



European Council of Academies
of Applied Sciences, Technologies
and Engineering

Session 3

NEED OF A STRATEGY FOR ENERGETIC INDEPENDENCE FOR EUROPE?



1



13th November 2012

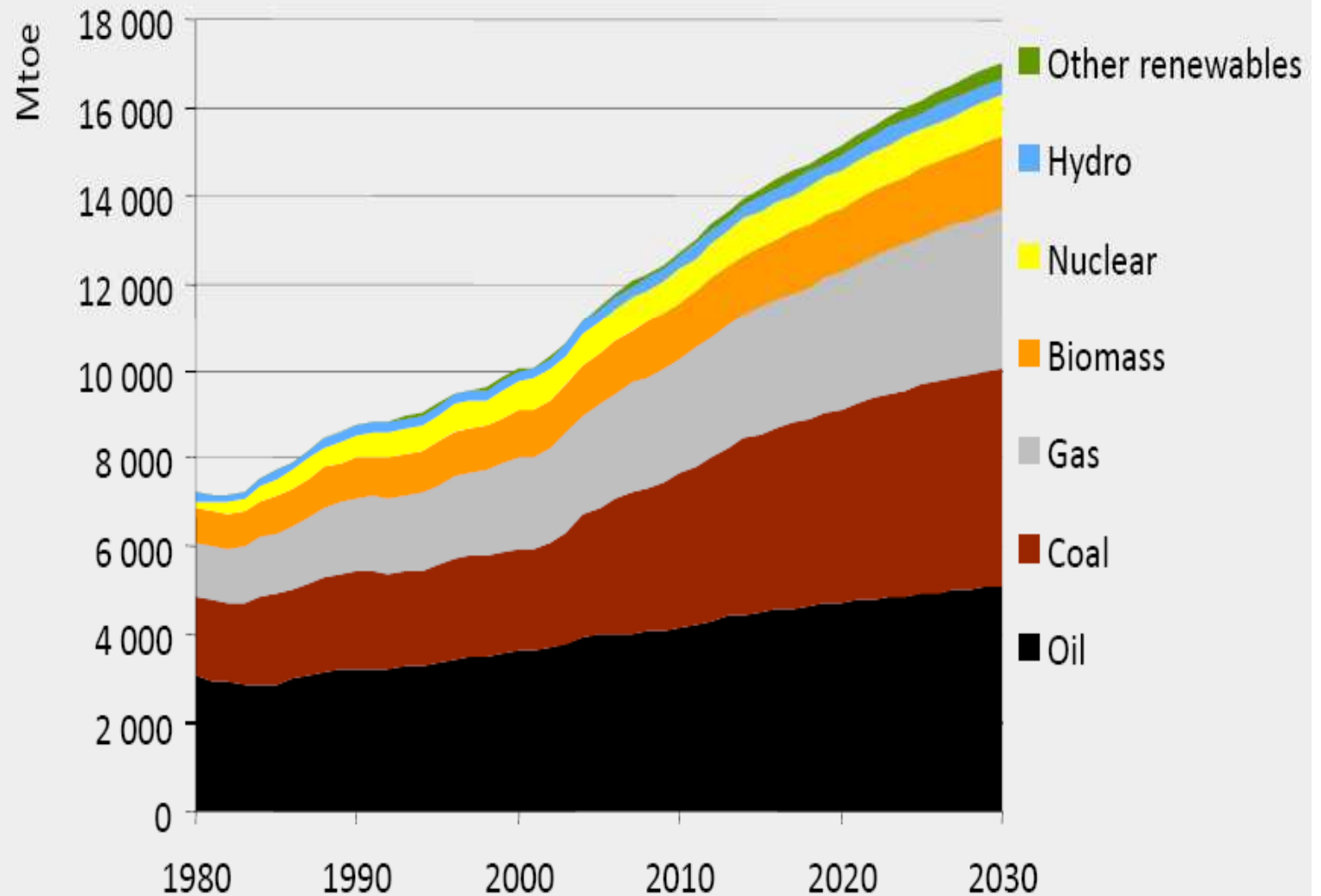
Antonio Colino

GLOBAL PRIMARY ENERGY DEMAND



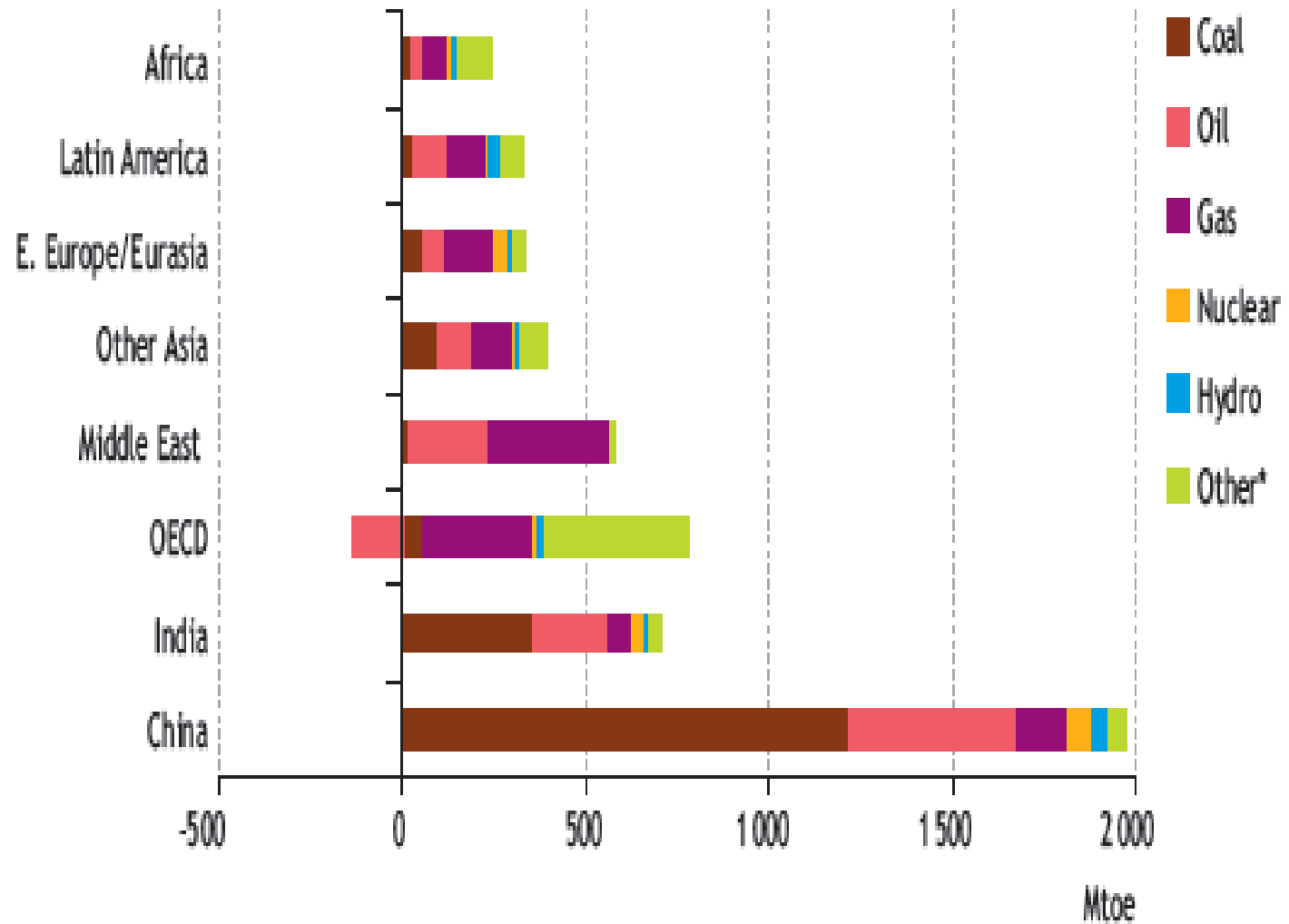
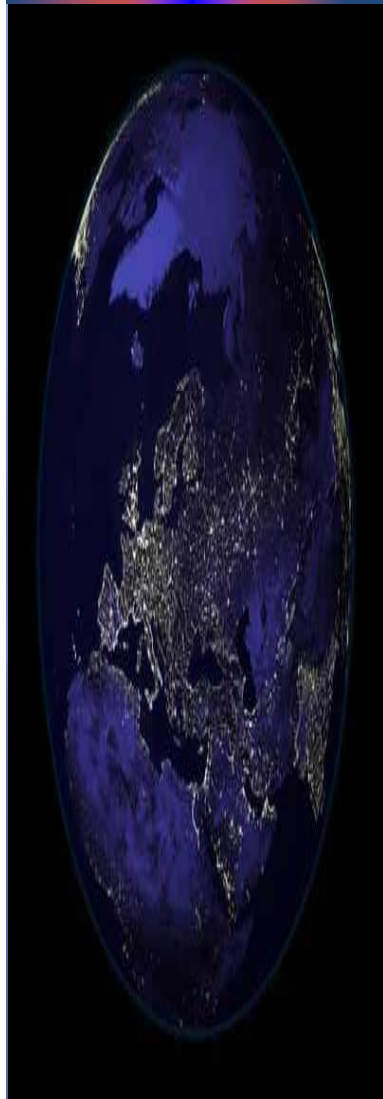
IAE: WORLD ENERGY OUTLOOK. 2030

2



PRIMARY ENERGY DEMAND BY REGION

3



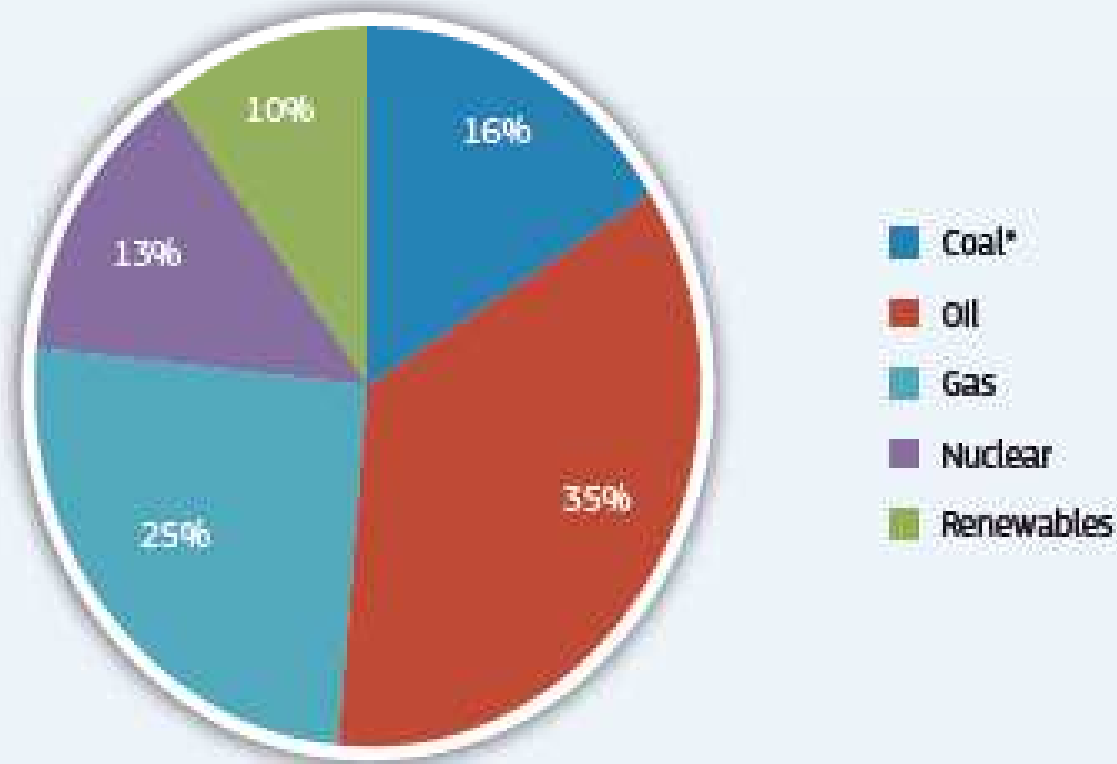
EU-27 ENERGY MIX



4

EU-27 Energy Mix in 2010 (%)

EU-27 Gross Inland Consumption: 1759 Mtoe

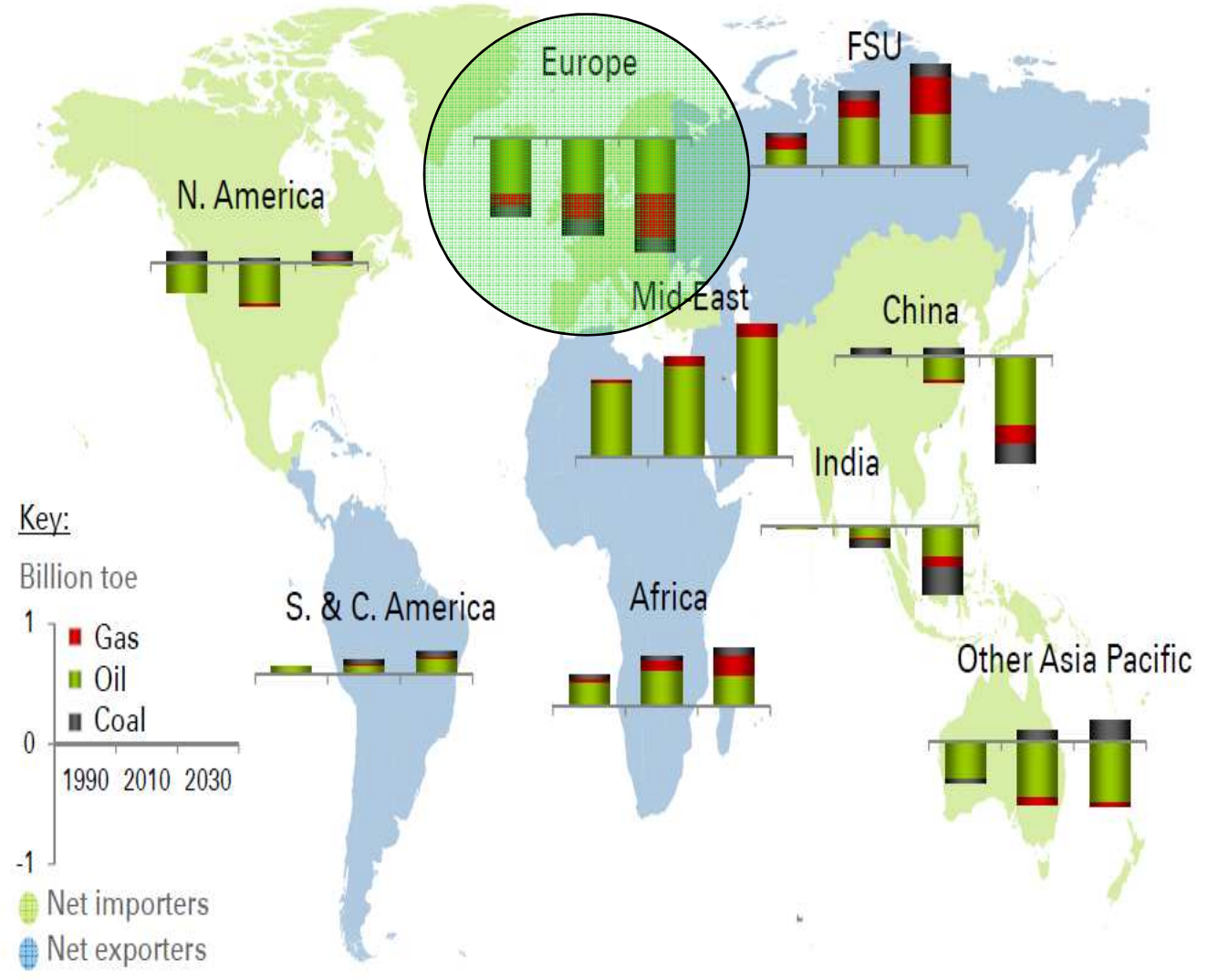
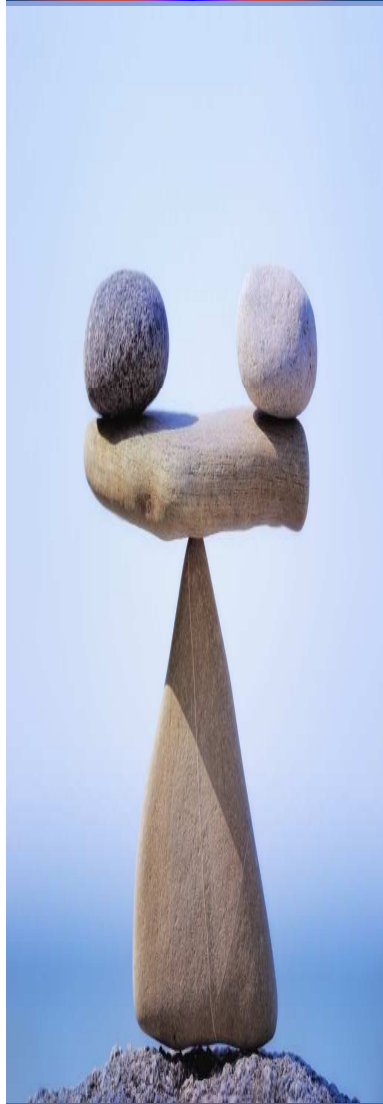


WORLD ENERGY BALANCE 1990-2030



BP STATISTICAL REVIEW OF WORLD ENERGY. 2012.

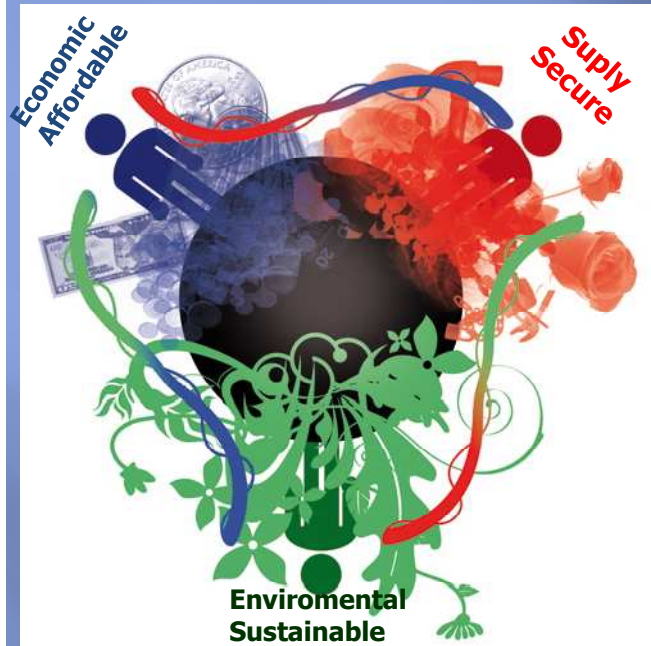
5



TREE MAIN AXES ENERGY MODEL



6



Secure of energy supply



Coal



Oil



Gas



Biomass



Nuclear



Hidraulic



Solar



Wind

Greenhouse gas emissions



European Council of Academies
of Applied Sciences, Technologies
and Engineering



UE ENERGY 2020 GOALS AND STRATEGY

7



20 / 20 / 20 Goals: By 2020:

- at least 20 % reduction in greenhouse gas emissions compared to 1990 (30 % if international conditions are right);
- saving of 20 % of EU energy consumption compared to projections for 2020;
- 20 % share of renewable energies in EU energy consumption, 10 % share in transport.

A strategy for competitive, sustainable and secure energy

Energy roadmap 2050.



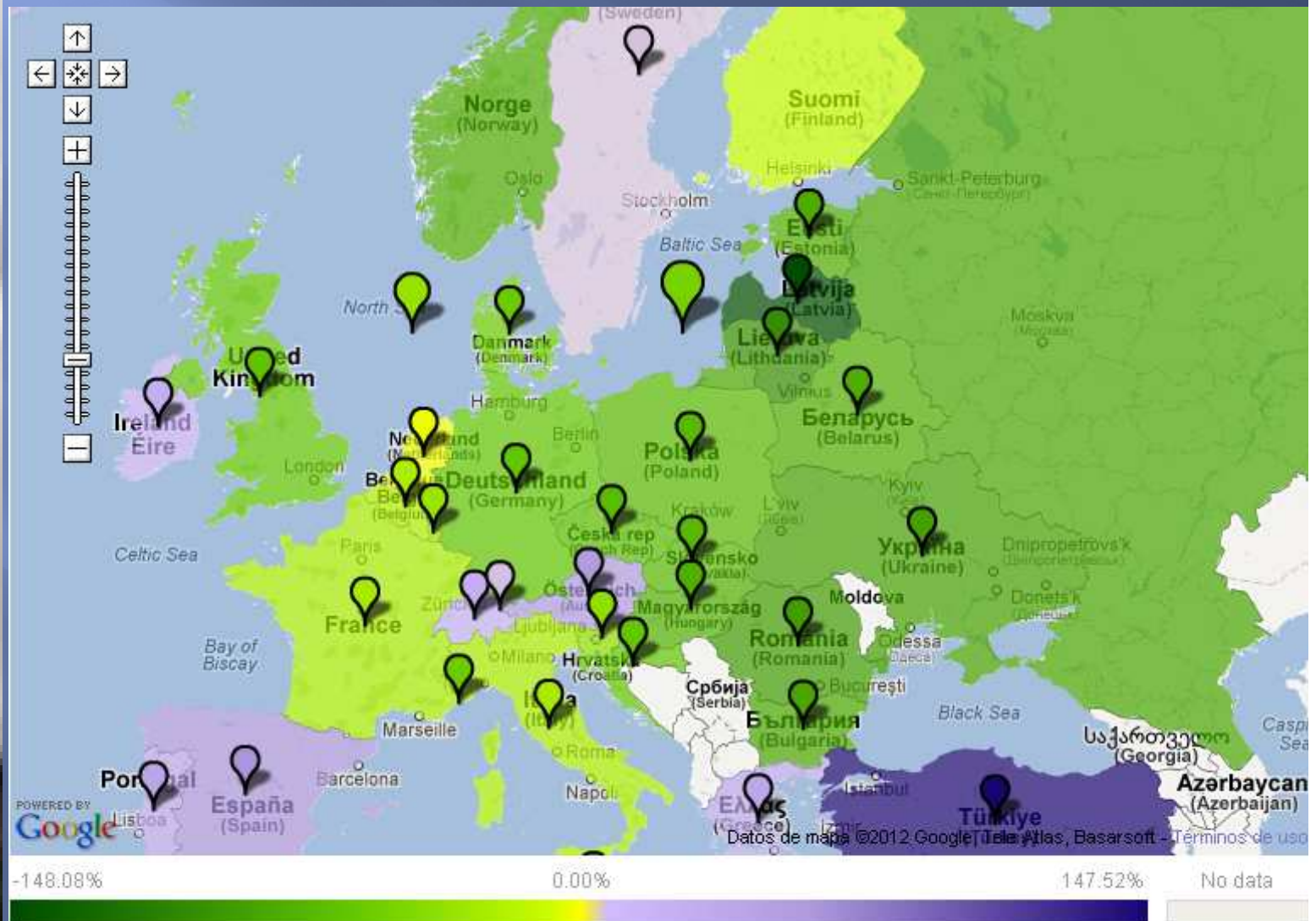
European Council of Academies
of Applied Sciences, Technologies
and Engineering

2010 UE GREEN HOUSE EMISIONS



8

<http://maps.unfccc.int/di/map/>

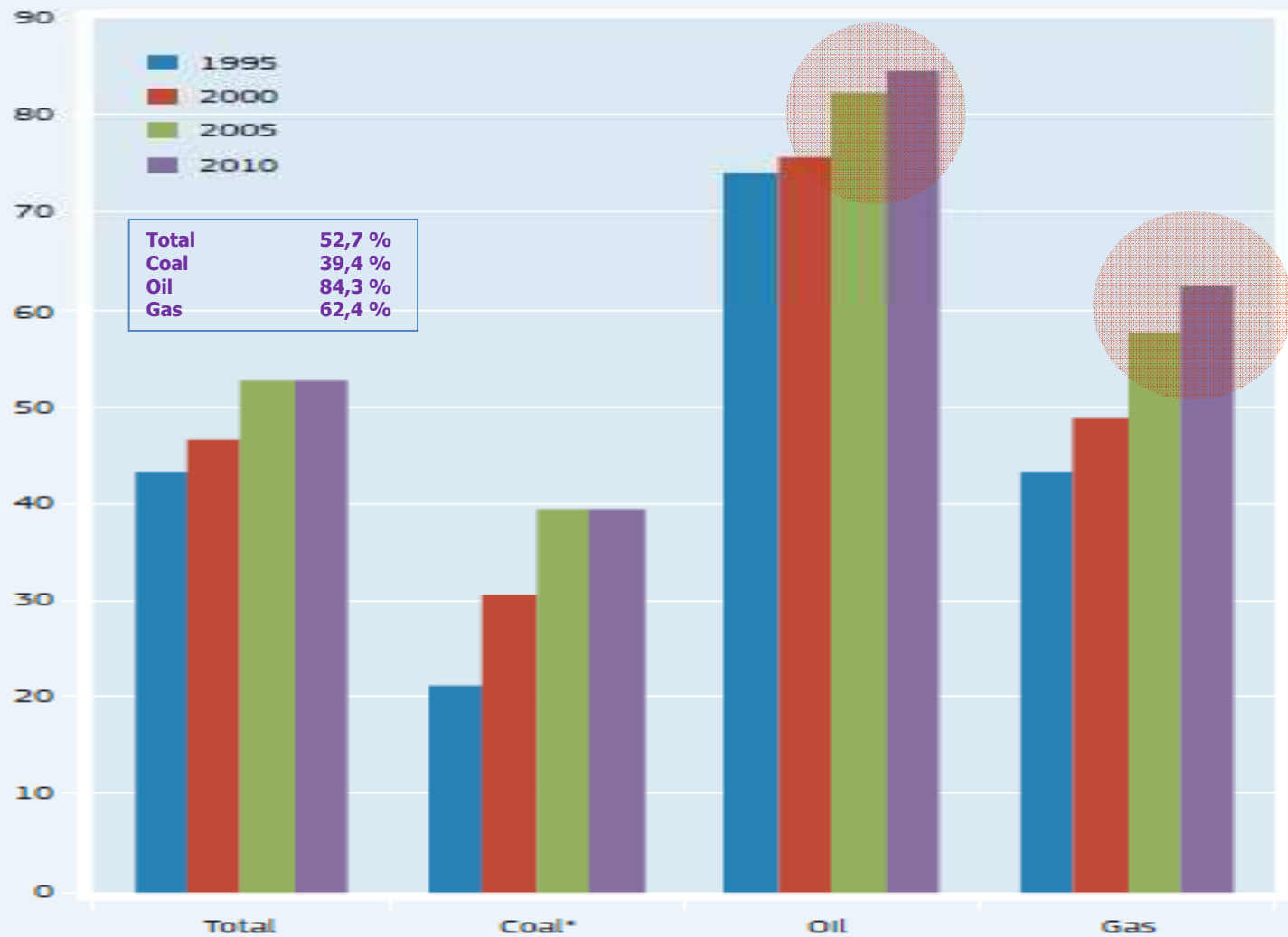


EU-27 FUEL DEPENDENCY

9

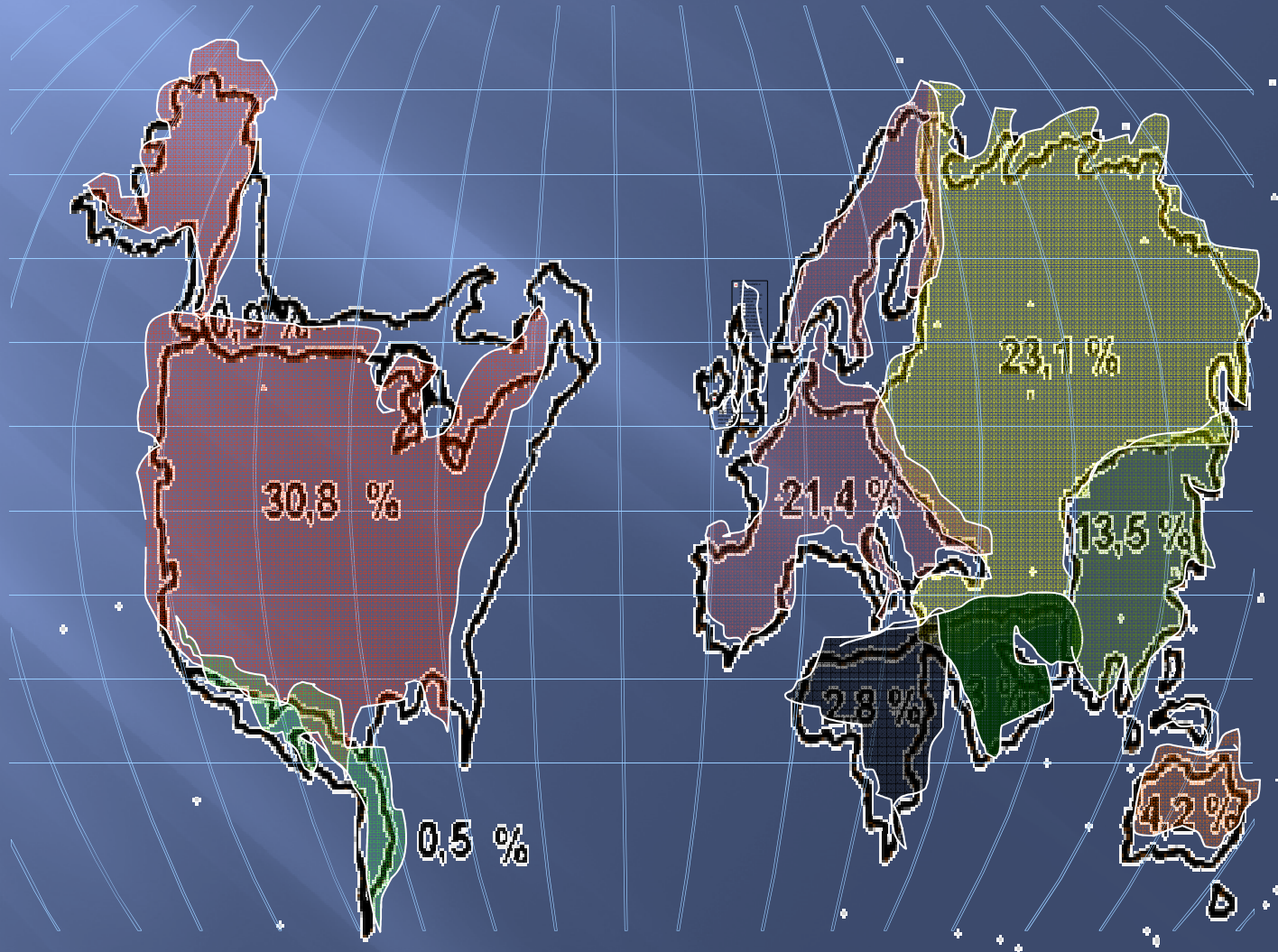


EU-27 Energy Import Dependency (1995-2010) by Fuel (%)



World Coal Reserves

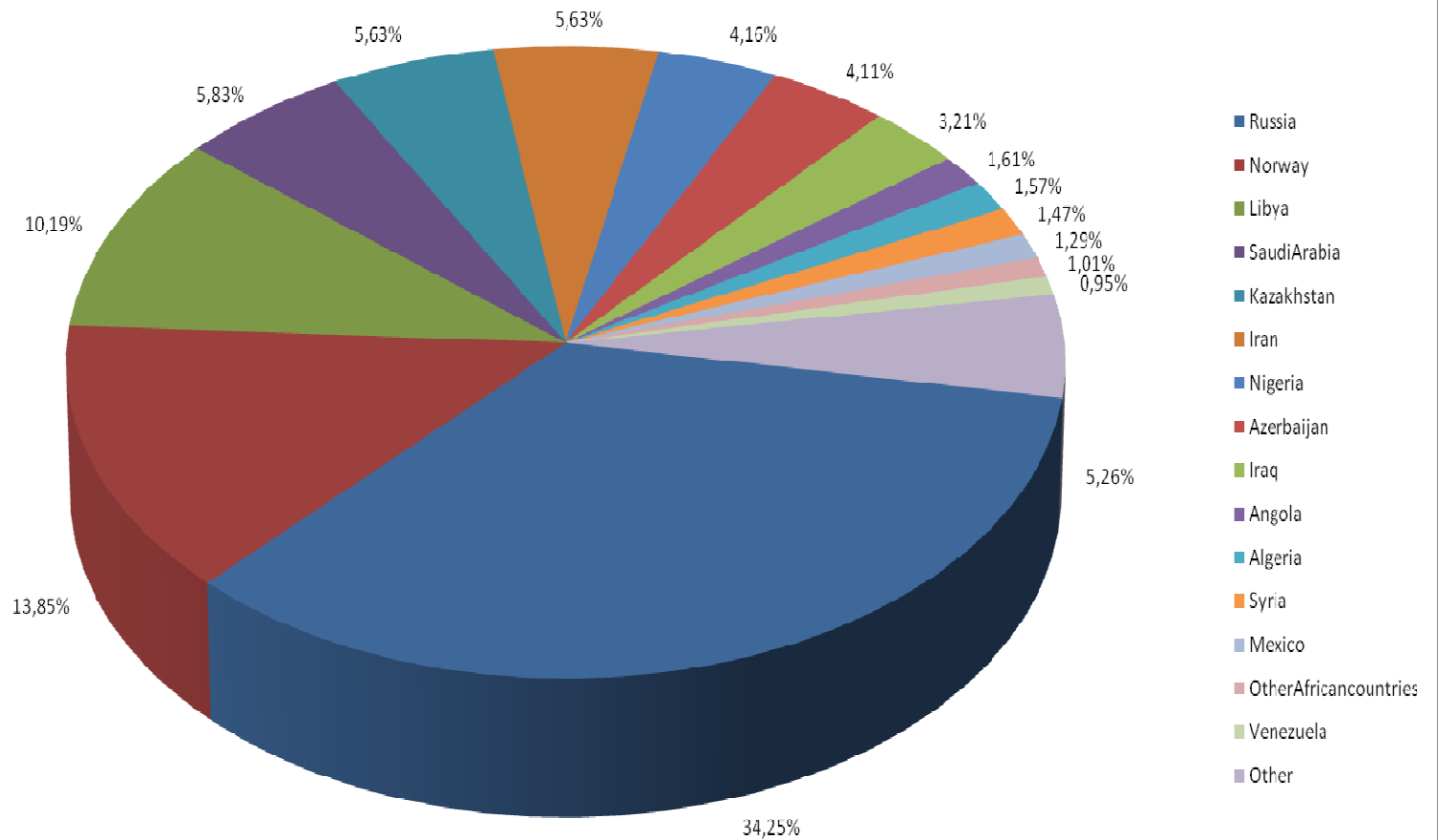
10



OIL AND NGL IMPORTS

11

Imports (by Country of Origin) EU-27 – Crude Oil and natural gas liquids (NGL).



OIL RESERVES



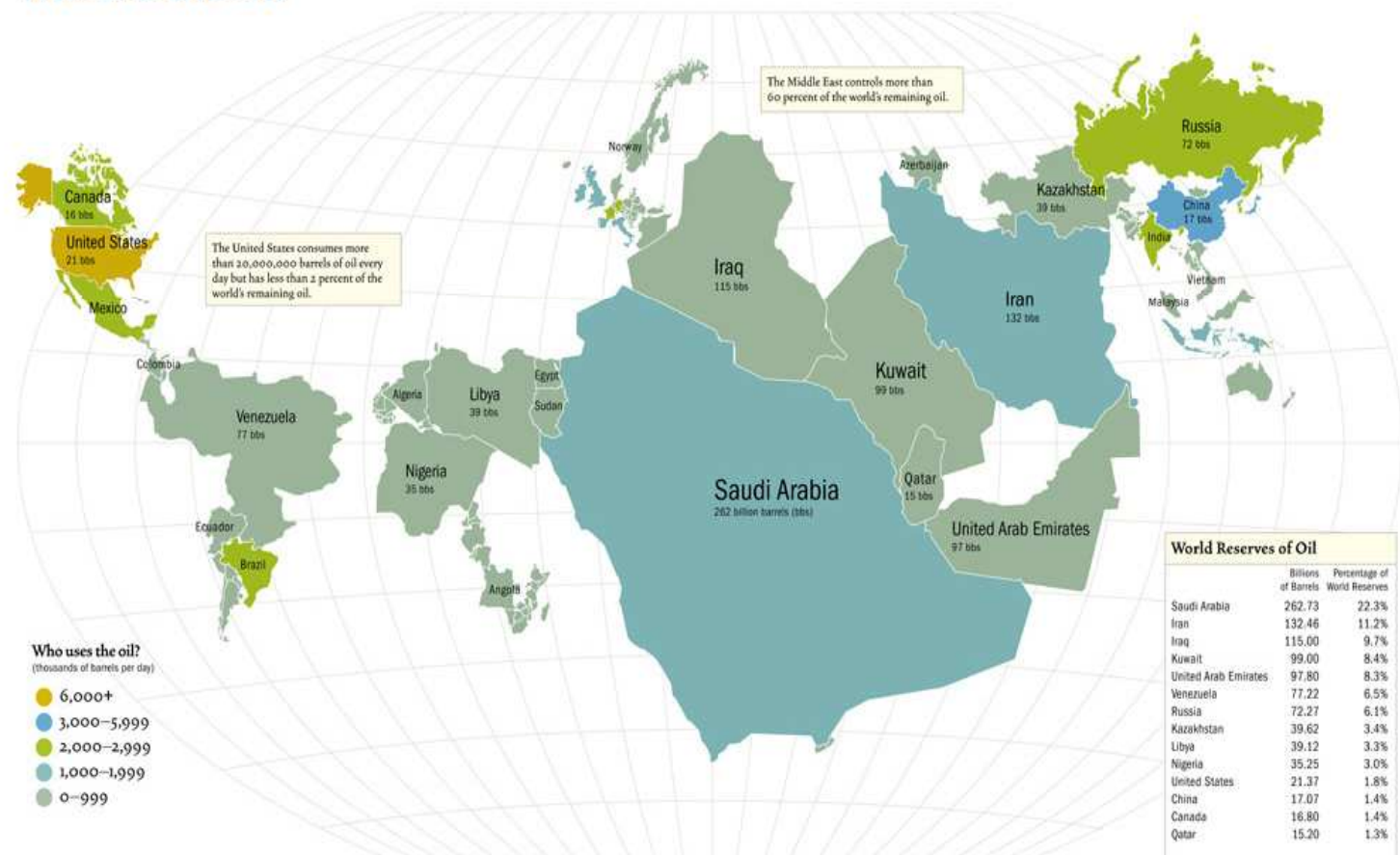
12



358 Oil Well, Robinson, Ill.

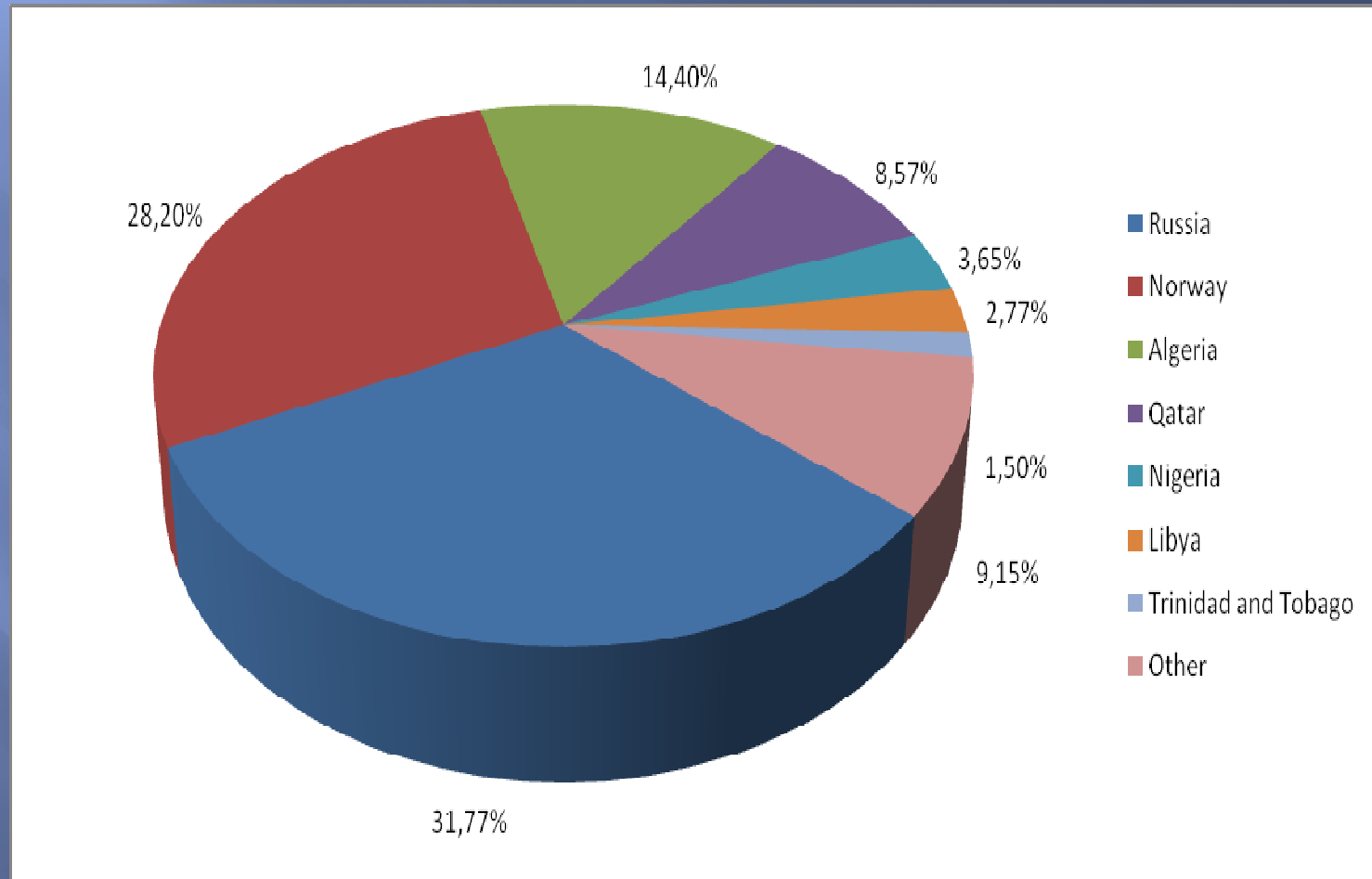
L. B. WILLIAMS, PHOTO BY K. BOWEN, III

Who has the oil?



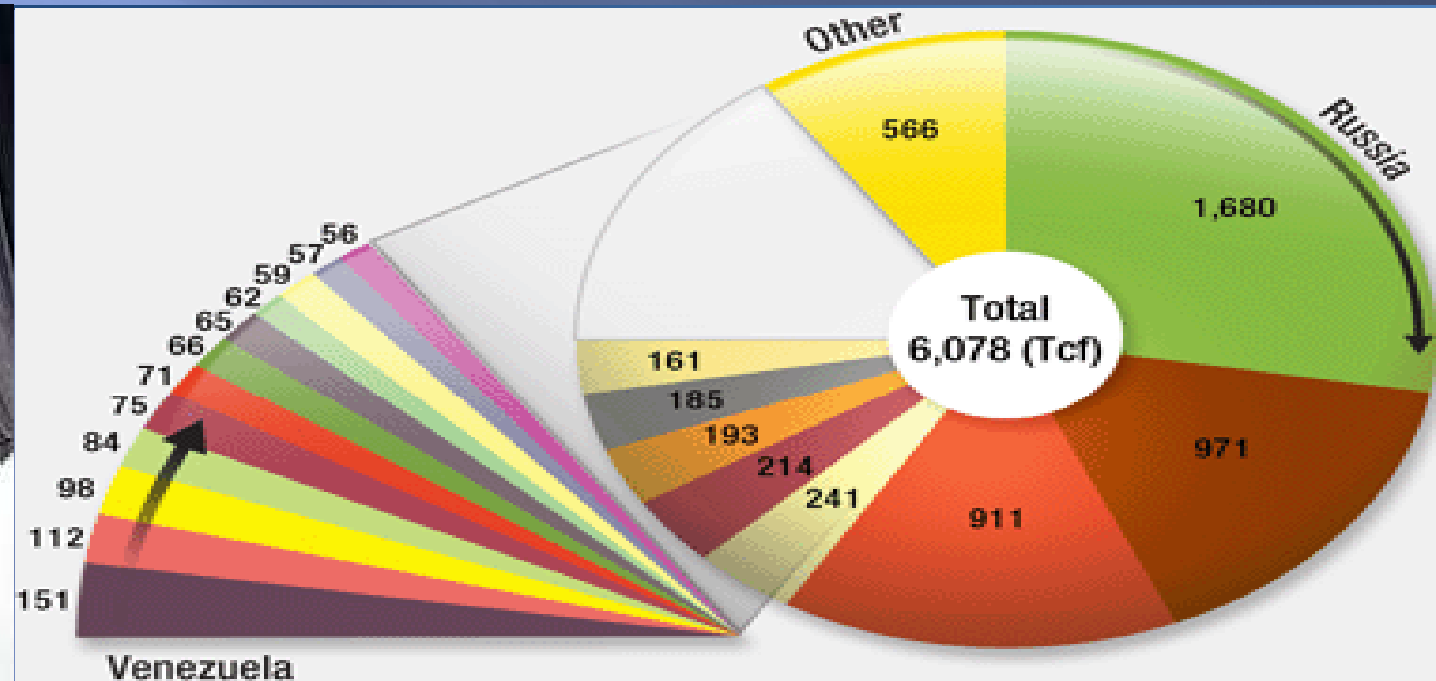
NATURAL GAS IMPORTS


13



GAS RESERVES

14



- | | | |
|--|--|---|
|  Russia |  Algeria |  Uzbekistan |
|  Iran |  Venezuela |  Kazakhstan |
|  Qatar |  Iraq |  Netherlands |
|  Saudi Arabia |  Indonesia |  Egypt |
|  UAE |  Norway |  Canada |
|  USA |  Malaysia |  Kuwait |
|  Nigeria |  Turkmenistan |  Other |

(Clockwise from Russia, blow-up starts with Venezuela)





European Council of Academies
of Applied Sciences, Technologies
and Engineering

PIPELINS FOR SECURE OF GAS SUPPLY



15

IEA - Gas Trade Flows in Europe, in Mcm



2011 OECD/IEA. Software: © Artique, All rights reserved

Nord Stream



South Stream



NABUCCO

Nabuco

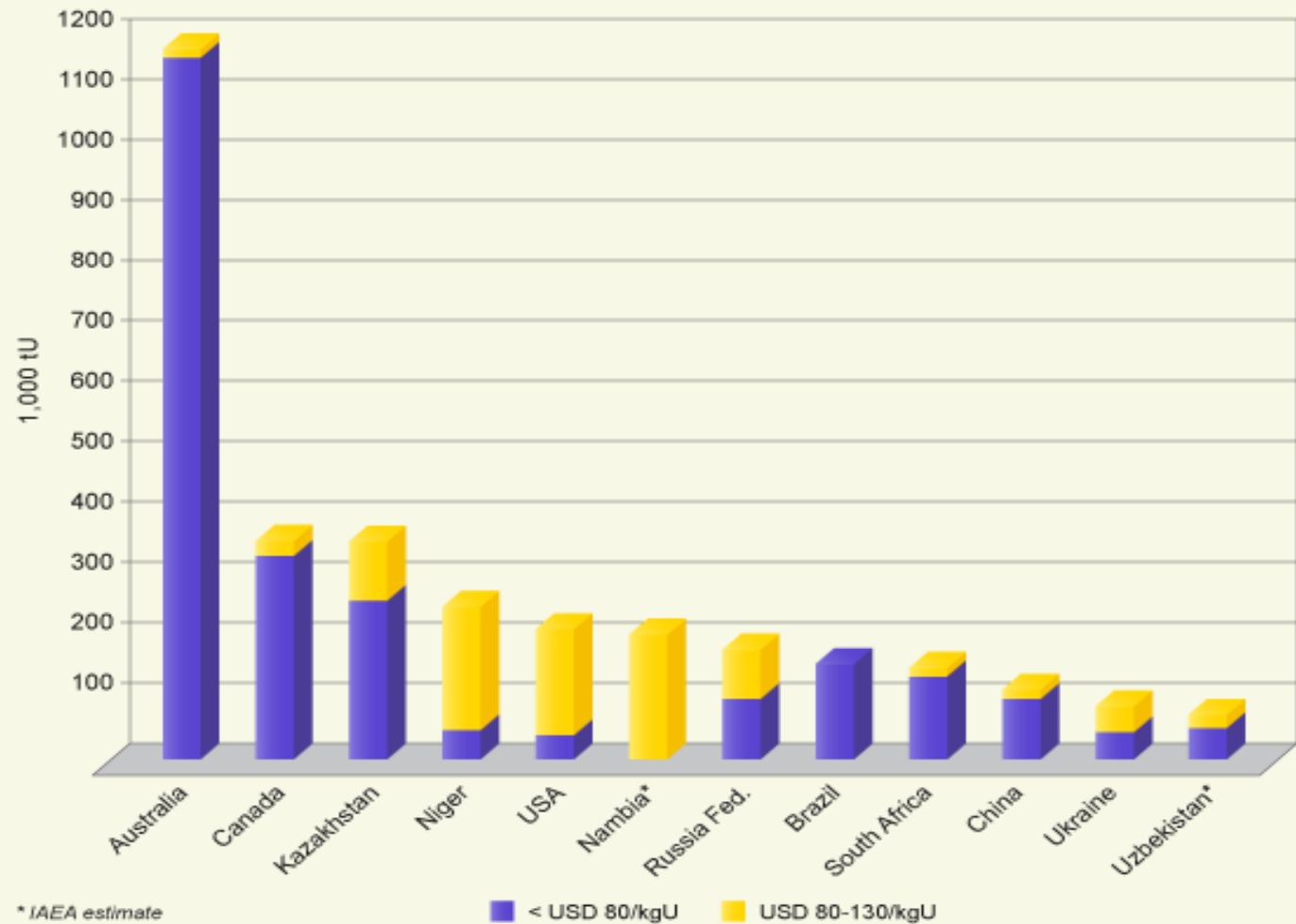


URANIUM RESERVES

16



Reasonably Assured Resources of Uranium in 2009



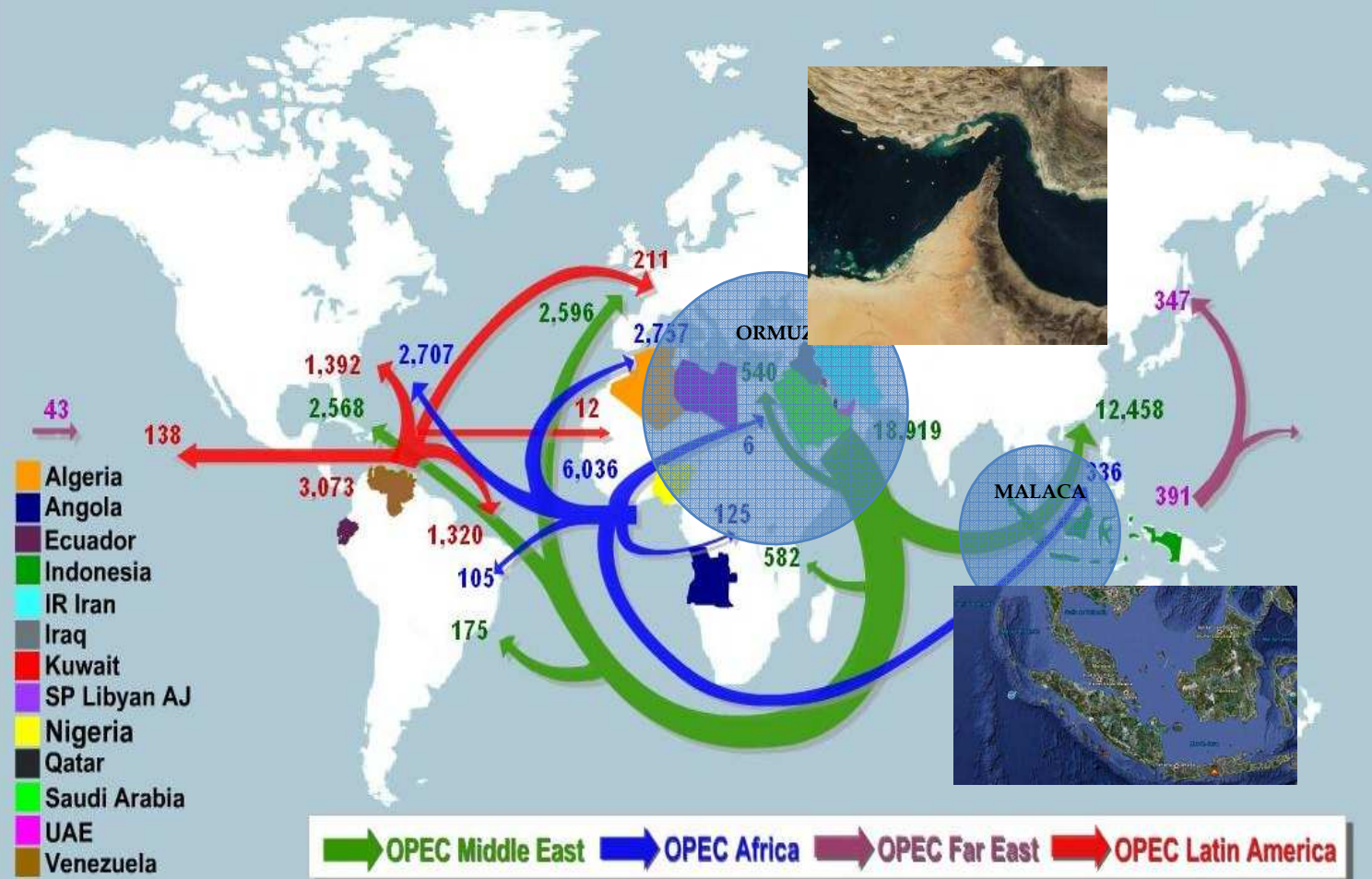
GEOSTRATEGY OF ENERGY (OIL)

17

OPEP: Organization of the Petroleum Exporting Countries

[View Table](#)

OPEC flows of crude and refined oil, 2008 (1,000 b/d)



IRAN CRISIS



18

"Not a single drop" of oil would pass through the Strait if the West imposed sanctions on Iran's oil ports.



Iran's First Vice-President Mohammad Reza Rahimi
28th December 2011

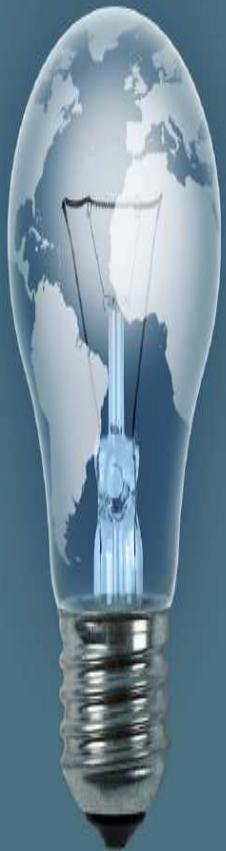


The U.S. Navy's Fifth Fleet:

"Any disruption of traffic in Strait of Hormuz will not be tolerated."

CONCLUSION

19



NEED OF A STRATEGY FOR ENERGETIC INDEPENDENCE FOR EUROPE?

We need to be far more energy efficient

We need to be more sustainable and secure energy

Strategy key elements:

- Energy saving
- growing shares of renewables
- Gas substitution of coal (and oil)
- Development of CCS
- Nuclear energy (as decarbonisation option)
- Strategic energy technology plan (SET-Plan) – R&D



European Council of Academies
of Applied Sciences, Technologies
and Engineering



20

