

Greece's Energy Outlook in the Context of SE Europe

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**A Presentation by Costis Stambolis, A.A. Dip. Grad., MCIJ, MIE
Executive Director
Institute of Energy for S.E. Europe, Athens**

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“GREEK-ALBANIAN COOPERATION
IN THE ENERGY SECTOR”**

Key Topics

- The S.E. Europe Region Defined
- The Energy Markets
- The Greek Market
- Regional Oil and Gas Routes
- Conclusions





The South East Region Defined



The Energy Markets



❑ East Balkans

- *in a state of transition (Bulgaria, Romania)*
- *mature with limited growth (Greece, Cyprus)*

❑ West Balkans

- *under formation*
- *under development*

❑ Turkey

- *under transformation and continuous growth*

The S.E. Europe Energy Region Defined



Table 1

Country	Population (Million)	GDP (USD Billion)	FDI (% of GDP)	Installed Electricity Capacity (MW)
Albania	3,6	10,619	2.91	1,674
Bosnia & Herzegovina	4.5	14,780	5.48	4,341
Bulgaria	7,3	39,609	7.15	12,483
Croatia	4,5	51,356	6.94	4,049
Cyprus	0,8	21,303	9.0	1,100
FYROM	2,0	7,497	2.03	1,524
Greece	10,7	314,615	0.42	14,300
Montenegro	2,0	2,270	11.0	0,868
Romania	22,2	165,983	6.0	15,500
Serbia	10,0	41,679	10.0	8,355
Turkey	71,8	663,419	0.65	35,587 (40,000)
UNMIK	0,7	3,237	-	1,495
Total	140,1	1,336,367	5.6	101,276

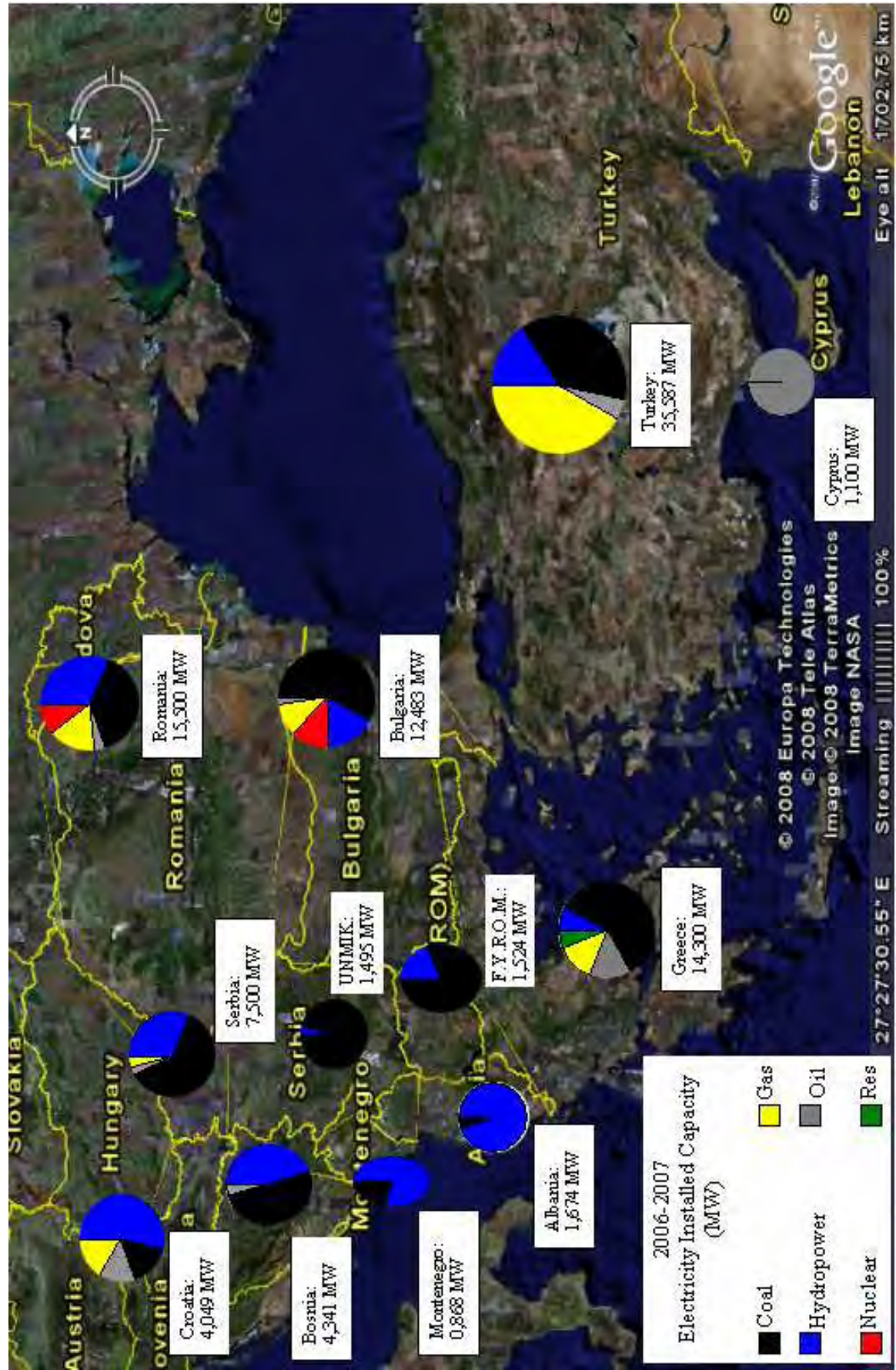
The S.E. Europe Energy Region Defined



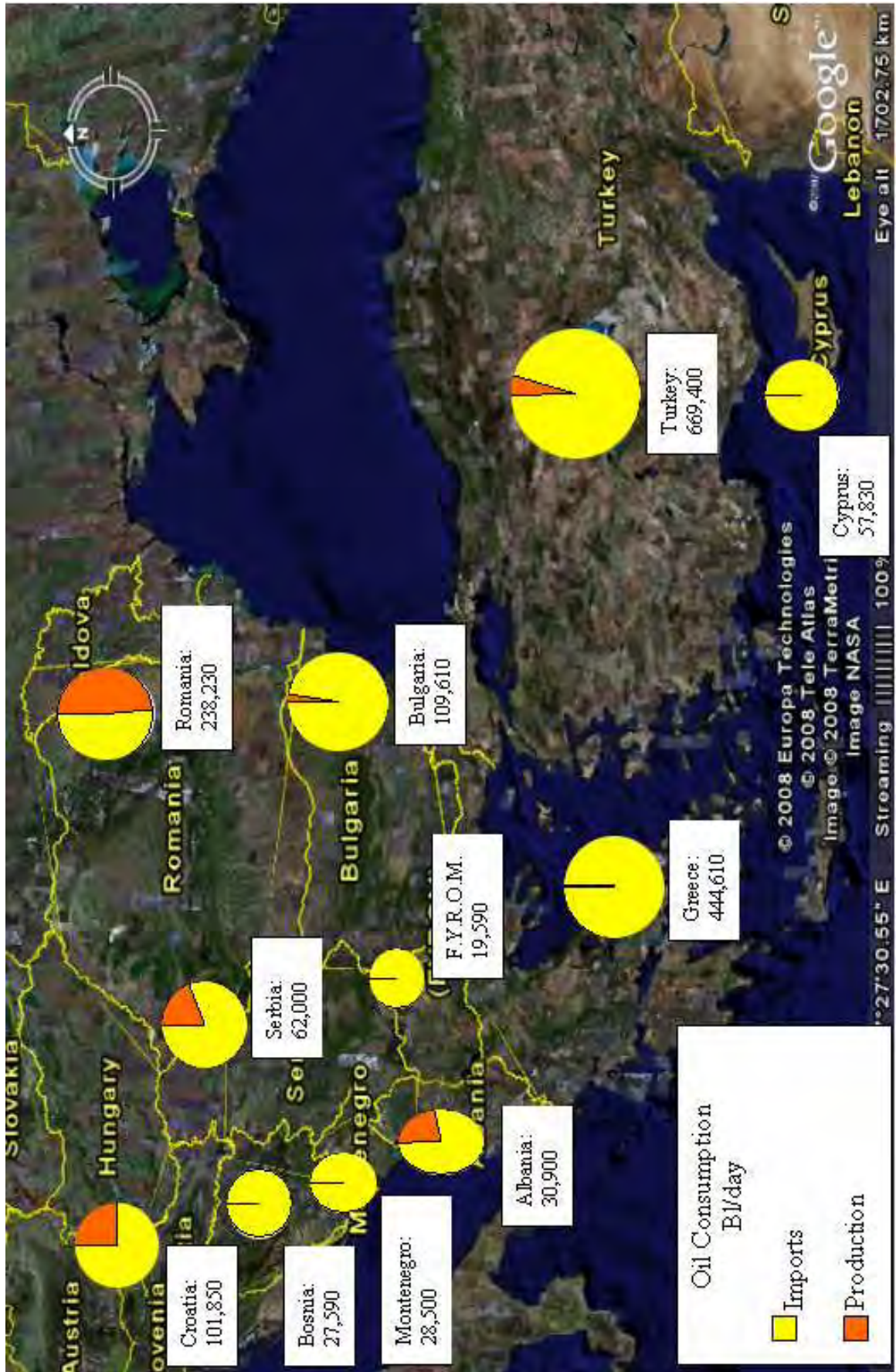
Table 2

Country	Oil Production (Bl/day)	Oil Consumption (bl/day)	Oil Refining Capacity (bl/day)	Gas Production (bcm/year)	Gas Consumption (bcm/year)
Albania	7,750	30,900	26,000	0,03	0,03
Bosnia & Herzegovina	0	27,590	0	0	0,43
Bulgaria	3,660	109,610	208,000	0	3,6
Croatia	25,280	101,850	163,000	1,65	2,9
Cyprus	0	57,830	0	0	0
F.Y.R.O.M.	0	19,590	50,000	0	0,12
Greece	4,860	444,610	413,000	0,03	3,05
Montenegro	0	28,500	0	0	0
Romania	113,840	238,230	468,000	12,6	19,6
Serbia & Kosovo	12,000	62,000	162,500	0,27	2,6
Turkey	43,950	669,400	622,000	0,98	33,6
Total	213,940	1,834,930	2,112,500	15,56	65,93

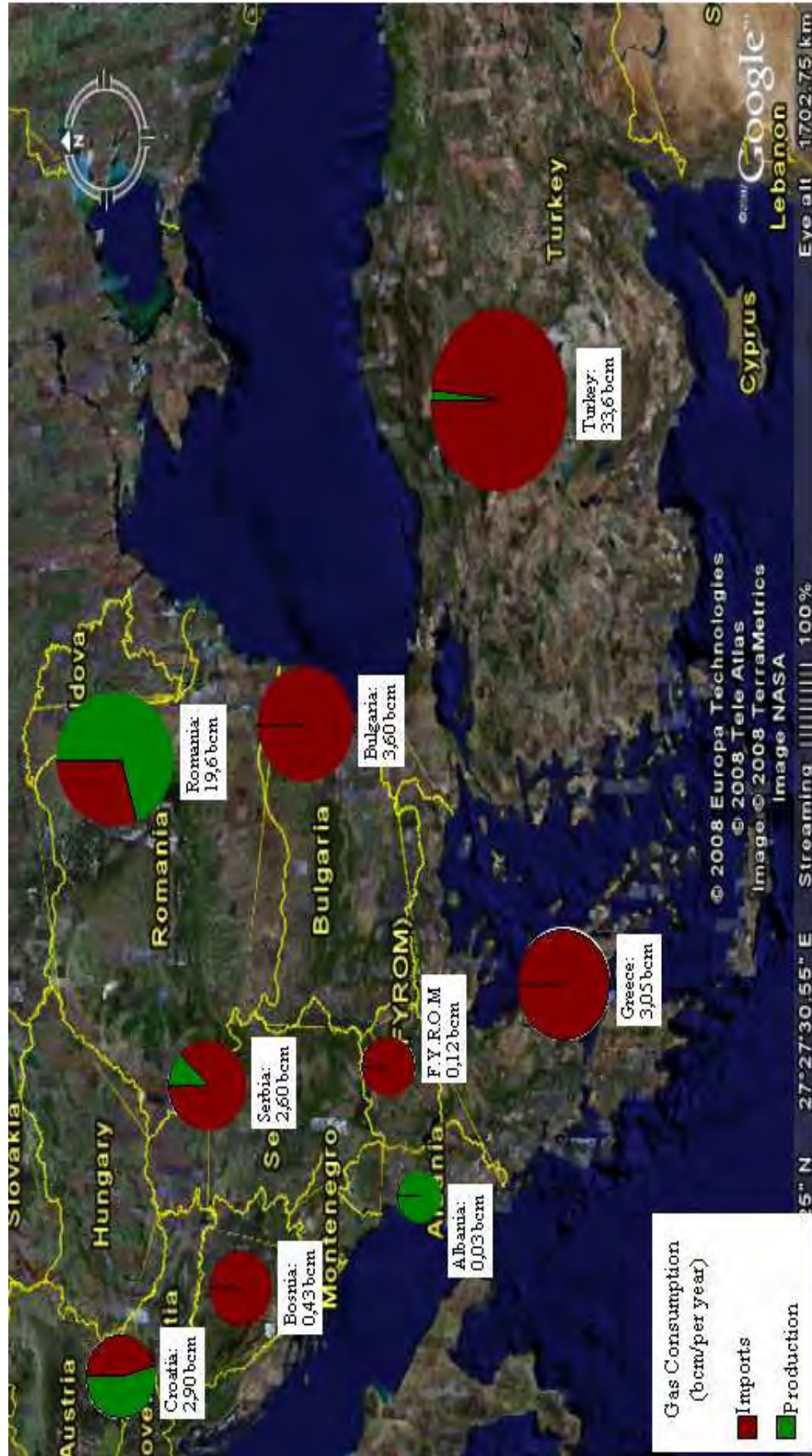
Electricity, Installed Capacity



Oil Consumption



Gas Consumption



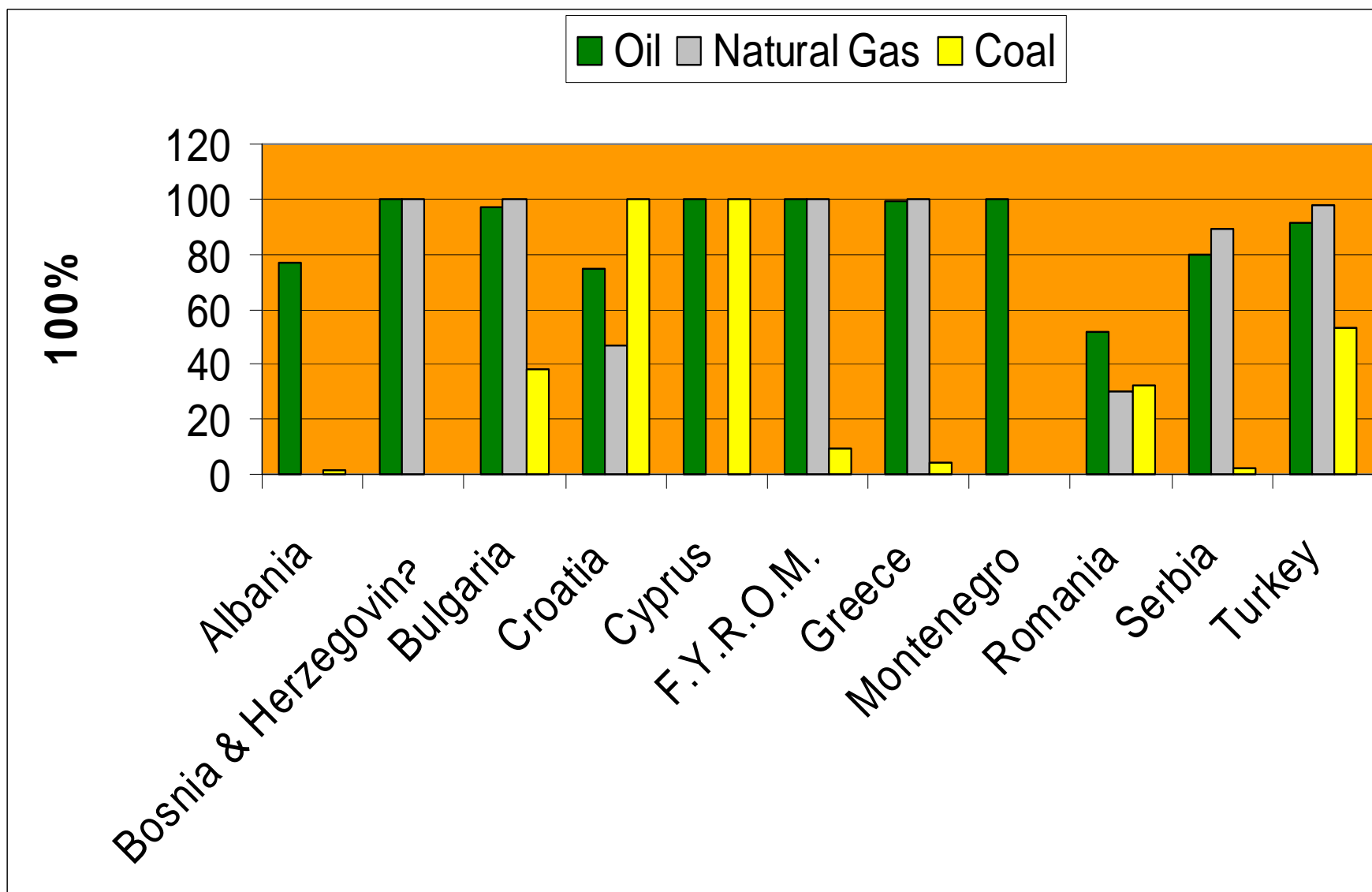
RES, Installed Capacity & Potential



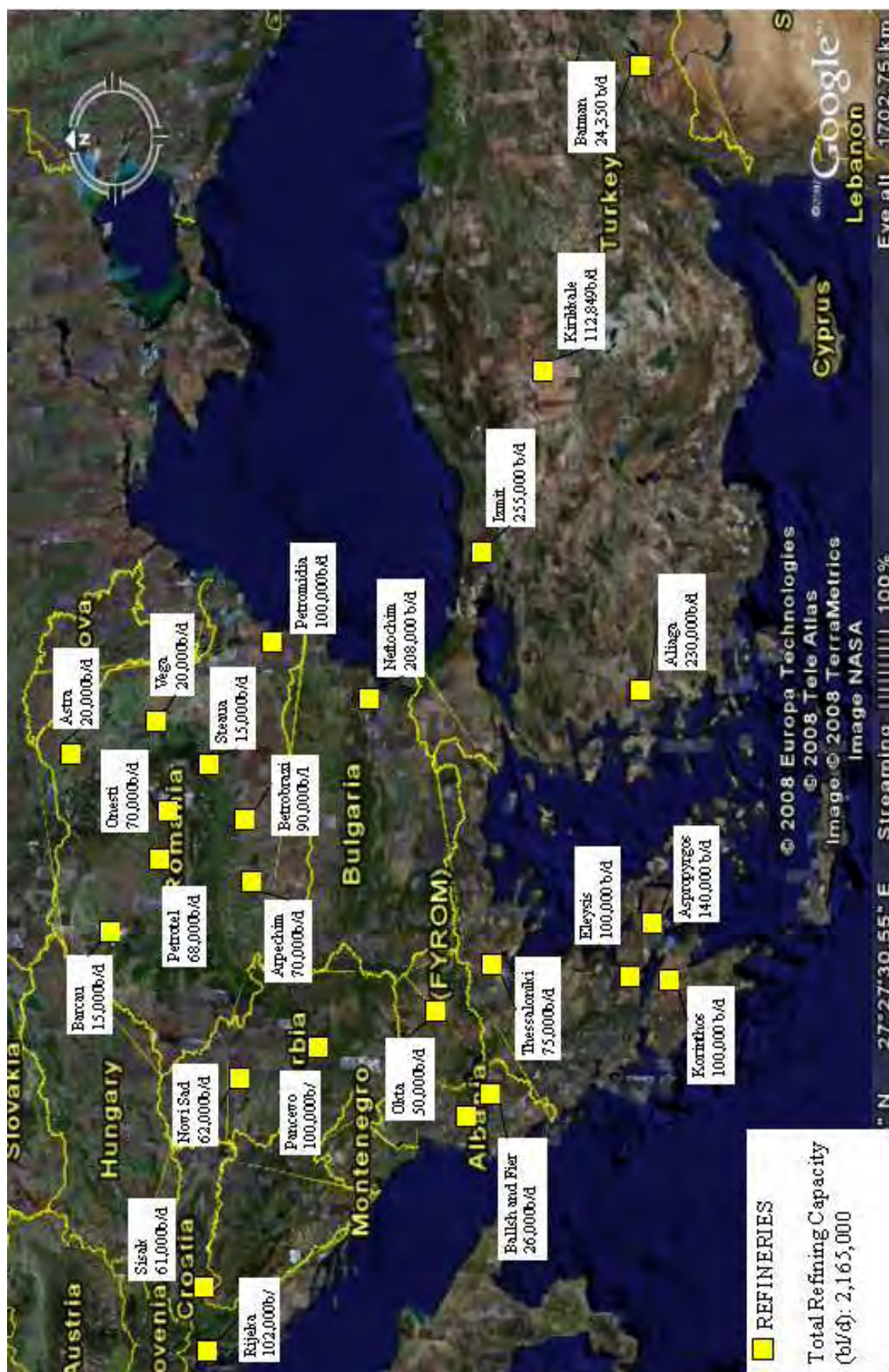
Power Generation From Nuclear Energy



Energy Dependency in S.E. Europe



Refining in S.E. Europe



The Greek Energy Market



- Primary Energy Supply
- Energy Production by Source
- Final Consumption by Source
- Final Consumption by Sector
- Energy Intensity
- Renewable Energy Sources



Map of Greece



The Greek Energy Market- Key Facts (2006)



- Total Primary Energy Supply 34.0 Mtoe
- Total Installed Electricity Capacity 14.500 MW
 - (i) 1.900 IPP's*
 - (ii) 12.600 PPC
- Total Final Energy Consumption 25.0 Mtoe
- Total Daily Oil Consumption 440.000 bbl/day
- Total Local Energy Production 10.5 Mtoe

*Includes 950MW from renewable (wind and small Hydro)

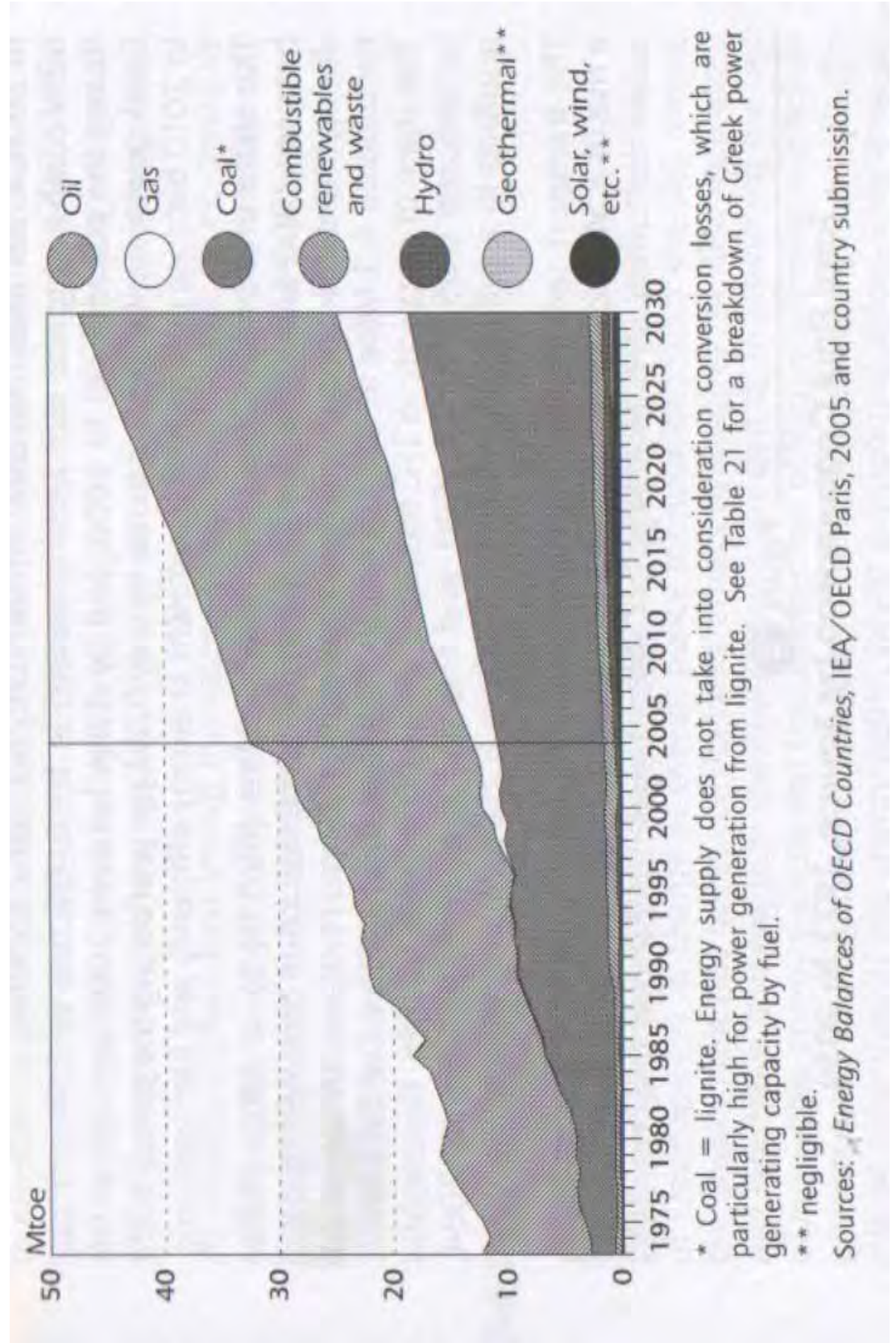
**Total Primary Energy Supply (TPES)
Shares % (2004)**



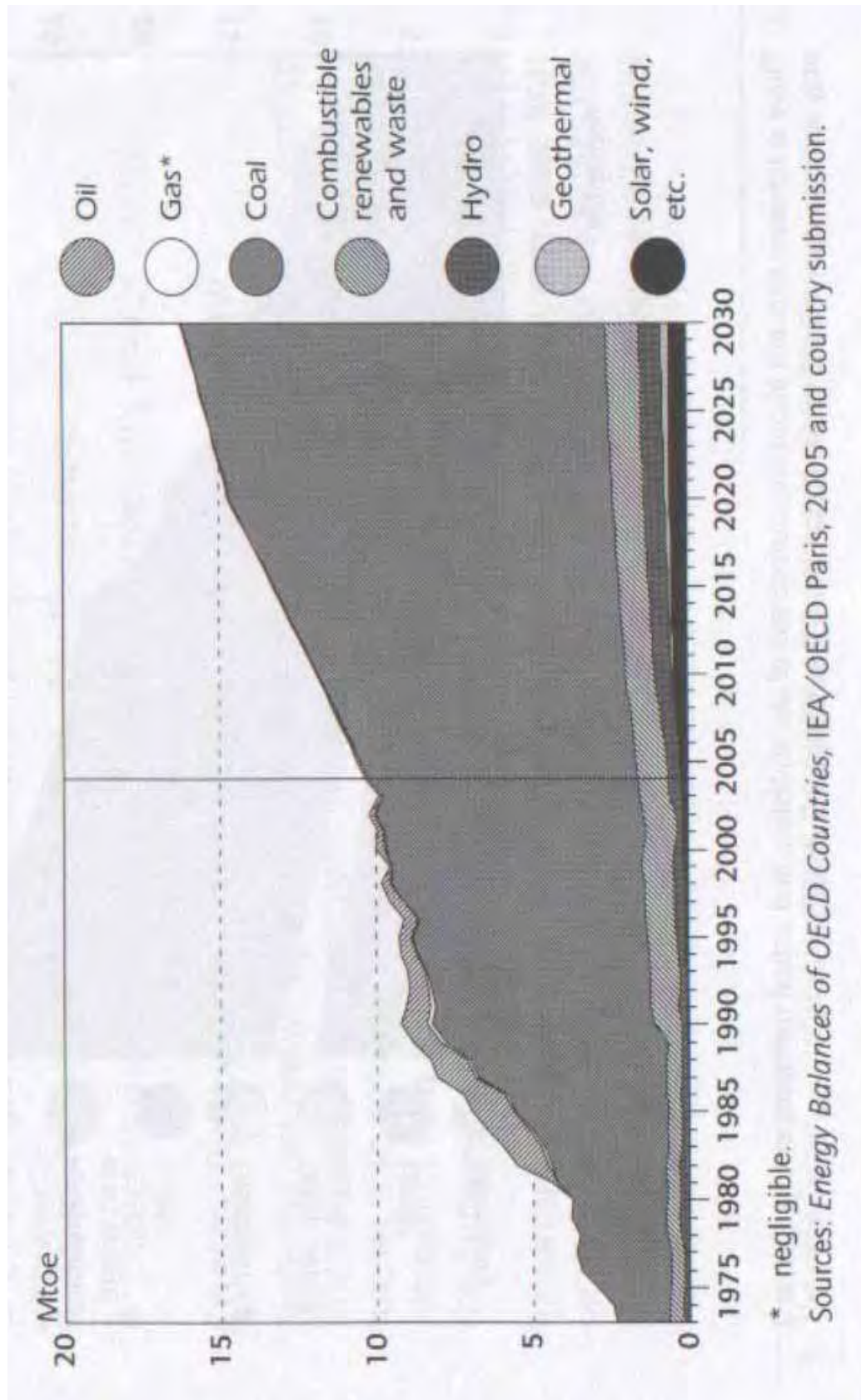
□ Coal (lignite & imported steam coal)	28.1
□ Oil	59.5
□ Gas	6.8
□ Comb. RES & Waste	3.1
□ Nuclear	-
□ Hydro	1.2
□ Geothermal	-
□ Solar / Wind	0.6
□ Electricity Trade	0.7

	100

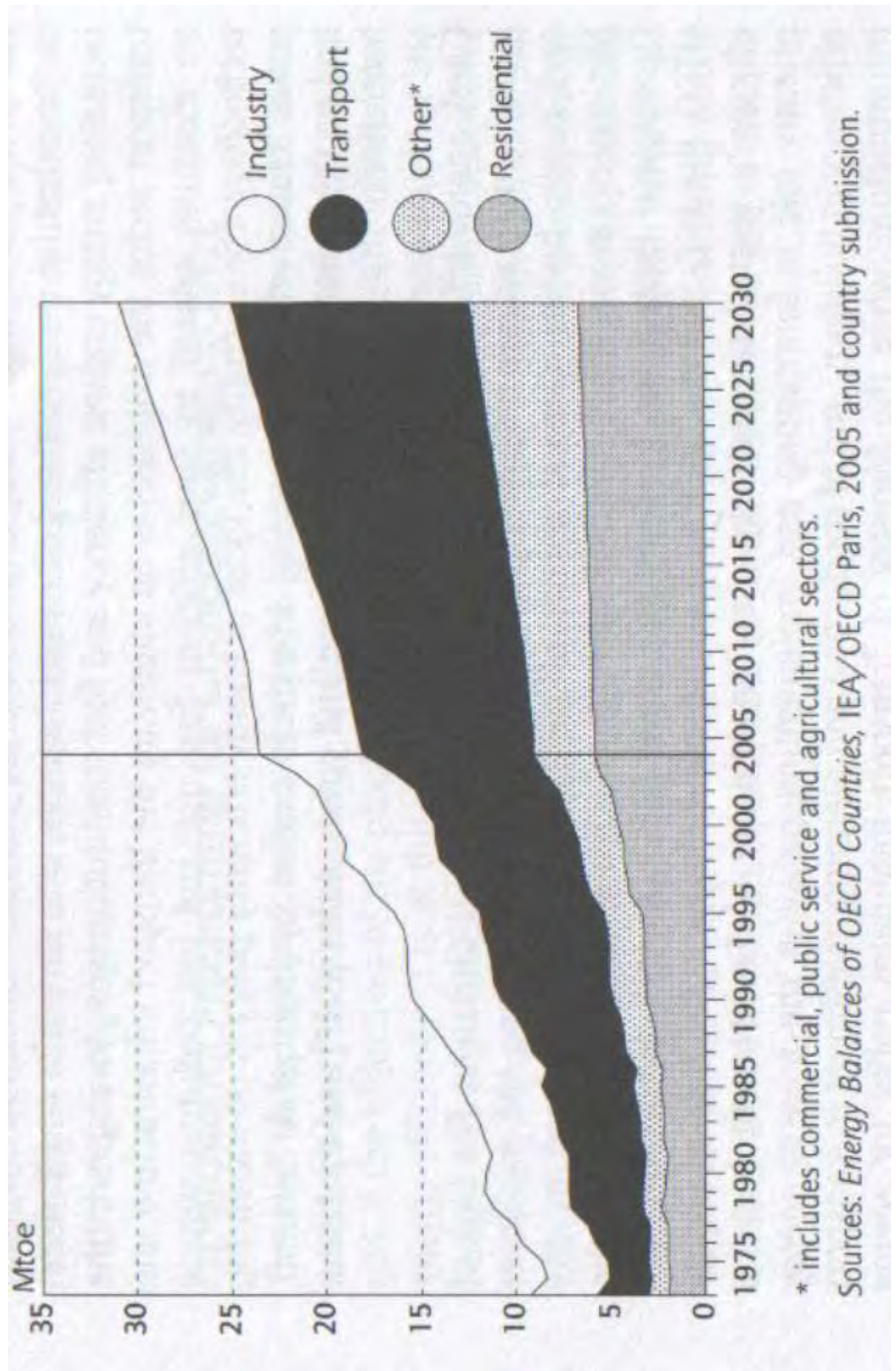
Total Primary Energy Supply



Energy Production by Source



Total Final Consumption by Sector



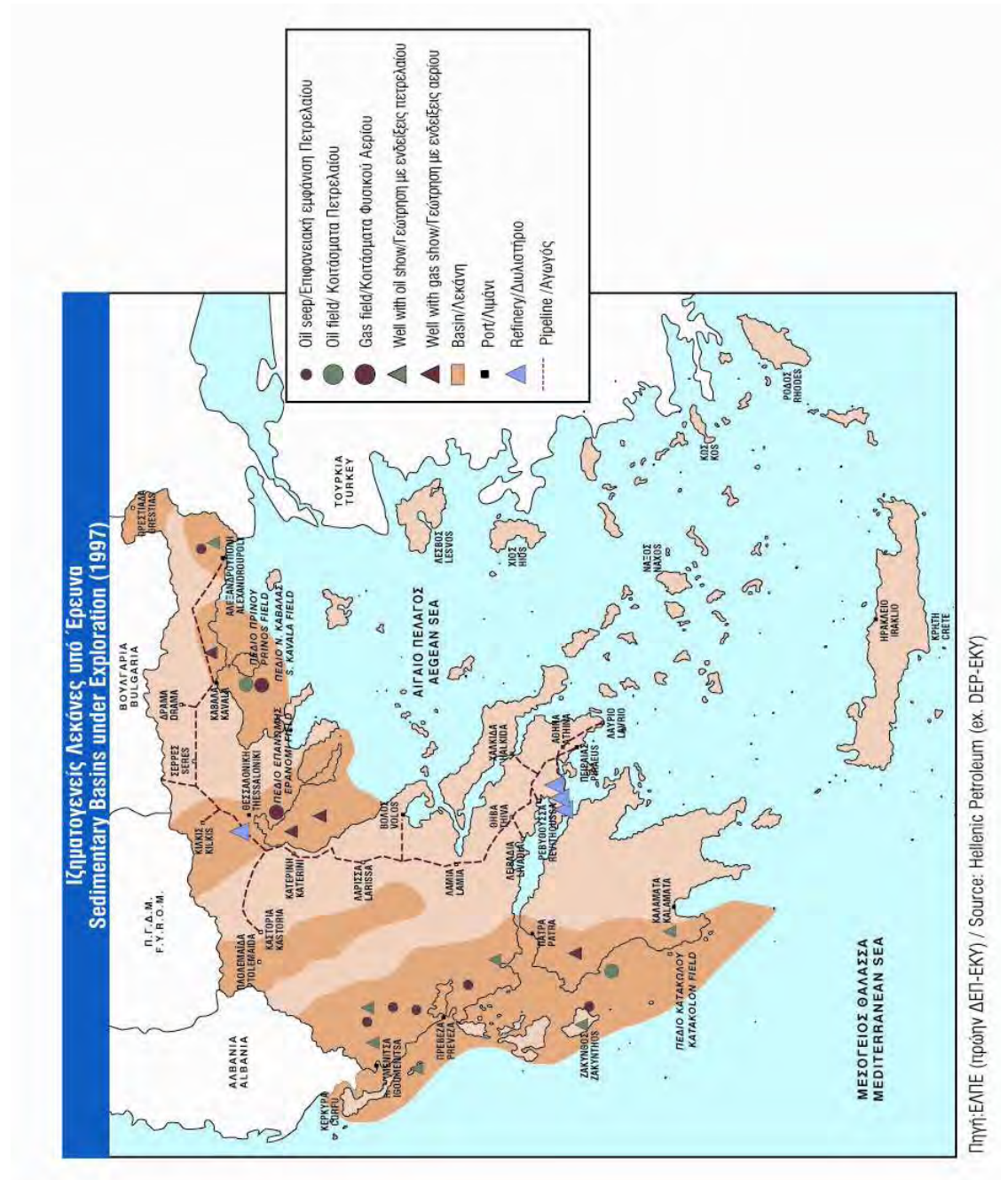
The Greek Energy Market – Some Observations

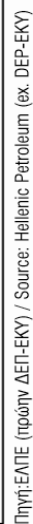


- (i) Overdependence on imported oil & gas
- (ii) Dominance of national electricity and of gas companies prevent entry of IPP's and development of competition
- (iii) Regulator and HTSO under strict government control
- (iv) Long term energy strategy, recently formulated
- (v) Lack of energy efficiency and demand side management
- (vi) Weak GHE reduction policy
- (vii) Small, but growing, contribution from renewables

- Oil accounts for approx 20.0 Mtoe or 59,5% of TPES (in 1990 it account for 57,8%)
- High share of oil supply e.g. Spain 50,7%, Italy 48,3%
- 15,1% oil used for power generation (mostly in the islands, 4.3% in other countries)
- 100% of oil imported (Iran, Saudi Arabia, Kuwait, Russia)
- Oil accounts for 17 Mtoe of TFC, or 72,4% (in 1990 it was 69.5%)
- 53% of TFC is for transport, 17% Industry or 9mtoe

Upstream Sector – Main Exploration Areas







Renewables – Some Key Observations

(A) Wind Energy

(ii) Power Generation

- Total installed Capacity 985 MW (January 2009)
- 70 Windfarms in different parts of the country
- 10 Main Operators (all private companies)
- Windgenerator suppliers Vestas, Bonus, Suzlon a.o with 20-25% local content in metal tower construction





Renewables – Some Key Observations

(B) Solar Energy

Solar Thermal Applications:

- Solar water heaters for households
- Solar water heating for hotels/hostels
- Solar water heating for industries, hospitals, schools, etc.



The Greek Solar Thermal Market – Key Statistics



Installed Collector Area in operation (2006)	2.300.000 sq.m. 1,656MWth.
Total installed collector area	3.100.000 sq.
Households using SWH	1.2 million apprx.
Number of manufacturers members of EBHE	18
Annual collector production (2006)	250.000 sq.m. or 180 MW th
Exports	130.000 sq.m.

(B) Solar Energy

(ii) Photovoltaics

10 MW current installed capacity (2008)

- Thousands of very small stand alone domestic installations
- 20 solar farms > 100KW each

20 MW IENE projection for 2009

100 MW IENE projection for 2010



Regional Oil Pipelines (Existing, Planned)



International Gas Pipelines (Existing, Planned)





Energy Markets in S.E. Europe

Conclusions I

- (a) From country and state controlled markets to an open and competitive regional market.*
- (b) With the exception of Greece and Turkey all other countries until 1990 belonged to the Eastern block. Since the fall of the Iron Curtain (1991) the economies of these countries started their transition towards a free market economy.*
- (c) The prospect for EU entry (satisfied in the case of Bulgaria - Romania and in progress for Croatia and Turkey) is helping to liberalize markets, develop competition and increase private investment.*

Energy Markets in S.E. Europe

Conclusions II

- (a) However, the energy sector in most of these countries still remains bound to strict state controls.*
- (b) In the energy sector the move is from 100% state controlled markets to partial liberalization, particularly in electricity and gas. The oil sector is more open and versatile and competition at pump level is evident in most countries.*
- (c) Major investments in basic infrastructure projects such as oil, gas pipelines and new power capacity is essential for energy market development.*

Concluding Remarks

Greek – Albanian Cooperation in Energy

(a) Energy sectors

- *Electricity – already well established*
- *Gas – excellent prospects*
- *Oil – under development*
- *Renewables – excellent prospects*

(b) There are several common energy development areas

Greece and Albania can become first class partners for the development of both energy markets and energy infrastructure

INSTITUTE OF ENERGY FOR SOUTH-EAST EUROPE



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