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Giant Oil Fields of the World

Presentation

AIM Industrial Contact Day

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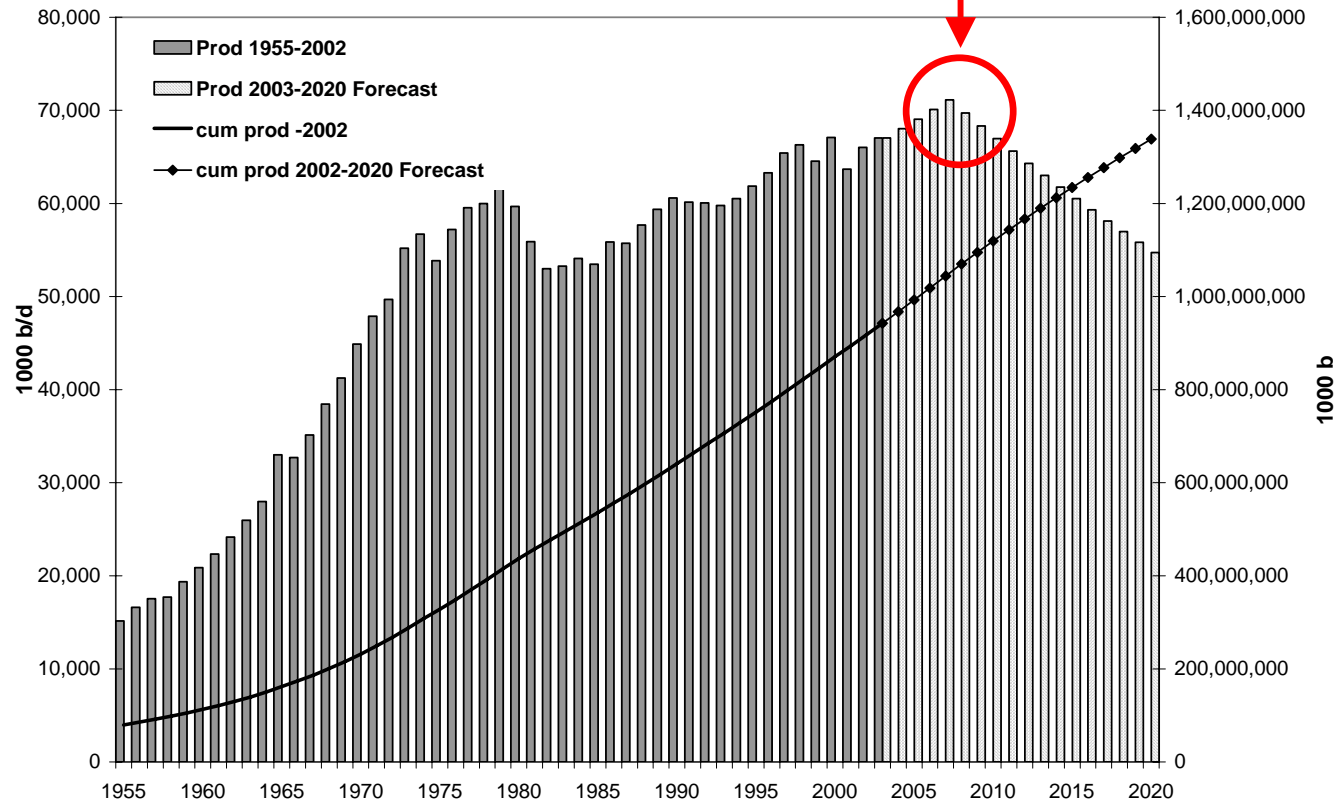
M.Sc. Engineering Physics



Introduction

Is Peak Oil here now

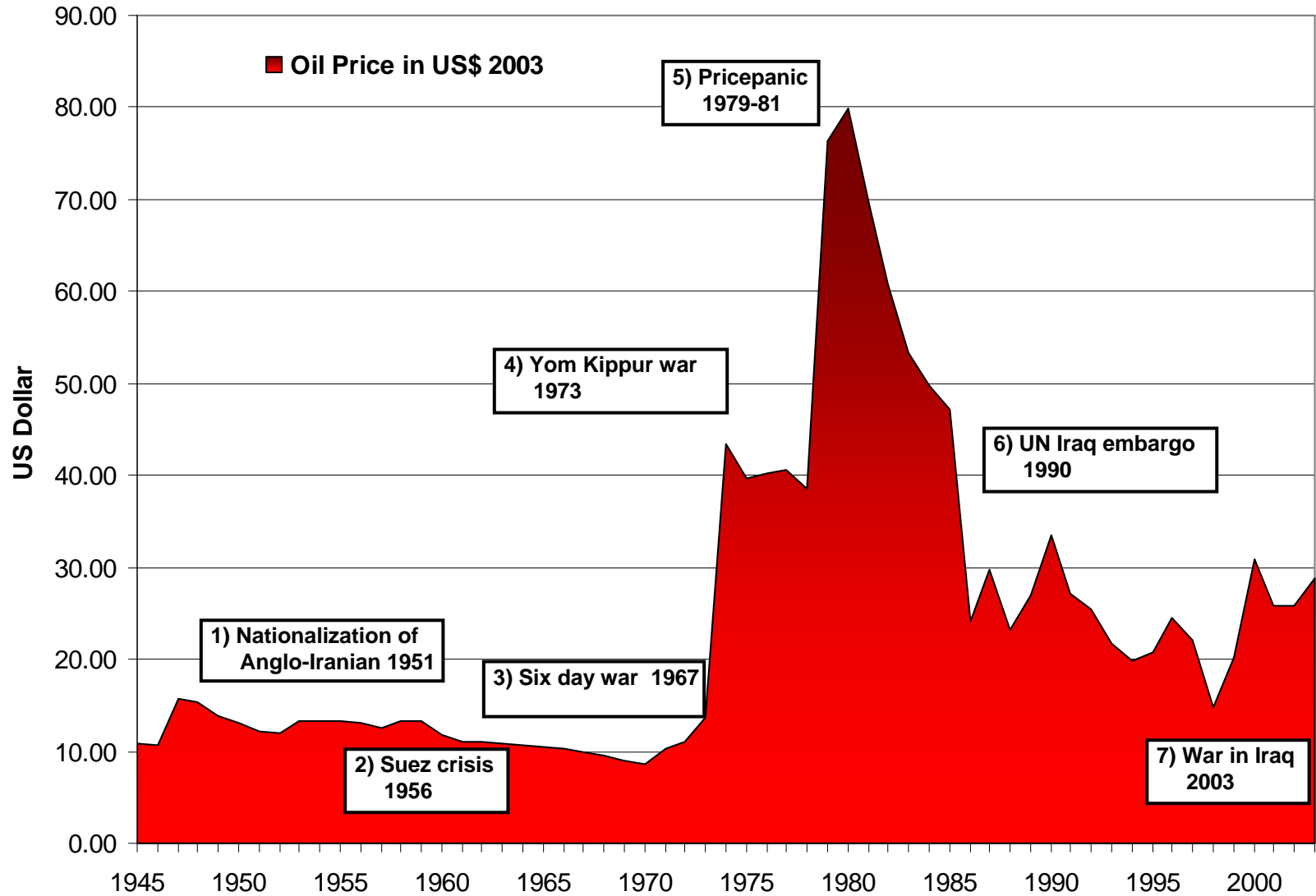
Peak oil



Or have we heard all this before???



Oil Crisis in relation to oil price





Common factors:

- Geographic
- The oil did not reach the market
- Media and some governments:
We are running out of oil!



Today - Same old story again?

or is the oil price a bad parameter?



Definitions

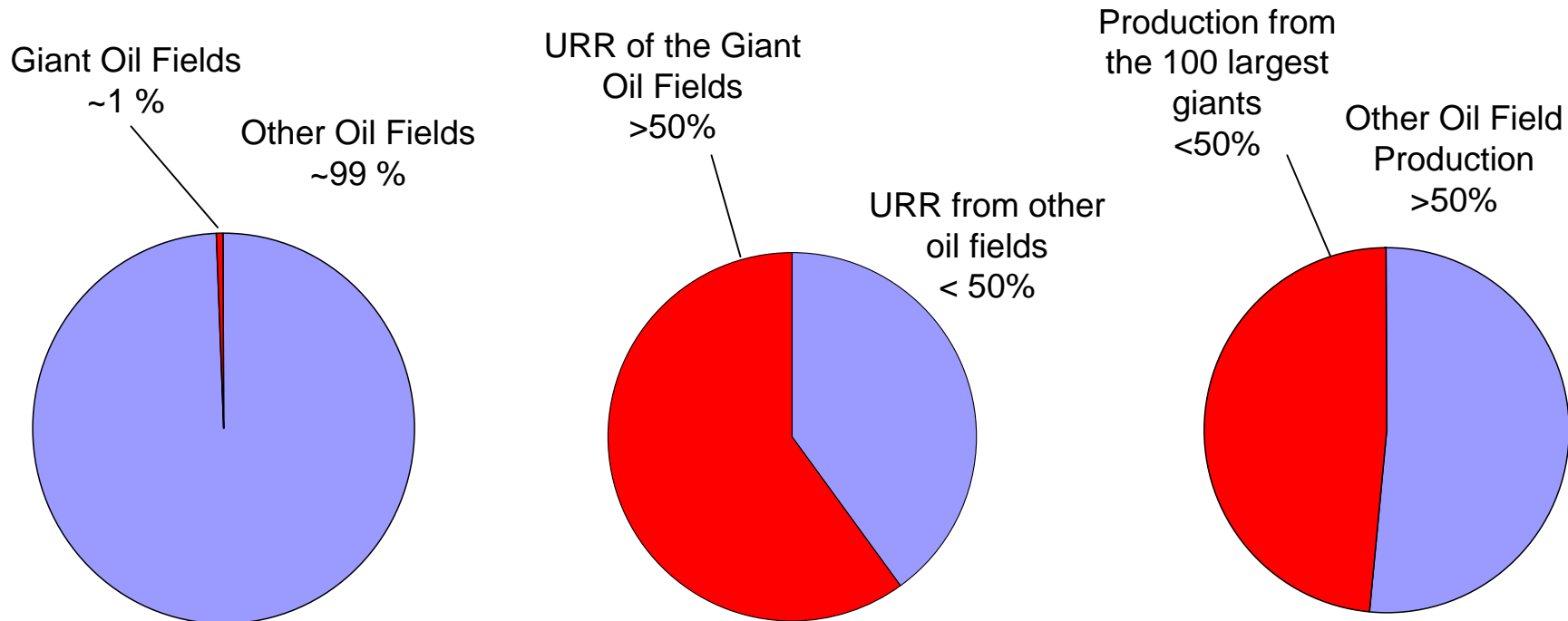
- **Ultimate Recoverable Reserves (URR)** – cumulative production plus the estimated remaining reserves
- **Gb** – Giga barrel = 10^9 barrels = billion barrels
= $0.159 \times 10^9 \text{ m}^3$ = 159 million m^3
- **Giant Oil Field** – an oilfield with estimated ultimate recoverable oil of more than 500 million barrels (>0.5 Gb)



The Important Parameter – Giant Fields

Giant fields compared to other fields with respect to:

- Number of fields
- URR
- Daily Production





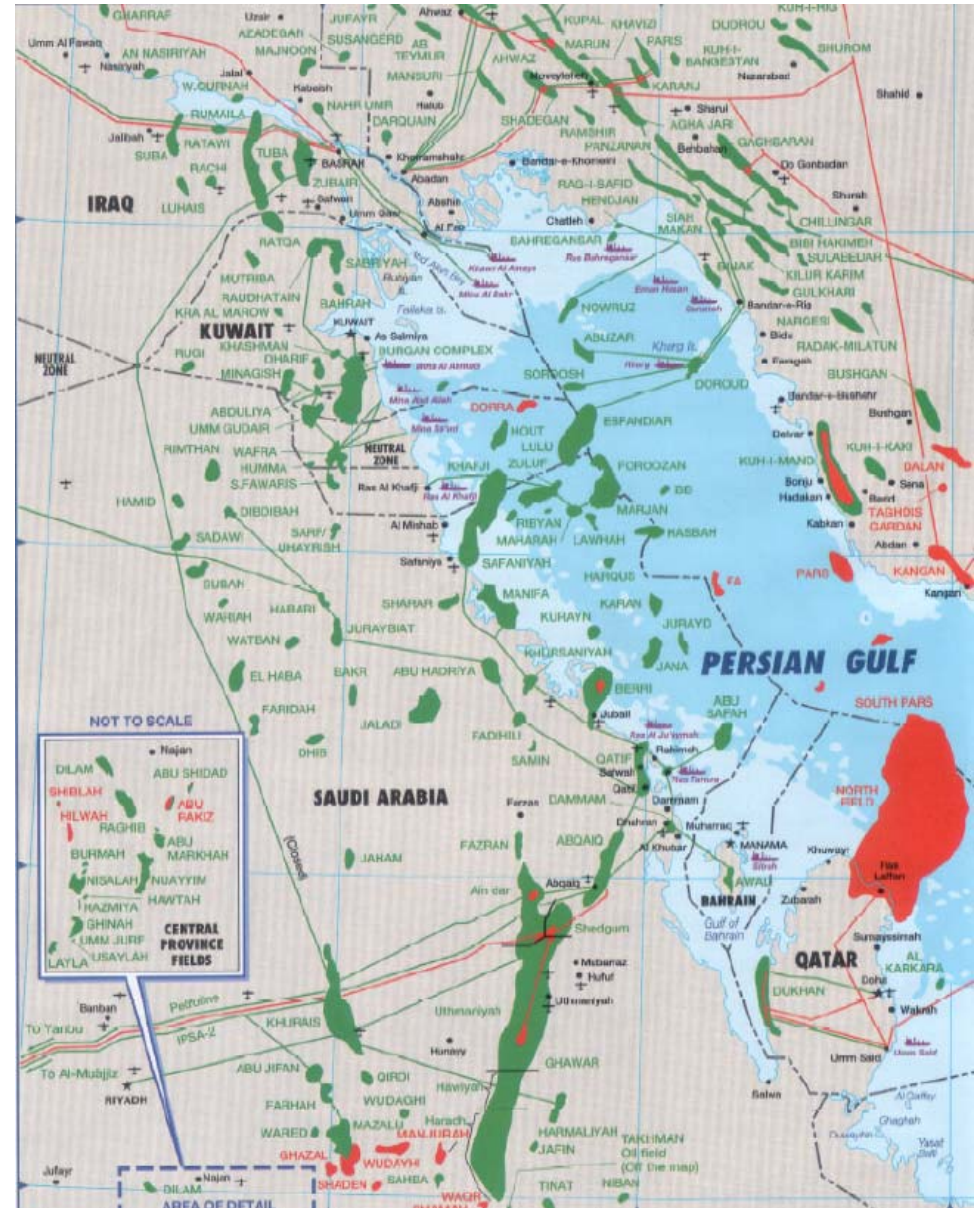
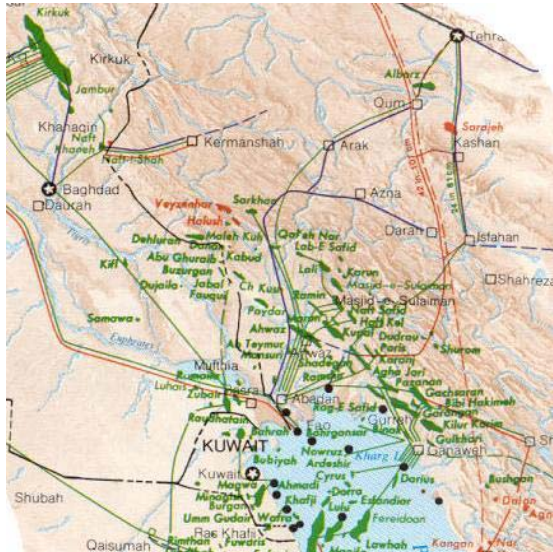
Top 18 Giant Fields

Field Name	Country	Discovery year	Range of URR [GB]
Ghawar	Saudi Arabia	1948	66-100
Burgan Greater	Kuwait	1938	32-60
Safaniya	Saudi Arabia	1951	21-36
Bolivar Coastal	Venezuela	1917	14-36
Berri	Saudi Arabia	1964	10-25
Rumalia N&S	Iraq	1953	22
Zakum	Abu Dhabi	1964	17-21
Cantarell Complex	Mexico	1976	11-20
Manifa	Saudi Arabia	1957	17
Kirkuk	Iraq	1927	16
Gashsaran	Iran	1928	12-15
Abqaiq	Saudi Arabia	1941	10-15
Ahwaz	Iran	1958	13-15
Marun	Iran	1963	12-14
Samotlor	Russia	1961	6-14
Agha Jari	Iran	1937	6-14
Zuluf	Saudi Arabia	1965	12-14
Prudhoe Bay	Alaska	1969	13



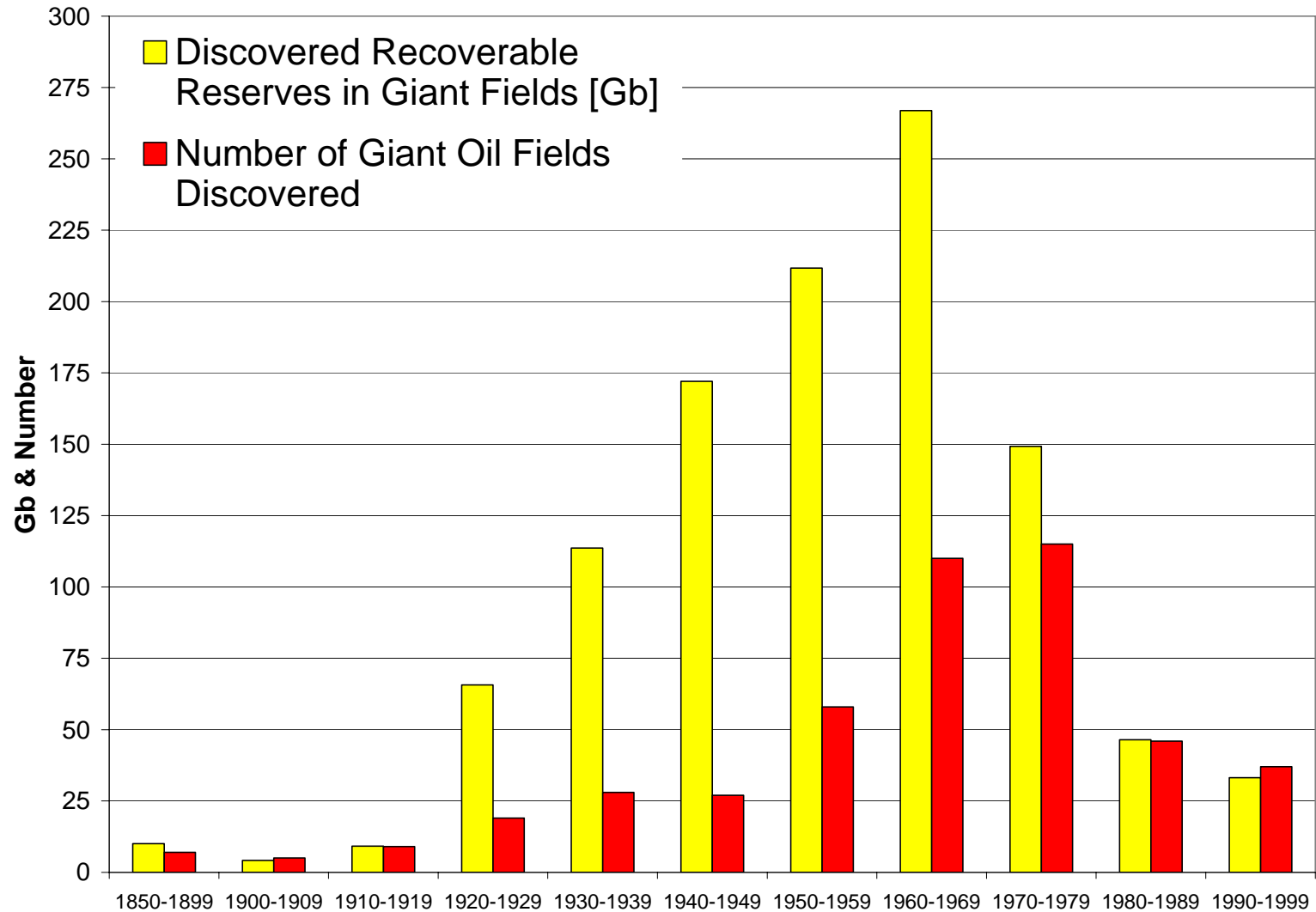
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Where are the giant fields?





Discovery Trends of Giant Fields





Discovery of Giant Fields

- 35 giant oil fields discovered during last decade
- None of the fields will have a production capability above 1,000,000 b/d
- The largest fields discovered the last decade:

Field	Country	Discovery Year	Ultimate Recoverable Reserves [Gb]
Kashagan	Kazakhstan	2000	7-9
Azadegan	Iran	1999	6-9
Roncador	Brazil	1996	2.9
Cusiana/Cupiagua	Colombia	1991	1.6
Sihil	Mexico	1999	1.4
Ourhoud	Algeria	1994	1.2
Thunder Horse	US GoM	1999	1-1.5

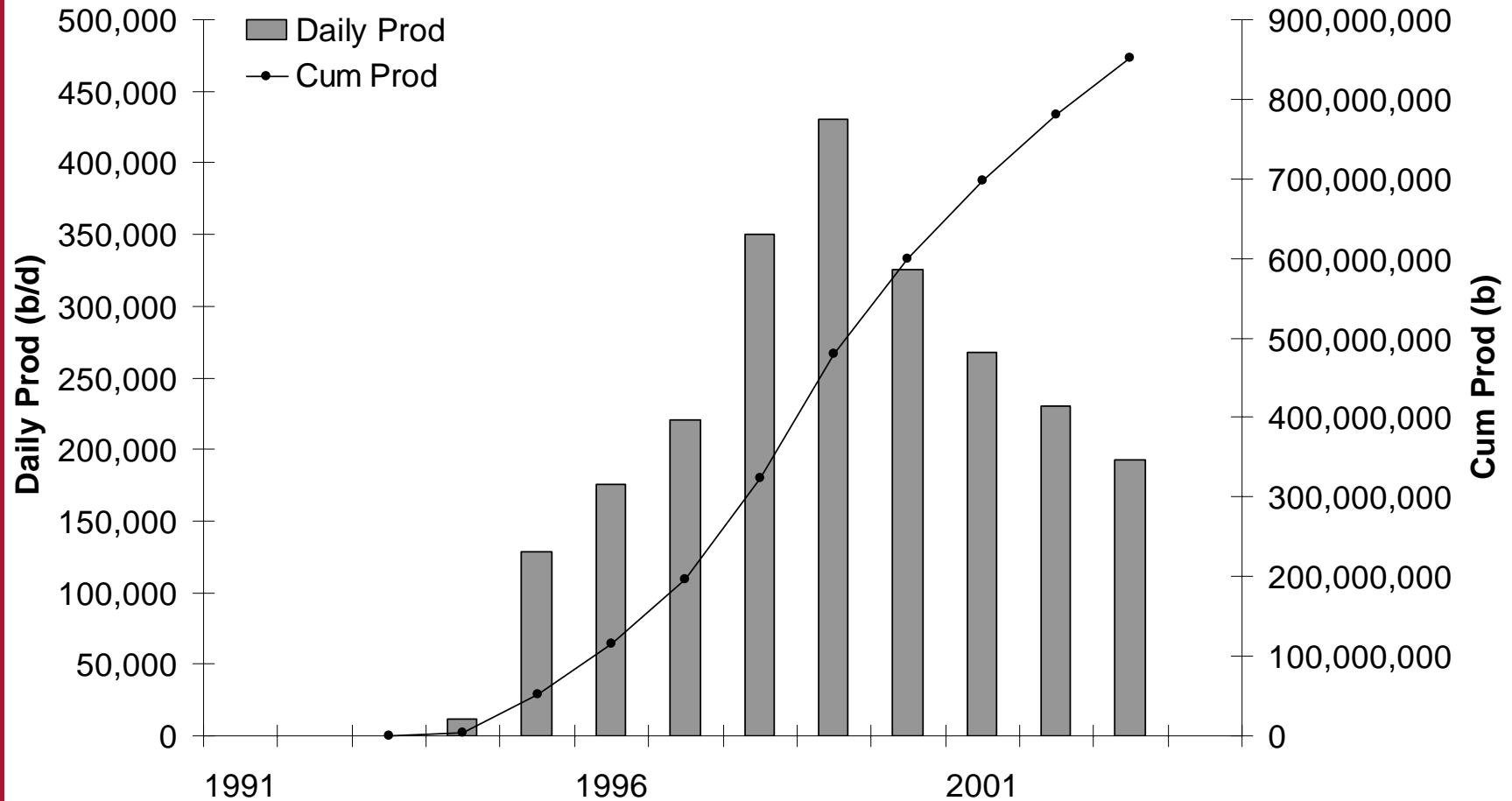


Comparison of number of fields and their URR

Field Name	Country	Discovery year	Range of URR [GB]	Field	Country	Discovery Year	Ultimate Recoverable Reserves [Gb]
Ghawar	Saudi Arabia	1948	66-100	Kashagan	Kazakhstan	2000	7-9
Burgan Greater	Kuwait	1938	32-60	Azadegan	Iran	1999	6-9
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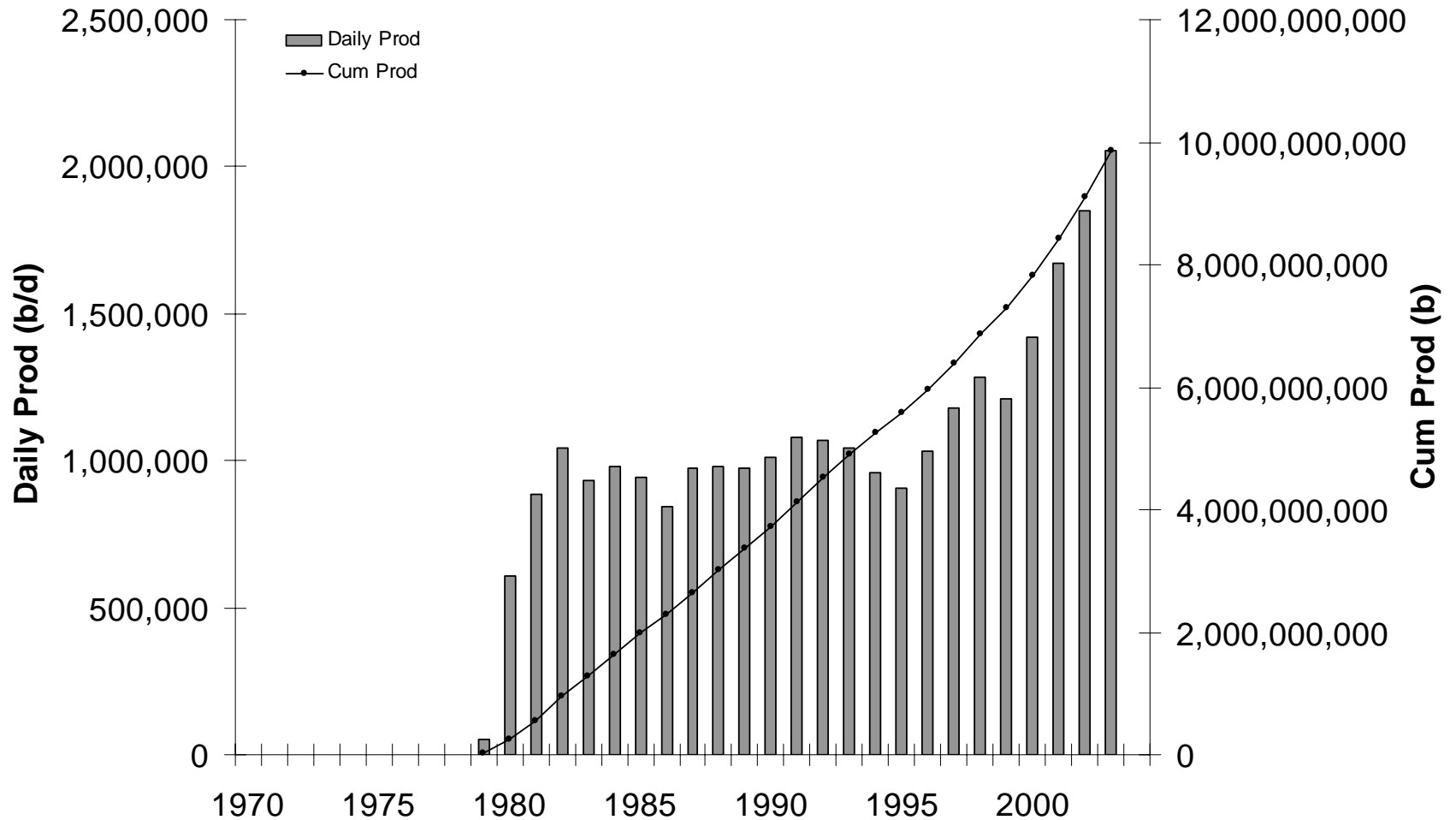


Production from Cusiana/Cupiagua



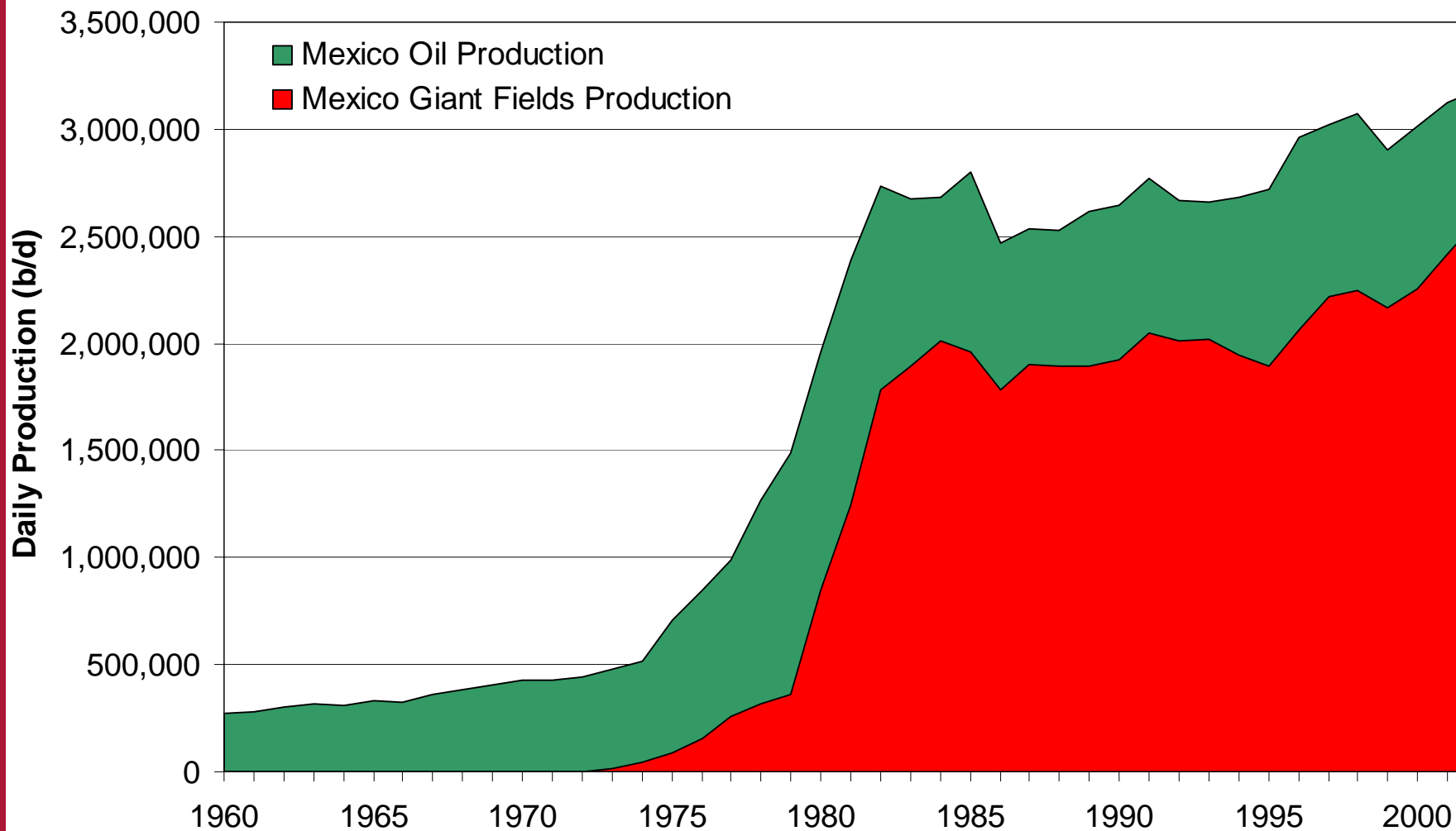


Production from Cantarell



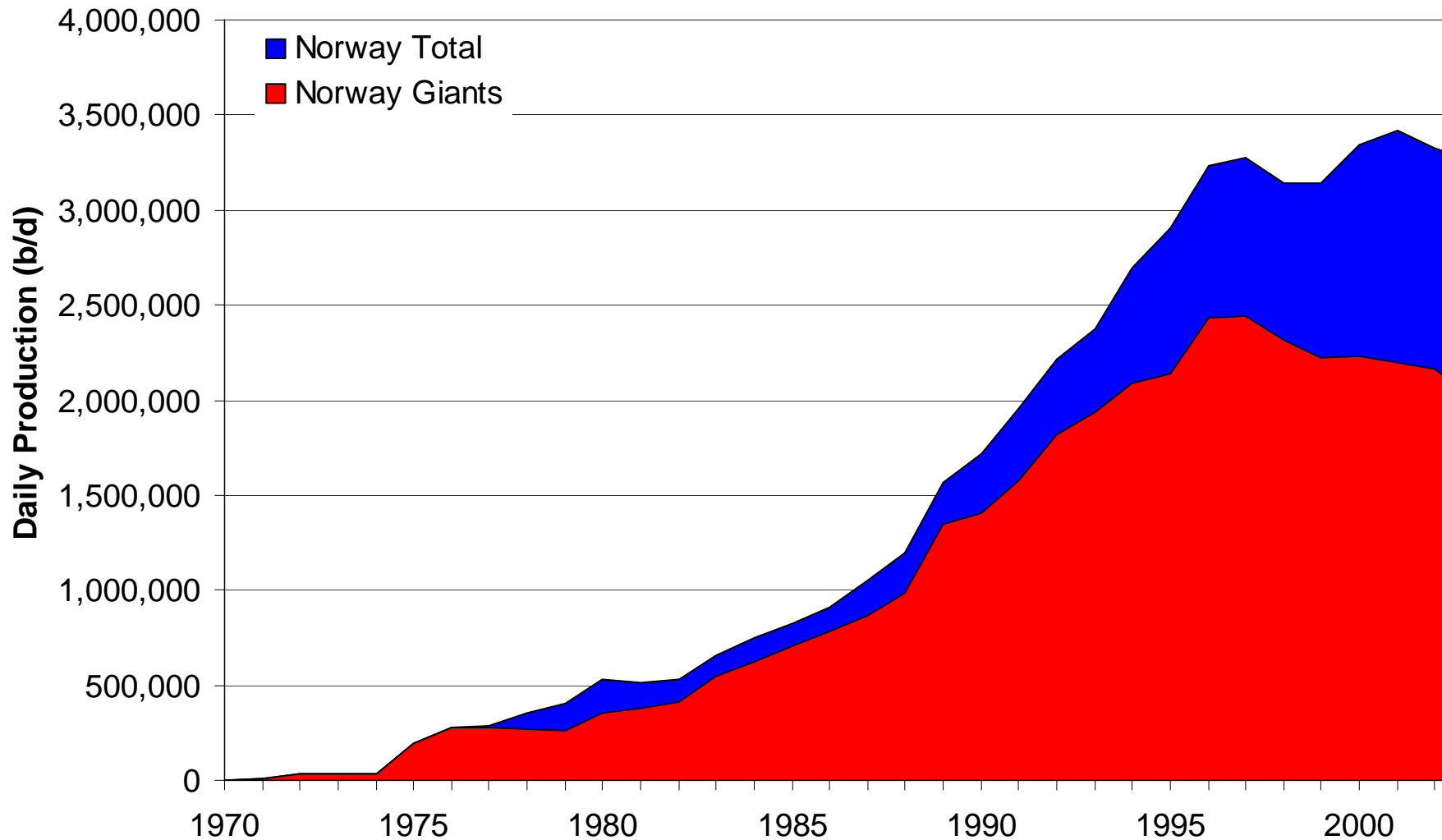


Oil Production from Mexico and their Giant Oil Fields



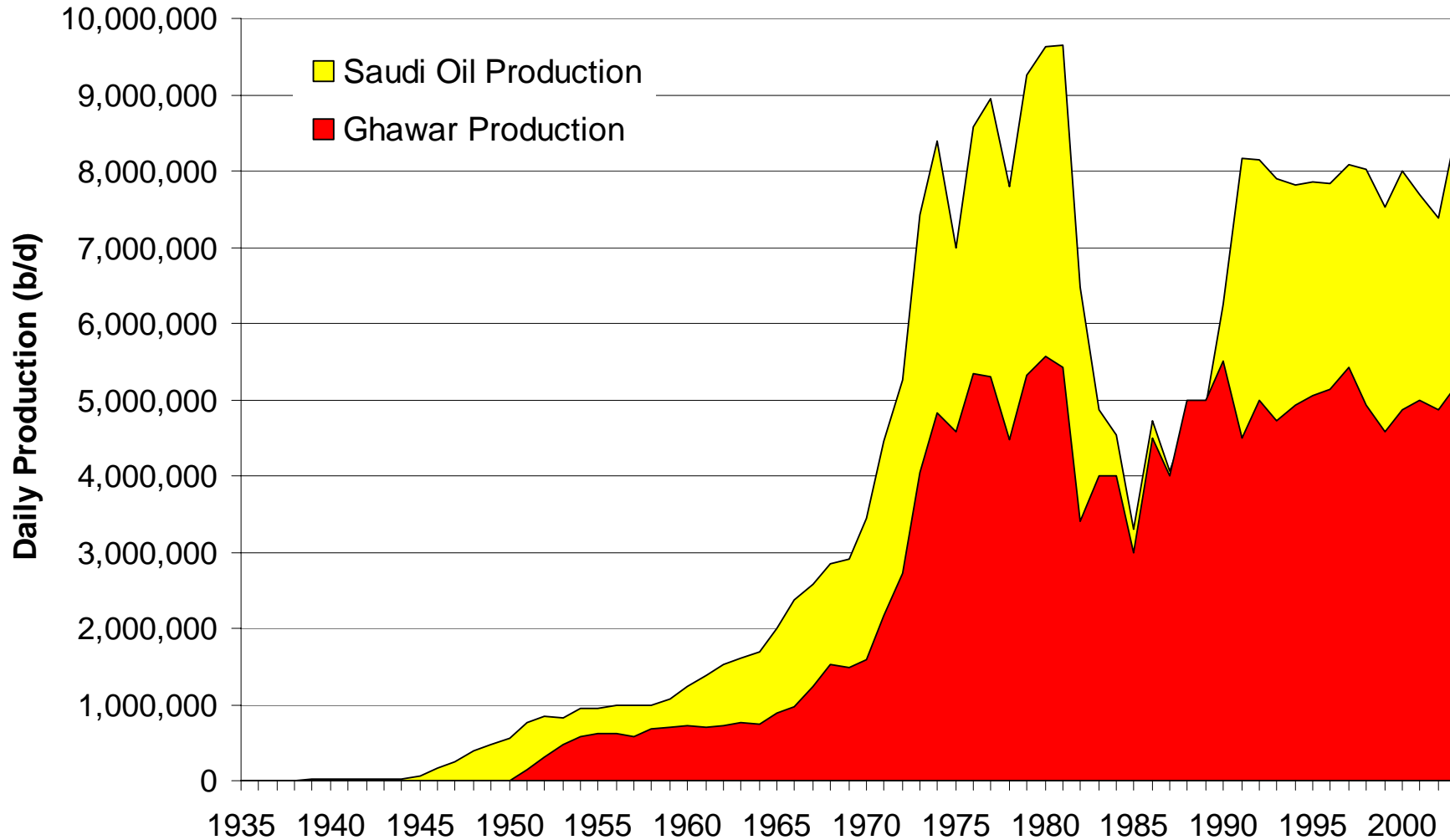


Oil Production from Norway and their Giant Oil Fields





Oil Production from Saudi Arabia and Ghawar Oil Field





Conclusion

20 years ago, 15 fields had the capacity to produce more than 1,000,000 b/d. Today only four field **can** produce that much:

- Ghawar (Saudi Arabia), 1948
- Kirkuk (Iraq), 1938
- Burgan Greater (Kuwait), 1927
- Cantarell (Mexico), 1976



Conclusion

- Producing regions will have a peak
- The Middle East is a key factor
- The giants are getting smaller, both to size and number
- When will the peak be?

It depends on the:

demand for oil, future exploration and the decline of the giants

My guess/prediction is around 2010