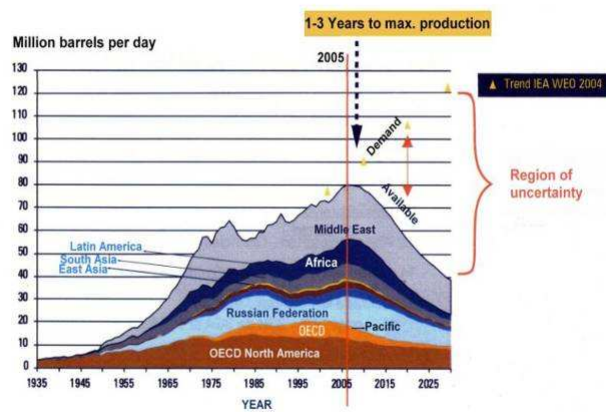


# HYDROGEN AS ENERGY CARRIER

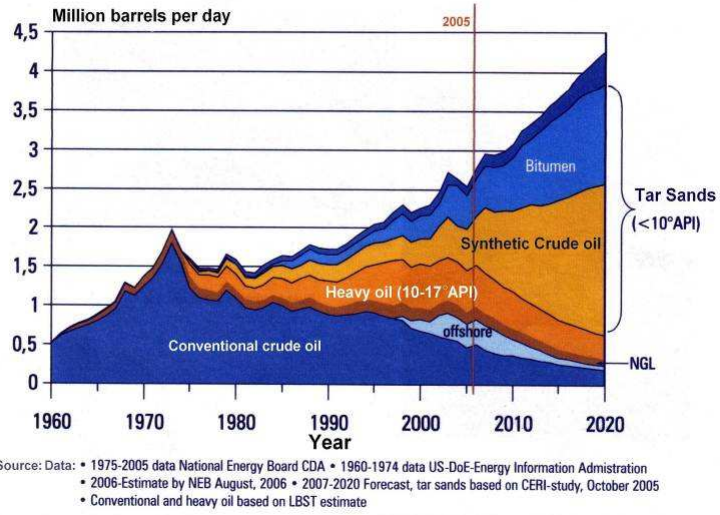
FIG.1 CONVENTIONAL CRUDE OIL PRODUCTION



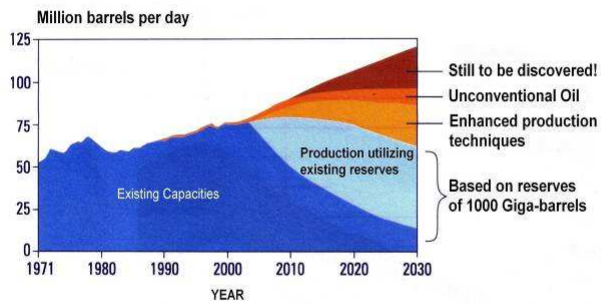
Source data: IHS Energy, BP 2005

ESTIMATE: LBST 2005 (based on ASPO\* scenario) \*JASPO = Association for the Study of Peak Oil & Gas: eine Vereinigung vornehmlich von Geologen, die ehemals in der Öl- und Gas-Exploration tätig waren

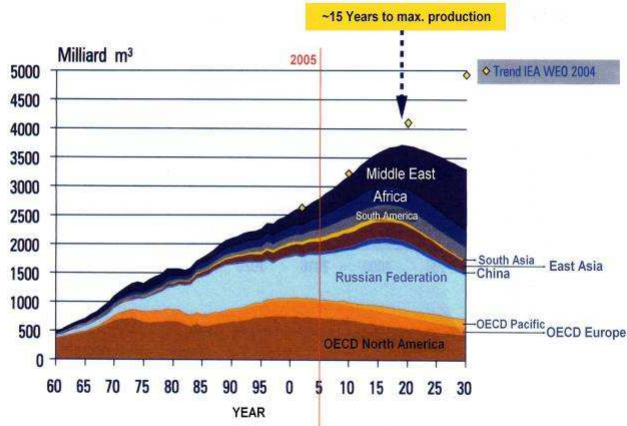
**FIG.2 UNCONVENTIONAL OIL PRODUCTION FROM CANADIAN TAR SANDS**



**FIG.3 FUTURE CRUDE OIL PRODUCTION (IEA)**

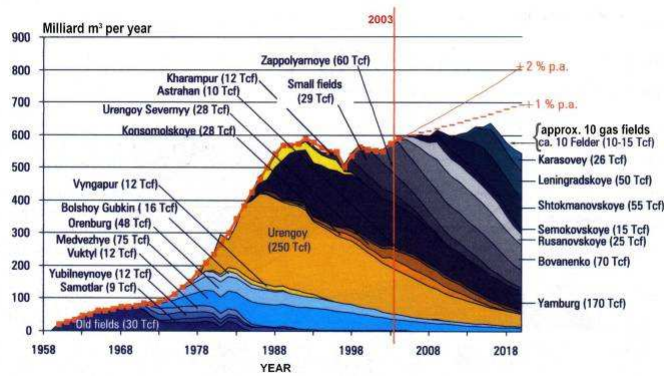


**FIG.4 WORLD NATURAL GAS PRODUCTION**



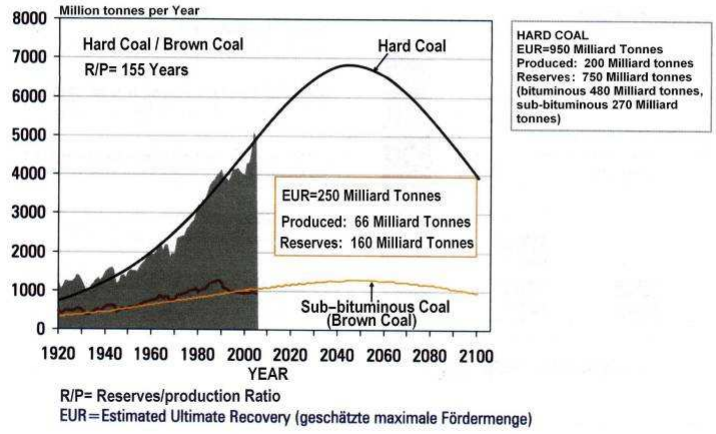
Data: IHS Energy, BP 2005  
Estimate: LBST 2005 (based on ASPO Scenario)

**FIG.5 ANALYSIS OF SINGLE FIELDS OF THE RUSSIAN NAT. GAS PRODUCTION**

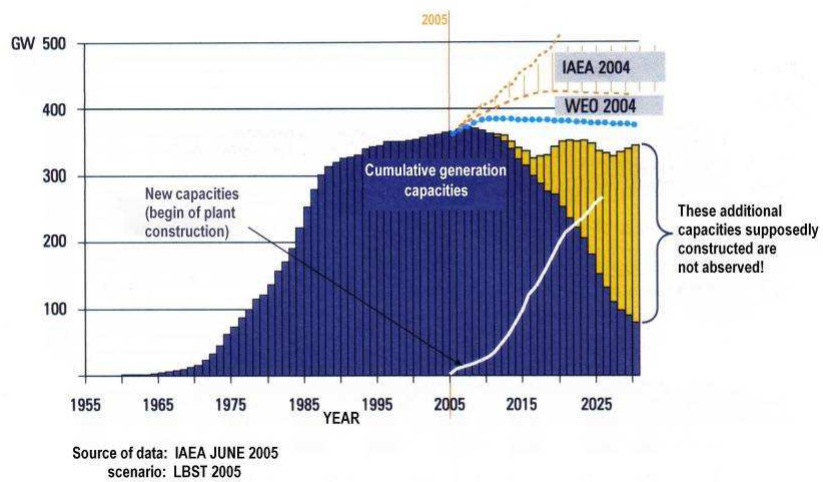


Data Source: Laherrere, LBST

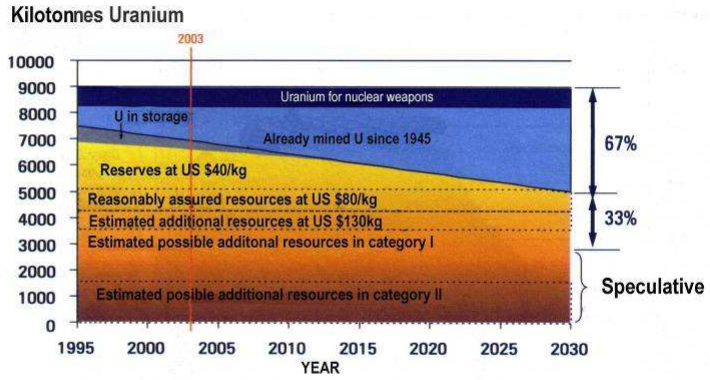
**FIG.6 WORLD COAL PRODUCTION**



**FIG.7 WORLD NUCLEAR POWER GENERATION CAPACITY**

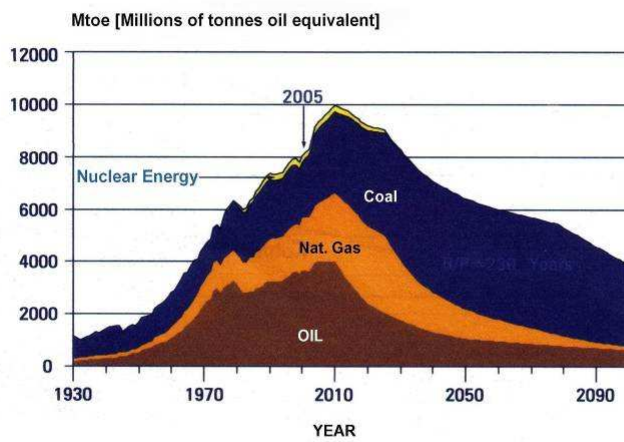


**FIG.8 WORLD URANIUM RESOURCES**



Source of Data: BGR, 2003

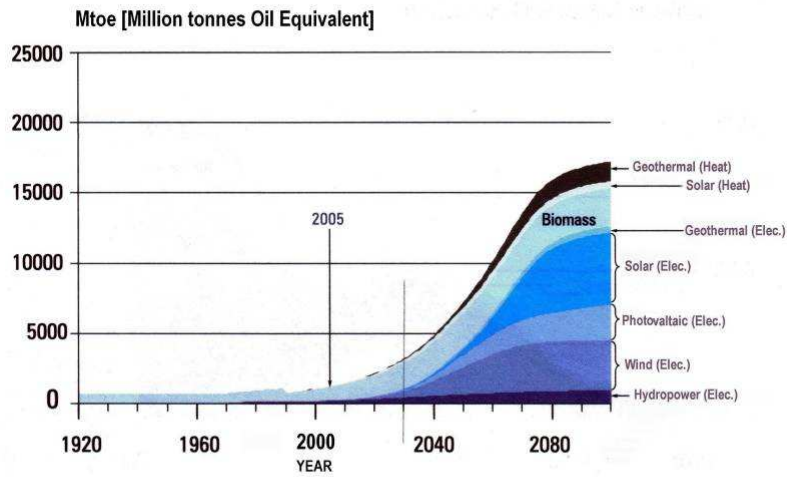
**FIG.9 FOSSIL FUELS AND NUCLEAR ENERGY SOURCES**



Source of Data: Oil, Gas, Coal- Nuclear Scenario, LBST 2005

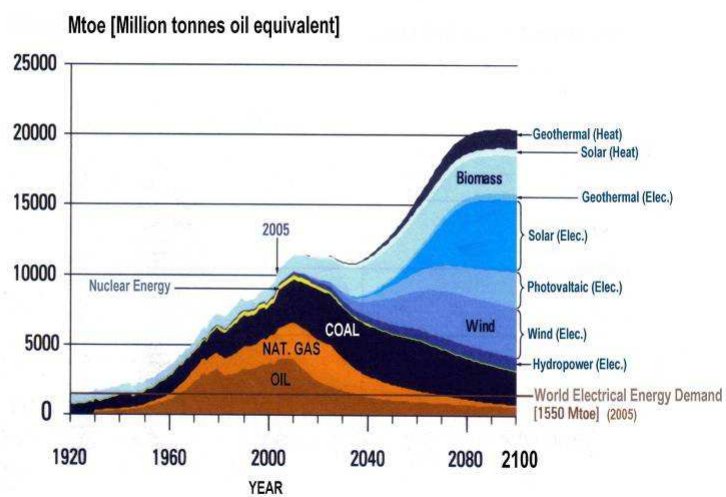


**FIG.10 CONTRIBUTION OF RENEWABLE ENERGY RESOURCES**



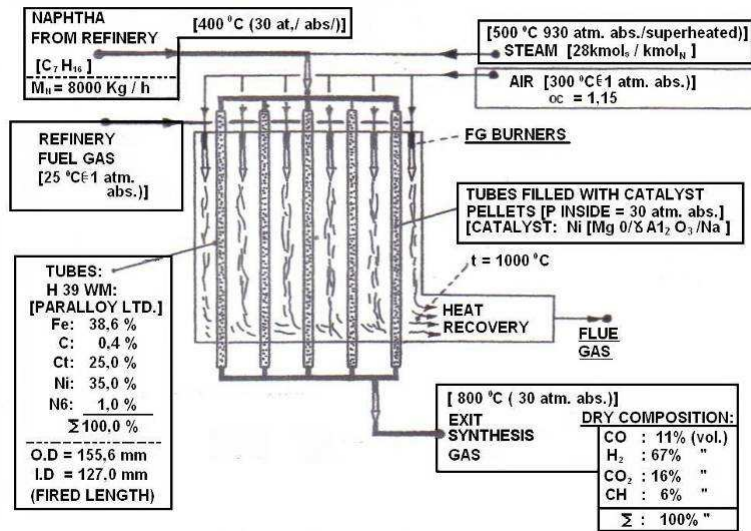
Source of Data: LBST Alternative World Energy Outlook 2005

**FIG.11 A POSSIBLE WORLD ENERGY SCENARIO**



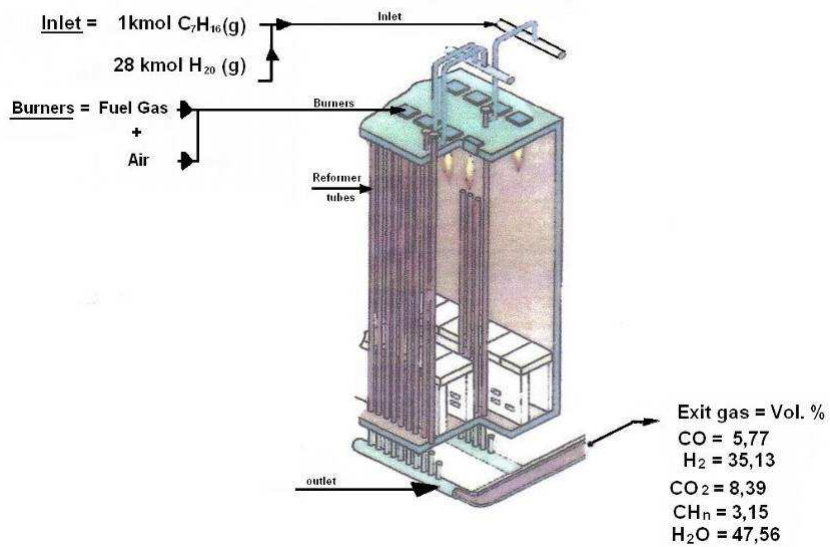
Source of Data: LBST Alternative World Energy Outlook 2005

**FIG.12 NAPHTHA STEAM REFORMER**

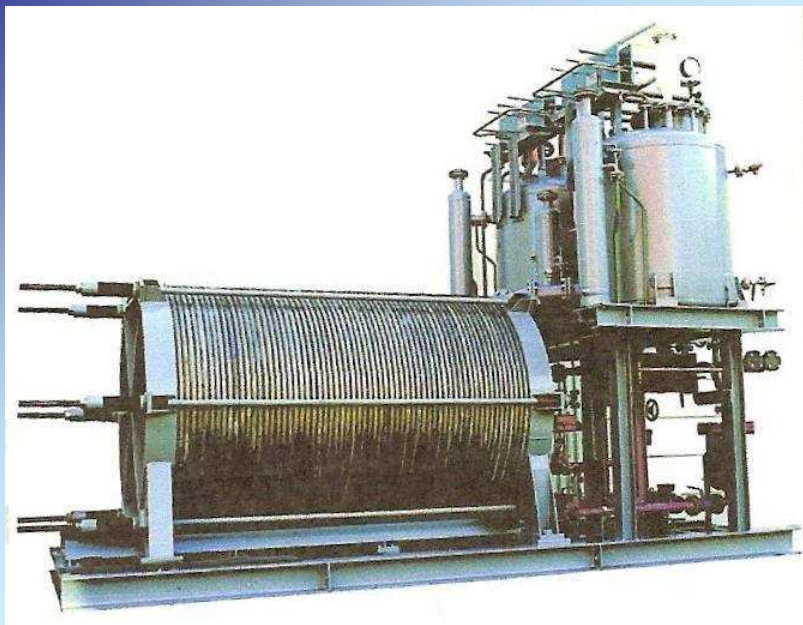
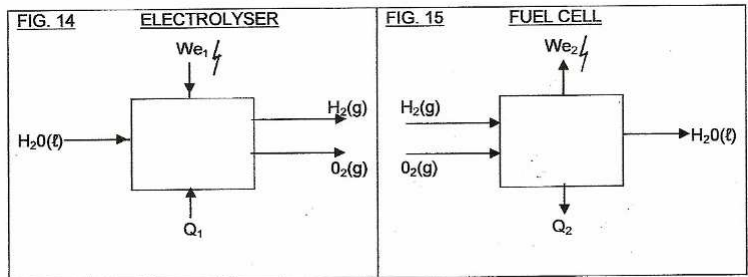


**FIG.13 SYNTHESIS GAS MASS BALANCE**

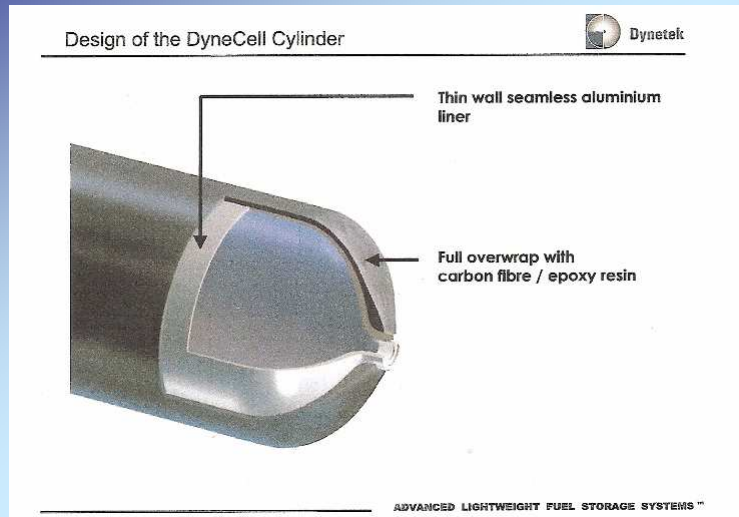
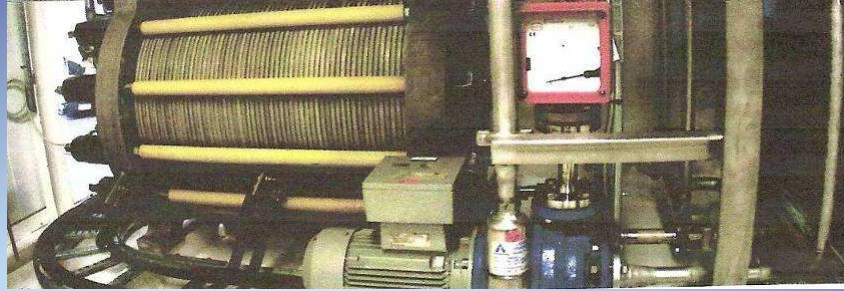
**[SECTION OF STEAM REFORMER]**



ITEM	FORMULA	STATE	$\Delta h^{\circ}_f$ (kJ/mol)	$\Delta g^{\circ}_f$ (kJ/mol)	$S^{\circ}$ (kJ/mol. K)
Water	H <sub>2</sub> O	ℓ	-285,840	-237,192	0,06994
Oxygen	O <sub>2</sub>	g	0	0	0,20503
Hydrogen	H <sub>2</sub>	g	0	0	0,13059







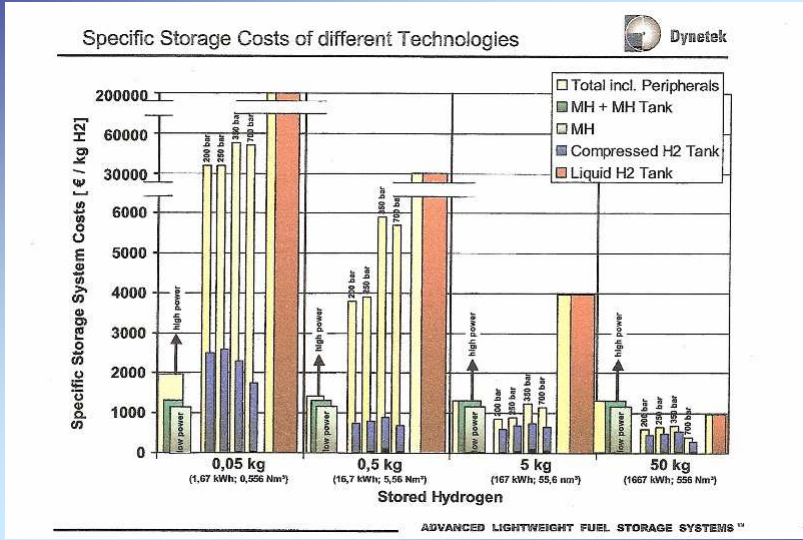


Figure 3.1-8: Electricity Consumption Depending on the Final Pressure

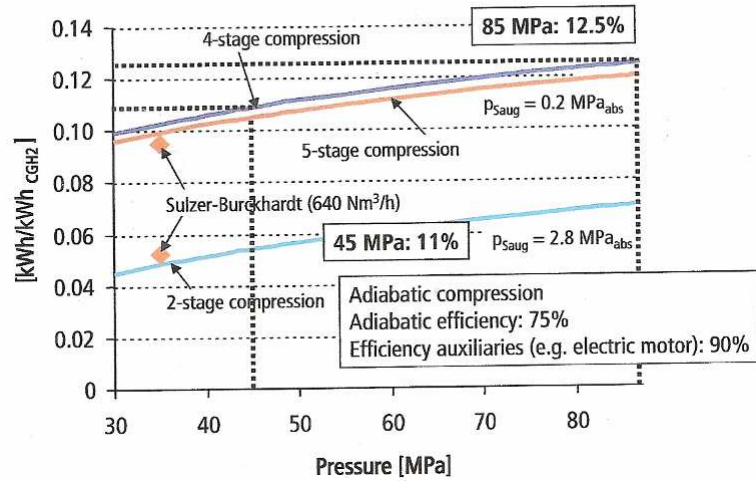
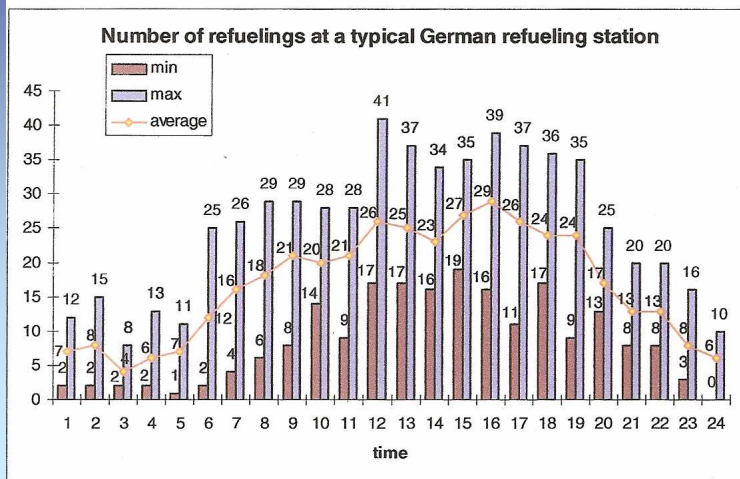


Figure 3.4-1: Number of Filling Operations at a Typical German Public Filling Station



A rectangular image with a blue gradient background. The top half shows a lighter blue sky with wispy clouds, and the bottom half shows a darker blue sea with a horizon line. The text "End of presentation" is centered in white with a black outline.

End of presentation