



La politica europea dell'energia: L'impatto dei nuovi scenari per le fonti energetiche

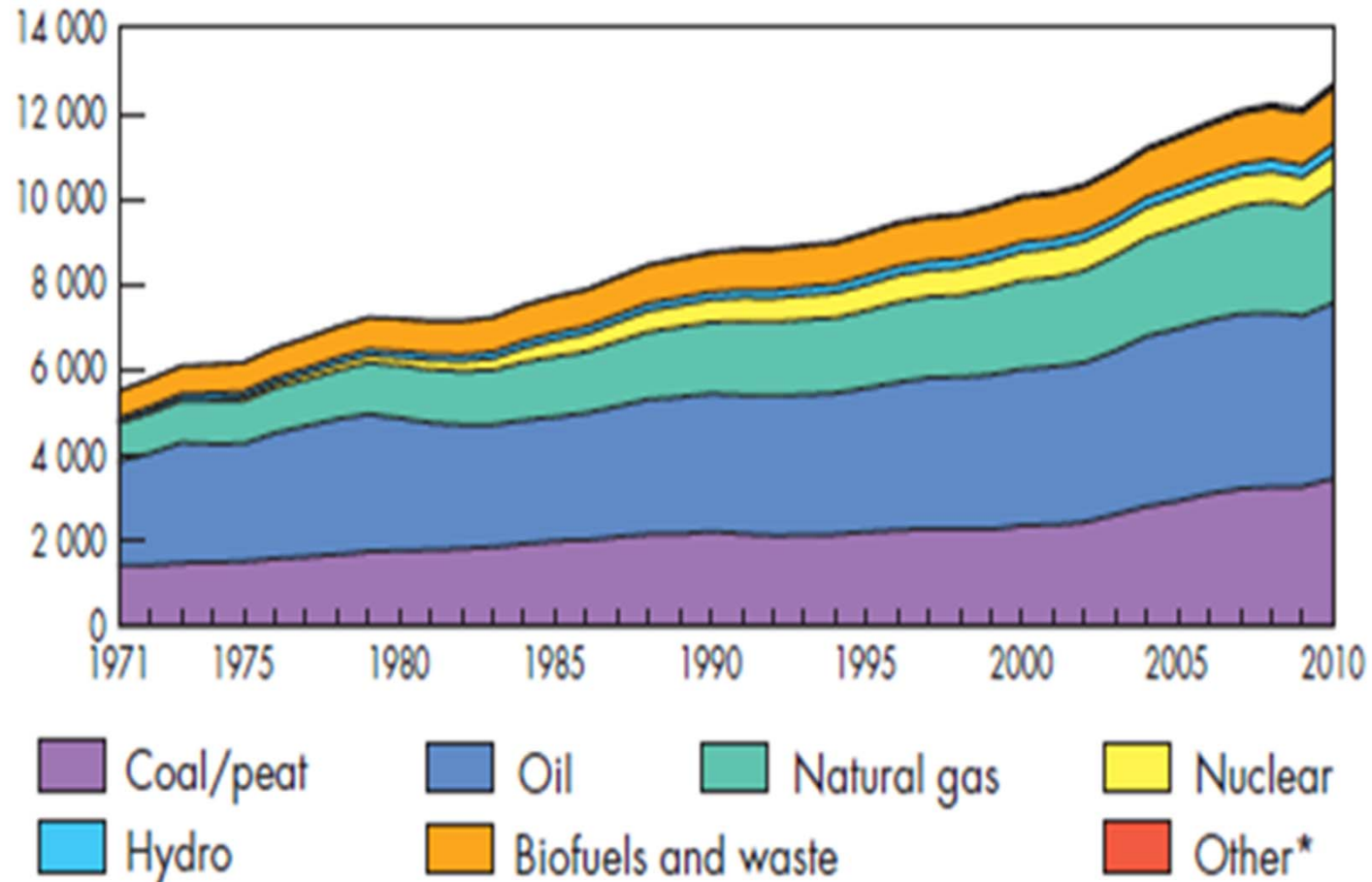
Valeria Termini

Università di Roma Tre e Autorità per l'Energia Elettrica e il Gas
Membro del Board di Acer e del Consiglio dei Regolatori europei dell'energia (Ceer)

Assonime – Roma, 23 luglio 2013



Moving away from the "Hydrocarbon society"?



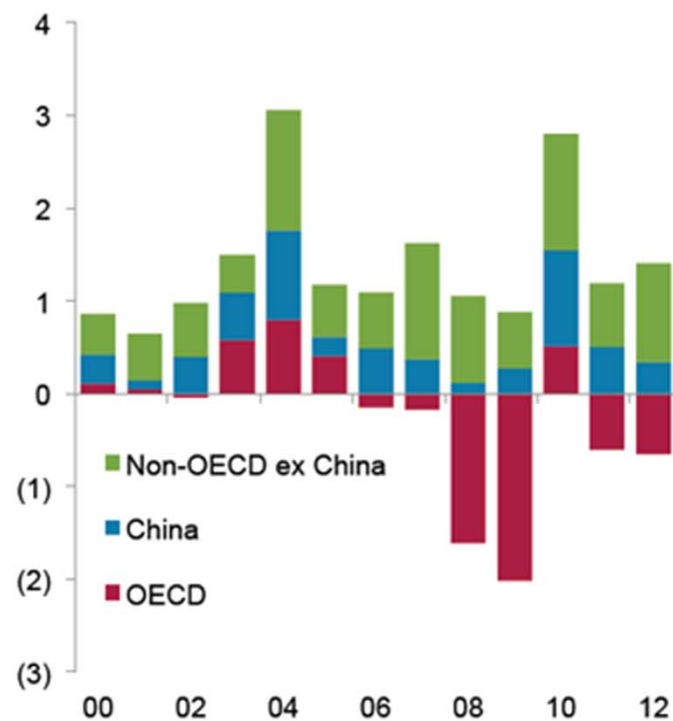
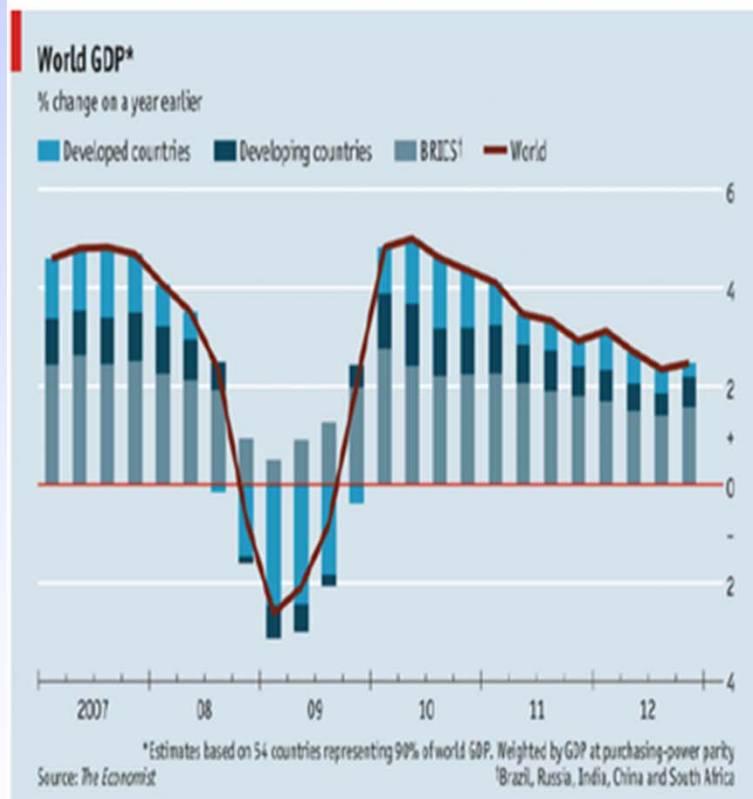
Fonte: Key World Energy, IEA, 2012

(World total primary energy supply 1971-2010, Mtoe)



World GDP – Global oil demand

Year-on-Year Changes in Global Oil Demand

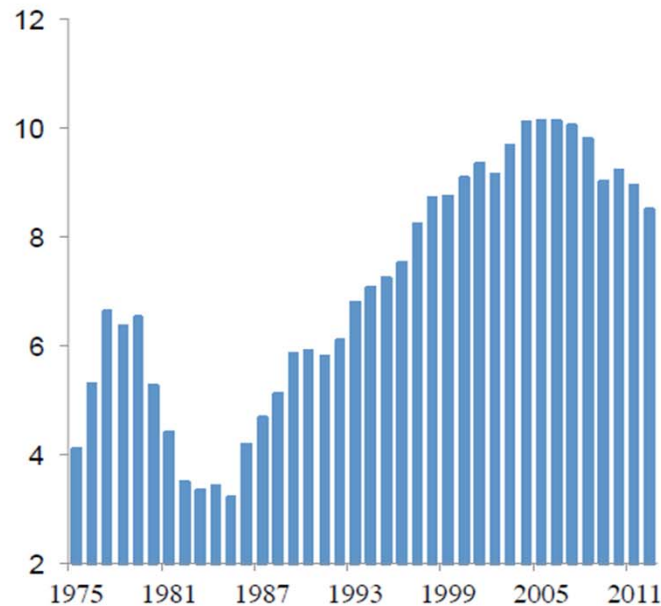


Fonte: Energy Aspects



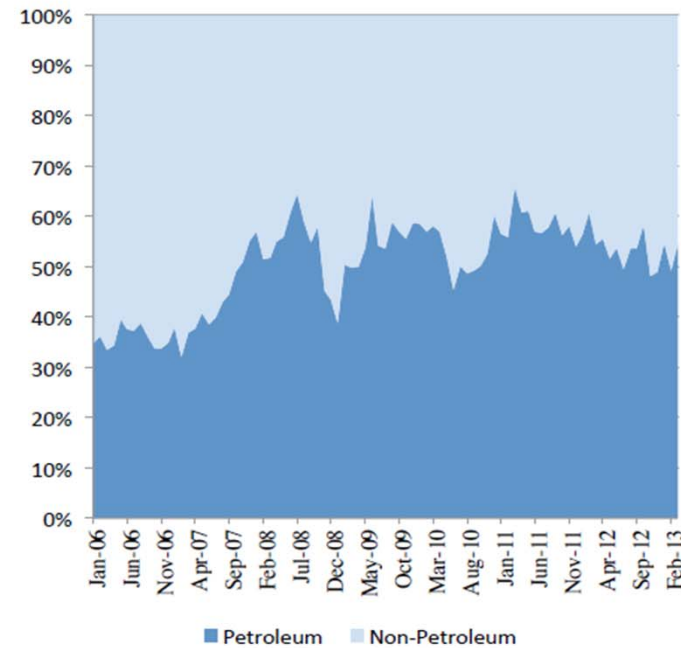
USA - reduction in oil imports

Crude Oil Imports, mb/d



Source: Energy Aspects

Petroleum as a % of Trade Deficit

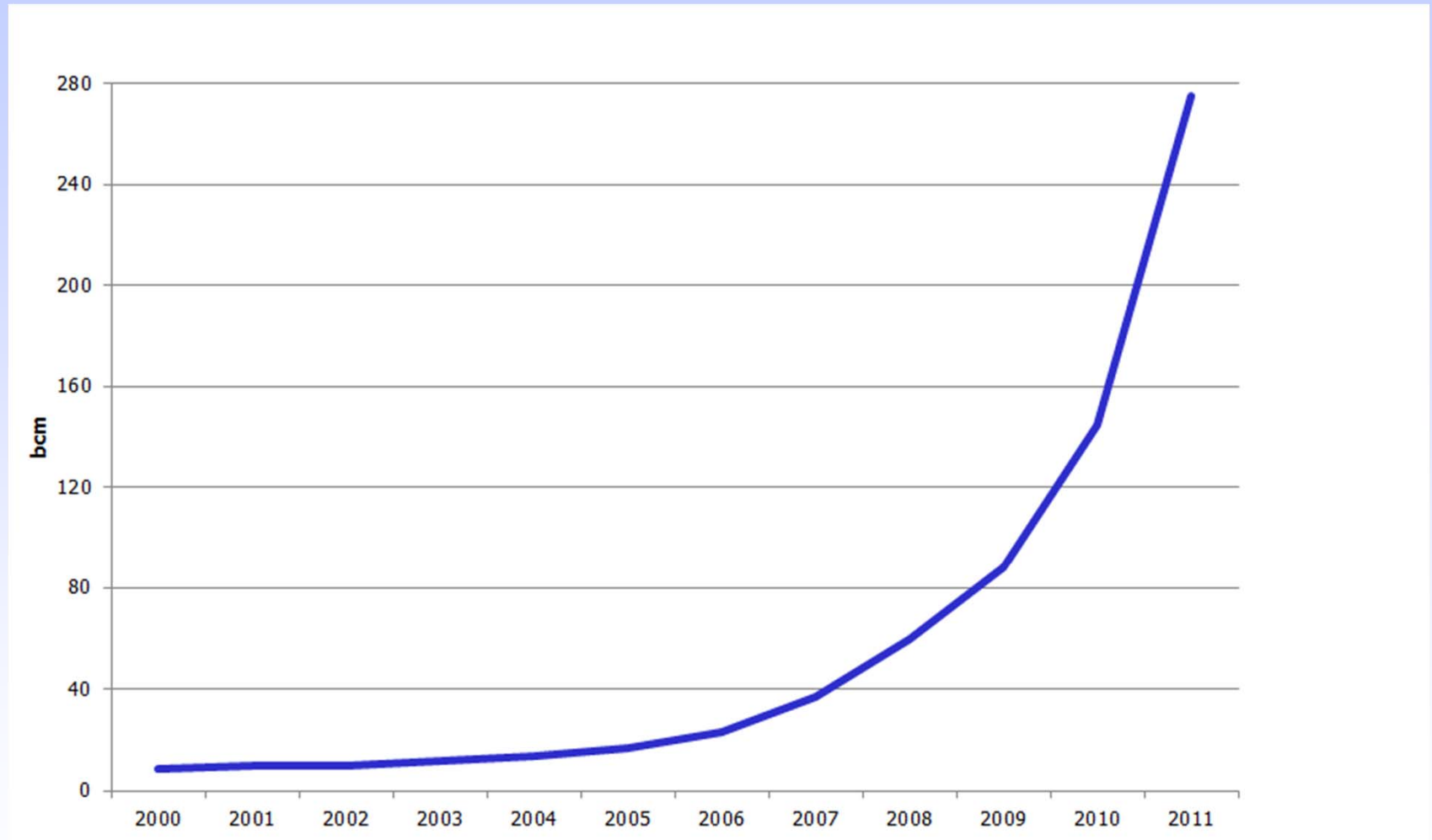


Source: US Bureau of Economic Analysis

- US crude imports fell from 10.1 to less than 8.5 mb/d between 2005 and 2012
- Petroleum share of trade balance fell marginally but still high



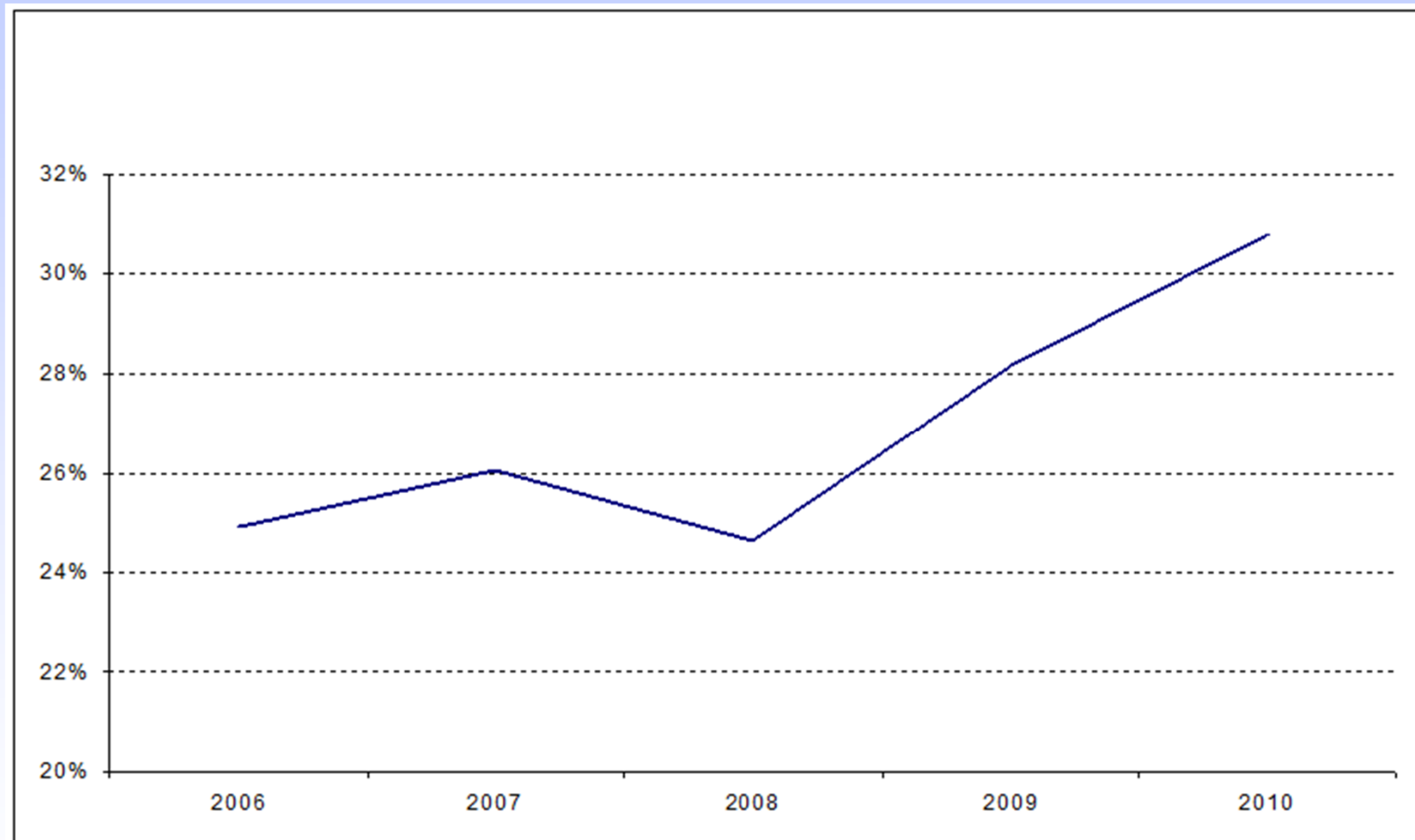
Shale gas world production



Fonte: IEA and AEEG elaborations (2012)



LNG...increasing share of world gas exports



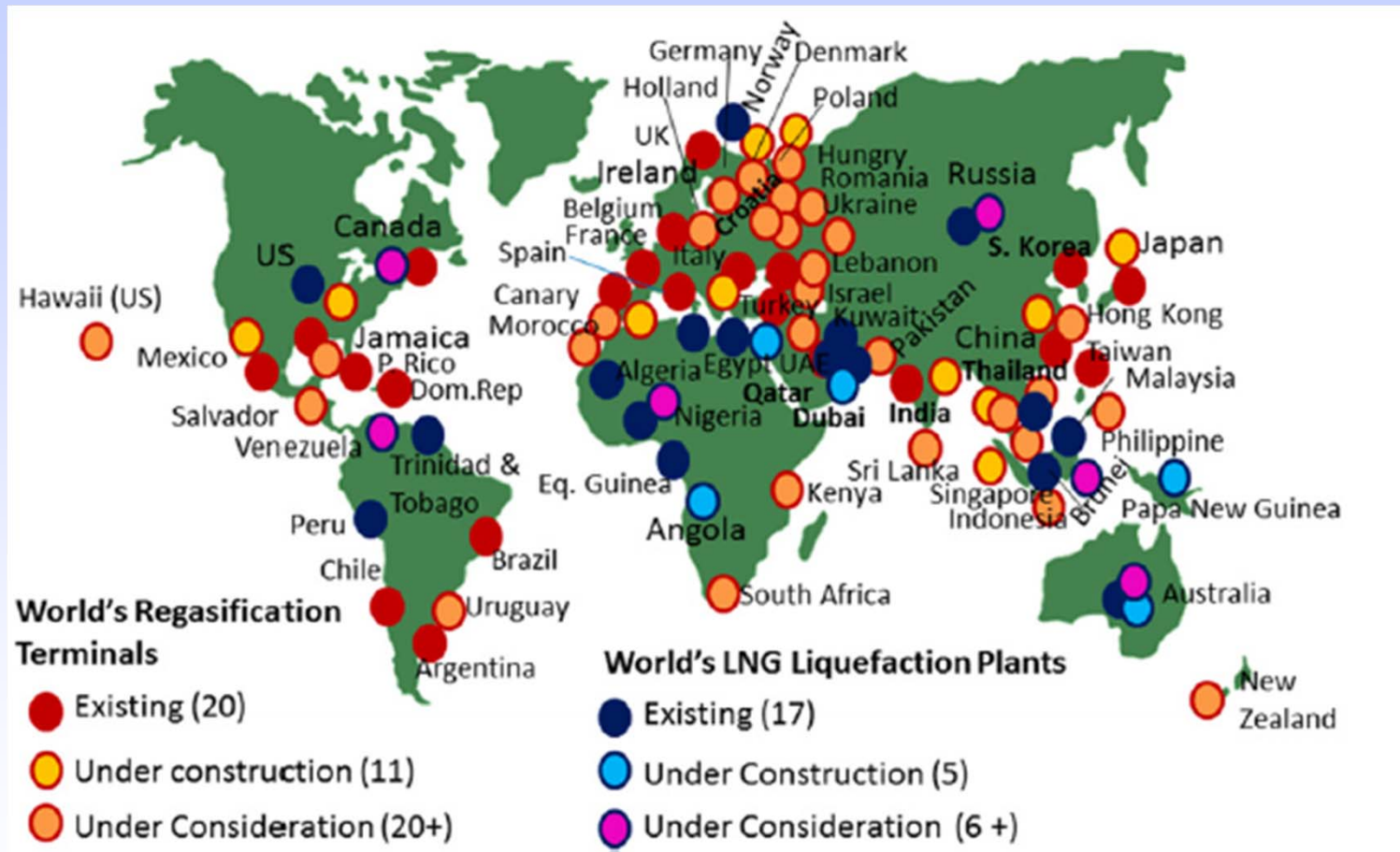
La quota di LNG sul totale export gas è aumentata del 24% tra il 2006 e il 2010.

In volume l' aumento delle esportazioni di LNG è stato del 37%

Fonte: IEA 2012



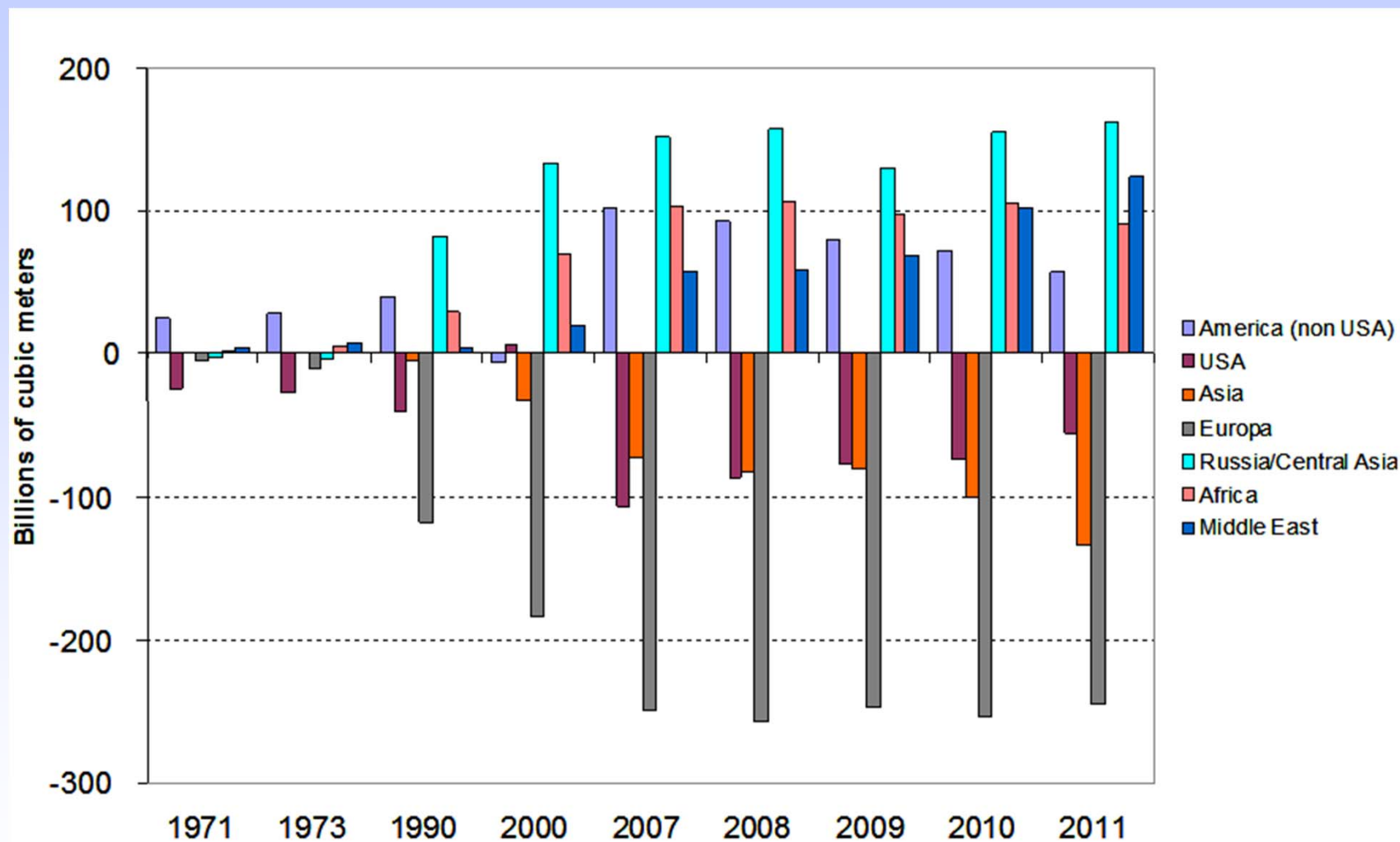
Investment in LNG exporting and importing countries



Source: BG group

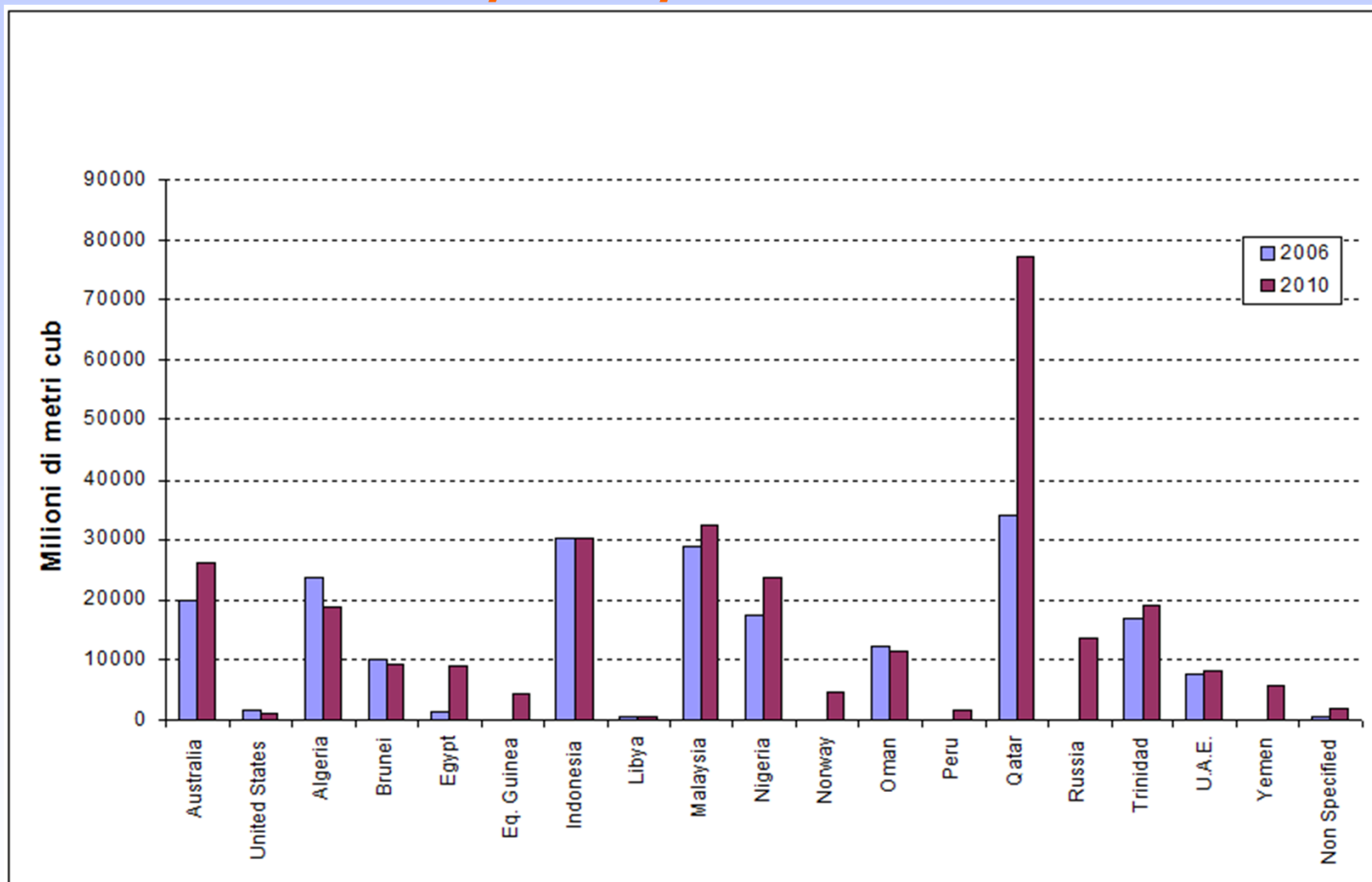


World natural gas net export flows increase



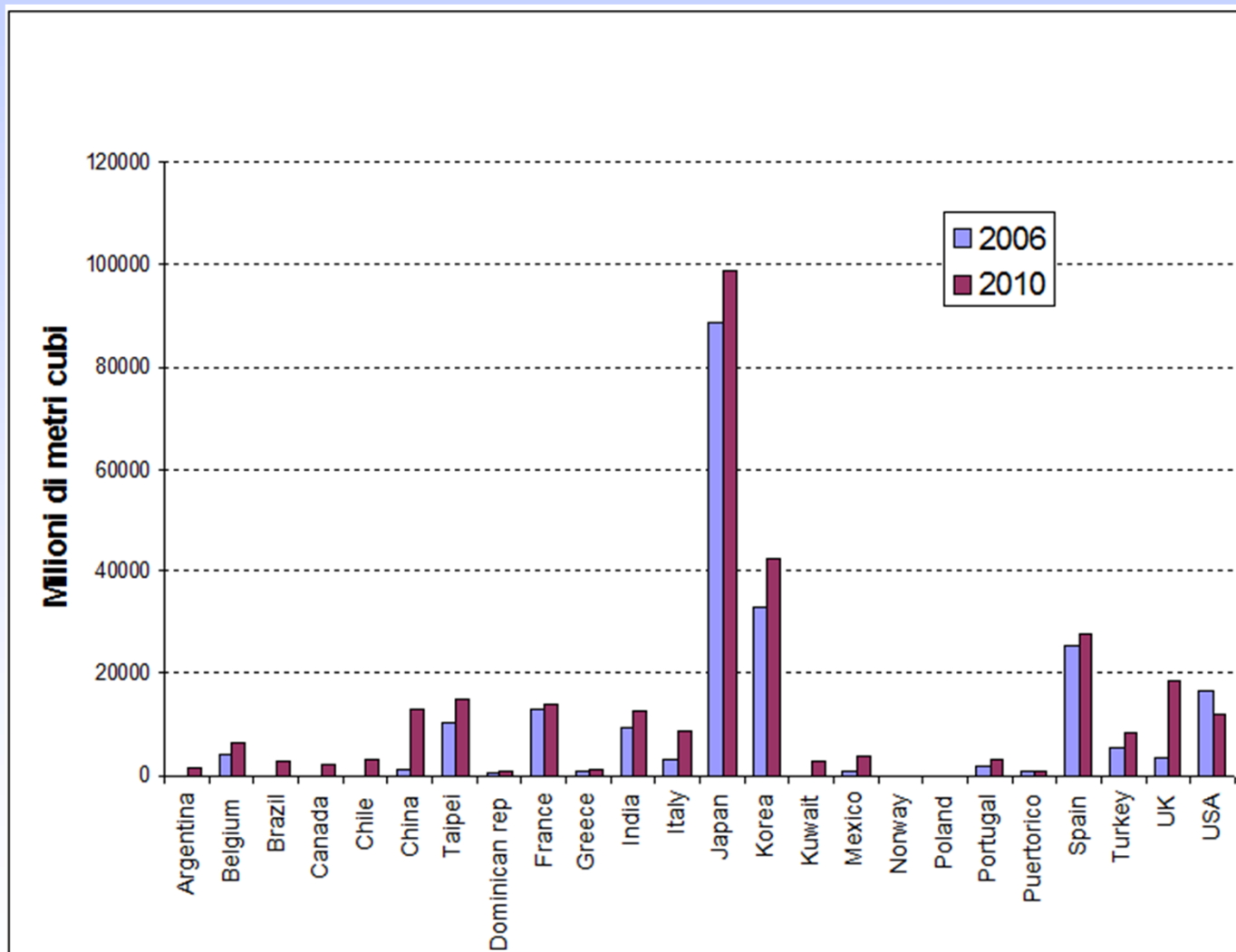
Fonte: IEA, Natural gas information 2012

LNG exports: producer countries



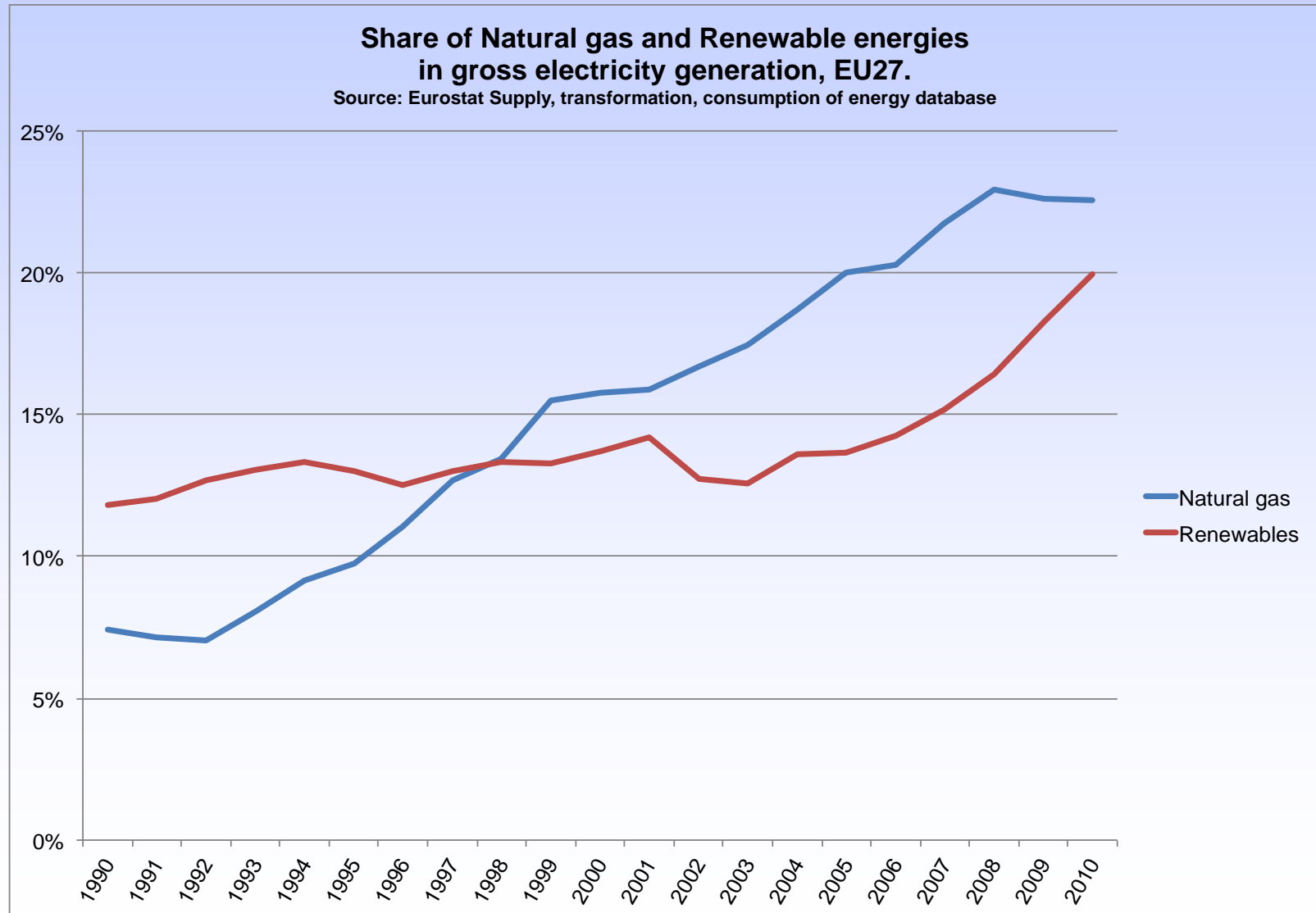
Fonte: IEA 2011

LNG importing countries

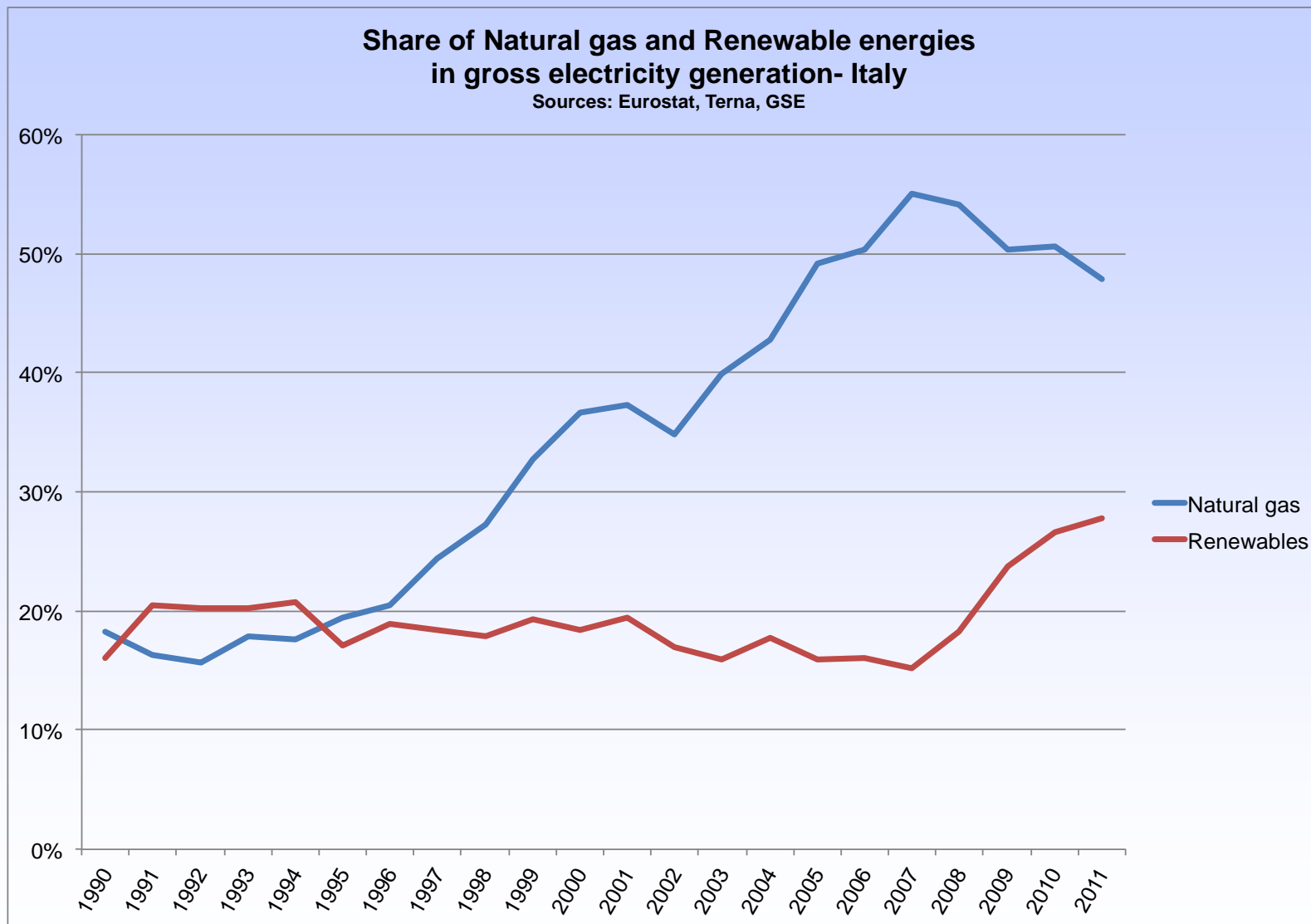


Fonte: IEA 2011

Gas and renewables increase in UE



Gas and renewables increase in Italy

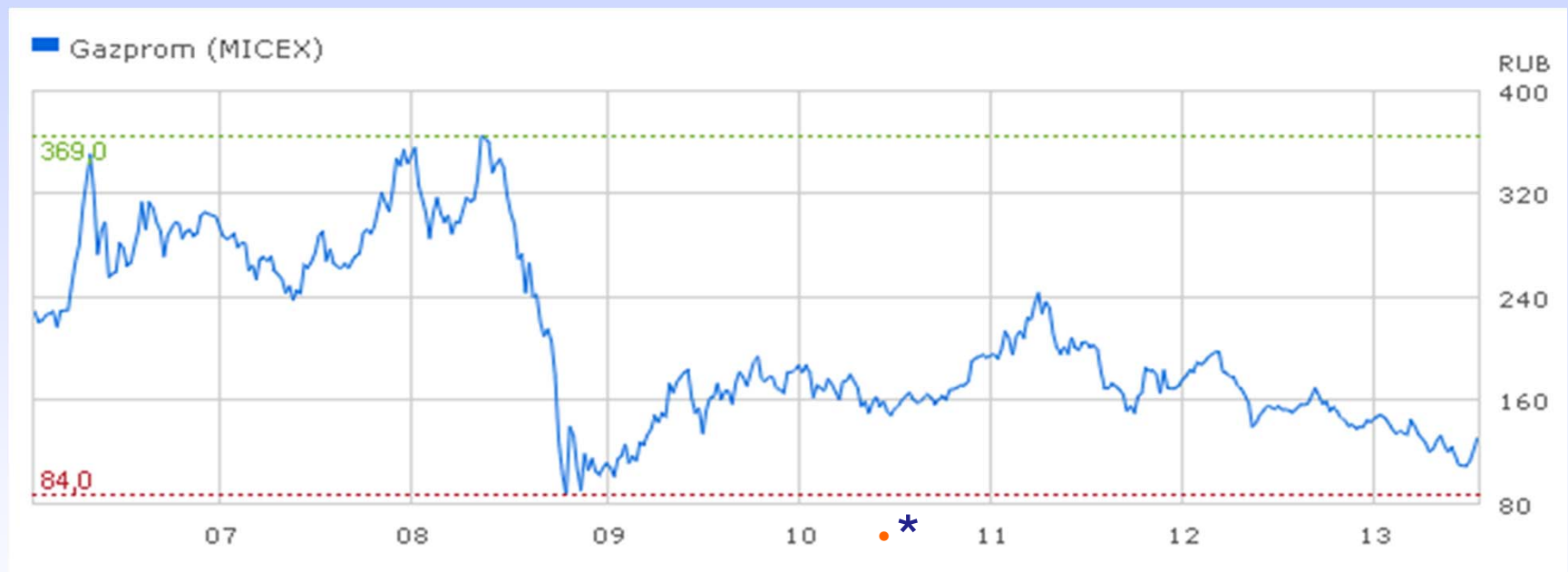


Gazprom: share prices (2010-2013)



Fonte: www.gazprom.com

Gazprom: share prices (2006-2013)

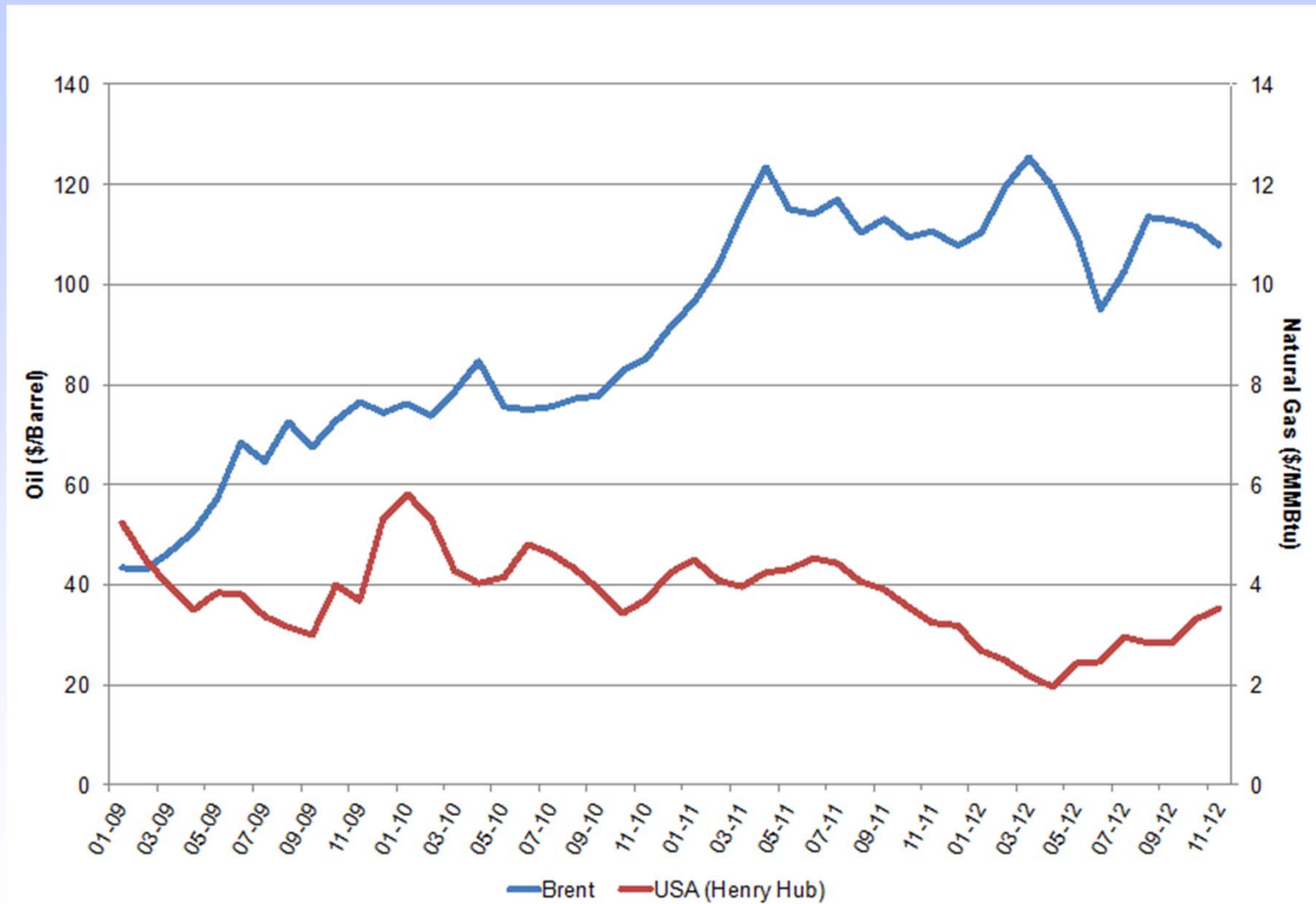


•* Next slide

Fonte: www.gazprom.com

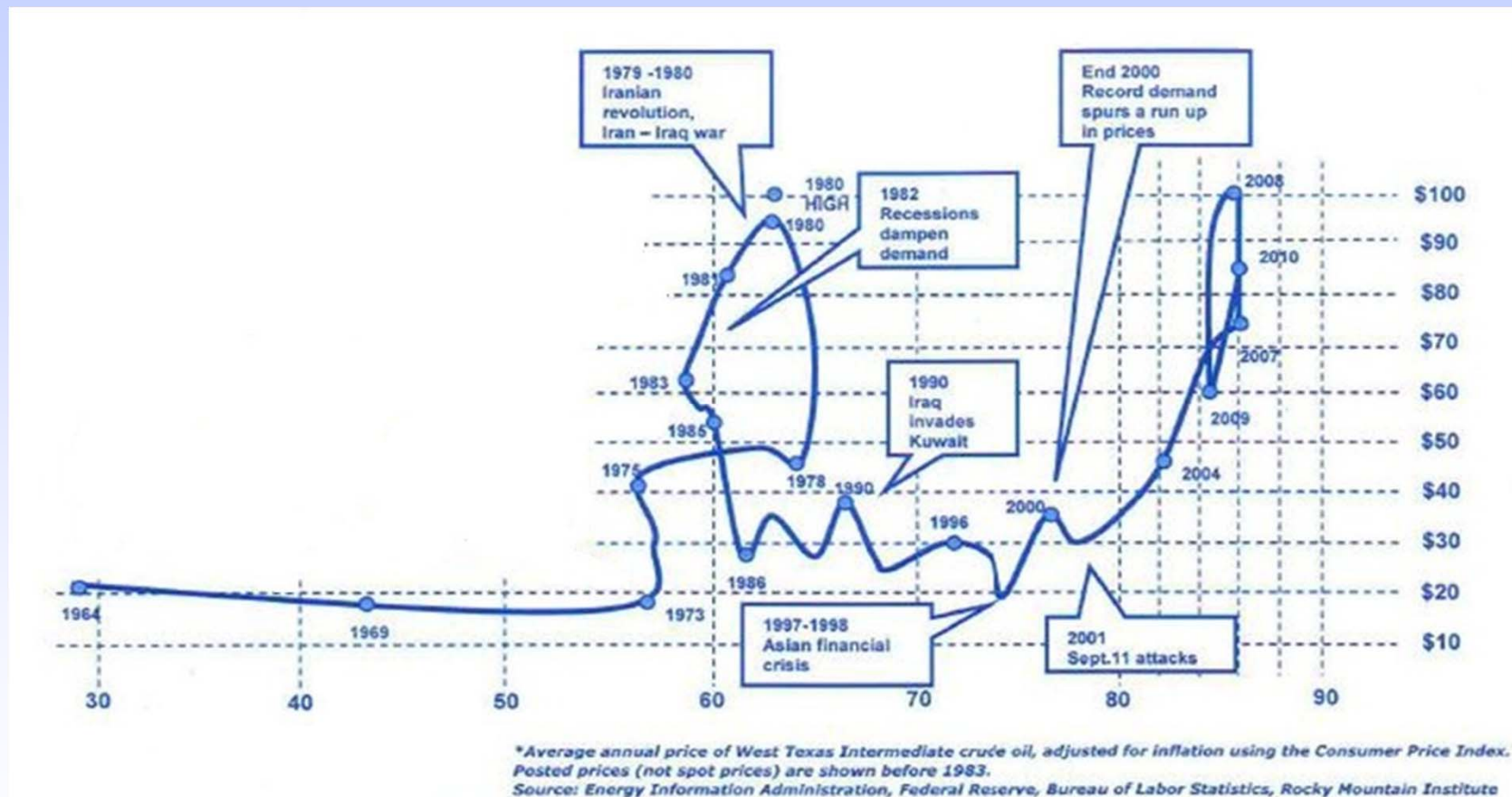


Oil and gas price decoupling (USA)



Fonte: Platts, EIA 2012

Geopolitics of oil : oil prices and oil demand (1964-2010)



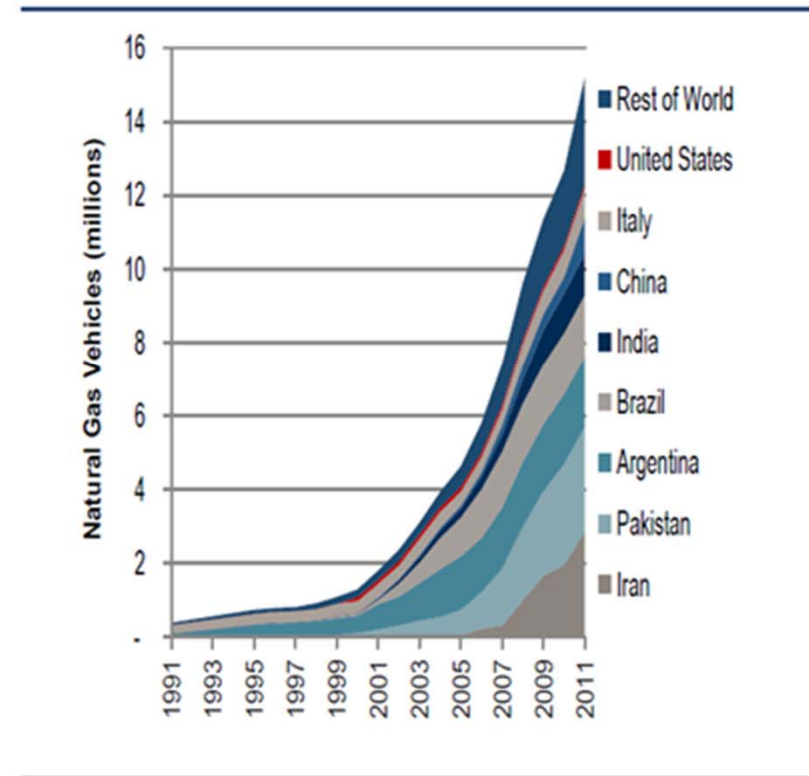
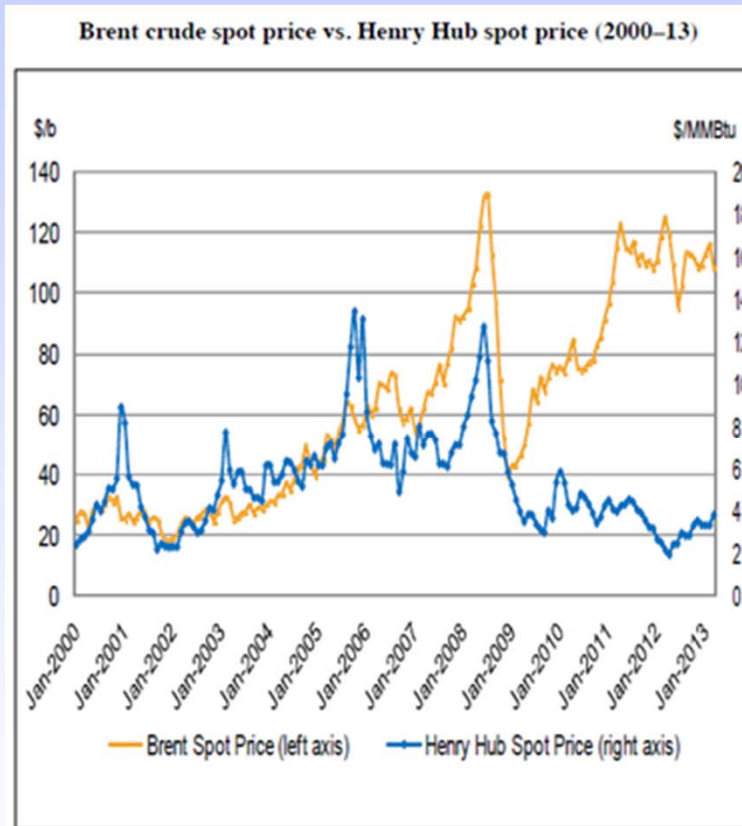
•Prezzo del petrolio

•Consumo mondiale di petrolio (Milioni di barili al giorno)

•Prezzi (\$/barile)



Relative prices matter ... in the long run



Brent oil spot price 2000-13 —

Henry hub gas price 2000-13 —

Fonte: Brown (2013)

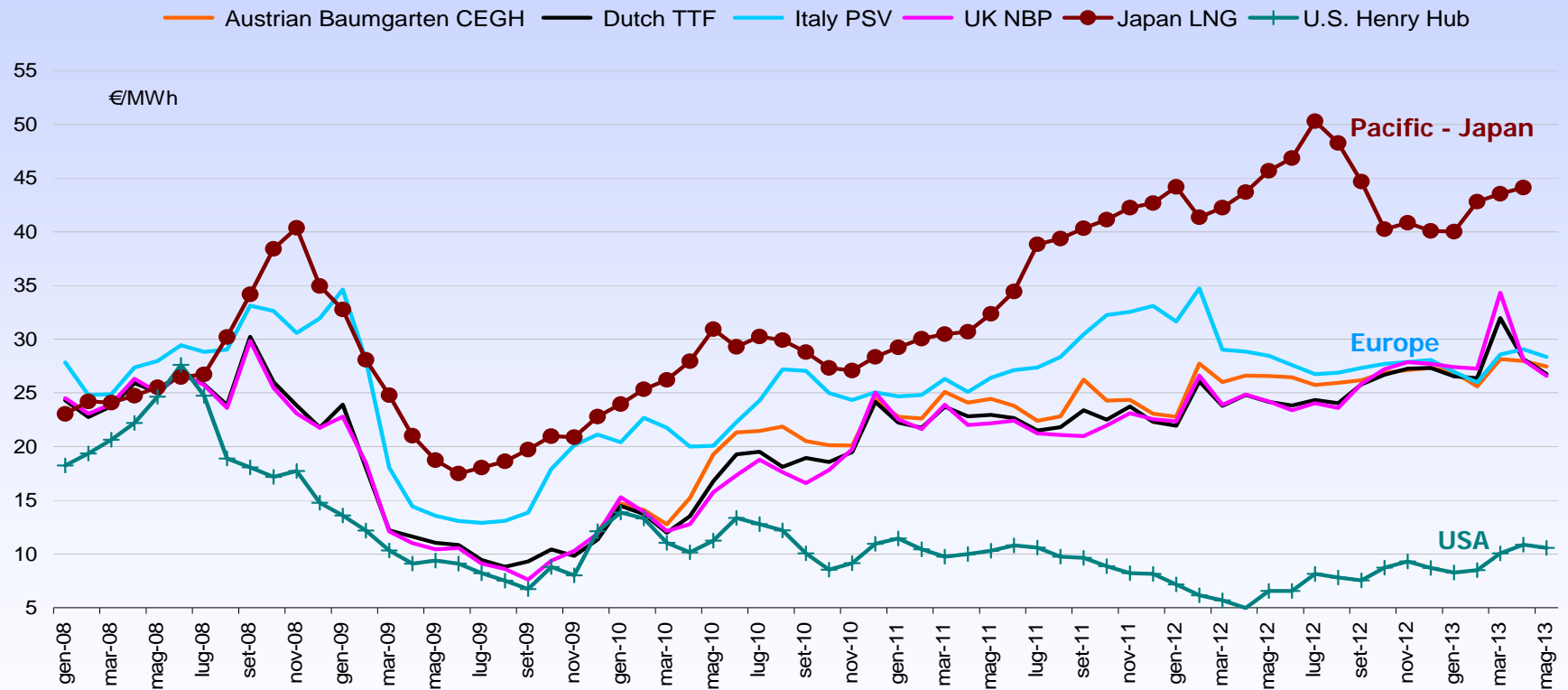
Natural gas vehicles (millions)

Fonte: NGV Global, Credit Suisse estimates



Towards a world gas market ?

3 regional prices (2008-2013)

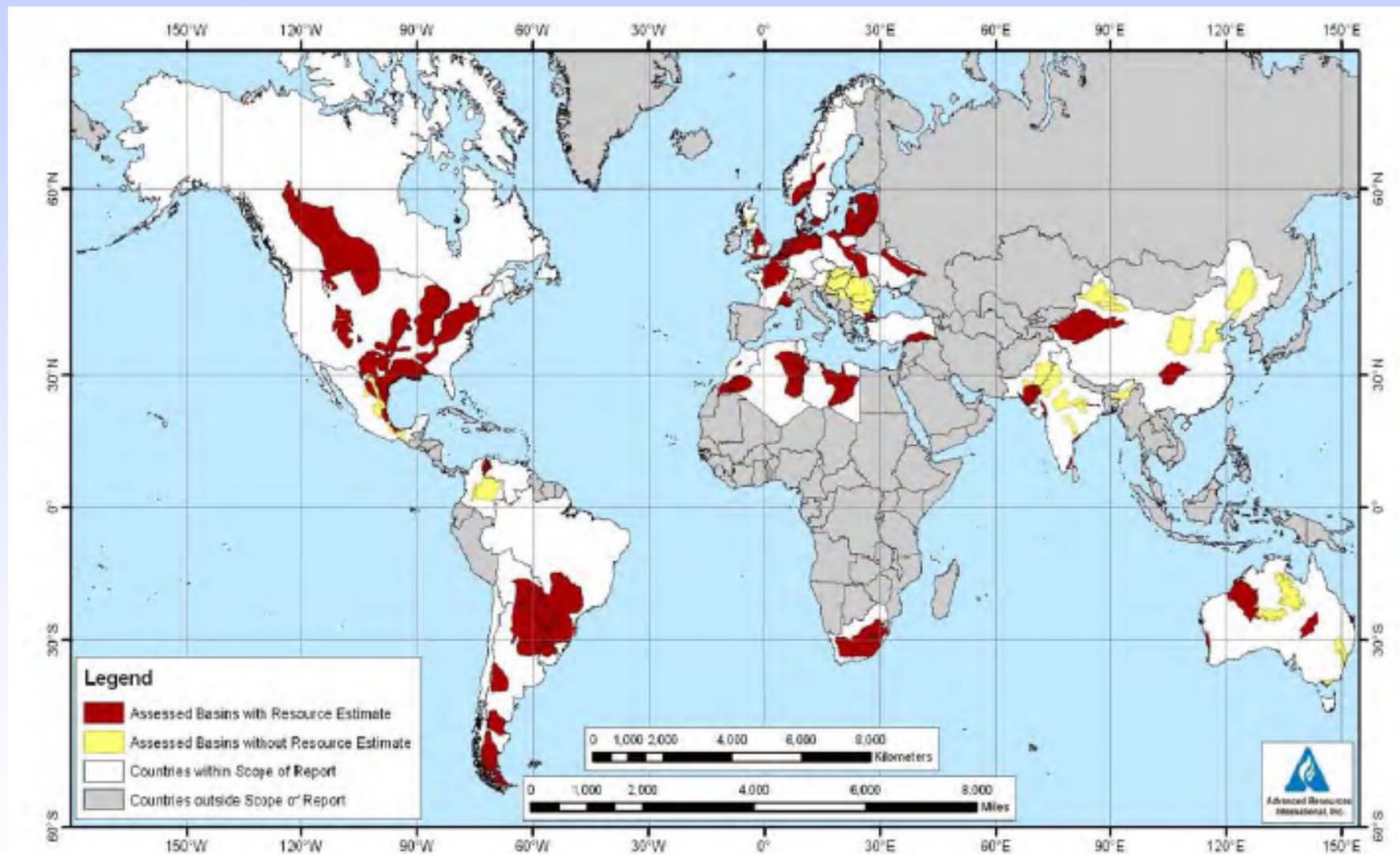


- ...gas hub prices converge



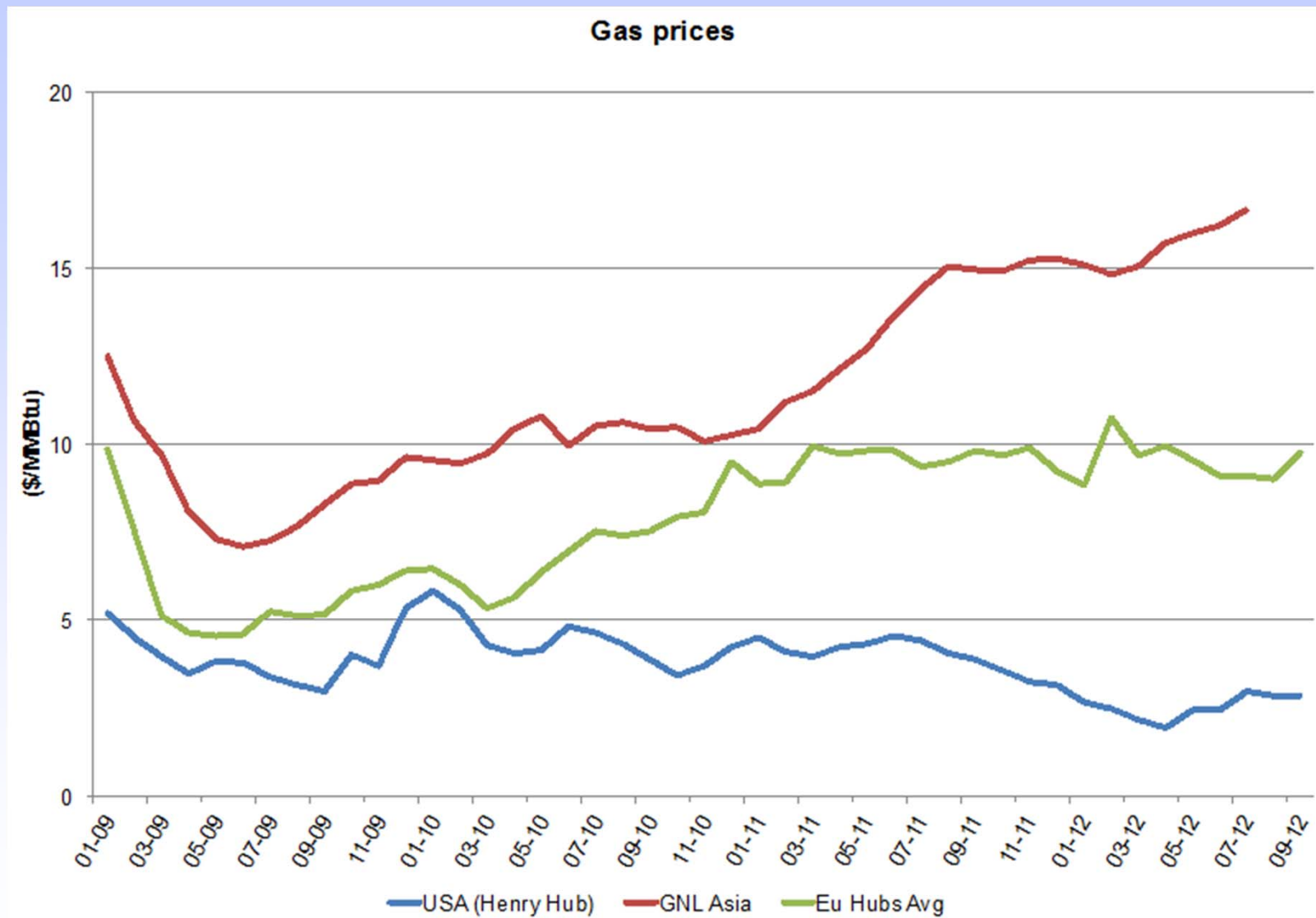
Fonte: Progetto di ricerca AF Mercados EMI Europe e REF-E su dati Platts, WGI

World shale gas



Stima di 48 bacini di shale gas in 32 Paesi – Fonte: EIA 2013

Gas regional prices: Asia, UE and USA



Fonte: Platts, EIA, World Gas Intelligence

LNG final transport costs from USA

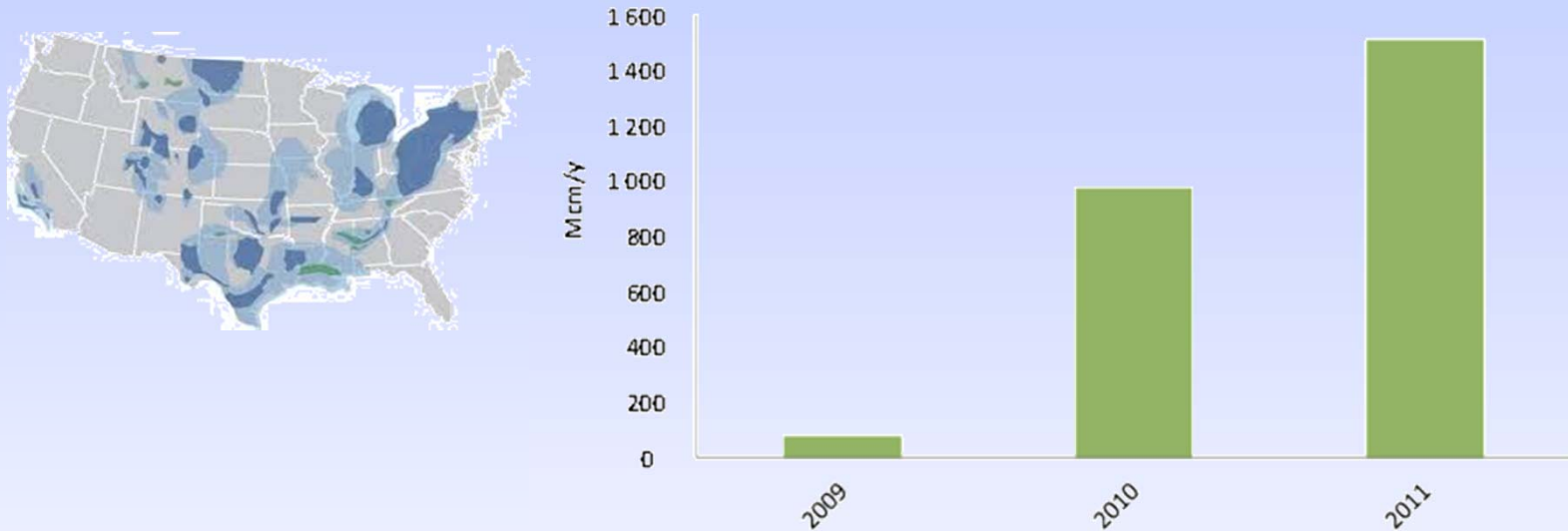
\$/MMBtu

	China/India	Europe	Korea/Japan
Regas to city gate pipeline cost	\$1.50	\$1.00	\$0.50
Regas cost	\$0.88	\$0.83	\$0.90
Shipping cost	\$2.87	\$1.33	\$2.60
Liquefaction cost	\$2.14	\$2.14	\$2.14
Wellhead to liquefaction pipeline cost	\$1.00	\$1.00	\$1.00
Total LNG transport cost	\$8.39	\$6.30	\$7.14

Fonte: Macroeconomic Impacts of LNG Exports from the United States, NERA 2013



LNG exports from USA 2009-11

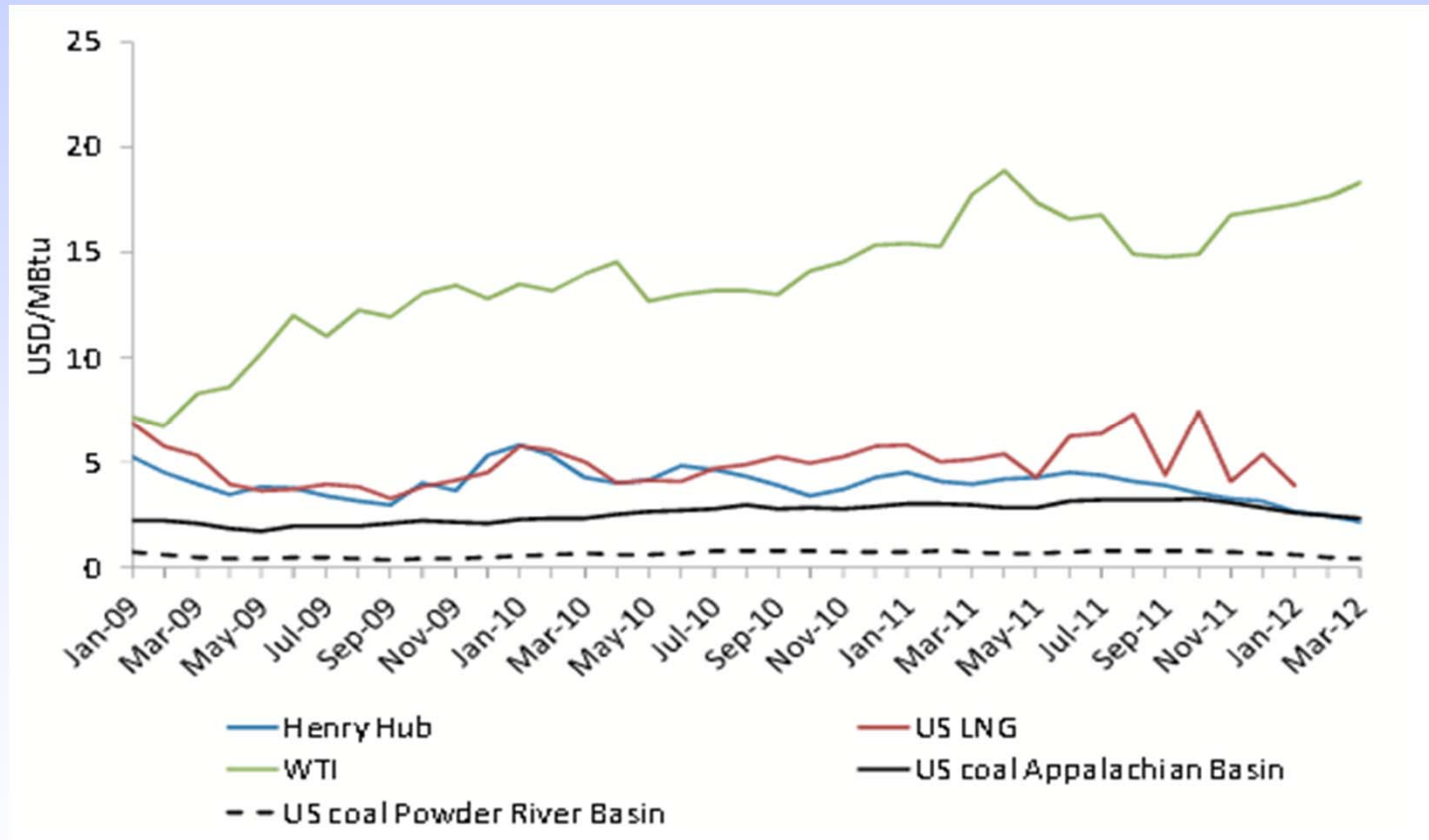


• **Applications received by the US DoE to export LNG, (May 2012)**

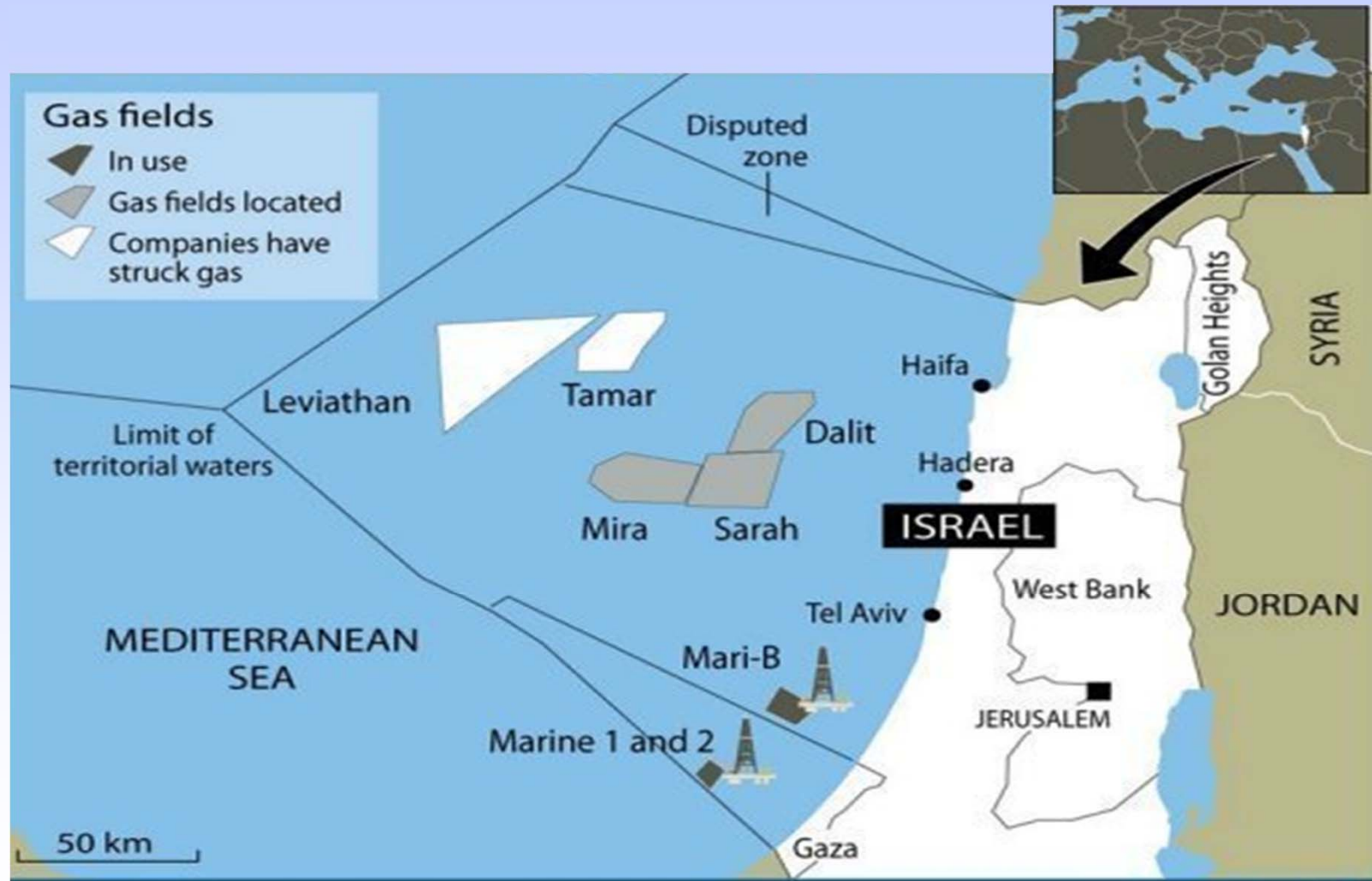
Project	Capacity (bcm)	FTA Applications	Non FTA Applications	Online date
Sabine Pass	22.7		Approved	2015
Freeport LNG	28.9	Approved	Under DOE Review	2015
Lake Charles	20.7	Approved	Under DOE Review	2018
Carib Energy	0.3 (FTA)/0.1 (Non-FTA)	Approved	Under DOE Review	Na
Cove Point LNG	10.3	Approved	Under DOE Review	2016
Jordan Cove Energy	12.4	Approved	Under DOE Review	2017
Cameron LNG	17.6	Approved	Under DOE Review	Na
Gulf Coast LNG	28.9		Under DOE Review	Na
Total	141.9			



USA gas price, oil and coal marker



New Mediterranean gas: «energy for peace»



Fonte: Limes

TAP project: Regulators cooperation to diversify EU gas sources

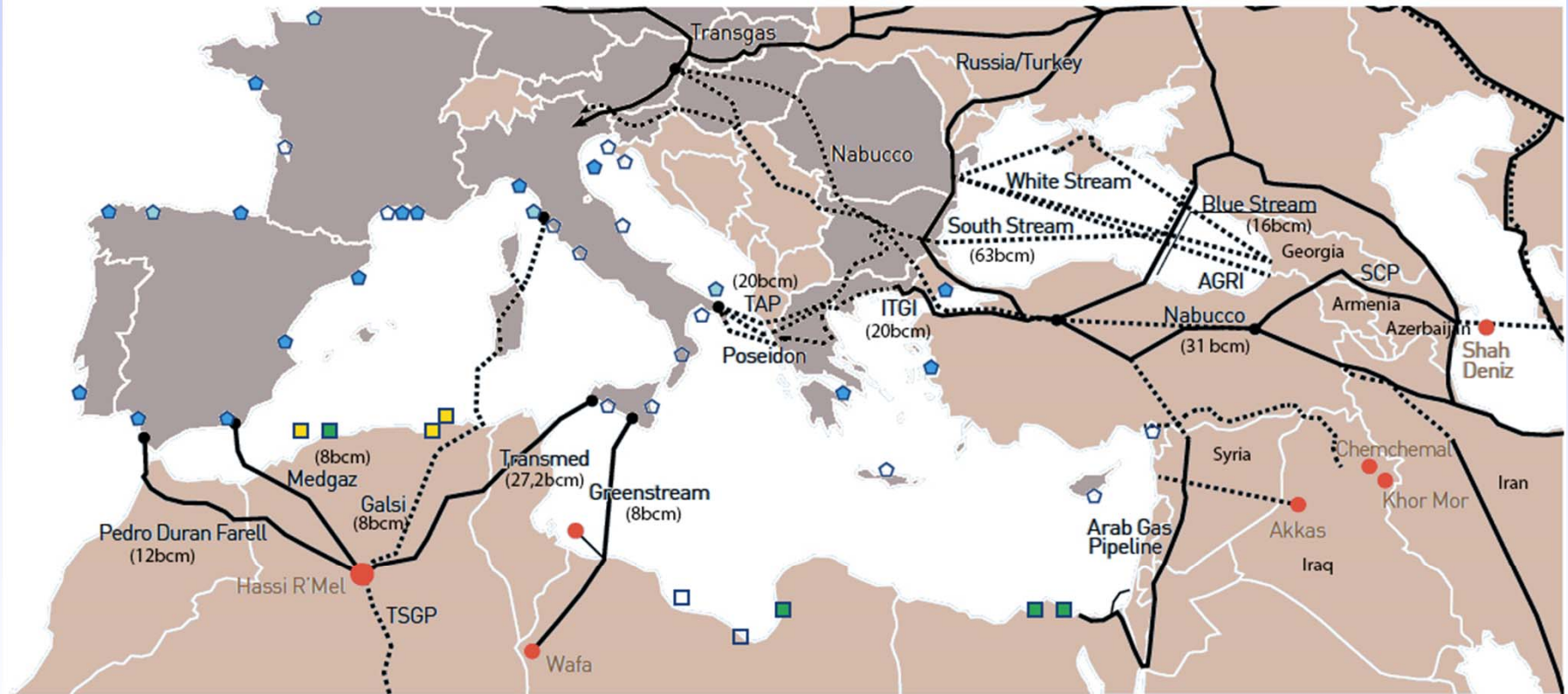


Fonte: Reuters



The need of infrastructures: regulation and policy

NATURAL GAS EXPORT-IMPORT INFRASTRUCTURES IN THE WIDE MEDITERRANEAN REGION



- Planned pipeline
- Existing pipeline
- Existing LNG Plant
- Under construction LNG Plant
- Planned LNG Plant
- Existing LNG Terminal
- ◐ Under construction LNG Terminal
- Planned LNG Terminal

Source: OME.



Gazprom: gas exports to Europe

Gas export to Europe, billion cubic meters

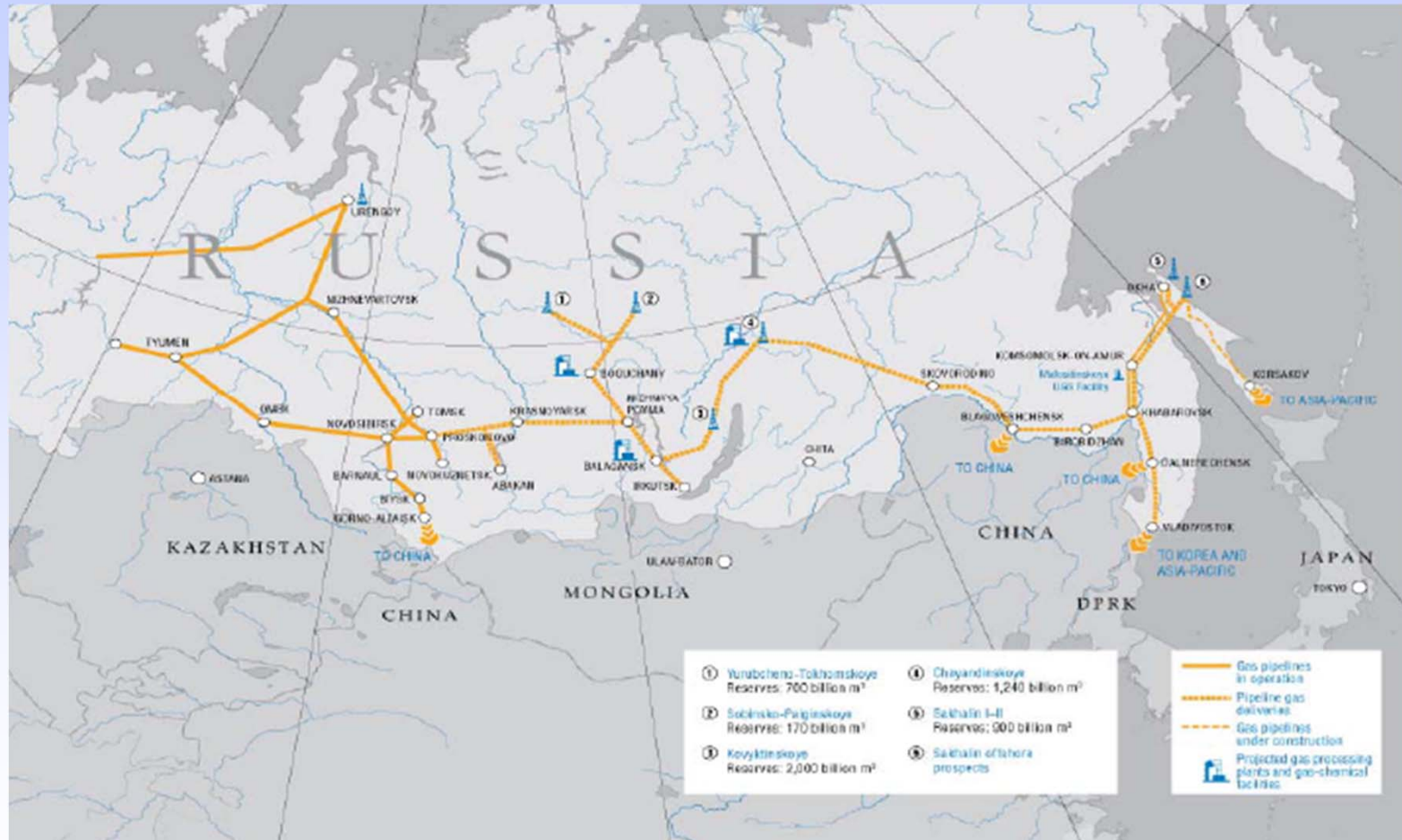
	2005	2006	2007	2008	2009	2010	2011	2012
Austria	6,8	6,6	5,4	5,8	5,4	5,6	5,4	5,22
Bulgaria	2,6	2,7	2,8	2,9	2,2	2,6	2,8	2,9
Czech Republic	7,4	7,4	7,2	7,9	7,1	8,6	7,6	7,28
Denmark							0,05	0,33
Finland	4,5	4,9	4,7	4,8	4,4	4,8	4,2	3,75
France	13,2	10	10,1	10,4	10	9,8	9,5	8,04
Germany	36	34,4	34,5	37,9	33,5	34	34	33
Greece	2,4	2,7	3,1	2,8	2,1	2,1	2,9	2,5
Hungary	9	8,8	7,5	8,9	7,6	6,9	6,3	5,29
Italy	22	22,1	22	22,4	19,1	13,05	17,1	15,08
Netherlands	4,1	4,7	5,5	5,3	5,1	4,3	4,4	2,31
Poland	7	7,7	7	7,9	9	9,9	10,25	9,94
Romania	5	5,5	4,5	4,2	2,5	2,3	2,8	2,17
Slovakia	7,5	7	6,2	6,2	5,4	5,8	5,9	NA
Slovenia	0,7	0,7	0,6	0,6	0,5	0,5	0,5	0,5
Switzerland	0,4	0,4	0,4	0,3	0,3	0,3	0,3	0,3
Turkey	18	19,9	23,4	23,8	20	18	26	27,03
United Kingdom	3,8	8,7	15,2	7,7	9,7	6,8	8,2	8,11
Total	150,4	154,2	160,1	159,8	143,9	135,35	148,2	133,75

•Serbia, Bosnia and Herzegovina, Macedonia were excluded from sum due to unincisive amounts

•Source: www.gazprom.com



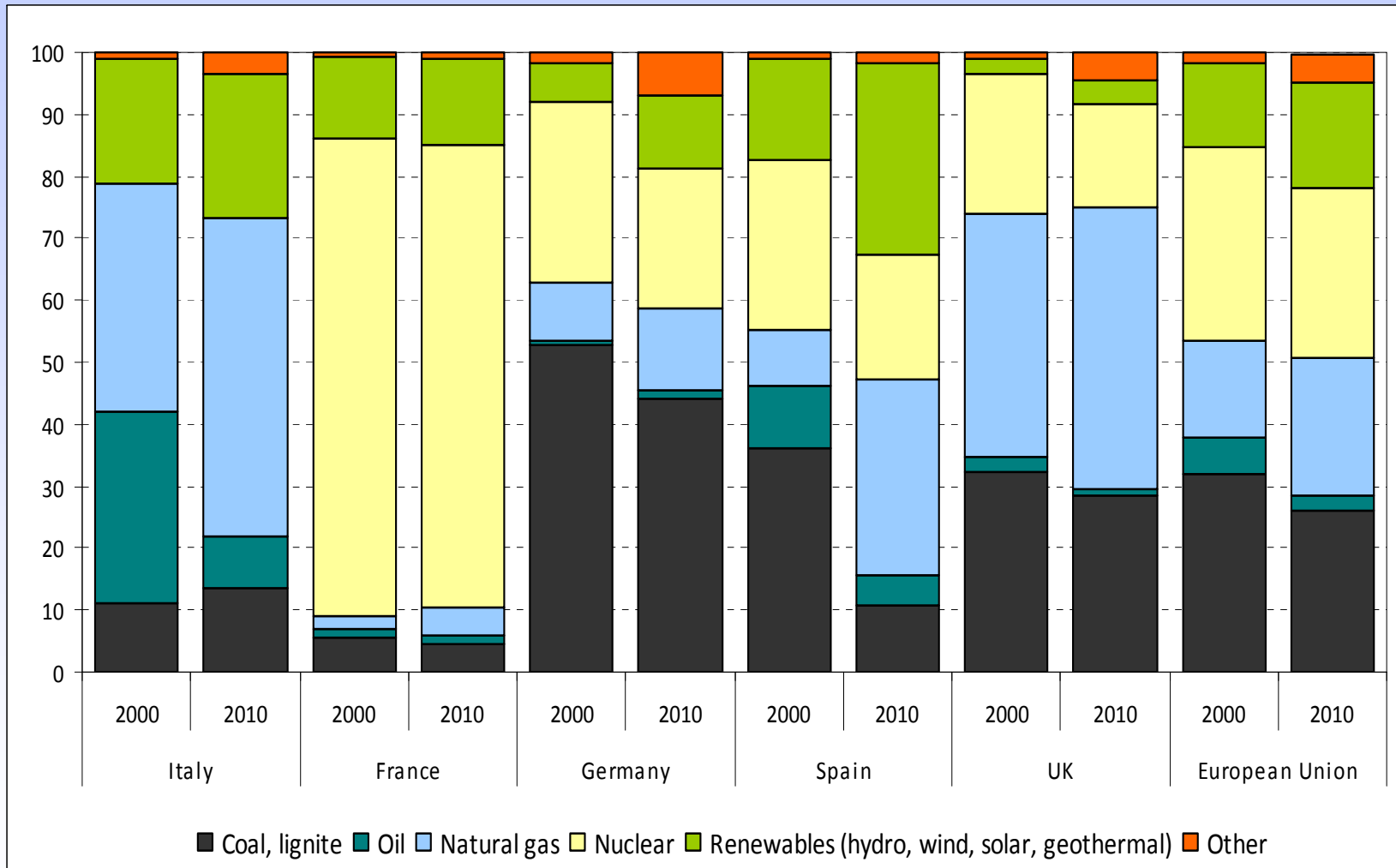
Gas from Russia



Fonte: Gazprom



Europe ?



Fonte: Enerdata



Europe energy dependency rate solid fuels, oil, gas – 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
All products	47.8	48.6	48.8	50.2	51.6	53.9	55.2	54.5	56.3	55.2	54.1
Solid fuels	30.5	33.7	33.1	34.9	38.1	39.3	41.0	41.3	44.7	41.1	39.4
Crude oil	75.6	77.7	76.4	78.7	80.9	82.4	84.0	83.5	85.0	84.2	85.2
Natural gas	48.9	47.2	51.1	52.4	54.0	57.7	60.8	60.3	62.3	64.3	62.4

Source: Eurostat (online data codes: nrg_100a, nrg_101a, nrg_102a and nrg_103a)



Main energy suppliers to Europe coal, oil and gas

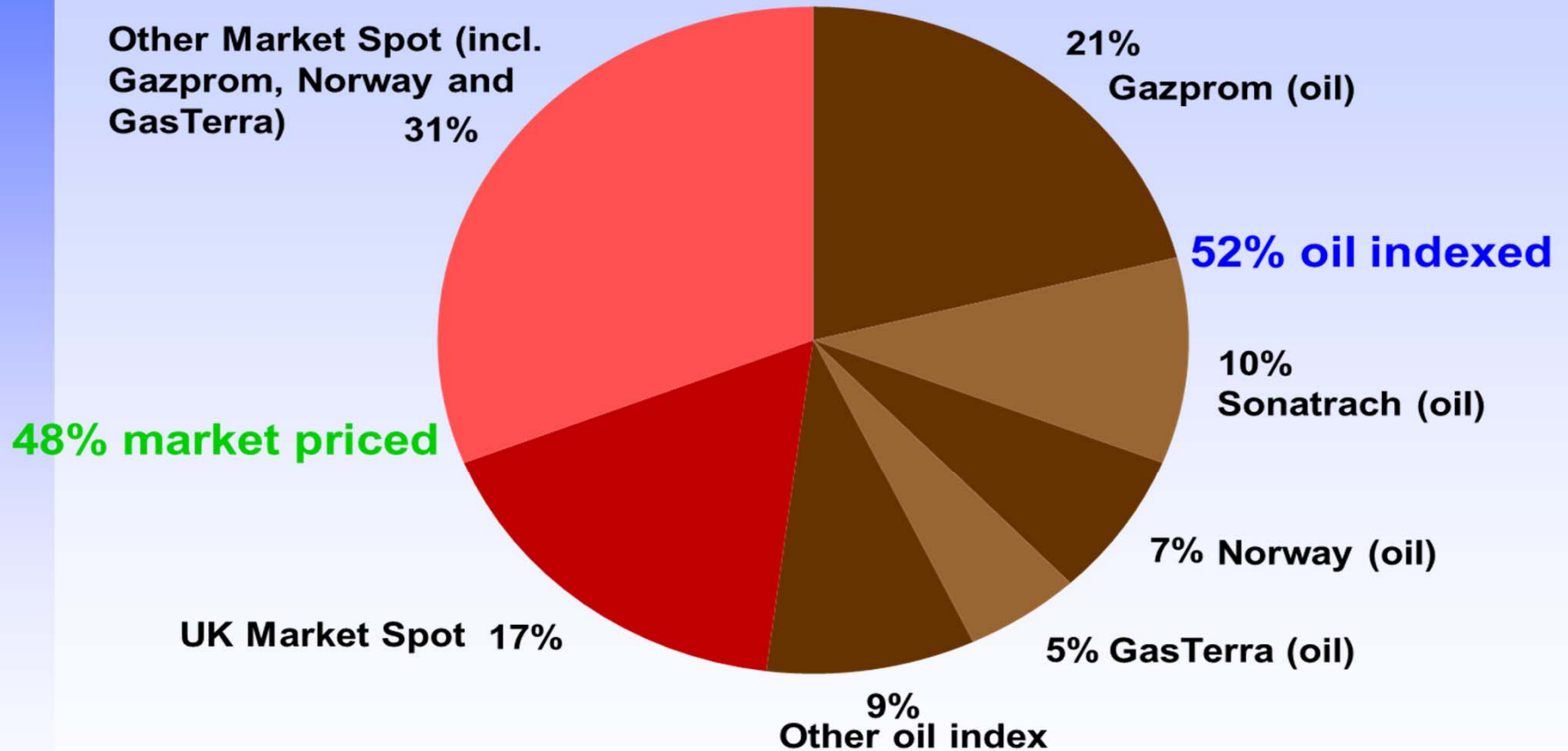
Hard coal									
	2002	2003	2004	2005	2006	2007	2008	2009	2010
Russia	13.1	13.5	18.7	24.1	25.4	25.1	26.3	30.2	27.1
Colombia	12.6	12.5	12.1	12.1	12.0	13.0	12.5	17.6	20.2
United States	8.2	7.0	7.5	7.8	8.0	9.3	14.3	13.7	16.9
Australia	16.9	17.0	15.3	13.5	12.4	13.5	12.0	7.6	10.8
South Africa	31.4	31.5	26.6	25.7	24.3	20.8	17.1	16.0	10.0
Indonesia	6.7	7.1	7.0	7.4	9.7	7.9	7.4	7.1	5.8
Canada	3.2	2.9	2.5	3.3	2.8	3.1	2.7	1.4	2.1
Ukraine	2.0	1.3	2.0	2.1	1.6	1.7	2.2	1.6	1.8
Norway	1.0	1.2	0.6	0.6	0.3	0.6	0.6	0.8	0.8
Others	5.0	6.0	7.8	3.5	3.7	5.0	4.8	3.9	4.5
Crude oil									
	2002	2003	2004	2005	2006	2007	2008	2009	2010
Russia	29.2	31.1	32.2	32.5	33.4	33.2	31.4	33.1	34.5
Norway	19.4	19.2	18.8	16.9	15.5	15.1	15.1	15.2	13.8
Libya	7.5	8.4	8.8	8.8	9.2	9.8	9.9	9.0	10.2
Saudi Arabia	10.1	11.3	11.3	10.6	9.1	7.2	6.9	5.7	5.9
Iran	4.9	6.4	6.3	6.1	6.2	6.2	5.4	4.7	5.7
Kazakhstan	2.4	2.7	3.4	4.5	4.6	4.6	4.8	5.4	5.5
Nigeria	3.5	4.3	2.6	3.2	3.6	2.7	4.0	4.5	4.2
Azerbaijan	1.0	1.0	0.9	1.3	2.2	3.0	3.2	4.0	4.2
Iraq	3.0	1.6	2.2	2.1	2.9	3.4	3.3	3.8	3.3
Others	18.8	14.2	13.4	14.0	13.2	14.7	16.1	14.6	12.8
Natural gas									
	2002	2003	2004	2005	2006	2007	2008	2009	2010
Russia	45.0	45.1	43.8	40.6	39.3	38.4	37.6	34.3	31.8
Norway	26.2	25.5	24.9	24.4	25.5	28.2	28.9	30.7	28.2
Algeria	21.2	20.0	18.2	18.0	16.4	15.4	14.7	14.2	14.4
Qatar	0.9	0.7	1.4	1.6	1.8	2.2	2.2	4.6	8.6
Nigeria	2.2	3.1	3.7	3.5	4.3	4.7	4.0	2.4	3.6
Libya	0.3	0.3	0.4	1.7	2.5	3.0	2.9	2.9	2.8
Trinidad and Tobago	0.2	0.0	0.0	0.2	1.3	0.8	1.6	2.2	1.5
Egypt	0.0	0.0	0.0	1.6	2.5	1.8	1.7	2.1	1.3
Turkey	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2
Others	4.1	5.3	7.5	8.4	6.4	5.5	6.2	6.5	7.7

Source: Eurostat (online data codes: nrg_122a, nrg_123a and nrg_124a)



Estimated split of European gas Supply: 2013

Q1-2013



Oil indexation is no longer relevant; the logic for gas-to-gas 'market pricing' is apparent and its share is expected to top 50% in 2013



Gazprom: gas supply to Europe 1973 -2012

Year	1973	1975	1980	1985	1990	1995	2000	2005	2010	2011	2012
Total	6.8	19.3	54.8	69.4	110.0	117.4	130.3	154.3	138.6	150.0	138.8



Countries outside former USSR

Source: www.gazprom.com

Table 32 Historical fuel prices (USD/MBtu)

	2005	2006	2007	2008	2009	2010	2011
Natural gas							
Henry Hub	8.84	6.75	6.98	8.86	3.95	4.39	4.00
NBP	6.31	9.56	5.82	10.97	6.80	5.41	8.59
German border price	5.83	7.88	8.00	11.61	8.53	8.03	10.62
Japan LNG	6.02	7.12	7.74	12.66	9.04	10.90	14.78
Oil							
WTI	9.73	11.38	12.46	17.18	10.63	13.69	16.36
Brent	9.38	11.23	12.50	16.72	10.60	13.70	19.18
JCC	8.89	11.04	11.90	17.65	10.45	13.65	18.81
Coal							
US Appalachian	2.38	2.09	1.81	4.27	2.07	2.67	3.07
NW European coal	2.55	2.69	3.72	6.18	2.96	3.82	5.28
Asian coal	2.60	2.37	3.55	6.22	3.31	4.43	5.10

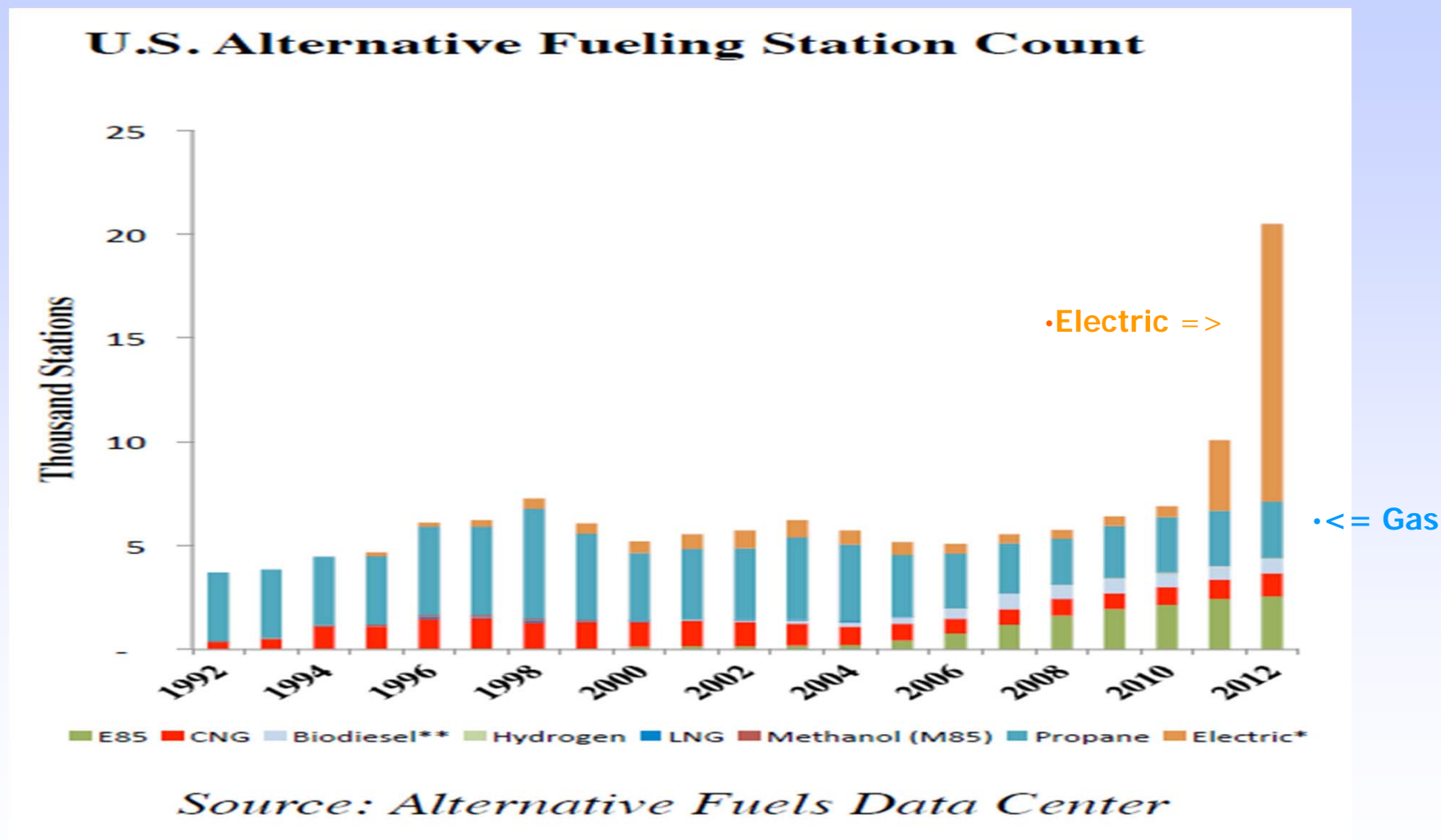
Sources: IEA, ICE, German Customs, Japanese Customs, EIA, Bloomberg, McCluskey, Federal Reserve and European Central Bank.

Notes: All prices are yearly averages, of their respective average monthly prices.

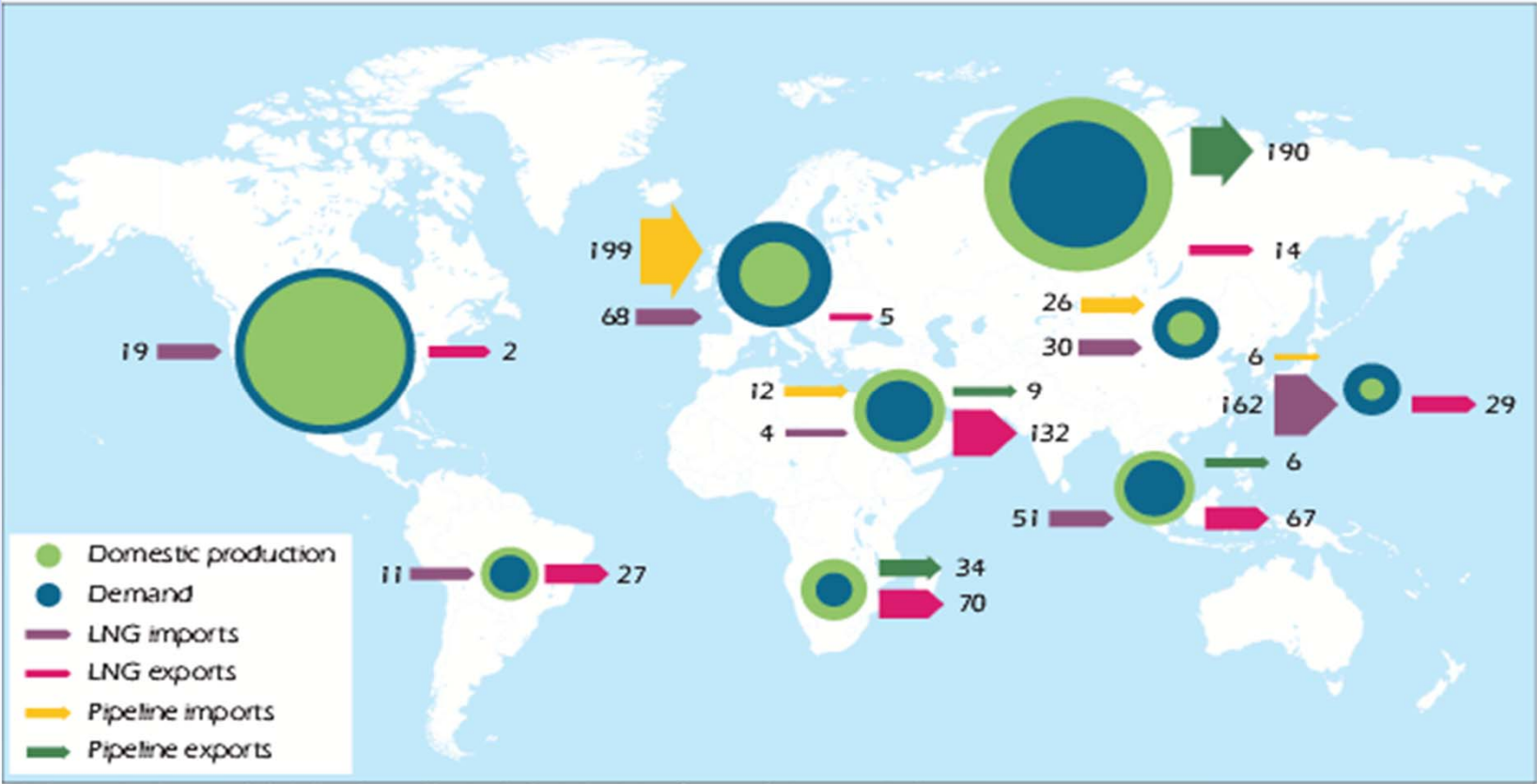
To convert oil prices in USD/bbl, the prices in USD/MBtu have to be multiplied by 5.8. To convert coal prices in USD/ton (6 000 kcal), the prices in USD/MBtu have to be multiplied by 23.8.



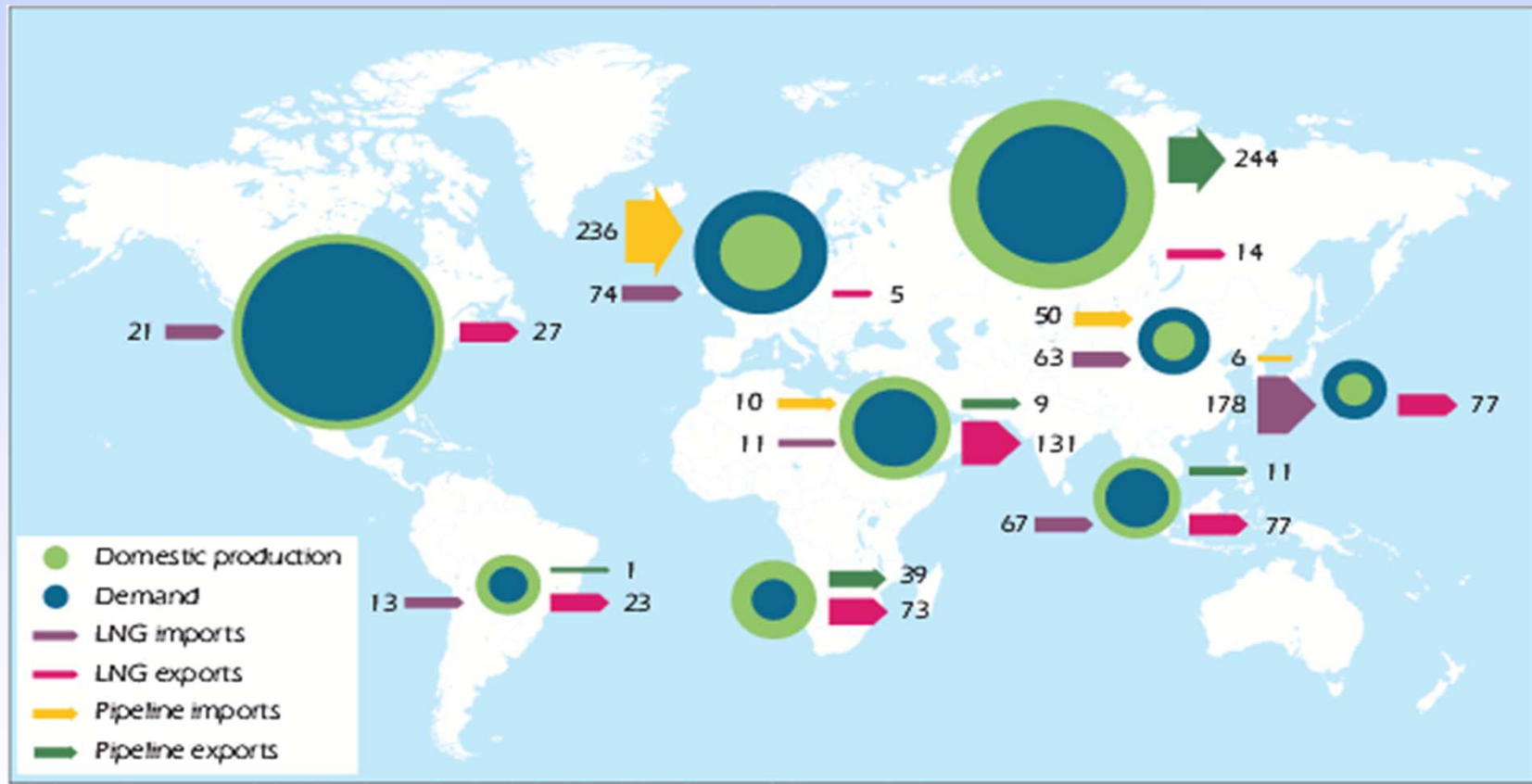
Low penetration of gas in transport sector



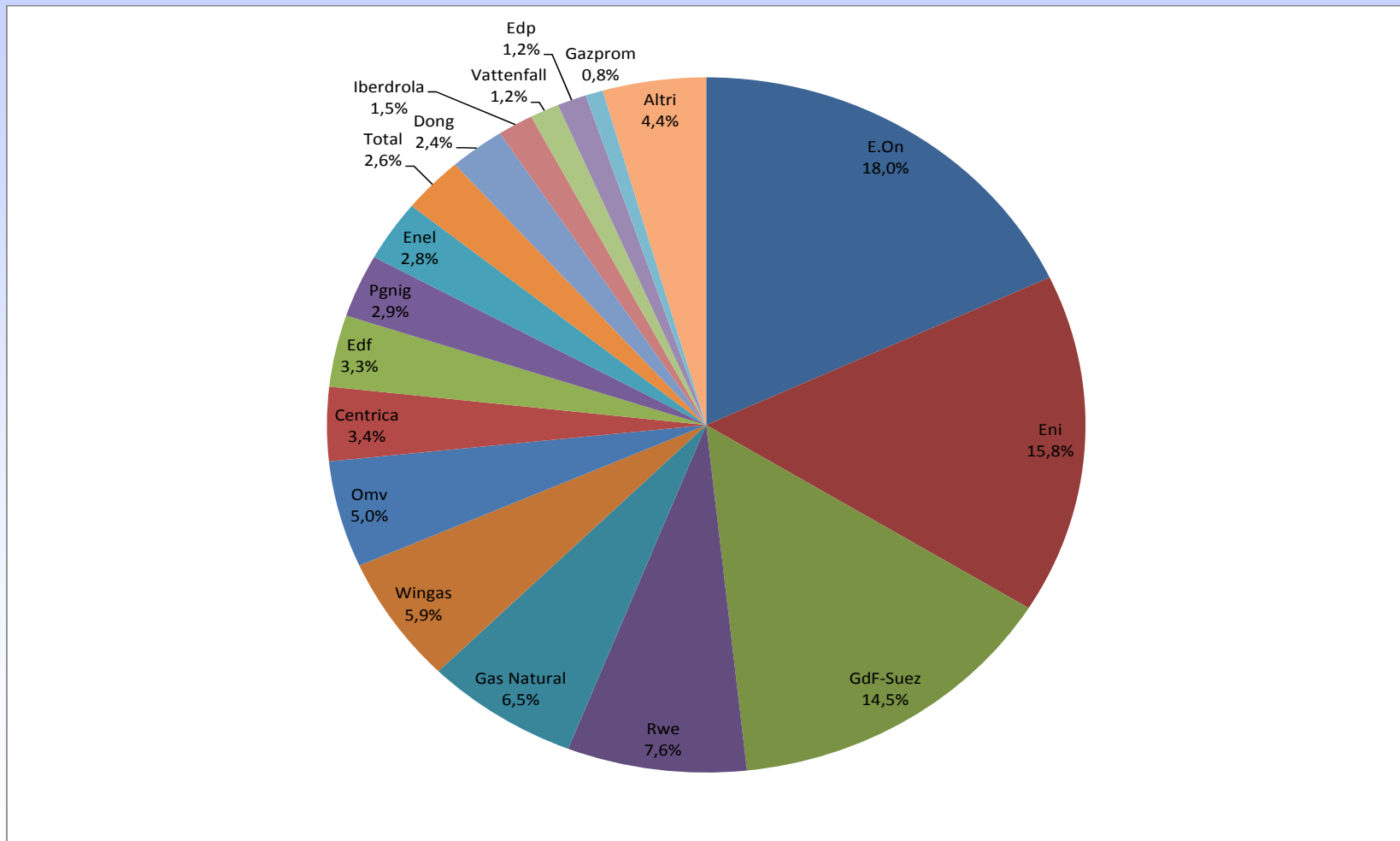
Global gas trade in 2013



Global gas trade in 2017

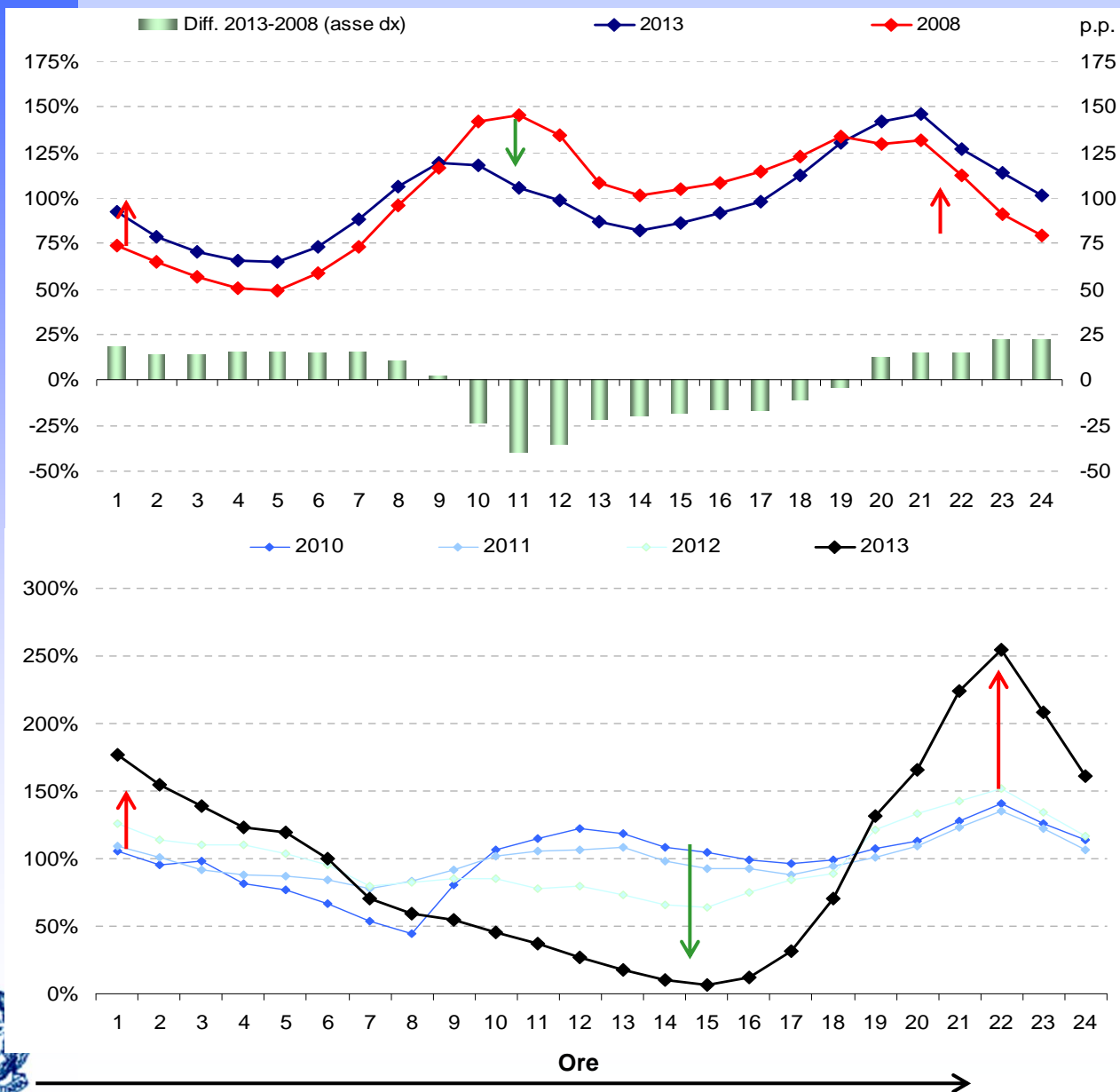


Midstreamers: market concentration in Europe



Fonte: Progetto di ricerca AF Mercados EMI Europe e REF-E su dati da Rapporti Annuali

Impatto delle rinnovabili sulla struttura di prezzo: esempio 1



GIORNO MEDIO
Gennaio - Maggio

DOMENICA MEDIA
Giugno

N.B. Il dato rappresentato esprime il rapporto tra il prezzo medio orario e la media complessiva del prezzo nel periodo considerato

