



International Energy Agency

Collaborative Project
on
Enhanced Oil Recovery

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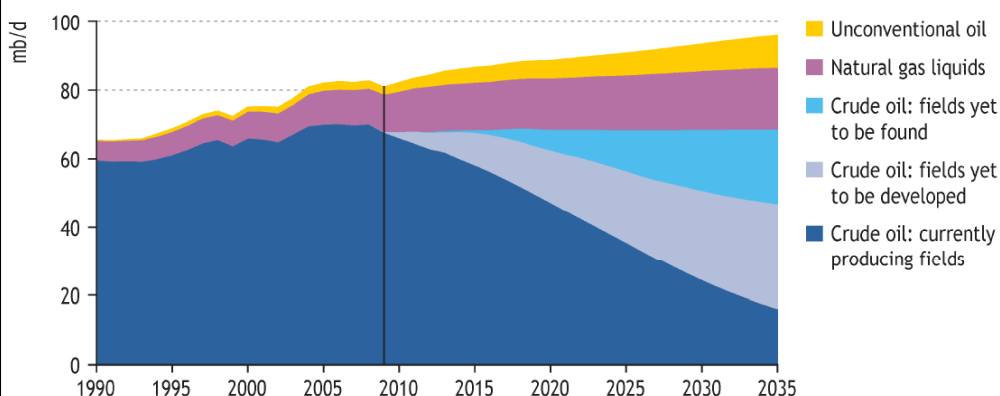
Chairman IEA EOR Initiative

Vienna, February 2011



Oil Production Forecast

World oil production by type in the New Policies Scenario

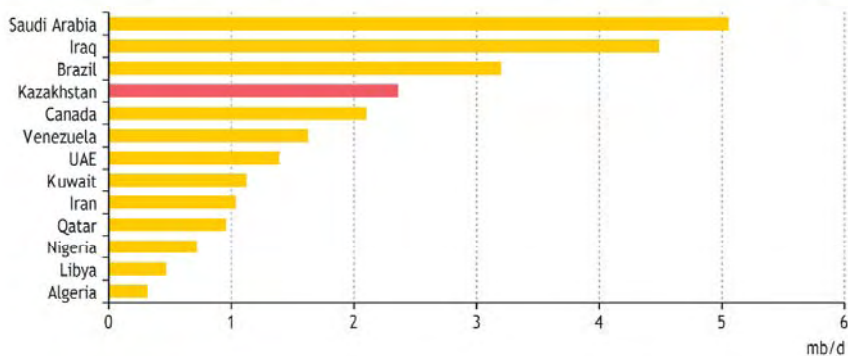


IEA World Energy Outlook 2010

Incremental oil production 2009-2035



Incremental oil production by selected country in the New Policies Scenario, 2009-2035

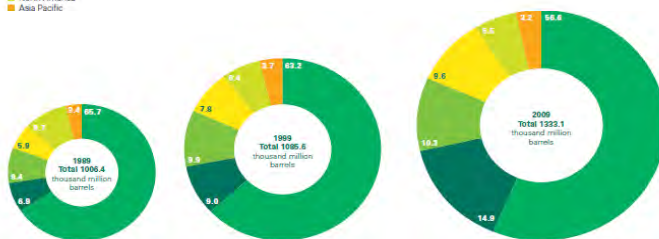


IEA World Energy Outlook 2010

Proved Reserves Distribution

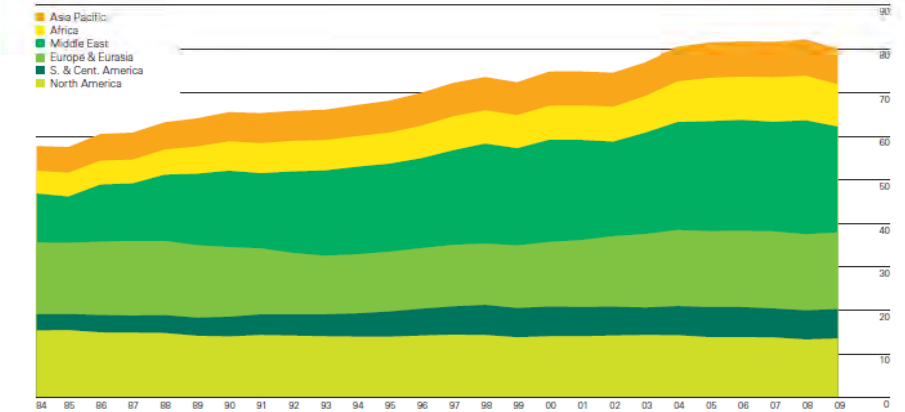


- Middle East
- S. & Cent. America
- Europe & Eurasia
- Africa
- North America
- Asia Pacific



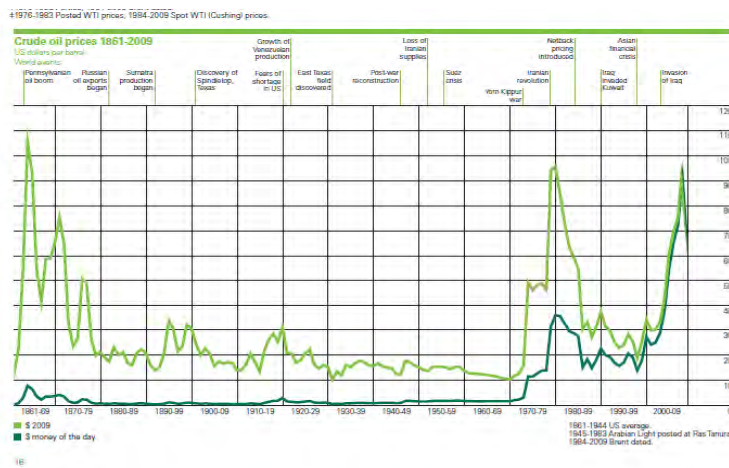
BP Statistical Survey 2010

Oil Production Distribution

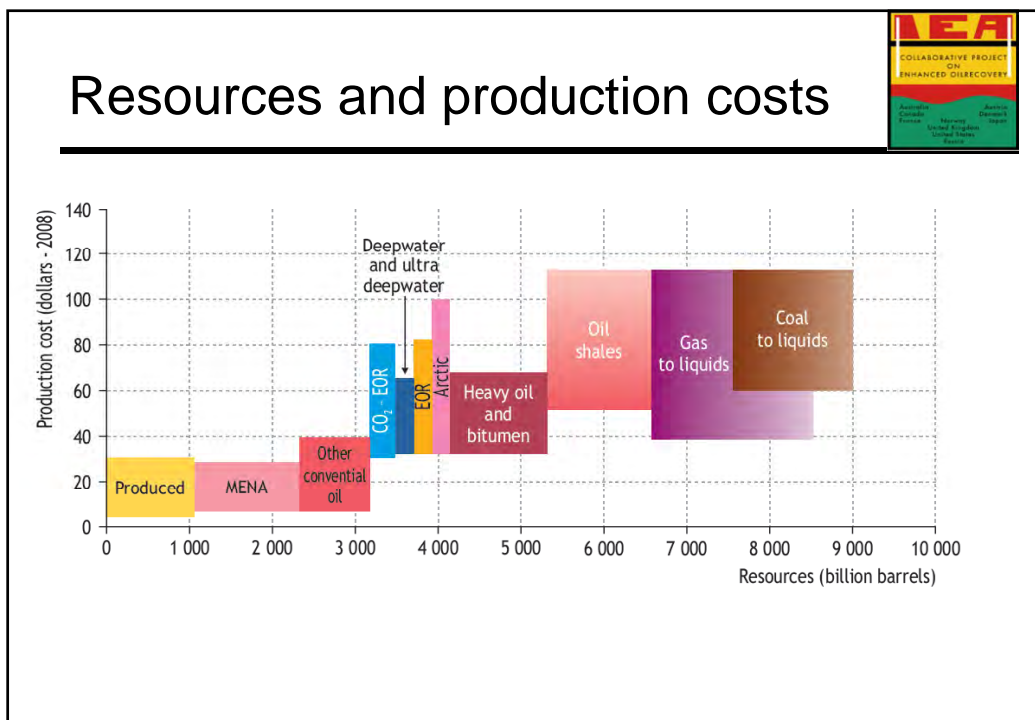
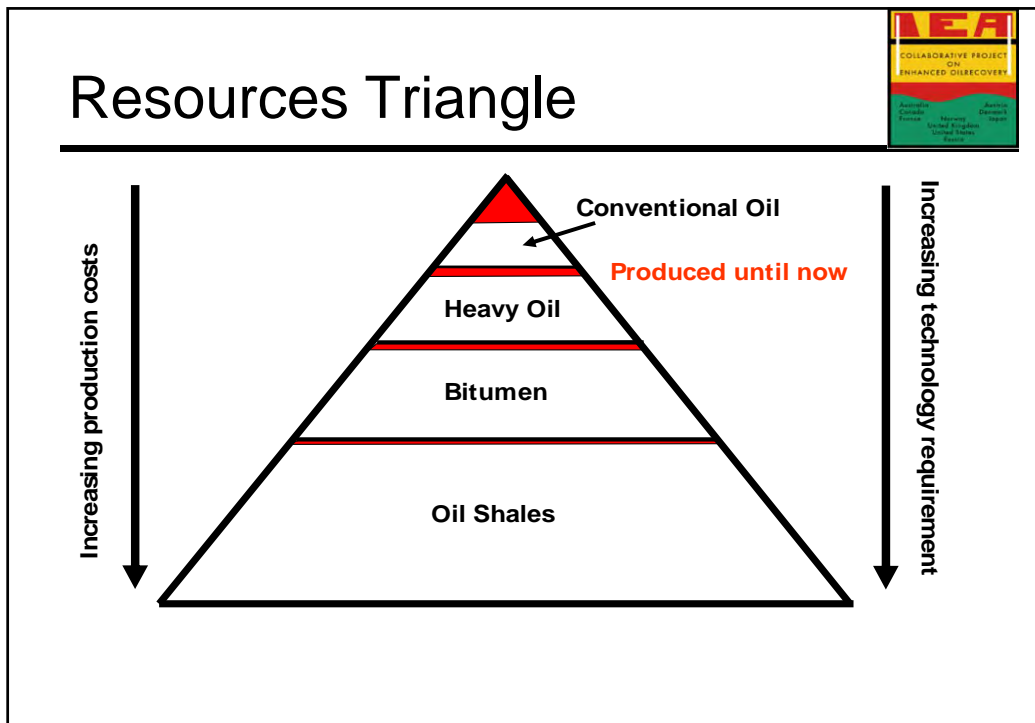


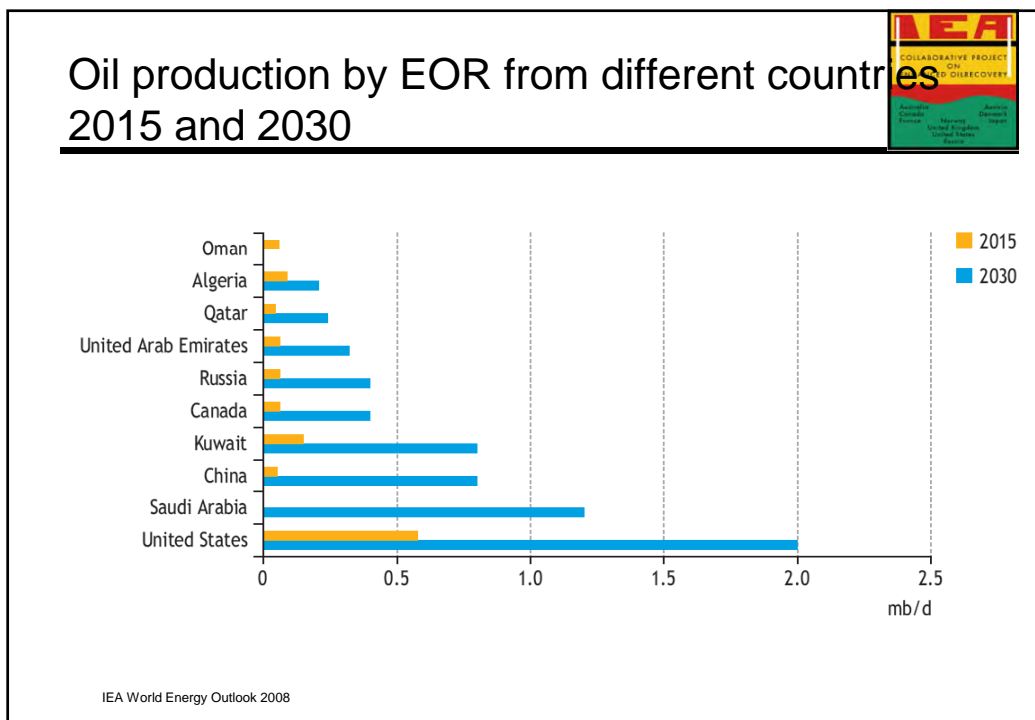
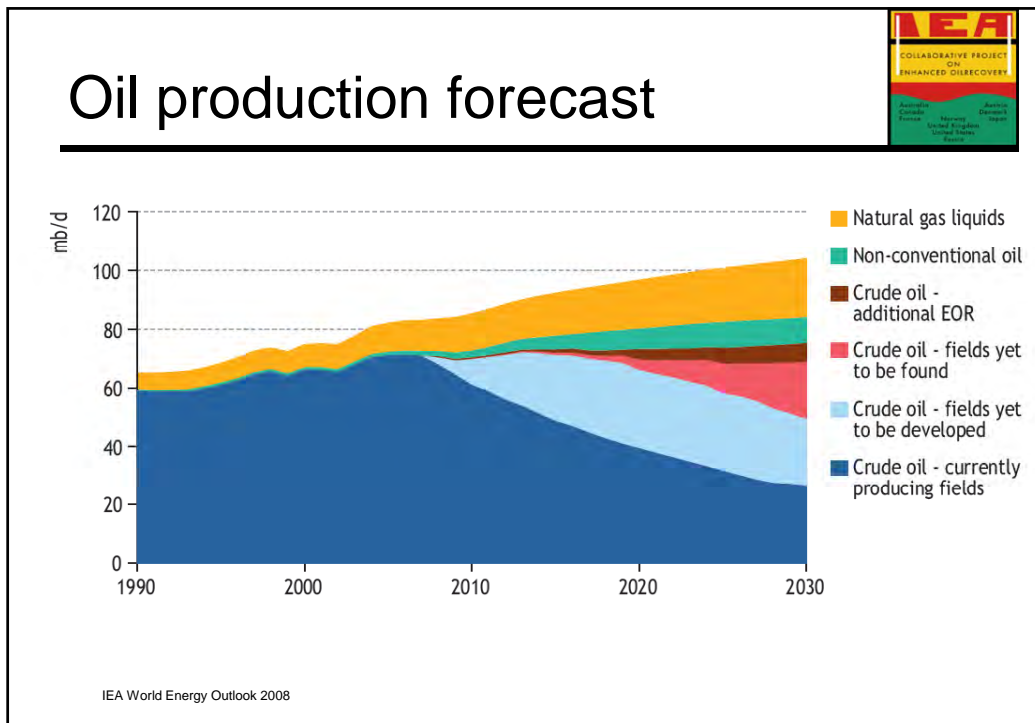
BP Statistical Survey 2010

Crude Oil Prices

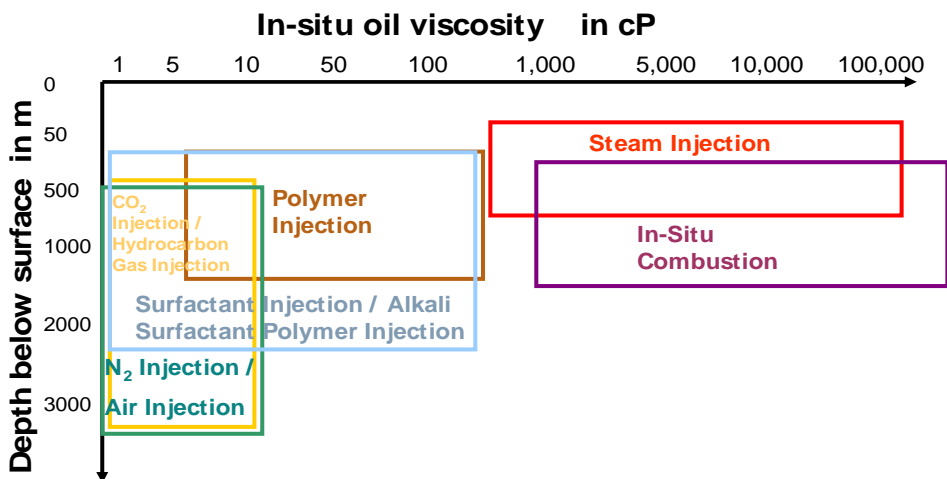


BP Statistical Survey 2010

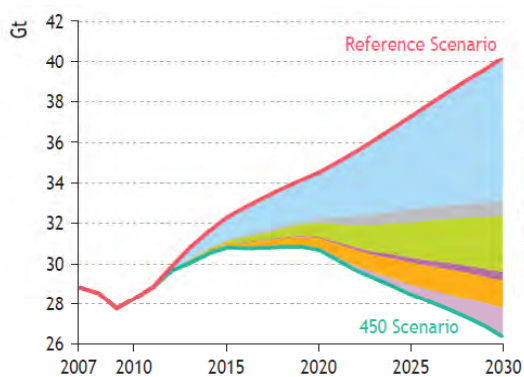




Enhanced Oil Recovery Technologies



CO₂ Emissions



	Abatement (Mt CO ₂)		Investment (\$2008 billion)	
	2020	2030	2010-2020	2021-2030
Efficiency	2 517	7 880	1 999	5 586
End-use	2 284	7 145	1 933	5 551
Power plants	233	735	66	35
Renewables	680	2 741	527	2 260
Biofuels	57	429	27	378
Nuclear	493	1 380	125	491
CCS	102	1 410	56	646

IEA World Energy Outlook 2008

IEA Joint Implementing Agreement - commitments study EOR technologies



TASK	A	B	C	D	E	F	Total
Australia		1				1	2
Austria		1	1				2
Canada			1	1		1	3
China		2	1	1		1	5
Denmark	1	1	1	1			4
France	1	1	1	1			4
Japan	1		1			1	3
Norway	1	1	1		1	1	5
Russia				2			2
Venezuela*							*
United Kingdom	1	1	1		1	1	5
United States	**		**	**			**

Note: Task A: Studies of Fluids and Interfaces in Porous Media
 Task B: Fundamental Research on Surfactants and Polymers
 Task C: Development of Gas Flooding Techniques
 Task D: Thermal Recovery
 Task E: Dynamic Reservoir Characterisation
 Task F: Emerging Technology

Summary of current research efforts of the IEA Joint Implementing Agreement on EOR



- Designer water flooding (low salinity water flooding)
- Chemical injection – injection of polymers, surfactants, alkali
- Gas injection – behaviour of cost-effective gases in the subsurface (CO₂, air)
- Nano technology

Conclusions



- Higher oil prices increase interest in Enhanced Oil Recovery (EOR) methods
- Dependent on oil quality and the reservoirs, different EOR methods have to be used
- Member countries of the IEA EOR joint implementing agreement are very active
- Research for EOR of the IEA member countries focuses on “designer water flooding”, chemical and gas injection