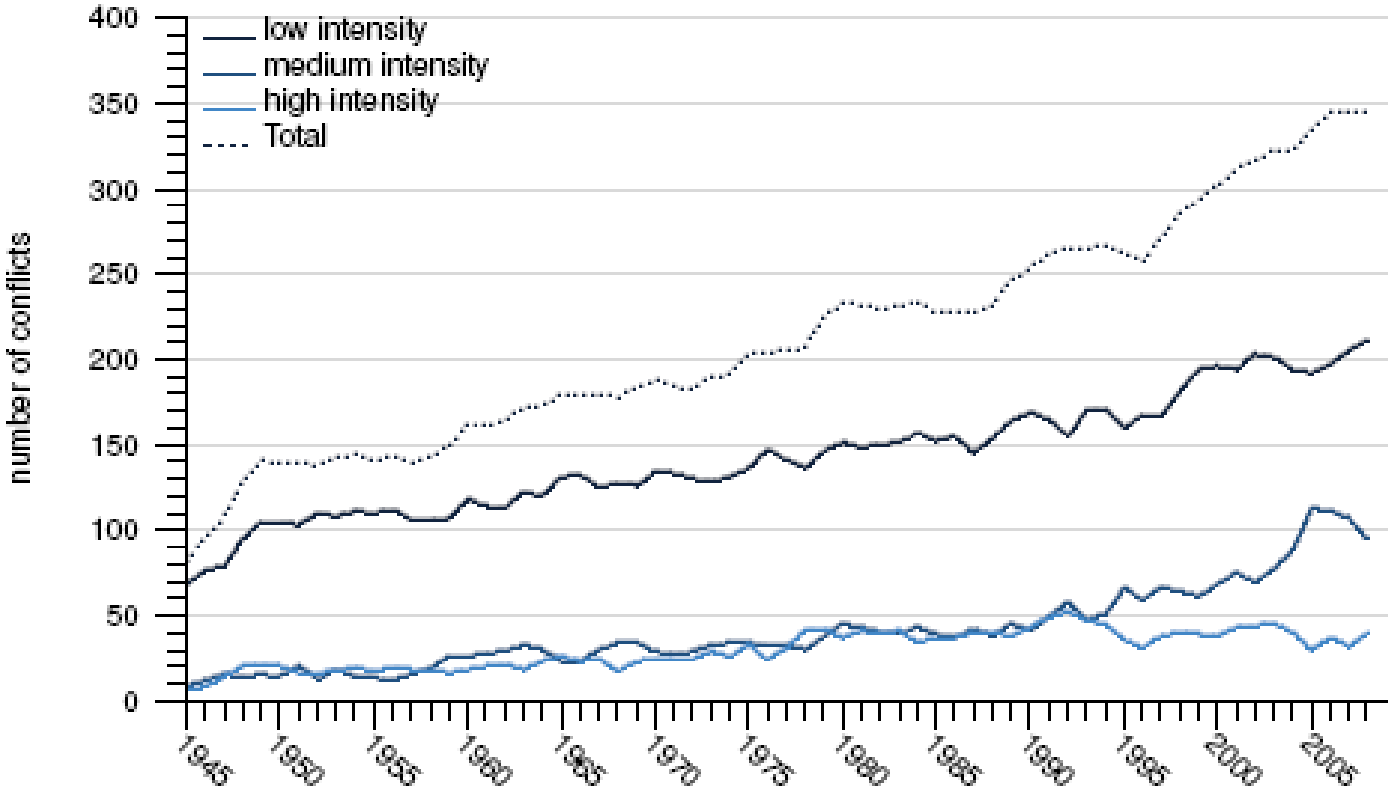
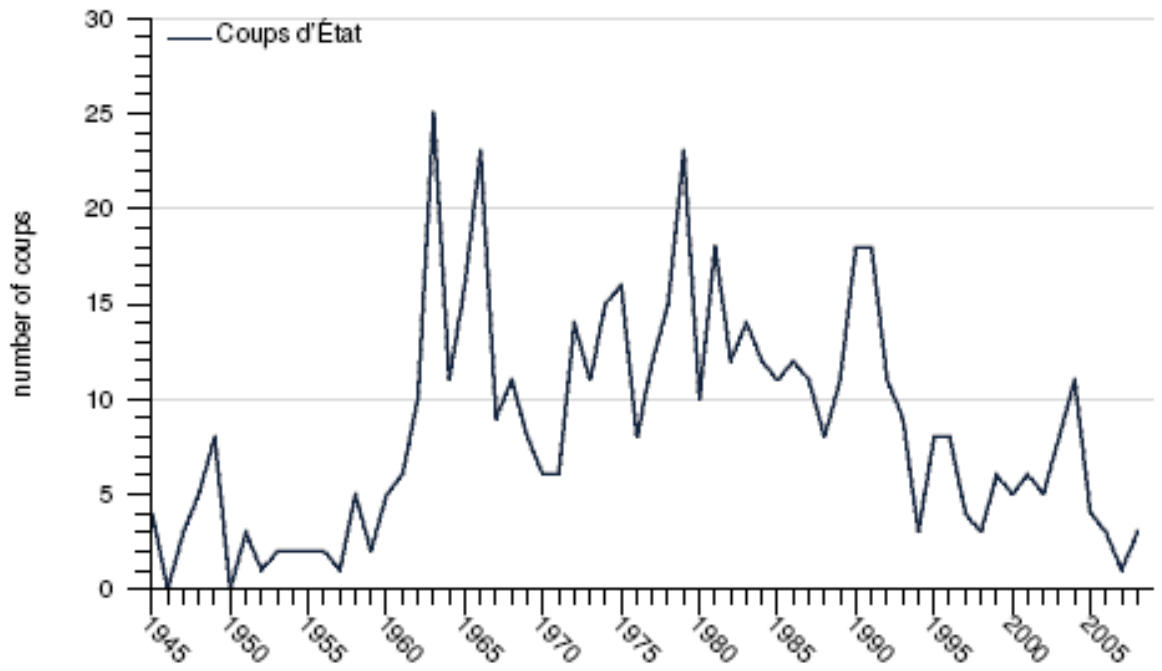
Global Conflicts of low, medium and high Intensity 1945 to 2008



Coups d'État and Attempted Coups d'État 1945 to 2008



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Six main crises

1. The Suez Crisis or War
2. The Six day war
3. The Yom Kippur war
4. The Iraq-Iran war
5. The Iraqi invasion of Kuwait
6. The US-led Coalition intervention in Iraq.

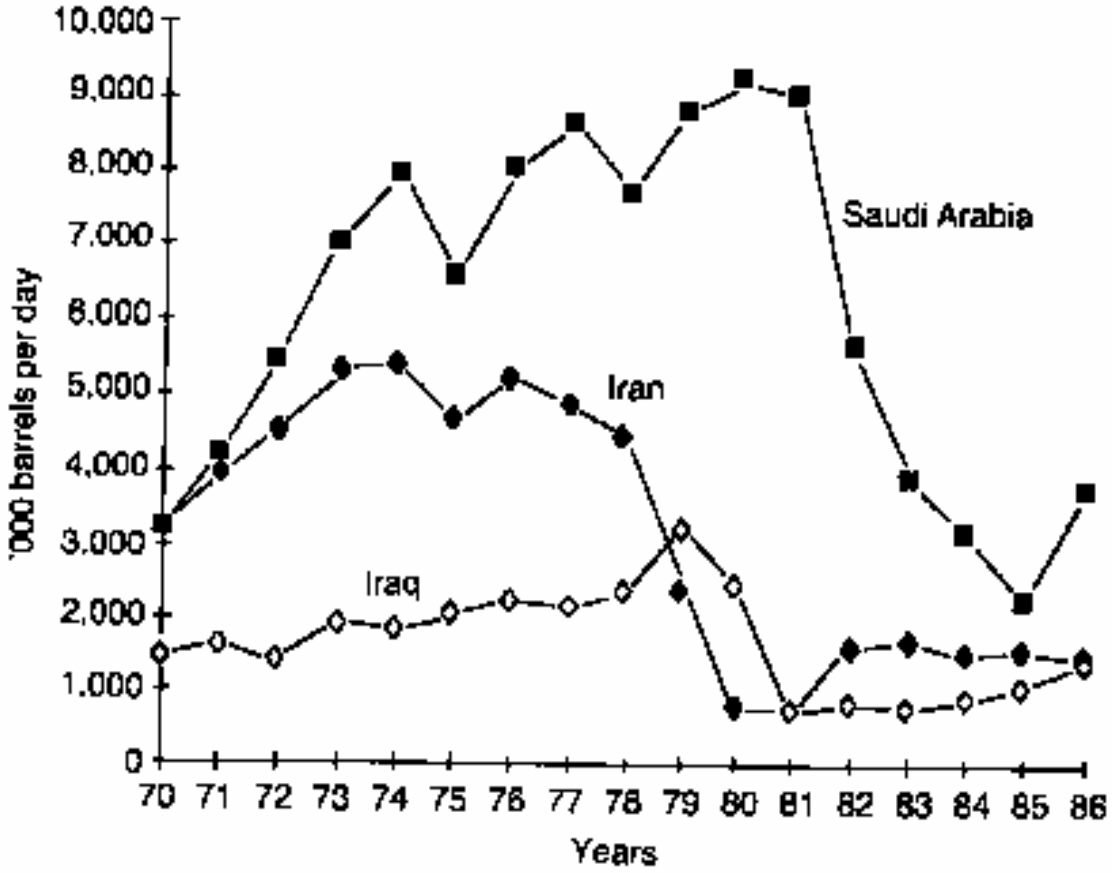
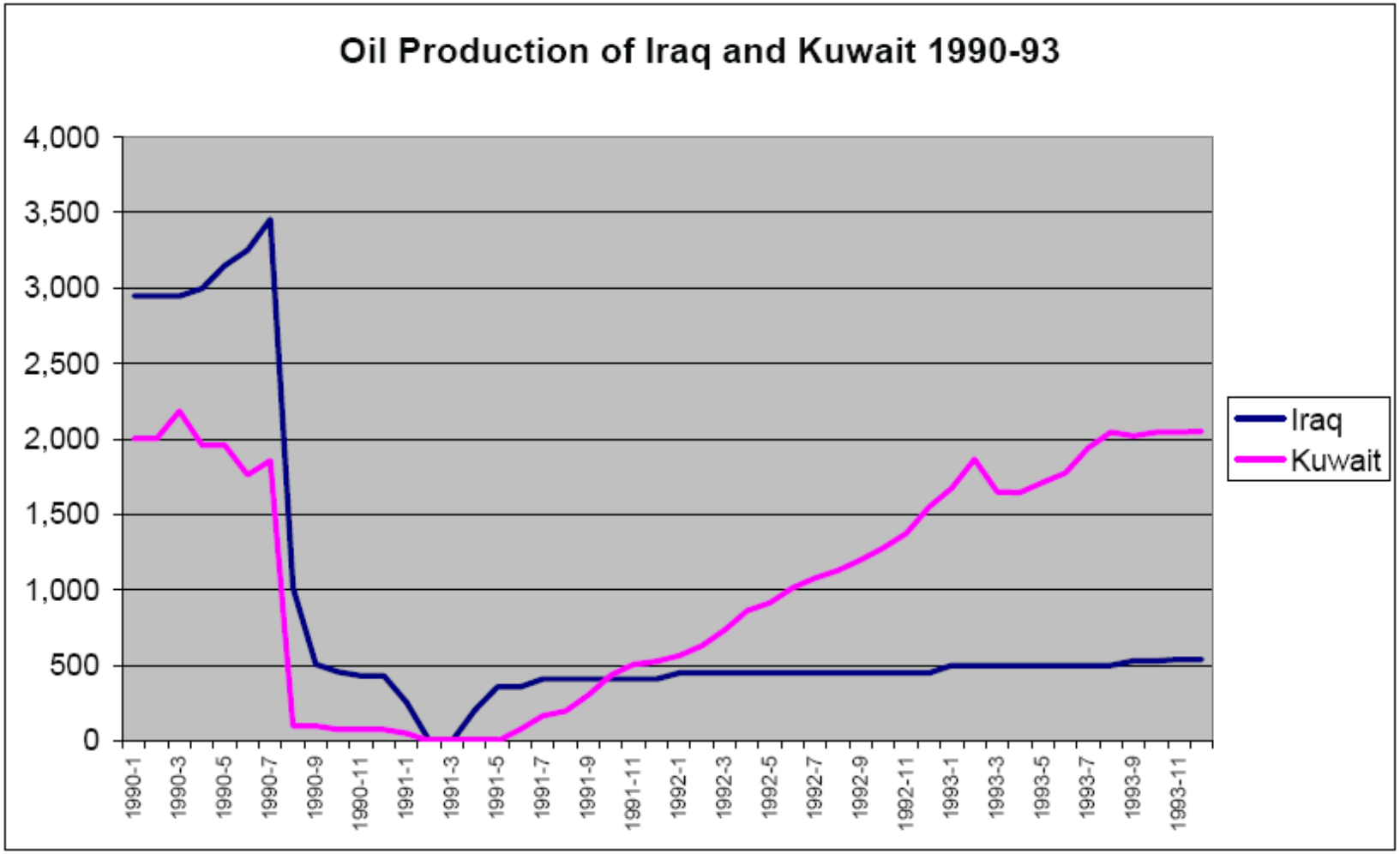


Figure 3.1 Crude oil exports of Iran, Iraq and Saudi Arabia, 1970–86
Source: OPEC, *Annual Statistical Bulletin*, 1987.


Oil Production of Iraq and Kuwait 1990-93
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
1990-1
1990-3
1990-5
1990-7
1990-9
1990-11
1991-1
1991-3
1991-5
1991-7
1991-9
1991-11
1992-1
1992-3
1992-5
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1992-9
1992-11
1993-1
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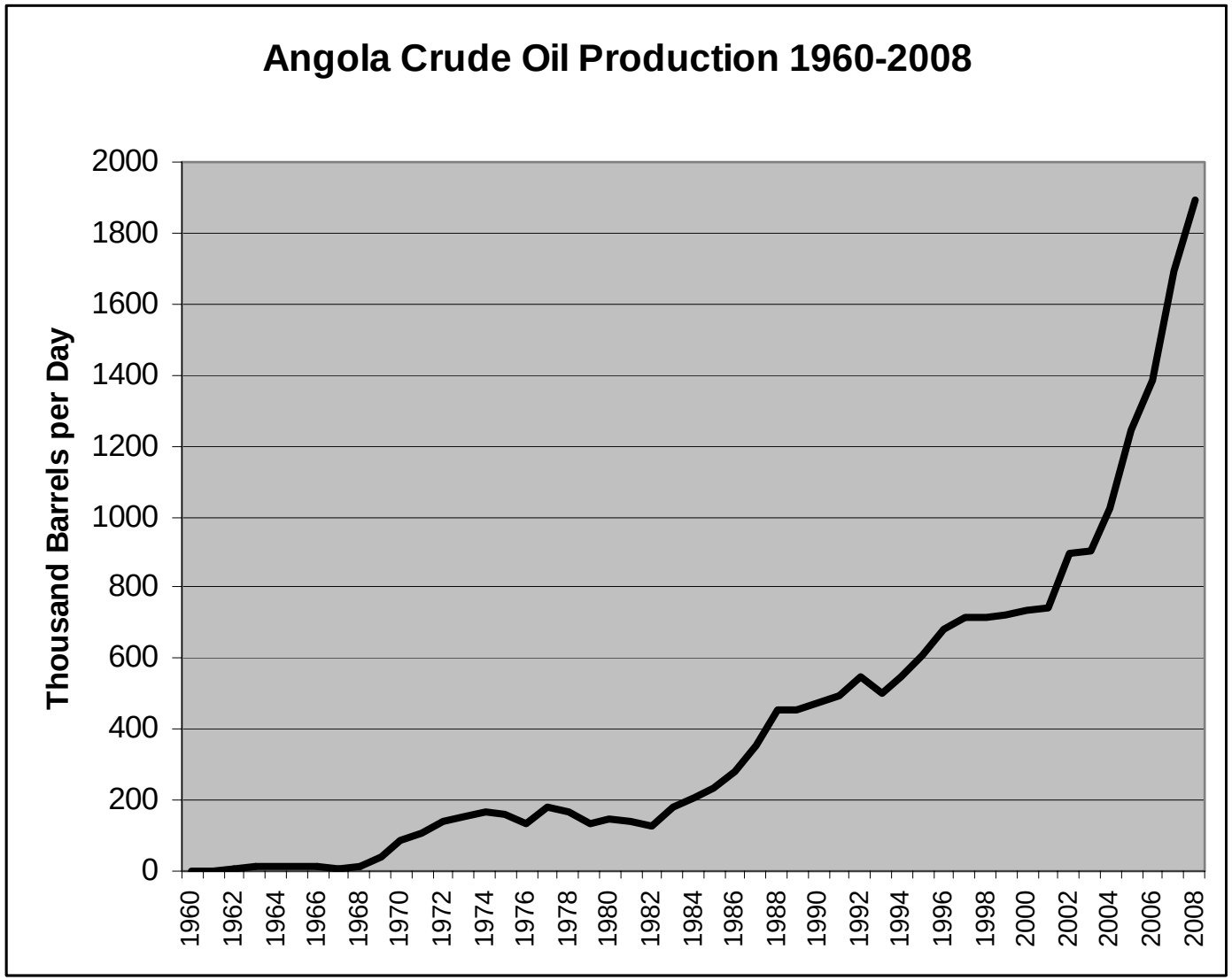
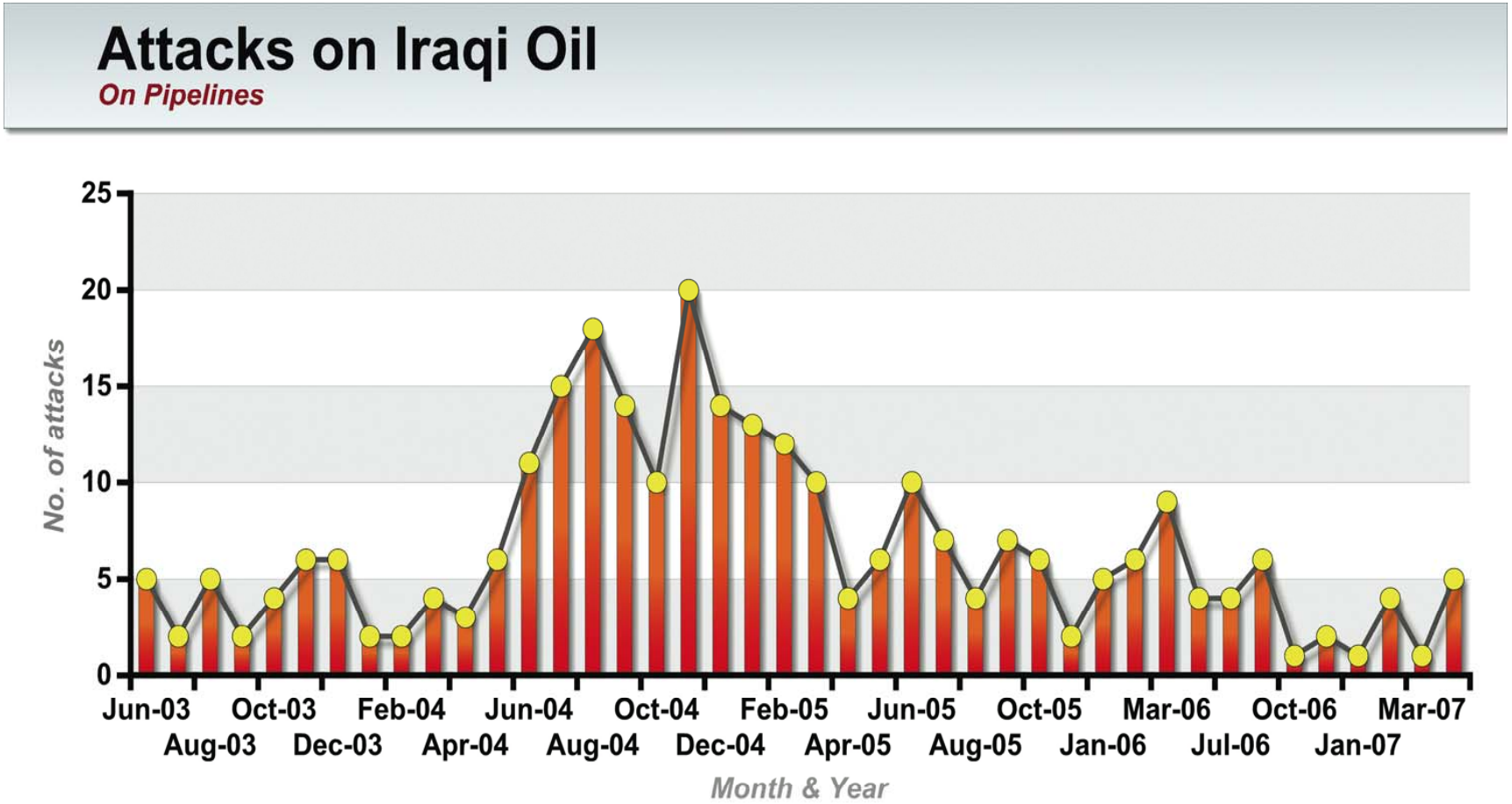
1993-5
1993-7
1993-9
1993-11
Iraq
Kuwait


Angola Crude Oil Production 1960-2008
Thousand Barrels per Day
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008

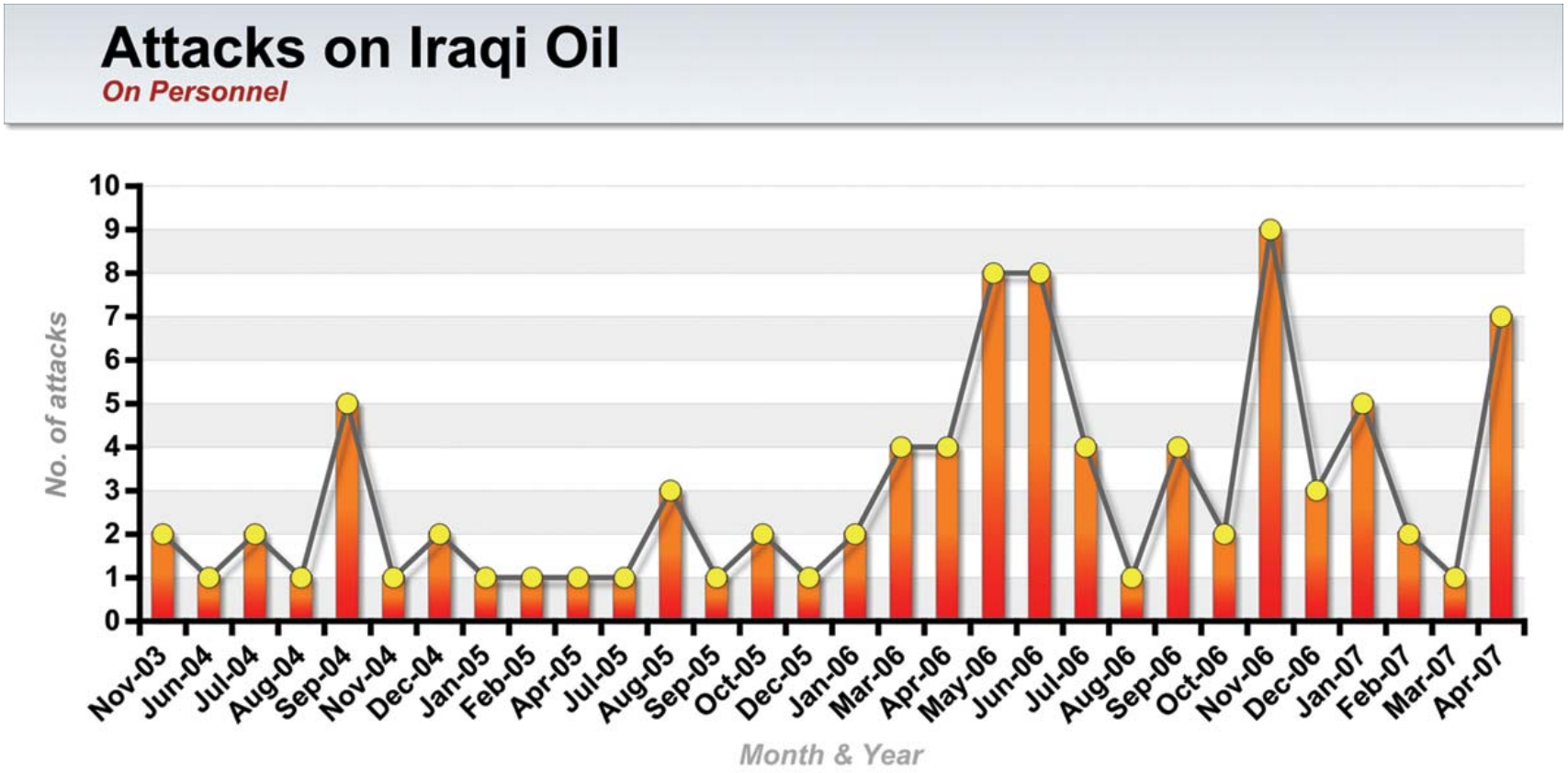
Threat to Oil

- Terrorist threat to oil Infrastructure is not a new phenomenon
- Experience of oil producing countries which have been subjected to terrorist attacks proves that this kind of threat is *manageable* and can be *contained*.
- Investment in Counter Measures to protect infrastructure seems effective in discouraging attacks and limiting damages.
- Activities in oil sector can continue despite threats and actual attacks.

Iraq: Attacks on Pipelines



Iraq: Attacks on Personnel



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Conclusions

- oil and gas installations appear to be much more resilient to armed conflict than is normally acknowledged
- interstate wars are a low-probability event; they are generally confined to two main belligerents and contained
- civil wars or violent action on the part of non-state actors are phenomena whose frequency has not diminished at the global level
- cases in which violent action on the part of non-state actors has inflicted significant damage to existing installations include the “insurgency” phase in Iraq and MEND in Nigeria
- if oil installations are in remote or inhabited locations – as is the case in Algeria or Angola and many other countries including Saudi Arabia – then the cost-benefit balance of attacking oil installations is considerably worse for the non-state actor
- however, it is very obvious that a government’s inability to overcome or reabsorb violent opposition discourages international oil company investment even if the violence does not affect the vicinity of oil and gas installations.

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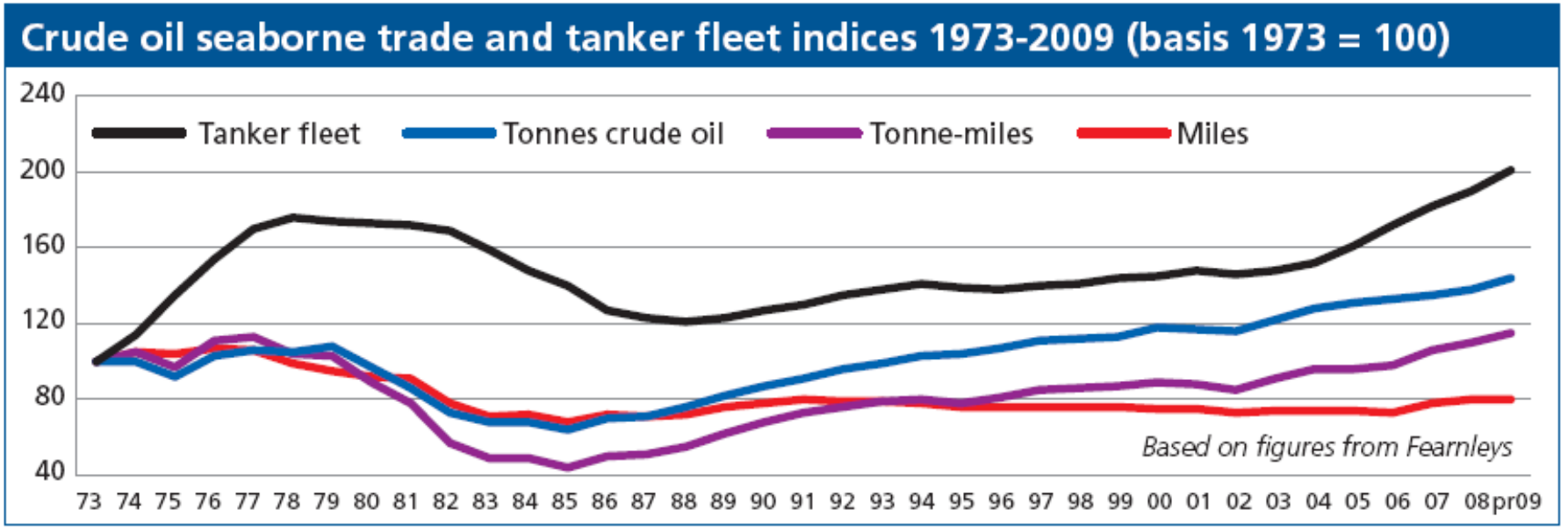
Restrictions of passage, accidents and oil transportation norms: scenarios of impacts on costs, global crude oil supplies and supply security.



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Lists of chokepoints

	EIA	EC Green Paper	IEA
Hormuz	X	X	X
Malacca	X	X	X
Bab el Mandab	X	X	X
Panama Canal and Pipeline	X	X	
Suez Canal and Sumed pipeline	X	X	X
Turkish Straits	X	X	
Baltic Sea		X	

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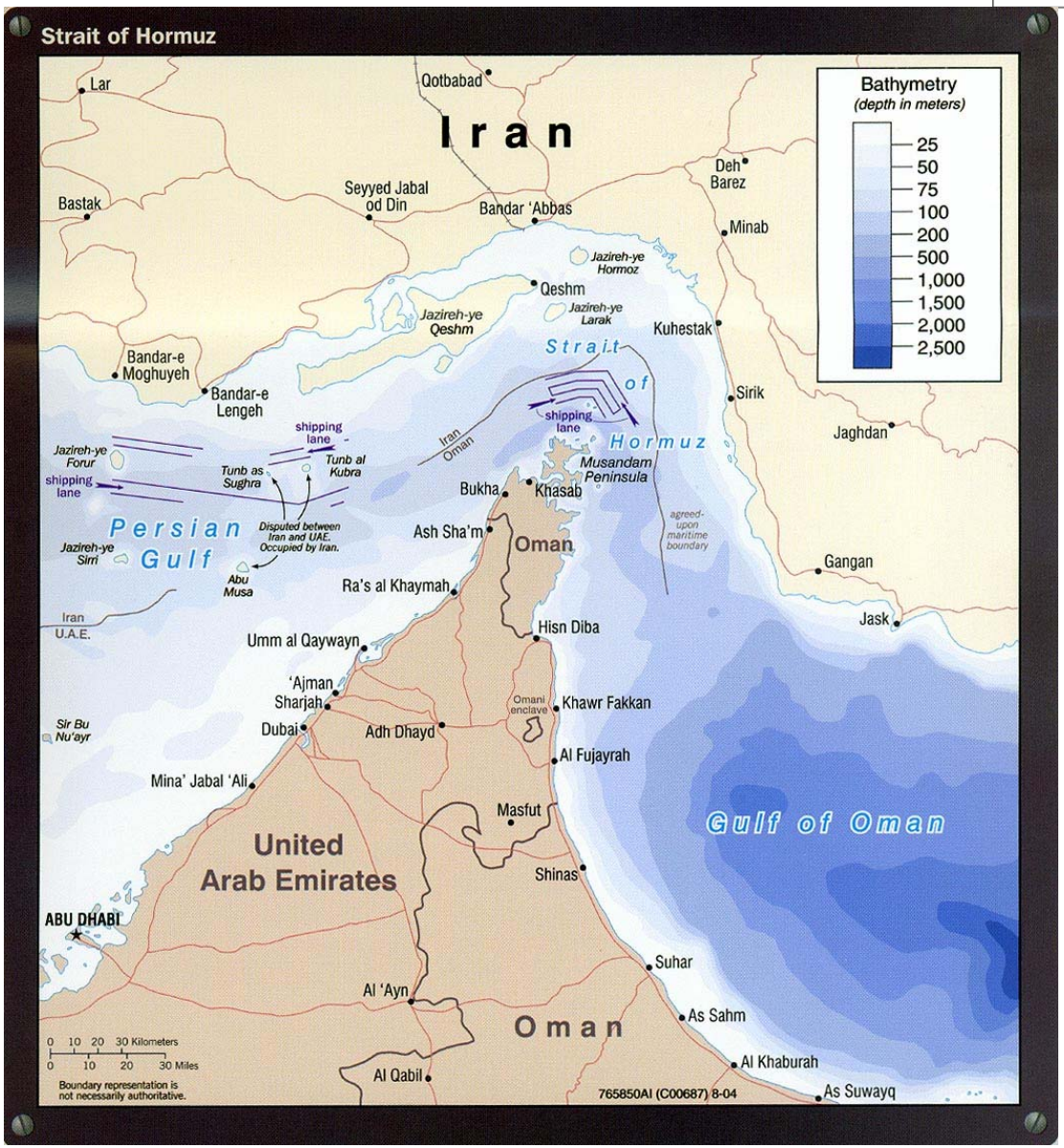
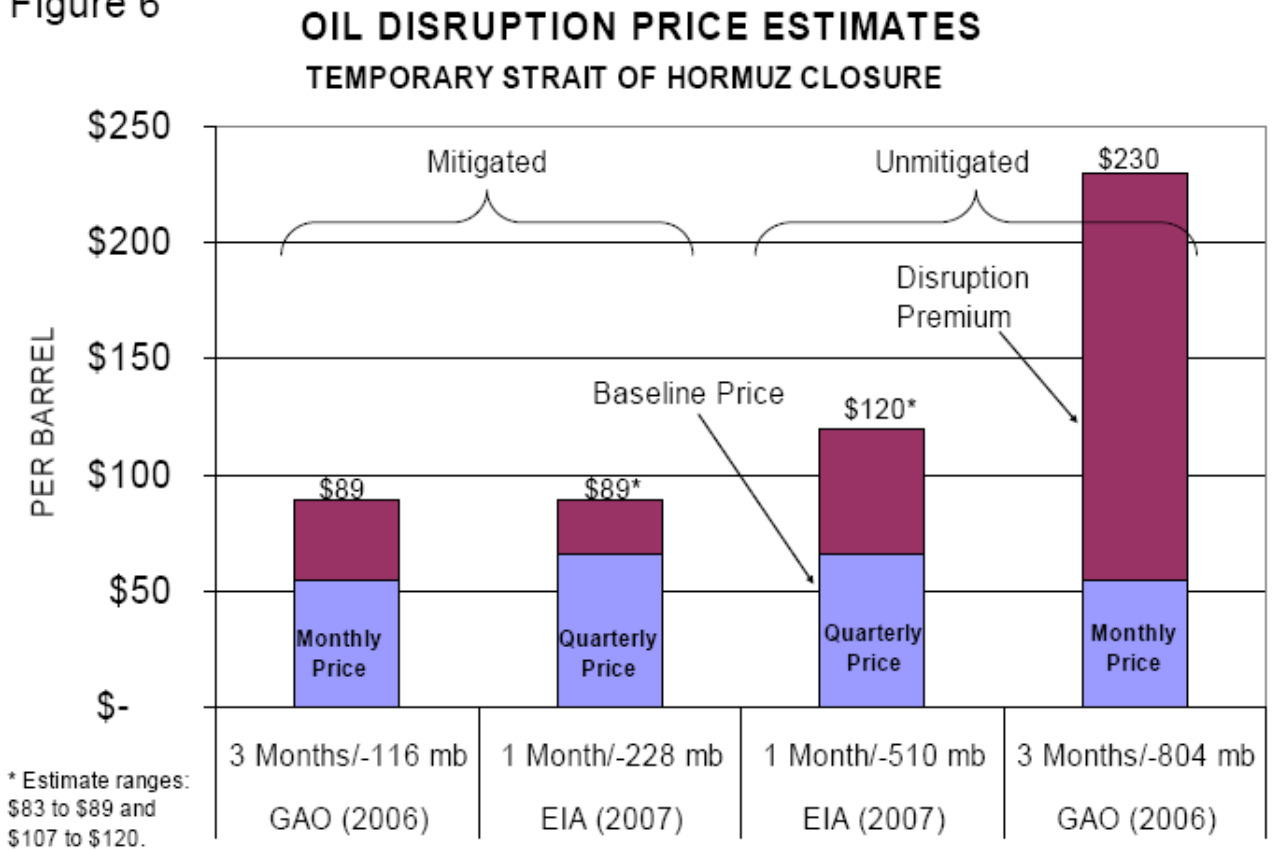


Figure 6



* Estimate ranges: $83 to $89 and $107 to $120.

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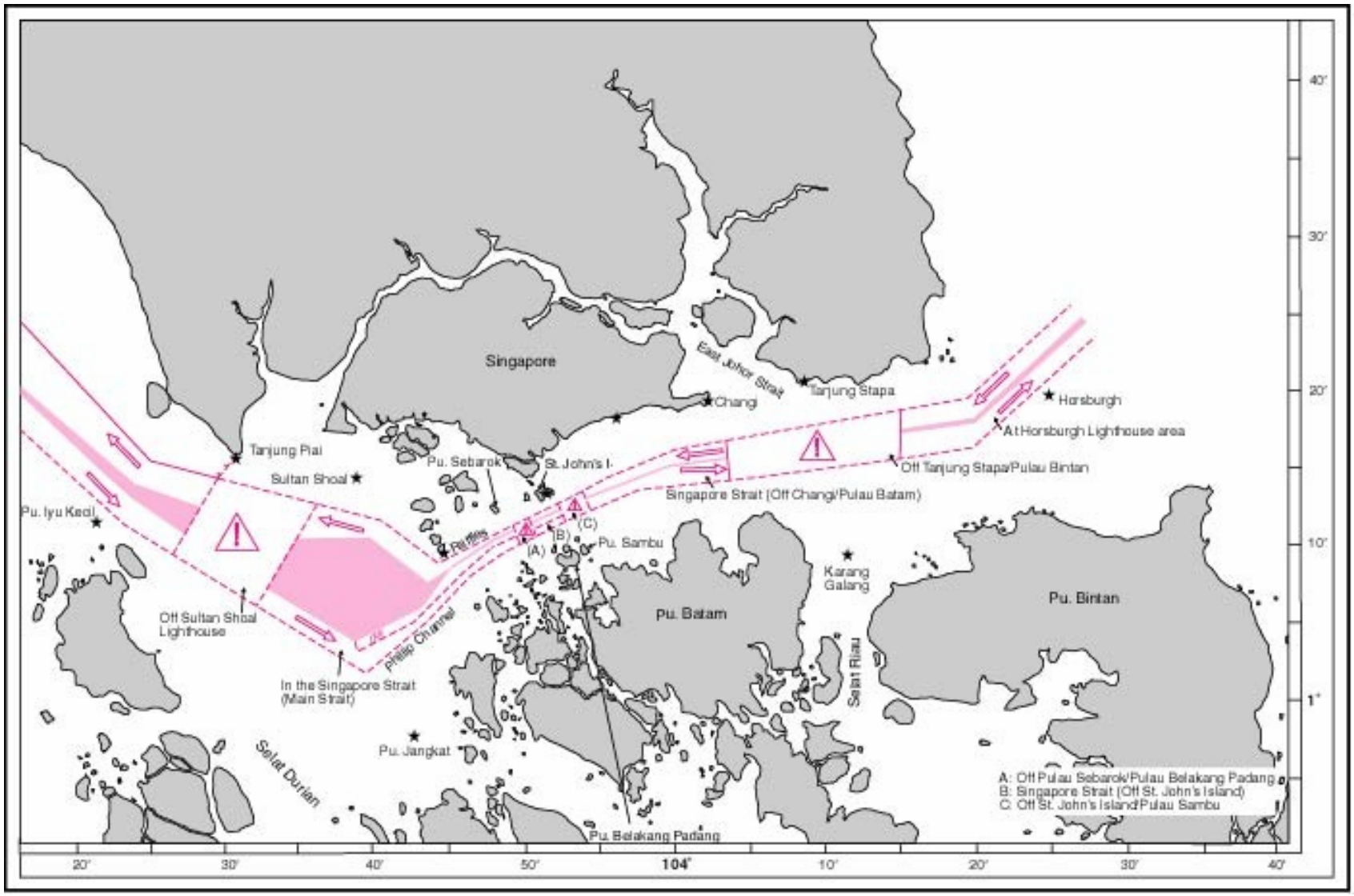

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The Suez Canal

Table: Energy Products Passage through the Suez Canal

	No of Vessels		Tonnage	
	2007	2008	2007	2008
Tankers	3470	3795	145934	146658
LNG	358	429	32776	38987

Source: Suez Canal Authority

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Total Tanker Passages		
	Bosphorus	Canakkale
1996	4248	5658
1997	4303	6043
1998	5142	6546
1999	5504	7266
2000	6093	7529
2001	6516	7064
2002	7427	7637
2003	8107	8114
2004	9399	9016
2005	10027	8813
2006	10153	9567
2007	10054	9271
2008	9303	8758

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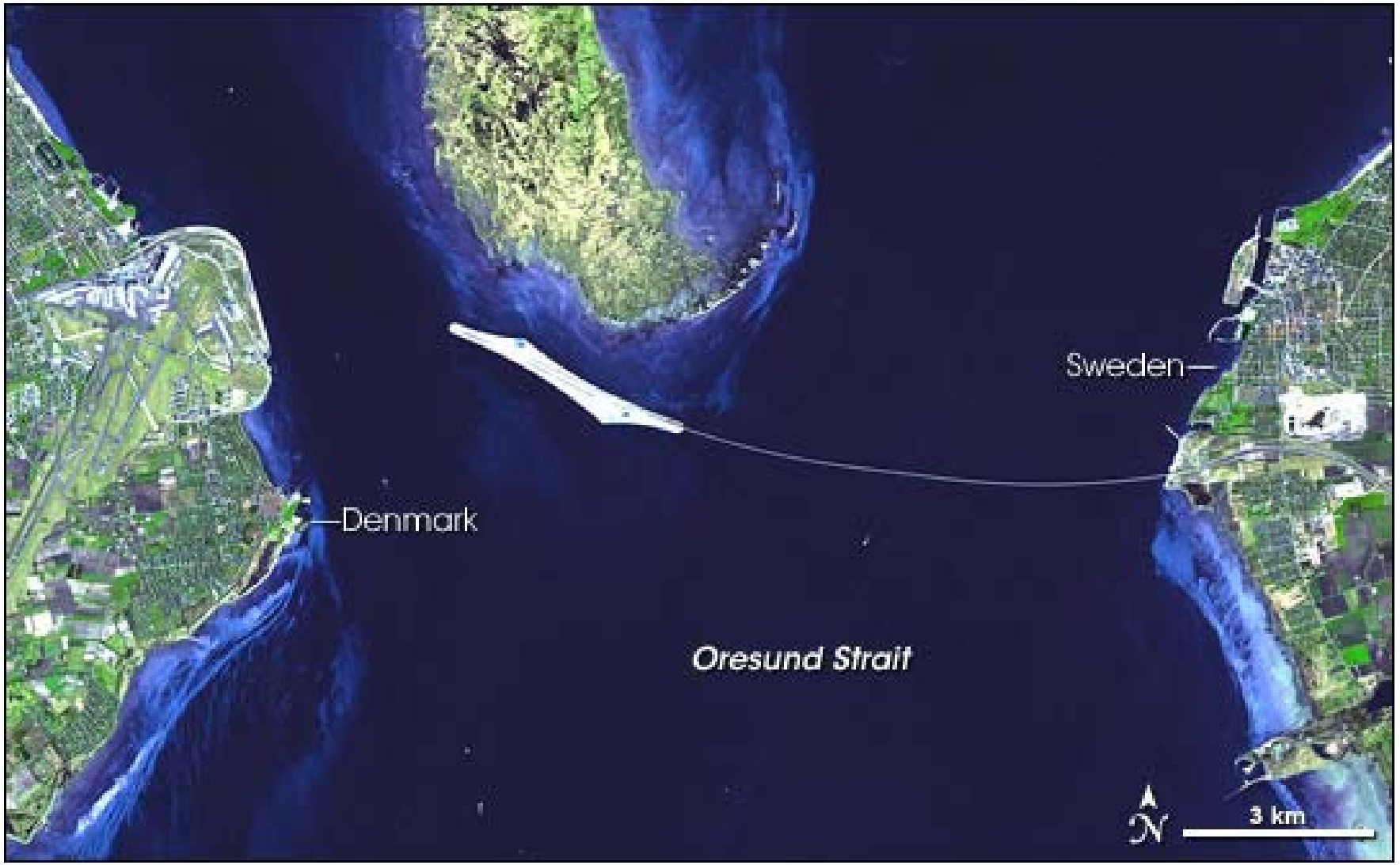
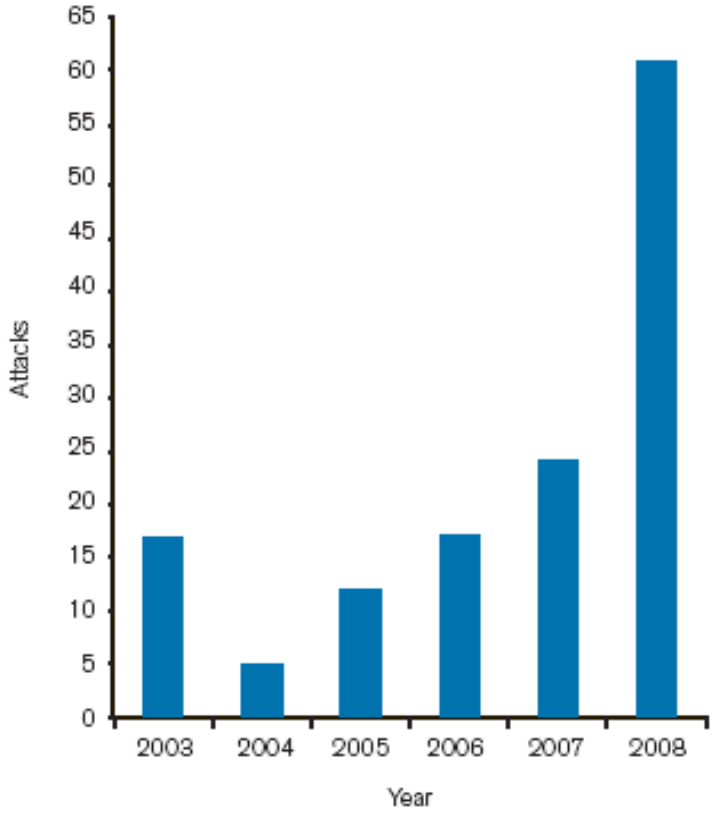


Figure 1: Number of actual and attempted attacks in Somalia and Gulf of Aden



Source: ICC International Maritime Bureau, *Piracy and Armed Robbery against Ships – Report for the Period 1 January–30 June 2008*, July 2008. Figures correct as at 25 September 2008.

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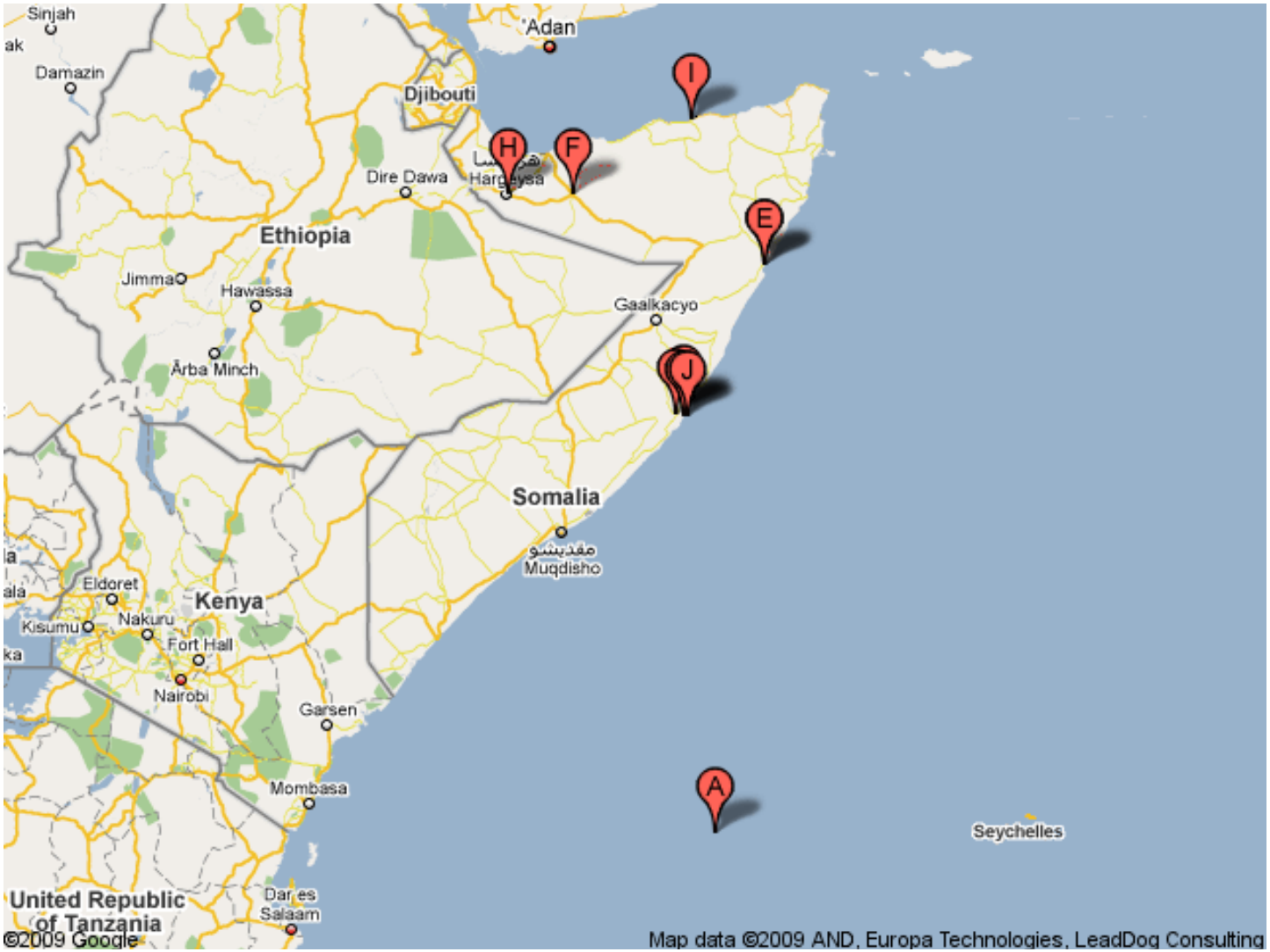

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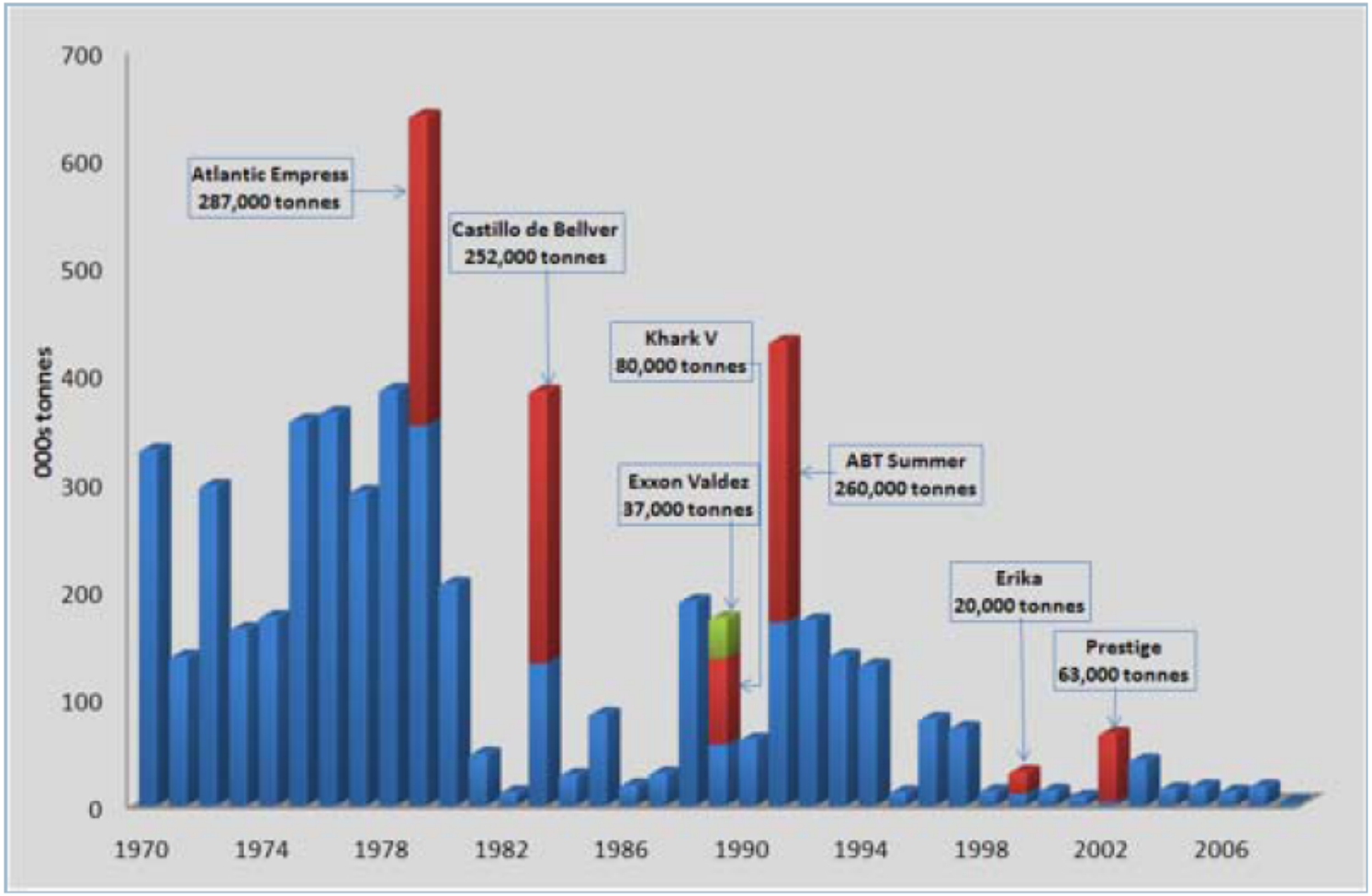

Figure 3: Quantities of oil spilt

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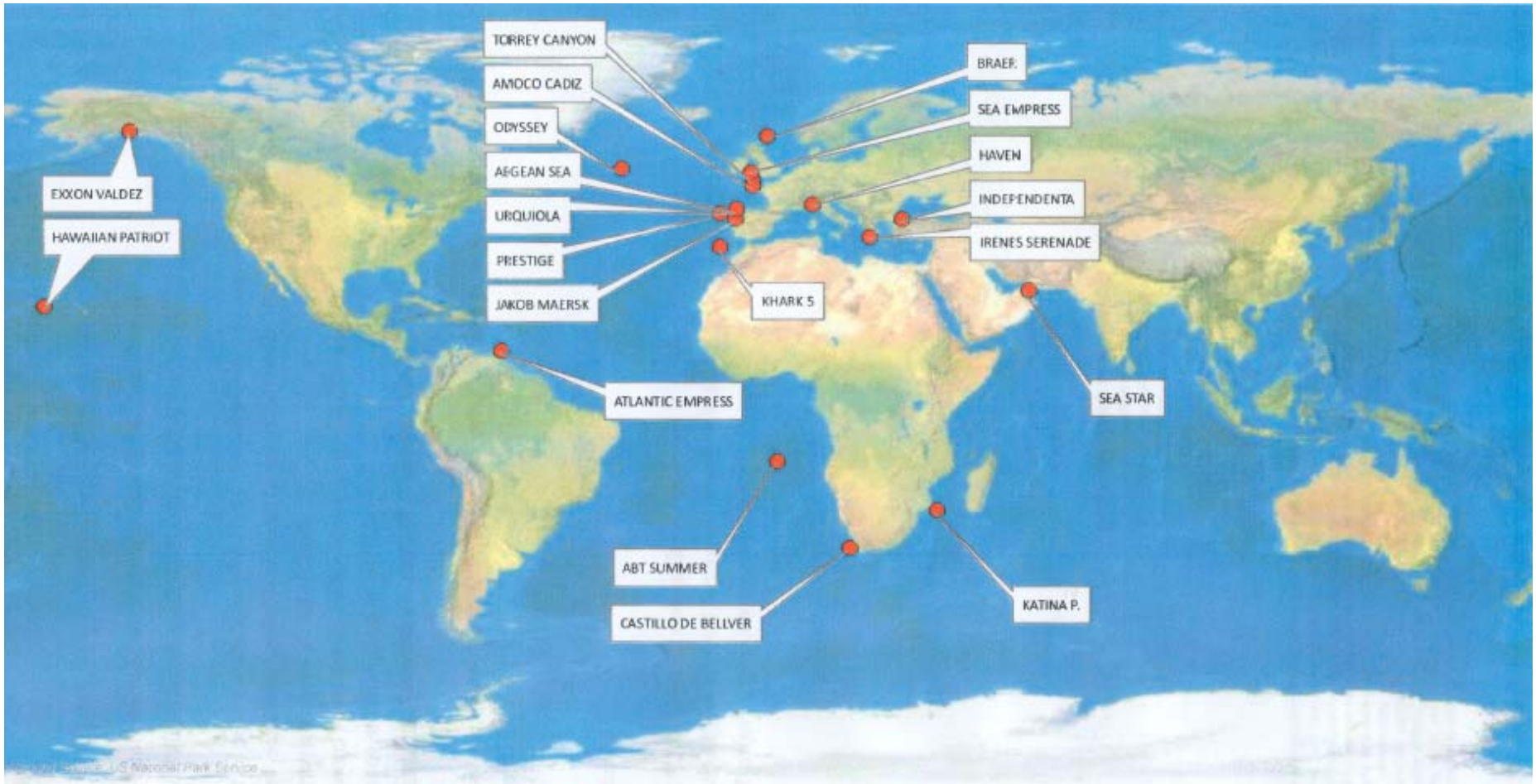

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Tanker phase out based on MARPOL 13 G, assuming all SH tankers to be phased out by end 2010 (phase out figures 20 April 2008/orders end March)

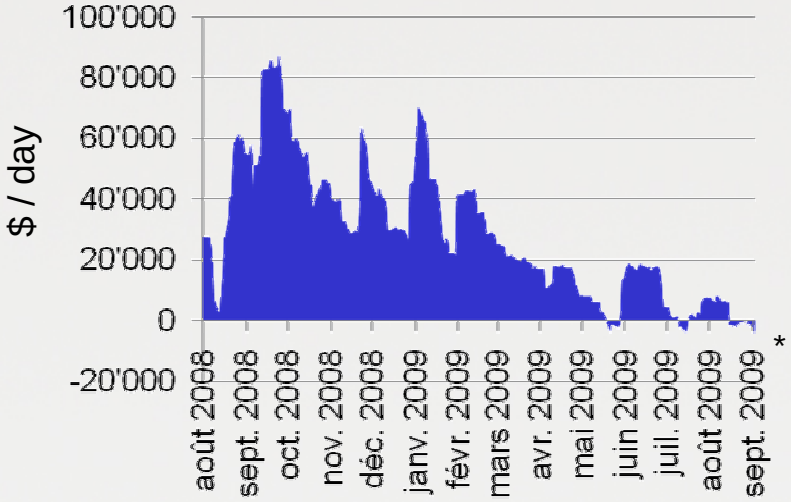
dwt	2008	2009	2010	2011	2012	2013	2014	2015	Phase out no	Phase out m dwt	Orders no	Orders m dwt
5-24,999	336	21	220	4	5	2	1	17	606	5.6	401	5.9
25-59,999	91	19	134	2	8	5	4	21	284	10.7	345	11.8
60-79,999	18	9	34	3	2	2		3	71	4.7	110	8.1
80-119,999	12	4	51	7	12		1	10	97	9.2	222	24.4
120-199,999	1	3	21			3	4	3	35	5.o	166	26.0
VLCC	1	1	93			1	1		97	26.6	227	70.3
Total	459	57	553	16	27	13	11	54	1,190	61.9	76.1	76.1

The small tanker figures are uncertain. The figures for 2008 are tankers that according to our records should already have been phased out, but some of these may have been converted or may operate in local trades. Tankers to be phased out after 2010 are double side or double bottom tankers

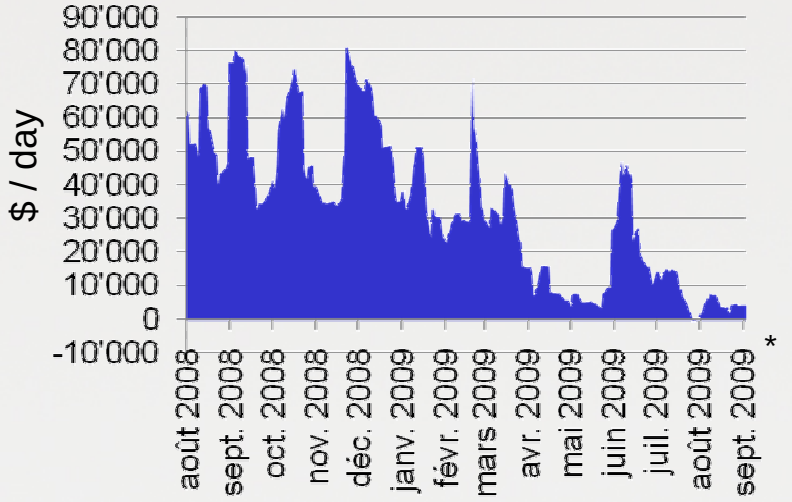
The Tanker Market… crash!

Title of the Presentation

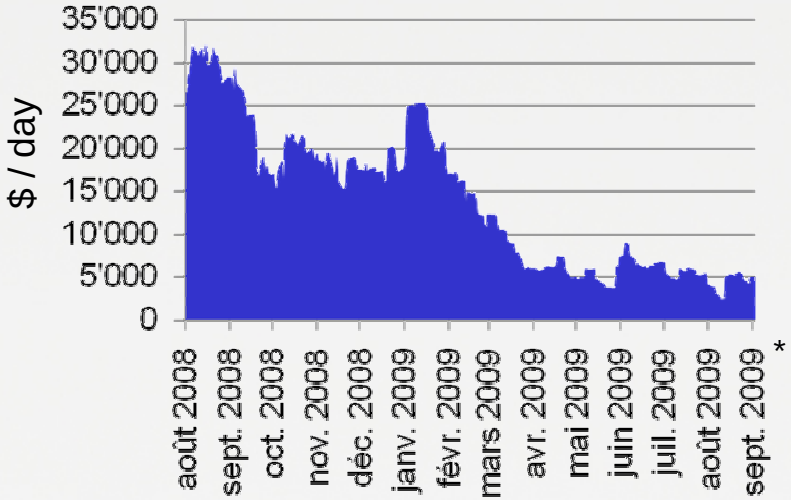
AG / FEAST 280 KMT Crude Oil



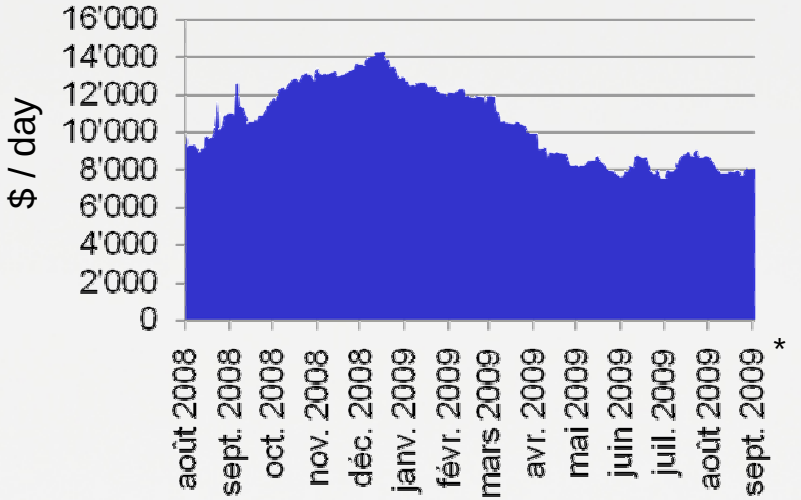
Baltic / UKC 100 KMT Crude Oil



Baltic / UKC 30 KMT CPP



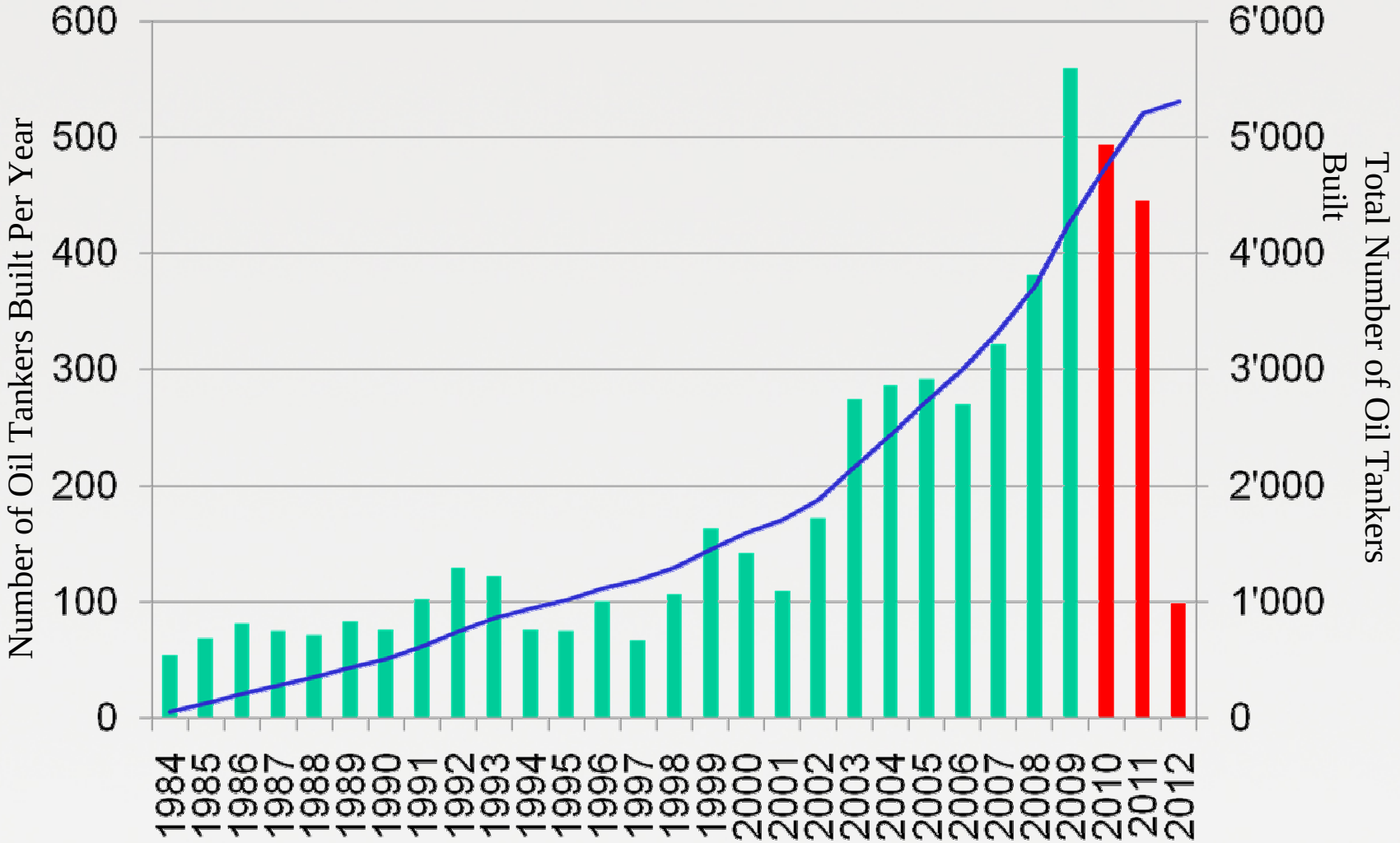
Baltic / UKC 6 KMT DPP



* Up to the 14th of September 2009

Number of Tankers >25 KDWT Built Since 1984

Title of the Presentation



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Conclusions

- Maritime logistics are unlikely to generate major crises, but require constant attention
- Patrolling and surveillance of maritime traffic is essential
- Investment to reduce pressure on key choke points (Bosphorus, Danish Straits) is essential
- Investment to reduce traffic in enclosed seas is highly advisable
- Stabilisation of the oil/tanker market is an important component of oil supply security

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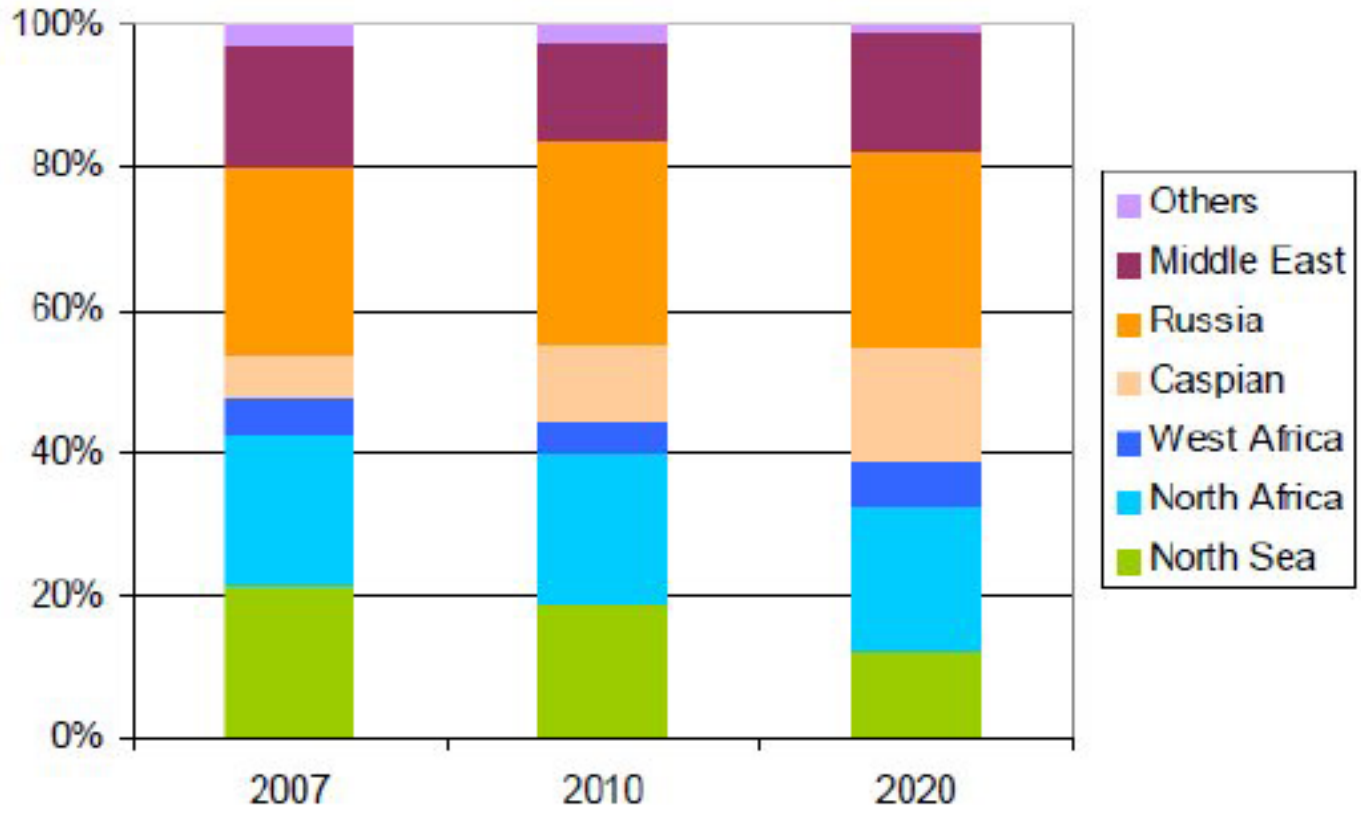
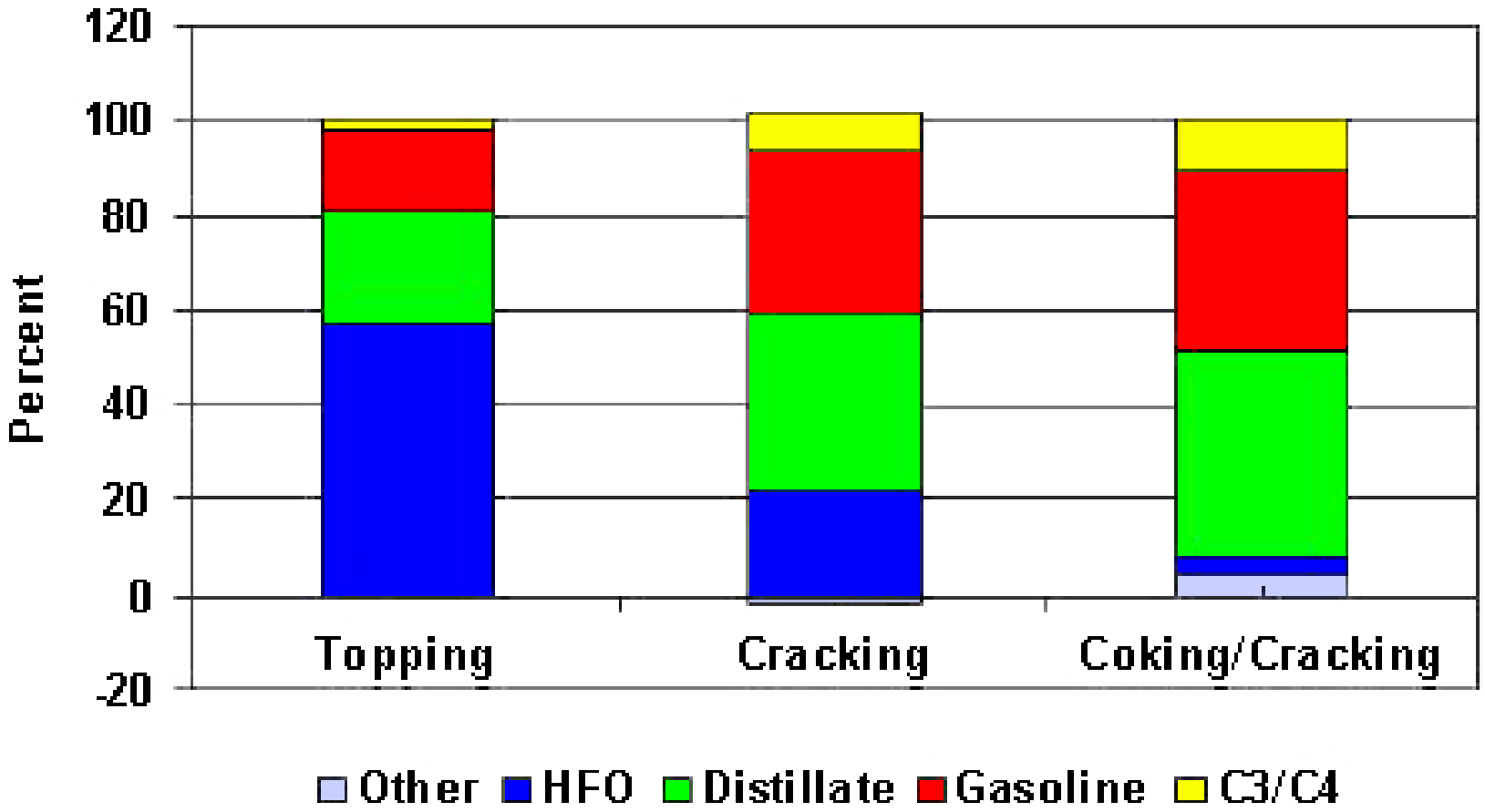
International markets of oil products: impacts of refinery localisation determinants and evolving oil product specifications on oil security of supply

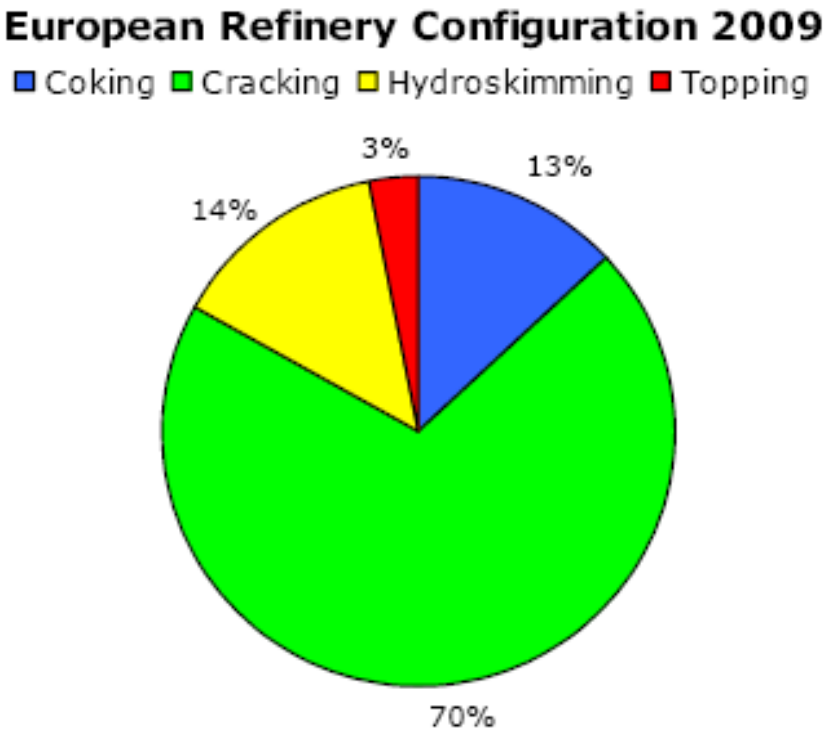
- We may get the oil, but… can we get the products?
- Crude oil is not of uniform quality
- The product slate depends on refinery complexity
- Tight product specifications make the task more difficult
- Europe: excessive dieselisation?

Figure 2: Present and Projected Crude Slate in Europe



Source: IEA Medium Term Oil Market Report, 2009.


120
100
80
60
40
20
0
-20
Percent
Topping
Cracking
Coking/Cracking
Other
HFO
Distillate
Gasoline
C3/C4



The European refining industry has at present 128 refineries with a combined capacity of 17.3 million b/d. The problem with present European refinery configuration, which may result in a 2mb/d decline in refining capacity, is that existing refineries are either too small (below 60kb/d) or not sufficiently complex in their ability to upgrade residual fuel oil into light and middle distillates

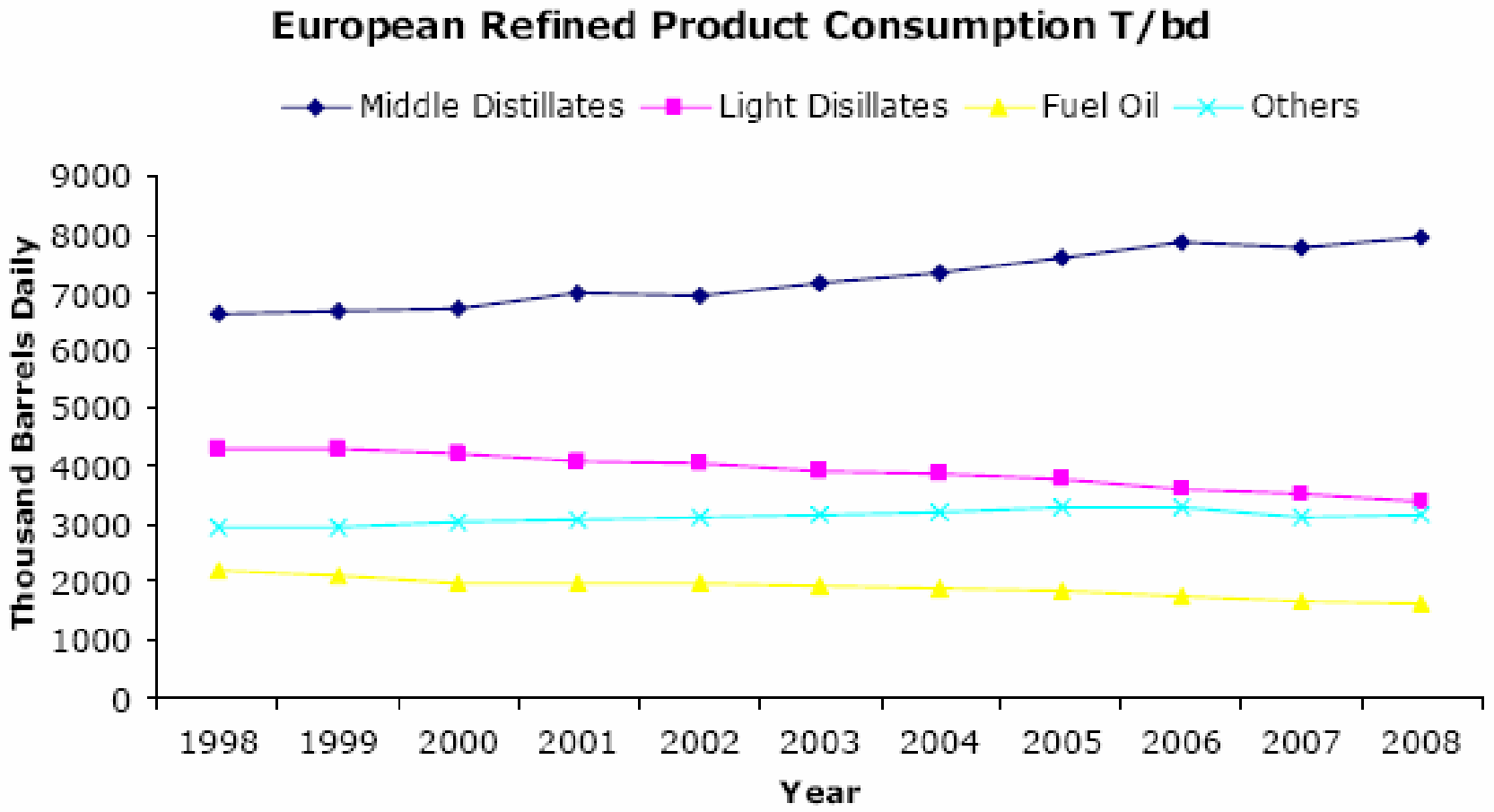
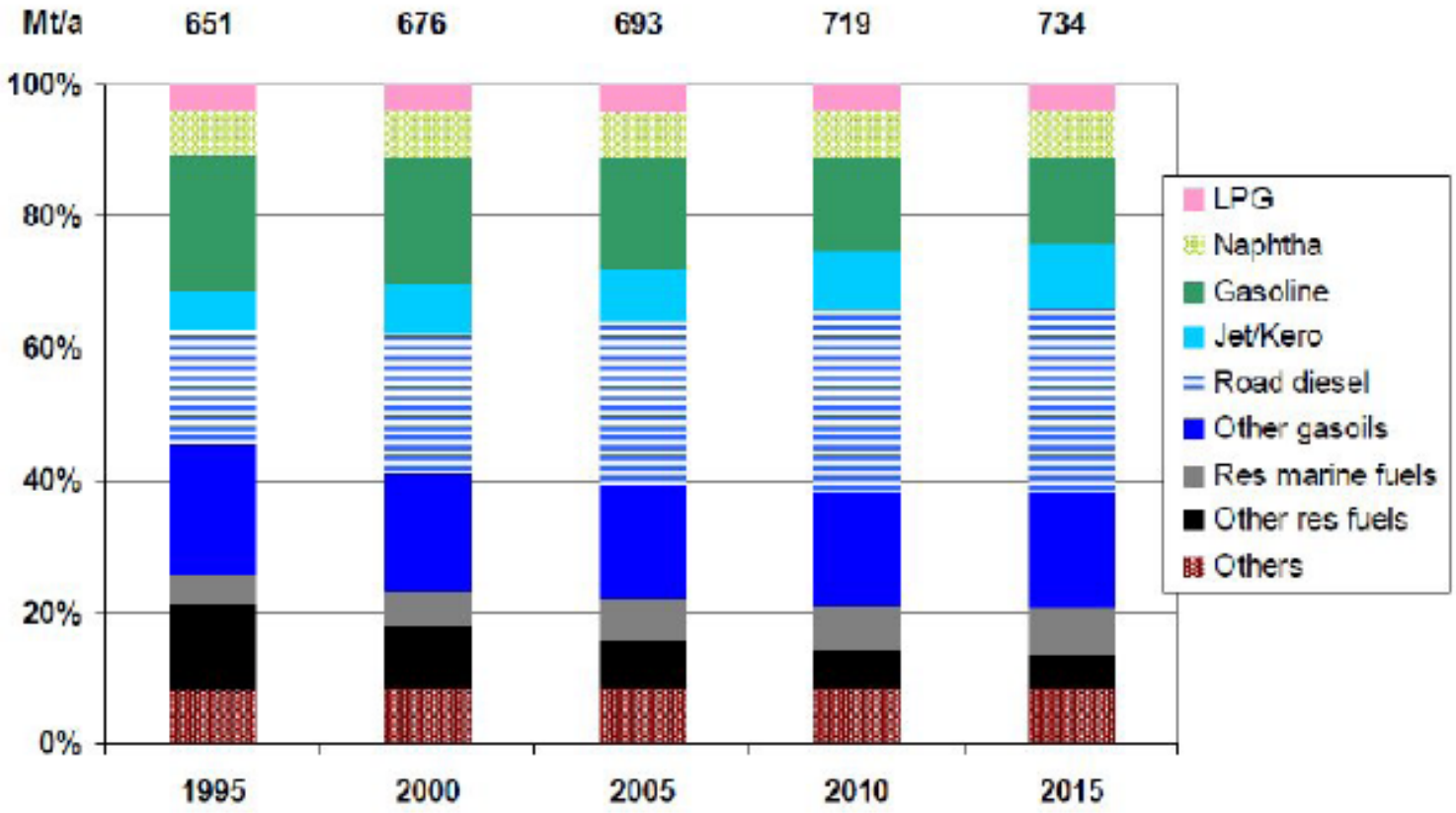
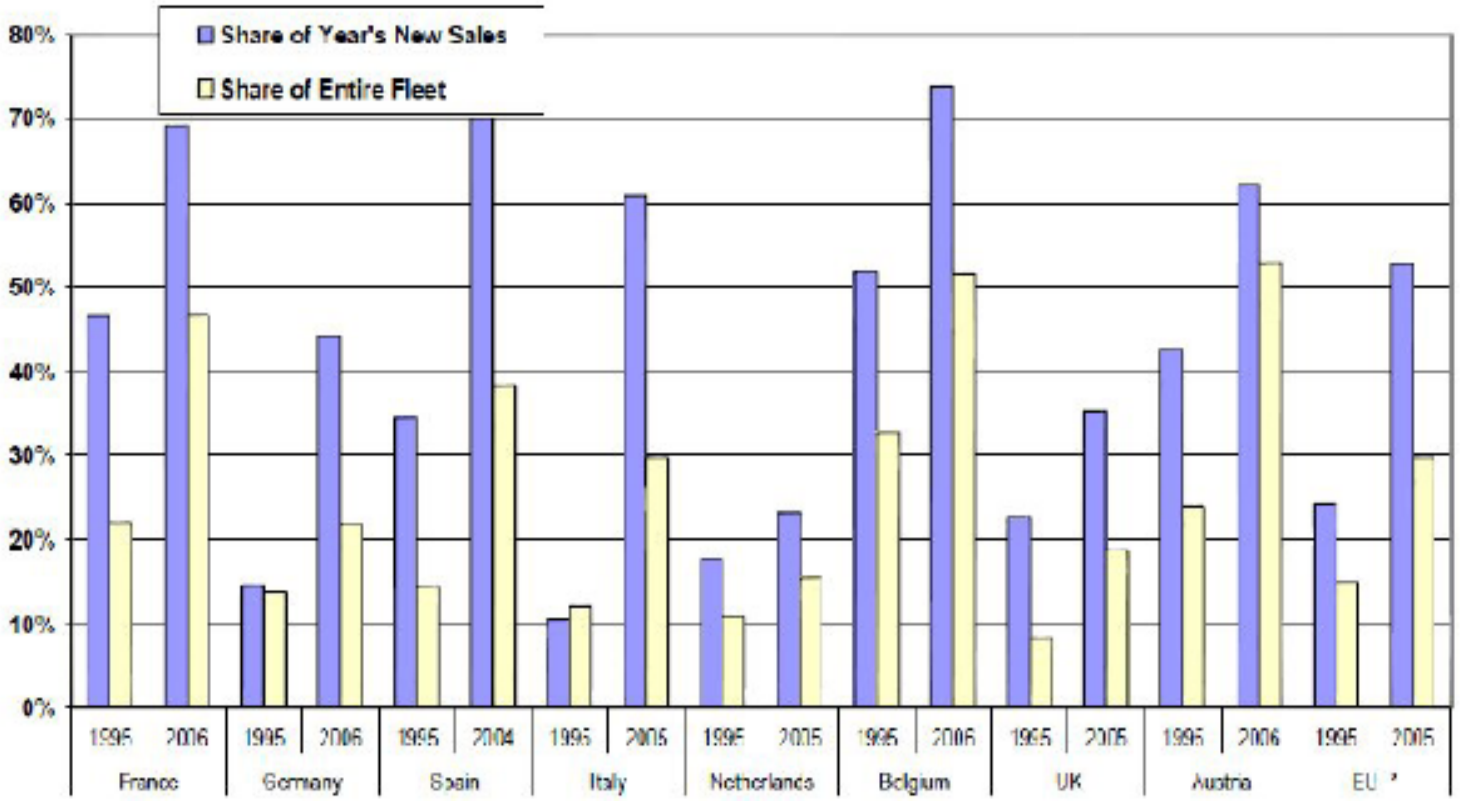

European Refined Product Consumption T/bd
Middle Distillates
Light Disillates
Fuel Oil
Others
Thousand Barrels Daily
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Year

Figure 7: Historical and forecast product demand (EU-27)



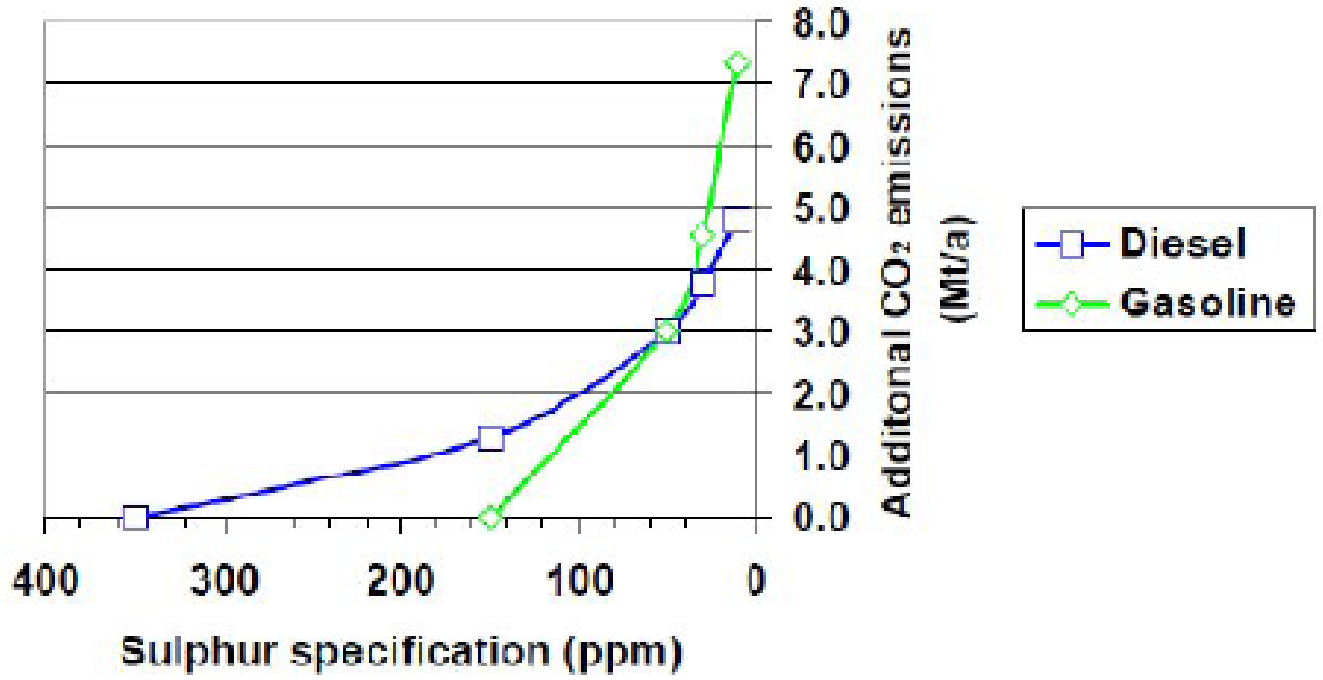
Source: Medium Term Oil Market Report, IEA, 2009

Figure 8: Share of diesel cars/SUVs in each country's new sales and entire road fleets, 1995 and 2005/6.



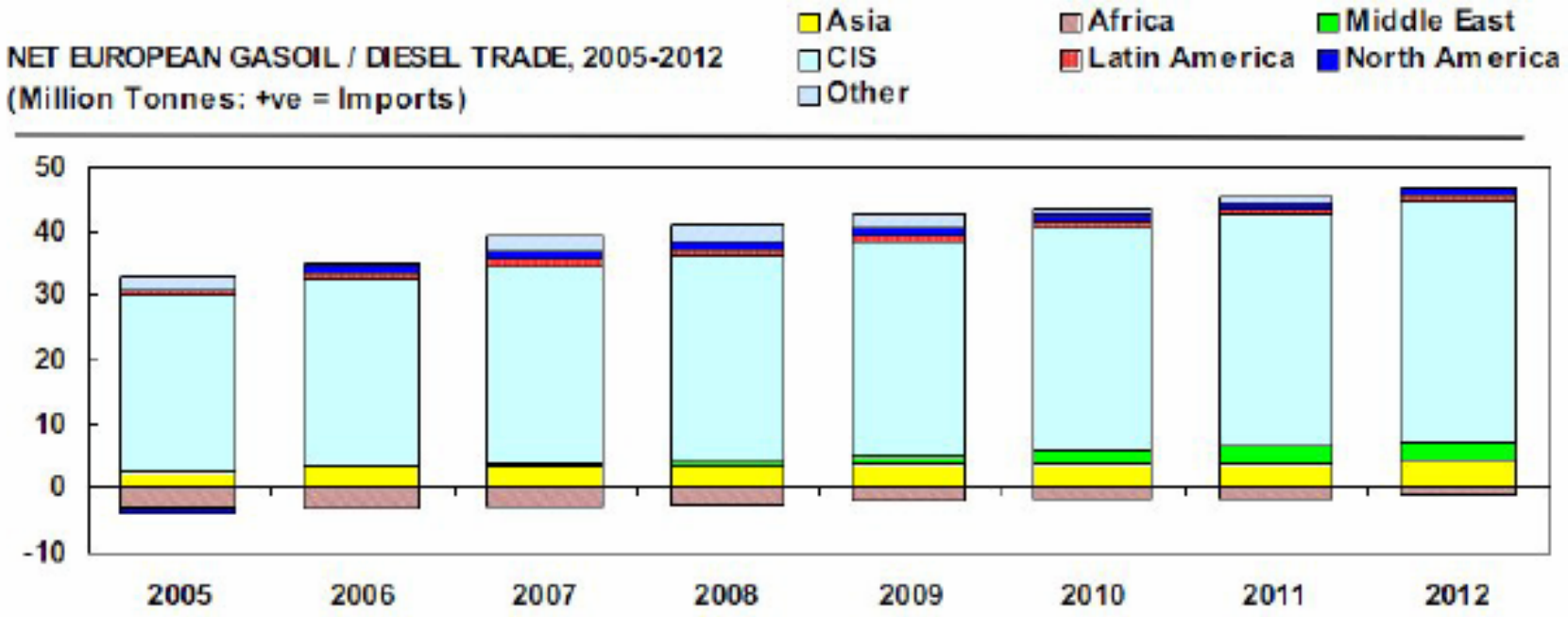
Source: Gasoline and Diesel Demand in Europe, Institute for Advanced Studies Vienna, 2007

Figure 12: CO2 Emissions increase following higher environmental specifications



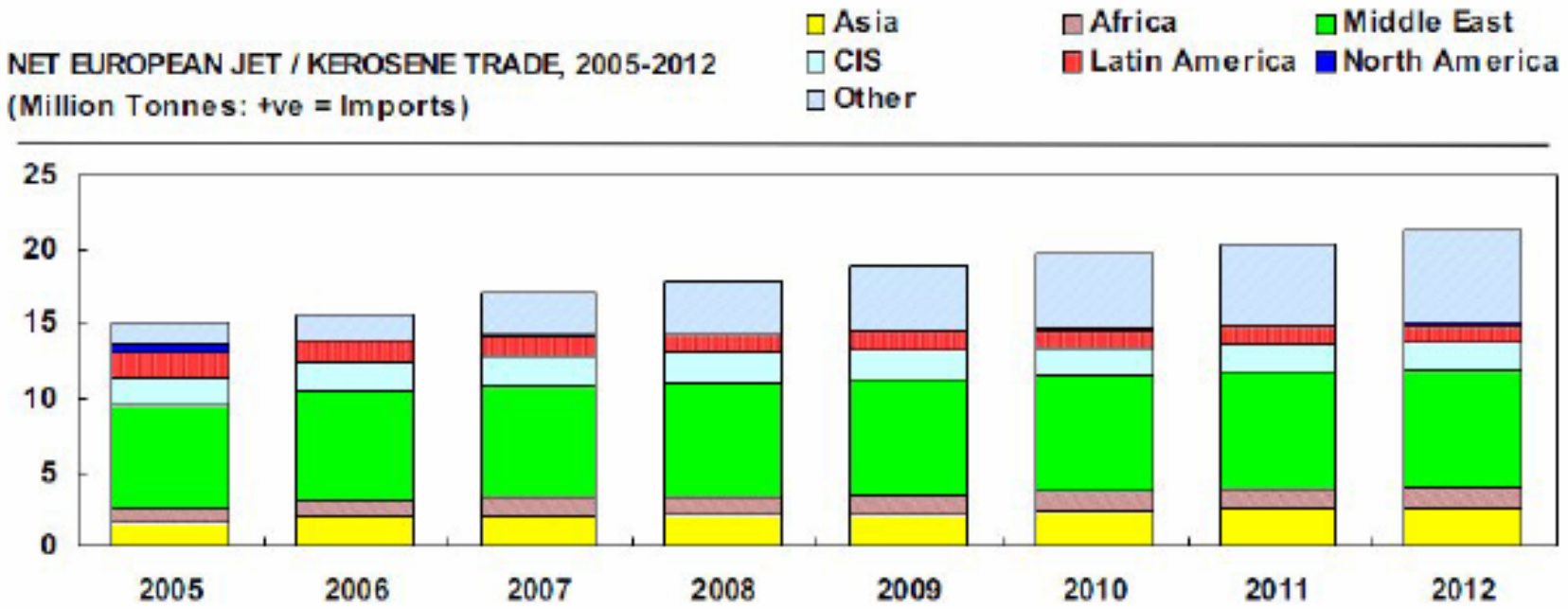
Source: Oil Refinfing in the EU in 2015, Conwae, 2007

Figure 14: Net European Gasoil/Diesel Trade 2005-2012



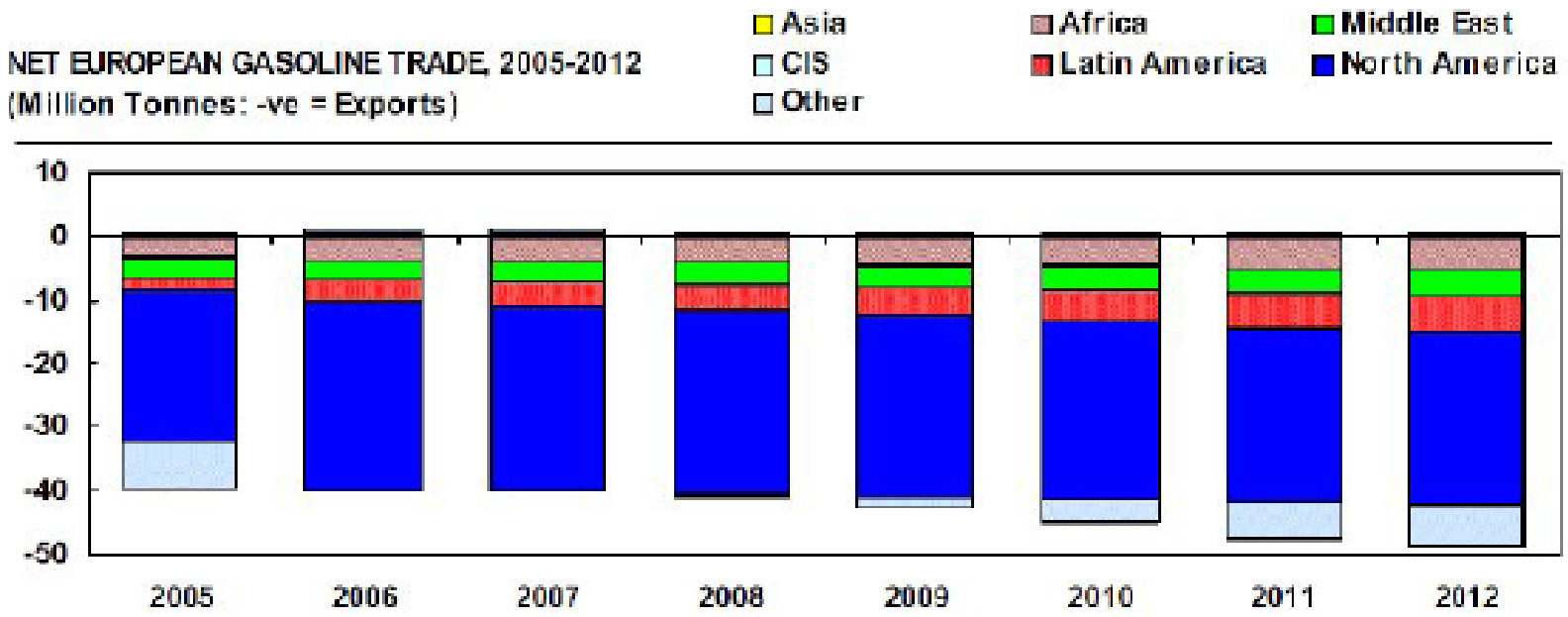
Source: Purvin & Gertz

Figure 15: European Imports Kerosene Mid-Term



Source: Purvin & Gertz

Figure 16: European net gasoline trade 2005-2012



Source: Purvin & Gertz

SEVENTH FRAMEWORK PROGRAMME

secure

Security of Energy Considering its Uncertainty, Risks and Economic implications

Gulf Research Center

Knowledge for All

Conclusion – mitigation measures

- Diversification of imports
- Reduction of differential in taxation
- Greater coordination between industry and legislators
- Biofuels

SEVENTH FRAMEWORK PROGRAMME

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Security of Energy Considering its Uncertainty, Risks and Economic implications

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Knowledge for All

Functioning of the international oil markets and security implications

- Energy security is primarily a function of investment
- Investment in a market economy is a function of the expected revenue stream, which in turn is a function of prices
- A well-functioning market is therefore a key component of security
- The main obstacle to oil and gas security of supply is the growing volatility of prices and their fundamental unpredictability
- Security itself is also dependent on prices. Customers feel secure if they can buy all the energy they need at prices that they can afford

Causes of volatility

- Structural causes of volatility
  - Demand and supply rigid to price
  - The impact of unconventional oil and EOR
- Faulty design of oil market
  - Major oil streams not available for trading
  - Inadequacy of benchmarks
- Vicious circle of volatility and speculation

SEVENTH FRAMEWORK PROGRAMME

secure

Security of Energy Considering its Uncertainty, Risks and Economic implications

Gulf Research Center

Knowledge for All

Policy Proposals

- Encourage the freer trading of major crude oil streams, notably those from the Gulf
- Increase reliance on long term pricing
- Enforce an internationally agreed price band
- Manage stocks
- Offer demand security through take or pay contracts
- Encourage vertical integration

Policy Responses

- A key question: How to stabilise market expectations? Is there a role for government policy and international coordination?
  - Distinguish between price cycles and short term (inter-day and intra-day) volatility
  - Causes are different
- Various proposals under discussion
  - Change the international pricing regime (Mabro, Luciani)
  - Spare capacity
    - It is now there, but issues of when, who, and how it would be used?
  - Regulation of derivatives (US)
    - Is it the magic bullet?
    - Very unlikely
  - Price band (UK government)
    - Heavy handed approach
  - A global oil agency (ENI)
  - Focal point (OIES)
    - Stronger when exporters and importers send a common signal as to preferable range of oil price