

WORLD ENERGY RESOURCES MARKETS OVERVIEW AND DEVELOPMENT TRENDS

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Subject 1. General description of mineral and fuel resources

- **Natural resources** - resources supplied by nature, not by men
- **Mineral resources** - natural resources in the form of minerals
- **Energy resources** – all main fuels: oil, natural gas, coal etc. + uranium resources
- **Fuel energy resources** – include only fossil fuels

Features of fuel resources markets

- Fuel resources are non-renewable
- Resources are limited
- Uneven placement of fuel resources and mining industries
- High degree of concentration and monopolization of production and marketing

- International associations of producers and consumers play a large part in the market
- Rental principle in pricing and considerable role of direct fuel price regulations
- Political and economic problems in fuel production, consumption and international trade

Total resources

- **Discovered** or **undiscovered**
- **Commercial** (recoverable) or **non-commercial** (unrecoverable)
- **Initial** or **remaining**

Discovered or undiscovered categories of resources

- **proved** or estimated - estimated with degree of accuracy up to $\pm 20\%$ judging by results of analysis of samples in wells (in Russia – category A)
- **probable** or contingent resources - quantities of petroleum which are estimated, on a given date, to be potentially recoverable from known accumulations, but which are not currently considered to be commercially recoverable (in Russia category B)
- **prospective** - resources which are estimated, on a given date, to be potentially recoverable from undiscovered accumulations (in Russia categories C1 and C2)

Commercial (recoverable) and non-commercial (unrecoverable)

Commercial – only part of potential resources, which may be recoverable at existing price levels and technology

Initial or remaining

Remaining (current) reserves =
initial reserves – cumulative production

Fuel reserves – proved, recoverable and remaining part of resources from known accumulations

Oil security

(or reserves-to-production ratio)

$$\text{Oil security (years)} = \frac{\text{V commercial reserves}}{\text{average annual production level}}$$

Reserves-to-production (R/P) ratio – the length of time that remaining reserves would last if production were to continue at that level

Factors affecting oil security

- Volume of production or extraction
- Fuel price level
- Developments of geological exploration
- Technological developments

The role of new technologies in fuel markets

Positively (increases supply)

- Advanced technology permit to develop previously noncommercial wells
- Geological exploration works and extraction in previously inaccessible places
- New consuming industries

Negatively (relatively decreases consumption)

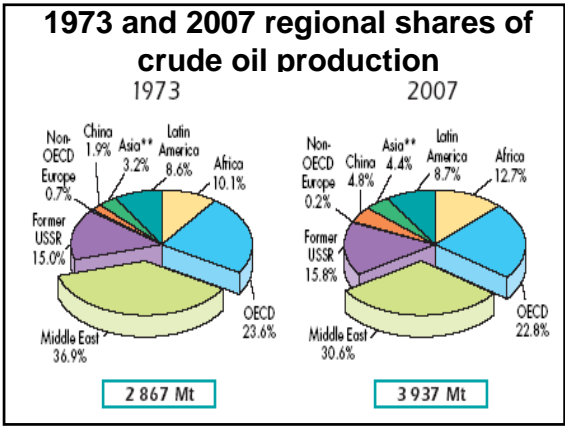
- Non-waste technology of oil processing (continuous factor)
- Energy-saving technologies
- Production of substitute goods
- Alternative energy and recycled raw materials usage

**Subject 2.
Development trends of
main types of fuel
resources**

**World proved oil reserves at end
2007**

BP, 2008

	Thousand million tons	Share of total
World	168.6	100
Saudi Arabia	36.3	21.3
Iran	19.0	11.2
Iraq	15.5	9.3
Kuwait	14.0	8.2
United Arab Emirates	13.0	7.9
Venezuela	12.5	7.0
Russia	10.9	6.4
Libia	5.4	3.3
Kazakhstan	5.3	3.2
Nigeria	4.9	2.9



Producers of crude oil, 2007

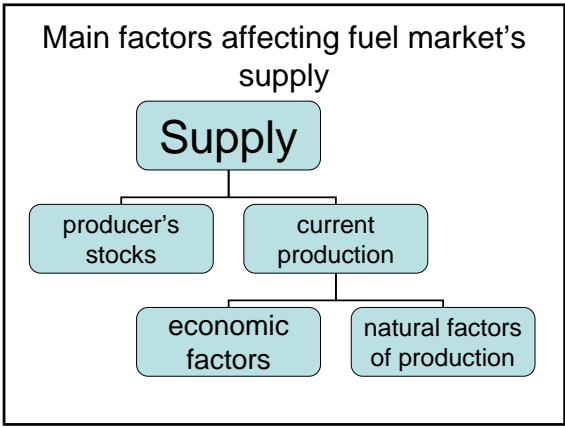
Producers	Mt	%
World	3 937	100.0
Russia	487	12.4
Saudi Arabia	483	12.3
United States	310	7.9
Islamic Rep. of Iran	218	5.5
People's Rep. of China	188	4.8
Mexico	173	4.4
Canada	157	4.0
Venezuela	138	3.5
Kuwait	136	3.5
United Arab Emirates	131	3.3

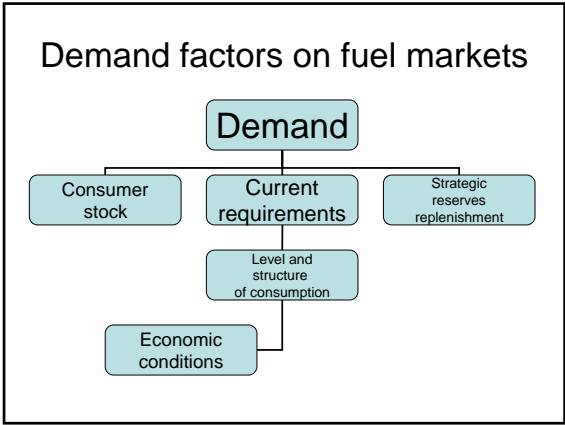
Total primary energy supply

Supply (commodity's mass ready for selling) =
current production + seller's stocks

TPES (total primary energy supply) = indigenous
production + imports - exports - international
marine bunkers ± stock changes

Source: IEA





the environment

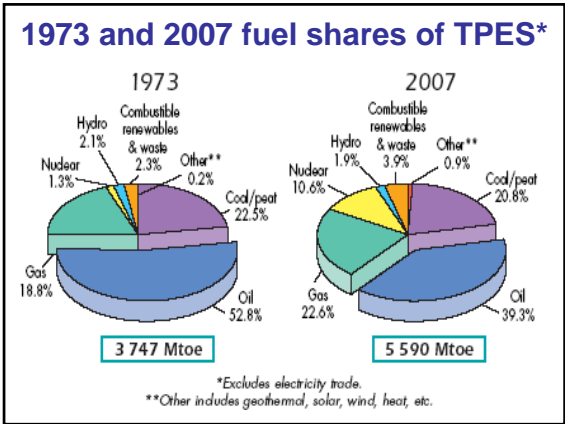
- Growth in world population and economic prosperity leading to sustained energy demand.
- Energy consumers showing resilience to oil prices, even in developing countries.
- Increasing concerns about security of supply driving market behaviour.
- States and NOCs playing an important role in access to resources.
- Increased consciousness and scientific evidence on climate change – matter of time before industry and policy makers respond.
- Unconventional energy gaining importance on the basis of security of supply agenda.
- Industry reputation adversely impacted by high prices and profits and concerns about reinvestment levels.

Economic factors

- Technology progress in prospecting and extraction
- Phase of business cycle
- State regulation (direct or indirect)
- Inflation processes
- Monopoly regulation (production, price and marketing policy)
- Transportation conditions

global demand issues bp 

- Global demand for major projects in E&P in 2006 by the top 20 players to be approx \$140bn
- Global demand is likely to remain strong for the next 5 – 10 years
- New developments are pushing the technical boundaries
- Every operator is looking at ways to try and secure the suppliers' "A teams"
- NOC's are exerting more influence in the marketplace and growing their share of service companies business



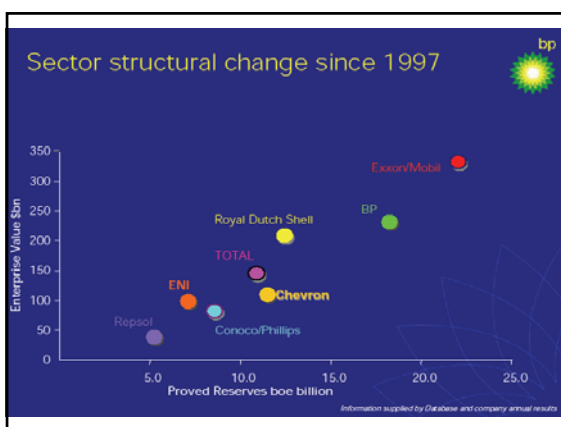
Main factors affecting oil supply

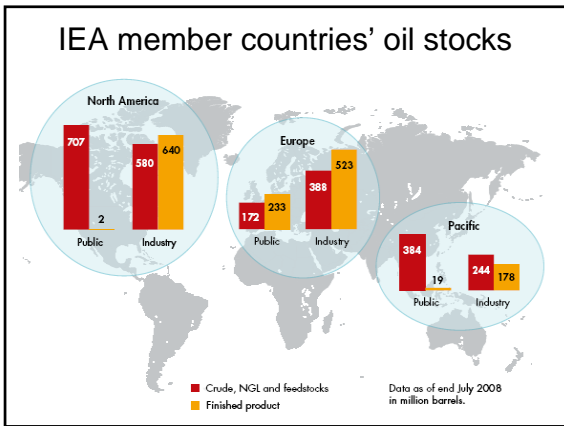
- Supply volumes of OPEC countries
- Oil policy of other big exporting oil countries (Mexico, Russia, Norway, etc)
- Strategic petroleum reserves in USA

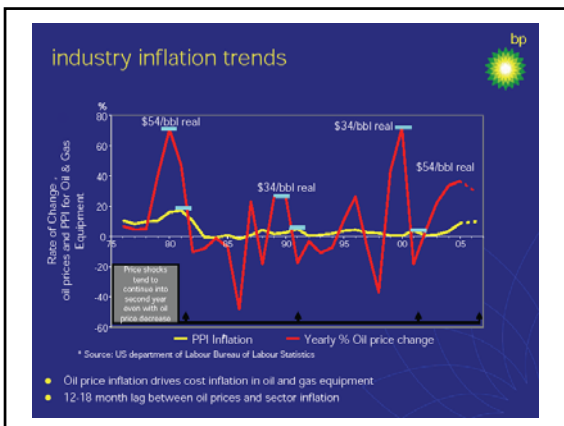
The world's largest companies

Market Cap (\$bn)		Company
371	1	Exxon Mobil
362	2	General Electric
281	3	Microsoft
238	4	Citigroup
233	5	BP
211	6	Bank of America
211	7	Royal Dutch/Shell
196	8	Wal-Mart Stores
196	9	Toyota
196	10	Gasprom
196	11	HSBC
190	12	Procter & Gamble
189	13	Pfizer
183	14	Johnson & Johnson
175	15	Saudi Basic Industries

Source: Financial Times, 31 March 2006





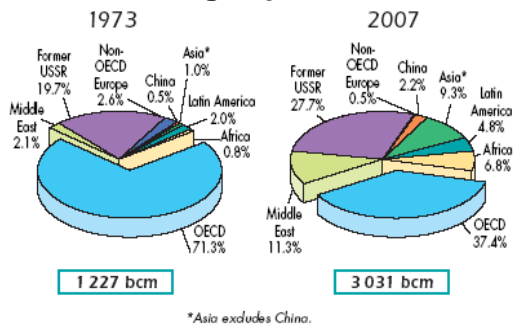




Gas market features

- High cost and long time of realization of export projects
- Natural gas is difficult to transport over long distances
- Export demands huge investments in construction or modernization gas-mains (gas-pipes), distribution networks etc.
- Now risks for pipeline investments crossing multiple frontiers are growing

1973 and 2007 regional shares of natural gas production



Producers of natural gas, 2007

Producers	mcm	% of world total
World	3 031 401	100.0
Russia	650 993	21.5
United States	546 140	18.0
Canada	183 395	6.0
Islamic Rep. of Iran	106 693	3.5
Norway	90 839	3.0
Algeria	89 970	3.0
Netherlands	76 334	2.5
United Kingdom	76 004	2.5
Indonesia	69 691	2.3
People's Rep. of China	67 746	2.2

Economic conditions

- Technology progress in consuming industries
- Phase of business cycle
- State regulation (taxes, subsidies, foreign trade policy)
- Company's financial solvency (capital market, profit level, inflation, depreciation policy)

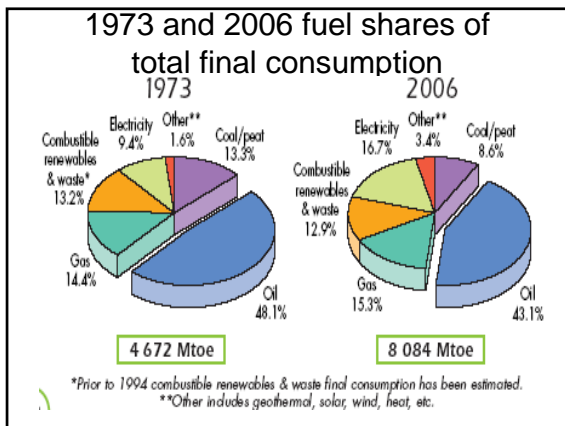
Main factors affecting oil demand

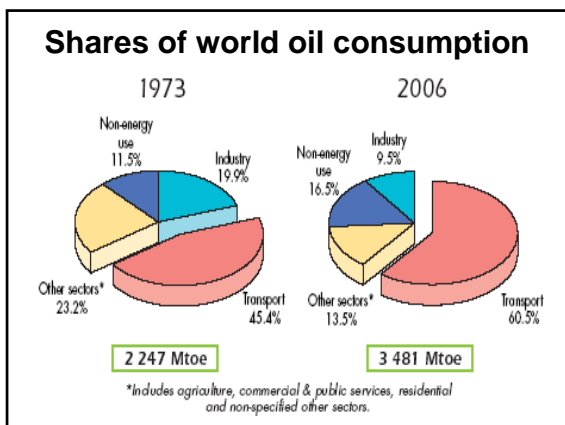
- Dynamics of world economy
- Rise in demand in new consuming centers (especially China)
- Commercial reserves in OECD countries
- Climate in oil consuming countries
- Natural gas consumption and prices

Consumption

Primary consumption – in the form of primary refining, enrichment and processing to give fuel consumer properties

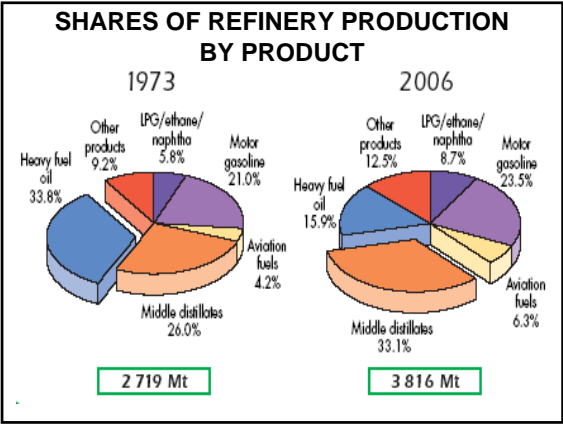
Final consumption of the most fuels – in the processed form: petroleum and petroleum chemical products





The leading producers of petroleum products, 2006

Producers	Mt	% of world total
World	3 816	100.0
United States	840	22.0
People's Rep. of China	298	7.8
Russia	217	5.7
Japan	196	5.1
India	146	3.8
Korea	122	3.2
Germany	121	3.2
Canada	101	2.6
Italy	99	2.6
Saudi Arabia	99	2.6



**Subject 3.
Trends in world fuel trade**

- Trends in international trade in fuels**
- Overall decrease of fuels' share in international trade
 - Fossil fuels take the leading place in raw materials trade
 - Diversification of trade structure
 - High rate of consuming countries' reliance on imports of fossil fuels
 - High export supplies' concentration ratio in rather small range of developing countries
 - Trade depends on TNC investment activities

Exporters and importers of crude oil, 2006

Exporters	Mt	Importers	Mt
World	2 203	World	2 285
Saudi Arabia	358	United States	587
Russia	248	Japan	203
Islamic Rep. of Iran	130	People's Rep. of China	145
Nigeria	119	Korea	120
Norway	109	India	111
UAE	106	Germany	110
Mexico	99	Italy	94
Canada	93	France	82
Venezuela	89	Spain	61
Kuwait	88	United Kingdom	59

Main oil trade patterns

- regular contracts – up to 1 year
- single deals
- barter agreements
- agreements for oil-processing in importing countries with following realization of oil products
- stock-exchange deals

Exporters and importers of petroleum products

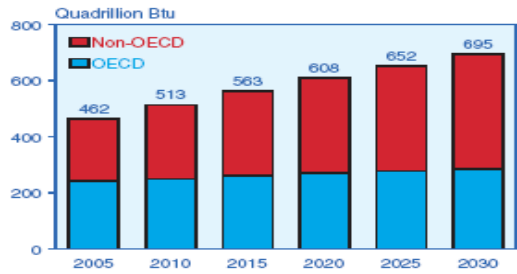
Exporters, 2006	Mt	Importers, 2006	Mt
World	998	World	925
Russia	88	United States	110
Netherlands	83	Netherlands	72
United States	65	Singapore	57
Singapore	62	Japan	47
Saudi Arabia	58	China	44
Korea	38	France	38
Venezuela	35	Germany	37
Kuwait	34	Spain	28
India	32	United Kingdom	27
United Kingdom	29	Korea	21

Exporters and importers of natural gas, 2007			
Exporters	Mcm	Importers	Mcm
World	900 188	World	899 083
Russia	191 892	United States	130 300
Canada	106 988	Japan	95 627
Norway	85 136	Germany	88 355
Algeria	62 676	Italy	73 950
Netherlands	55 666	Ukraine	50 087
Turkmenistan	51 064	France	42 902
Qatar	38 329	Turkey	35 832
Indonesia	33 554	Spain	34 474
Malaysia	32 039	Korea	33 385
United States	22 905	United Kingdom	30 837

**Subject 4.
Forecast of fuel
market development**

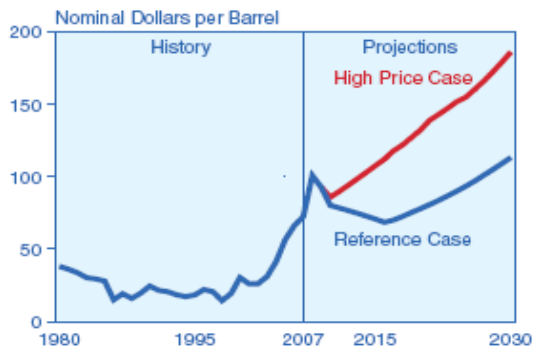
- Main future trends**
- Energy use grows more slowly to 2030 than projected before
 - Dominance of fossil fuels – oil, gas and coal
 - A rising share of emerging economies in global energy consumption
 - An increase in the consuming countries' reliance on imports of oil and gas
 - An inexorable rise in global carbon gas emissions

World Market Energy Consumption, 2005-2030



Sources: 2005: Energy Information Administration (EIA), *International Energy Annual 2005* (June-October 2007), web site www.eia.doe.gov/iea. Projections: EIA, *World Energy Projections Plus* (2008).

World Oil Prices, 1980-2030



Thank you for your attention
