



# **NATURAL GAS**

**RESOURCES GEOGRAPHY**

**AND WORLD DEMAND 2030**

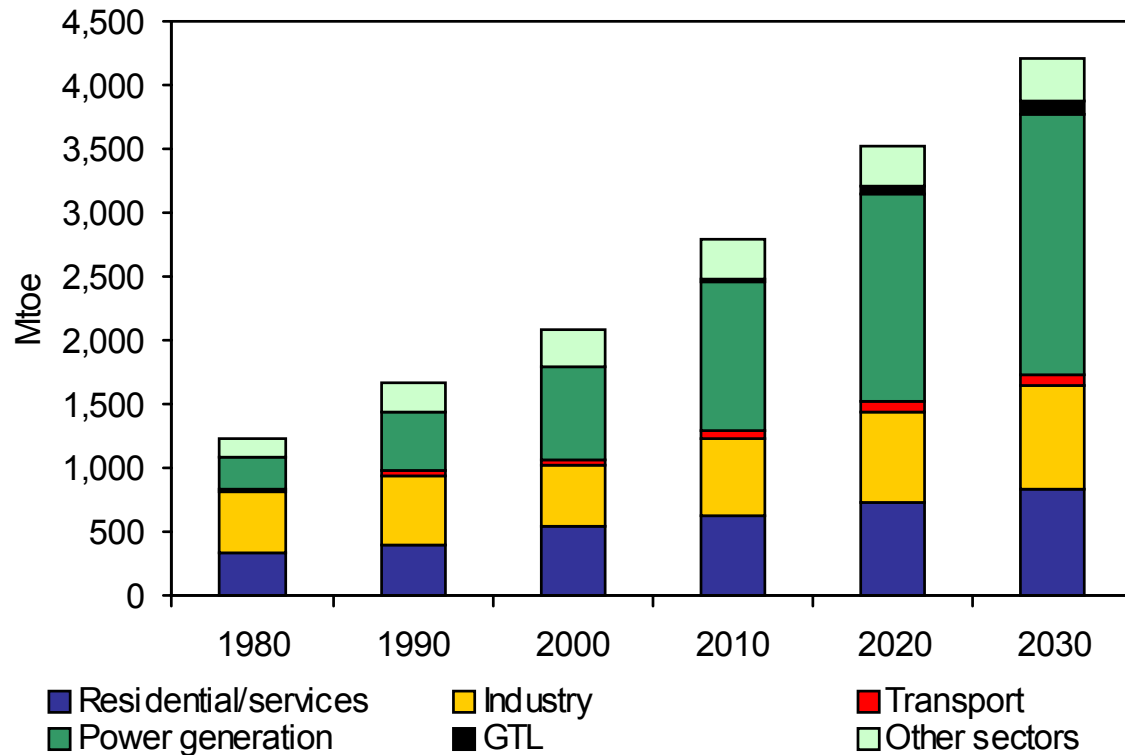


# **NATURAL GAS ENERGY VECTOR**



# NATURAL GAS - WORLD DEMAND EVOLUTION

Source: IEA



**FUTURE DEMAND FOR POWER GENERATION (50% in 2030)**

**POSSIBLE LIQUEFACTION (FISCHER TROPSCH)**



# NATURAL GAS AND ENVIRONMENT

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**LESS CO2 PRODUCTION / OTHER FOSSIL ENERGIES**

**CAPTURE AND SEQUESTRATION OF CO2 ?**

**NATURAL GAS : COST EFFECTIVE PRODUCTION OF HYDROGEN**



**HYDROGEN  
PRODUCTION UNIT**



# **HYDROGEN, COMBUSTIBLE OF THE FUTURE?**

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**PRODUCES NO GREENHOUSE GAS?**

**LARGE AVAILABILITY BUT NEEDS TO BE PRODUCED**

**MORE ENERGETIC IN MASS BUT LESS IN VOLUME THAN NG**

**COMBUSTIBLE FOR FUEL CELLS**

**STORAGE AND TRANSPORTATION**

**LARGE RESERCH EFFORT IN THE WORLD**



# **NATURAL GAS**

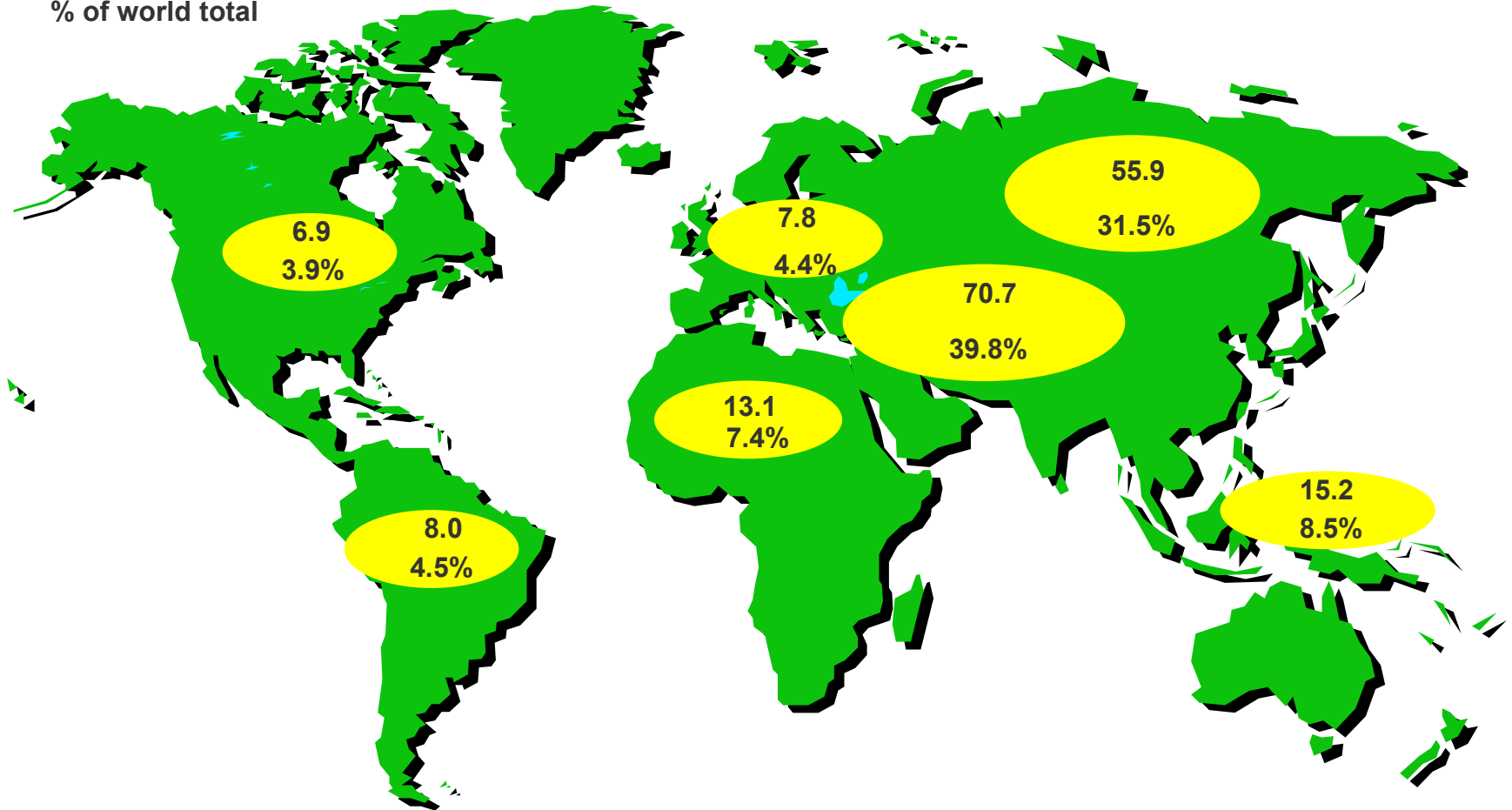
**TRANSPORT**

**NETWORK FUTURE TREND**



# NATURAL GAS - PROVEN RESERVES 2002 (Tcm) AND REPARTITION

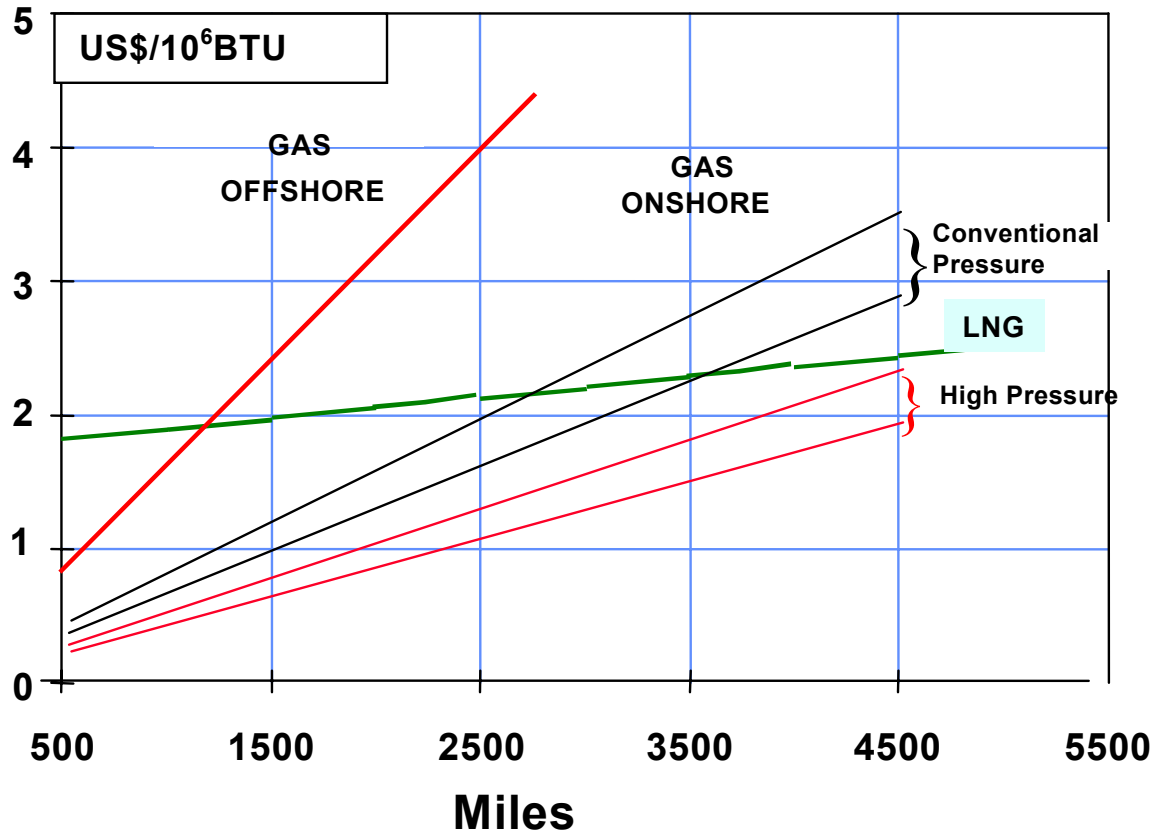
% of world total



Source: CEDIGAZ



# PIPELINES / LNG for 30 bcm capacity



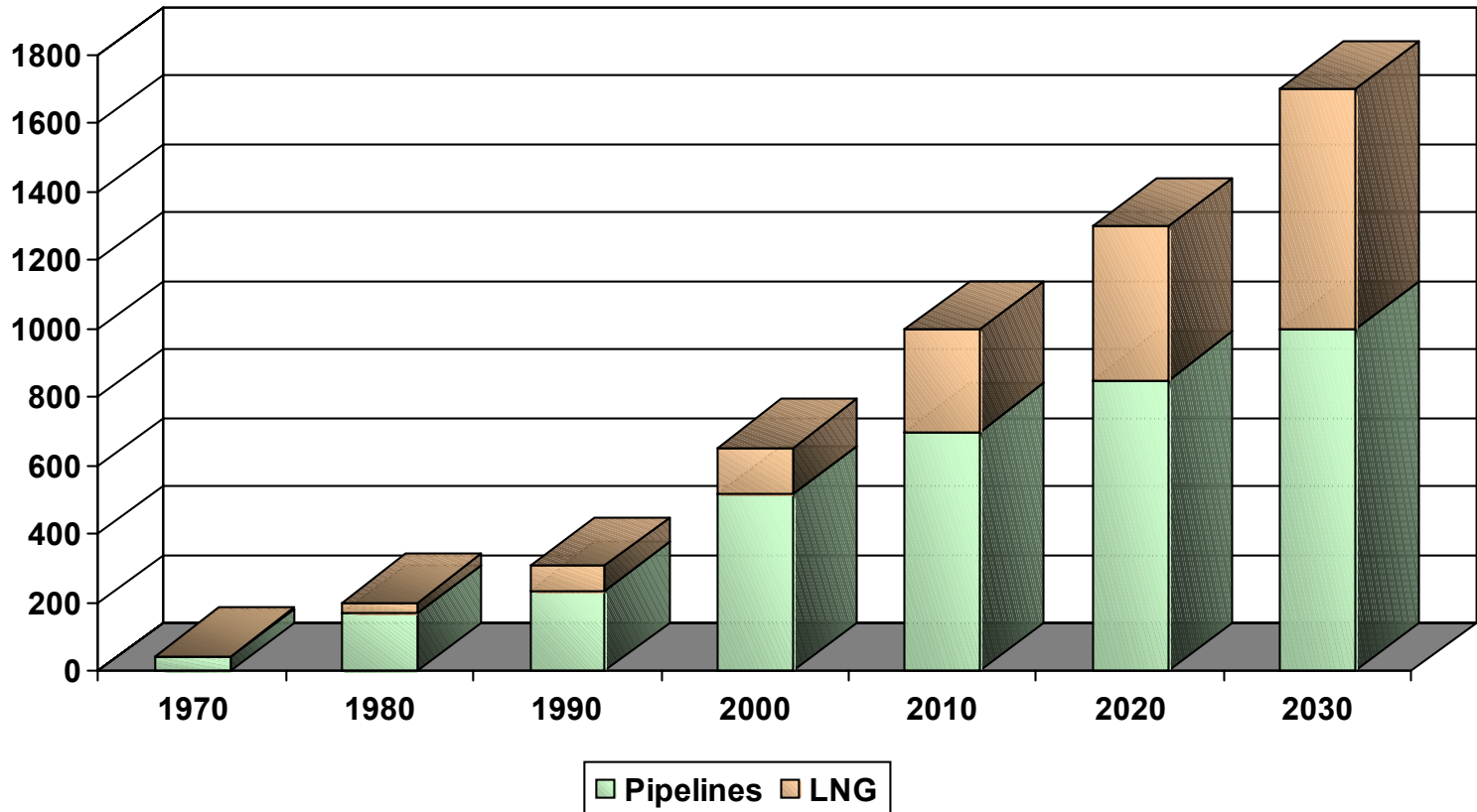
Source: ENI  
1 KW.h = 3400 BTU

**USE OF HIGH PRESSURE PIPES AND HEADLOSSES REDUCTION  
MAY FAIRLY IMPROVE LONG DISTANCE PIPE TRANSPORTATION**





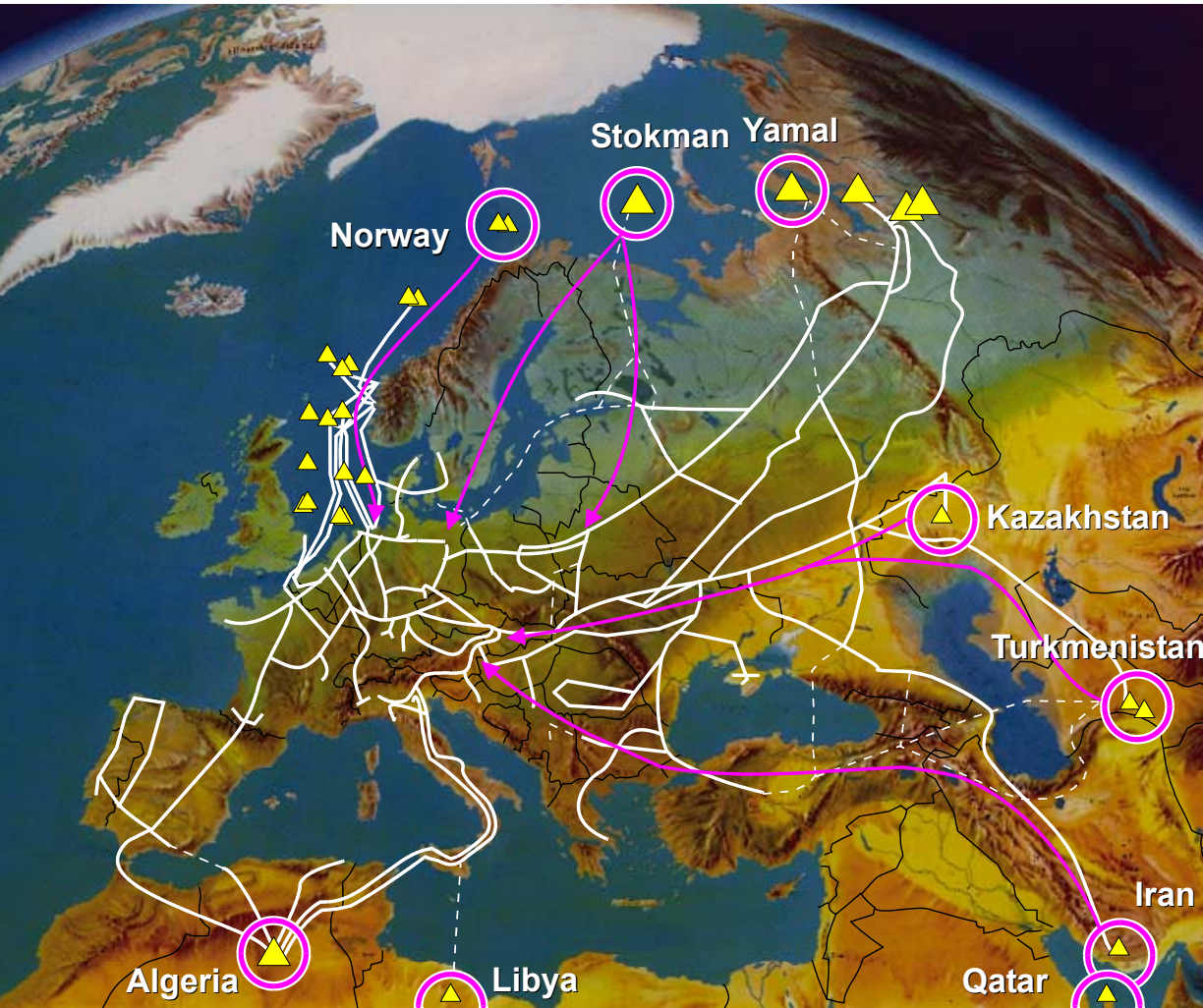
# NATURAL GAS INTERNATIONAL PROSPECT TRADE







Source: CEDIGAZ



# NATURAL GAS EUROPEAN NETWORK



-  **GAS FIELDS**
-  **Existing network**
-  **Under construction**
-  **Possible future projects**

Source : Ruhrgas, Eurogas Seminar, November 2002.



# NATURAL GAS FUTURE TRANSPORTATION

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## WORLDWIDE PIPELINE NETWORK TO GROW

Pipeline transportation sensitive to long distance

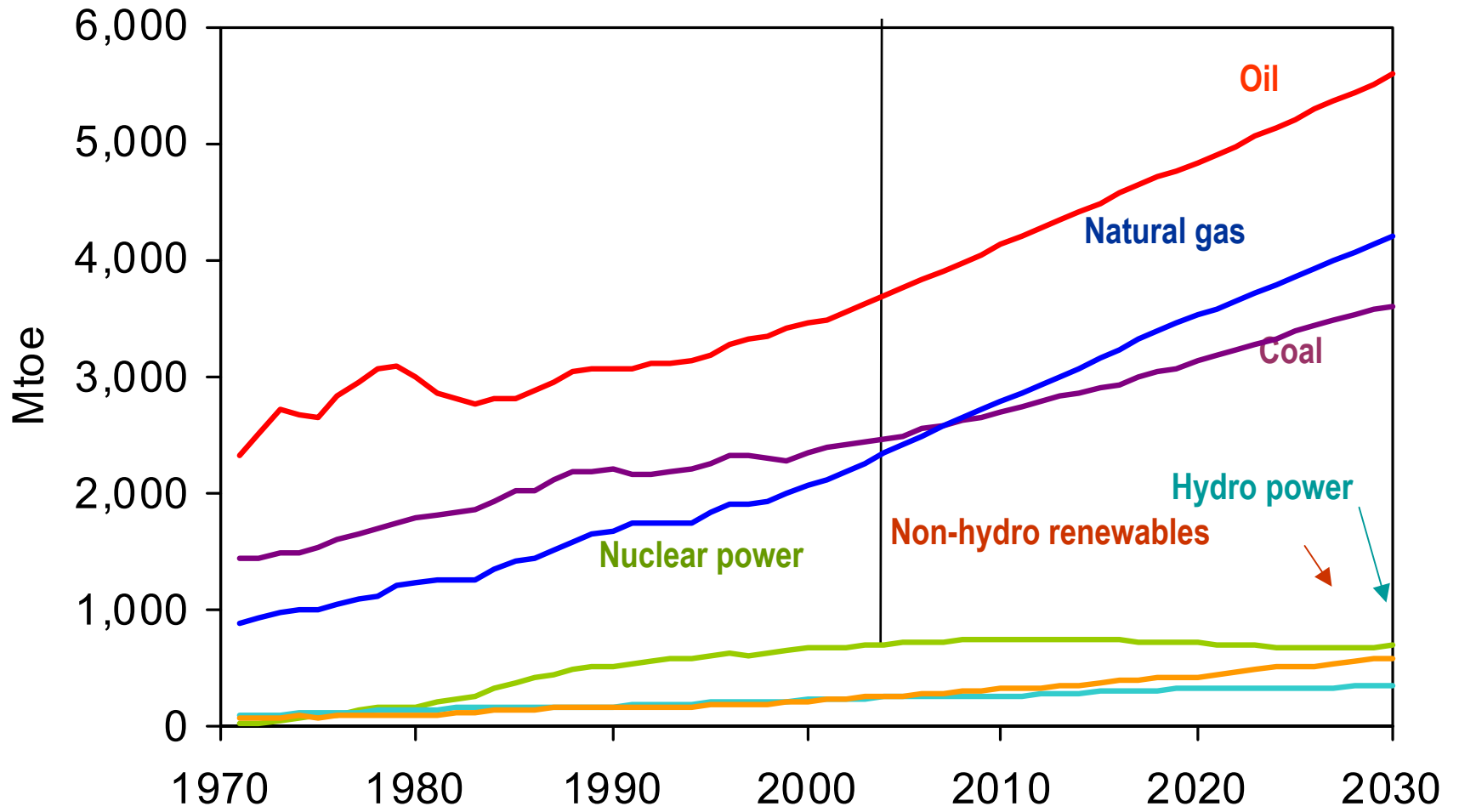
Possible improvements (high strength steel).

## LIQUEFIED NATURAL GAS

Alternative for intercontinental transport

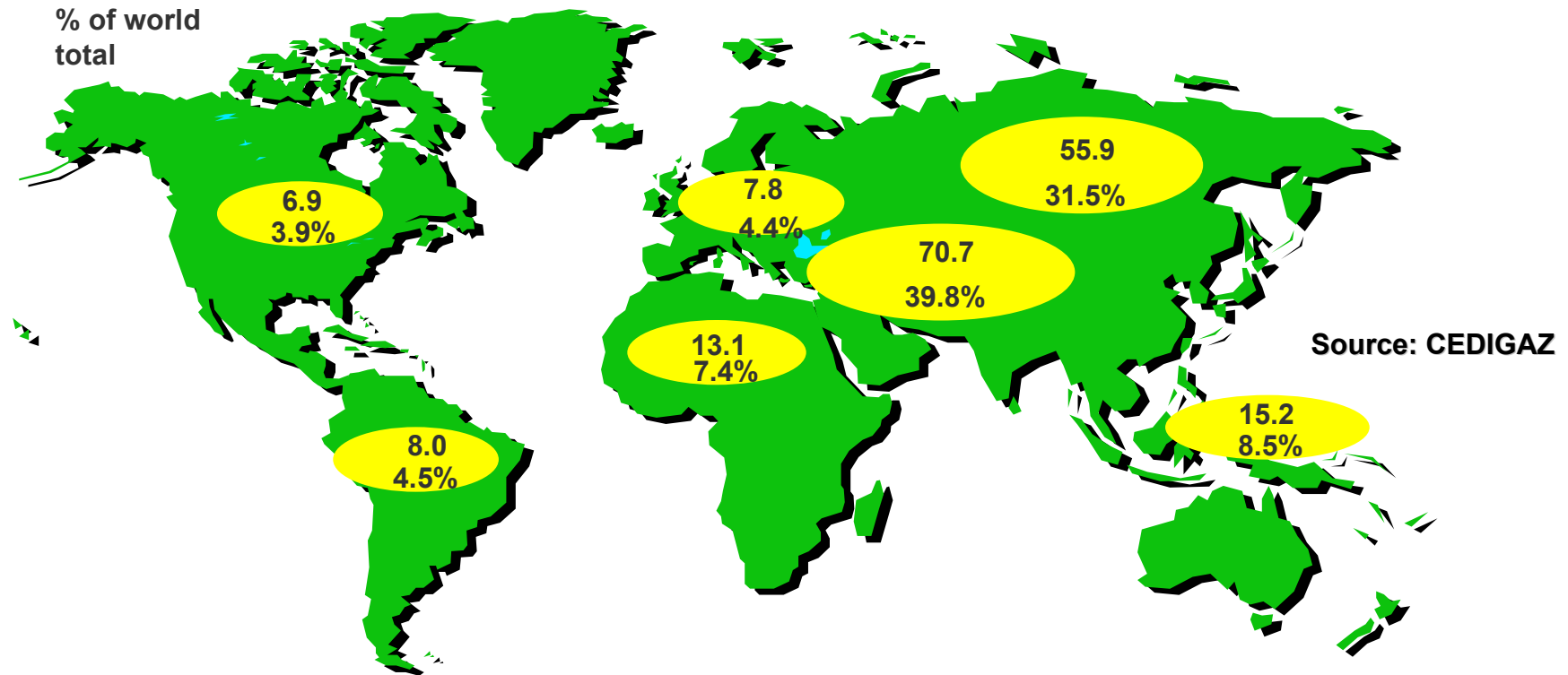


# WORLD PRIMARY ENERGY DEMAND 2030 ( source IEA )





# NATURAL GAS - PROVEN RESERVES 2002 (Tcm)

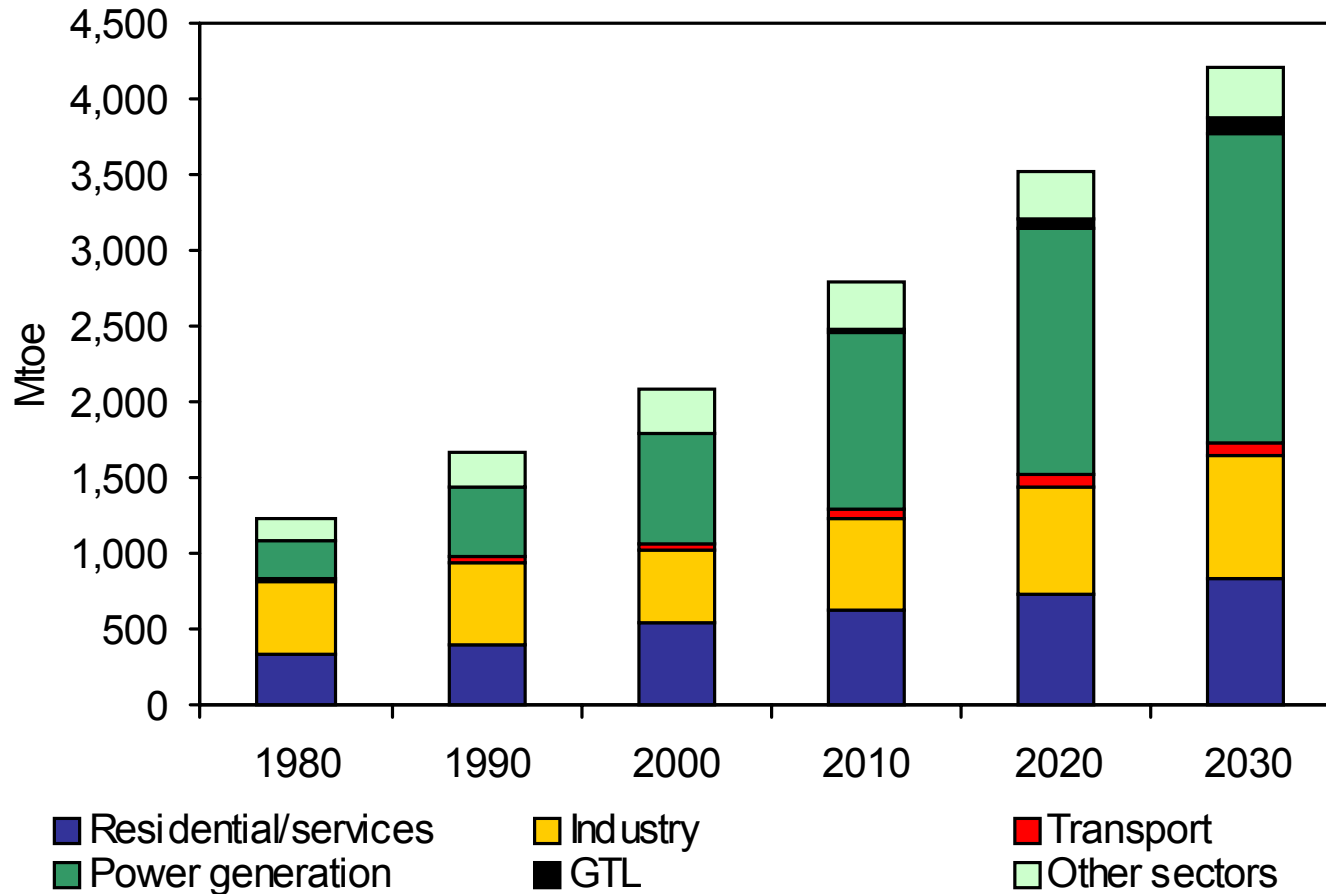


**PROVEN RESERVES / TO DAY CONSUMPTION / 60 YEARS**

**FAVOURABLE FUTURE PROSPECTS**



# NATURAL GAS - WORLD DEMAND EVOLUTION



Source: IEA



# NATURAL GAS RESOURCES AND NEEDS 2030

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**ABUNDANT RESERVES WORLDWIDE SPREAD**

**60 YEARS OF PROVEN RESERVES / TO DAY CONSUMPTION**

**RESERVE CONCENTRATION SIBERIA AND MIDDLE EAST**

**HIGH RATE OF DEMAND GROWTH**

**COST EFFECTIVE SOURCE FOR POWER GENERATION**

**WILL NEED TRANSPORT NETWORK DEVELOPMENT**