

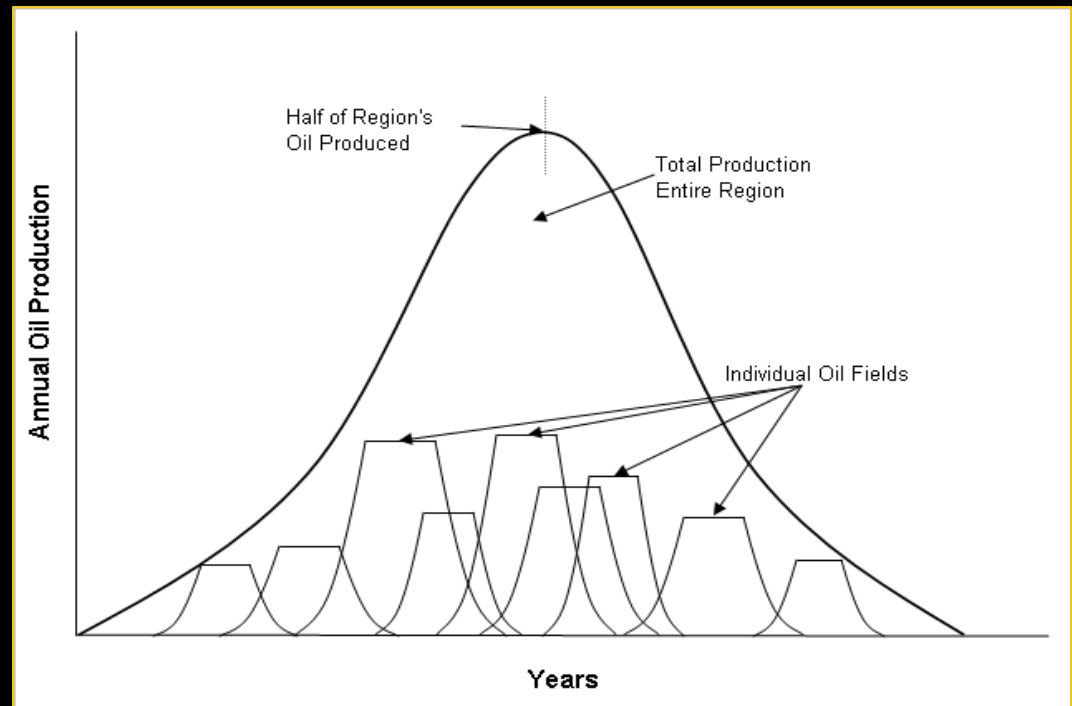
Introduction to Peak Oil



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Peak Oil definition

- Peak Oil is the point at which global oil production reaches its maximum rate.
- After that point production begins an irreversible decline.

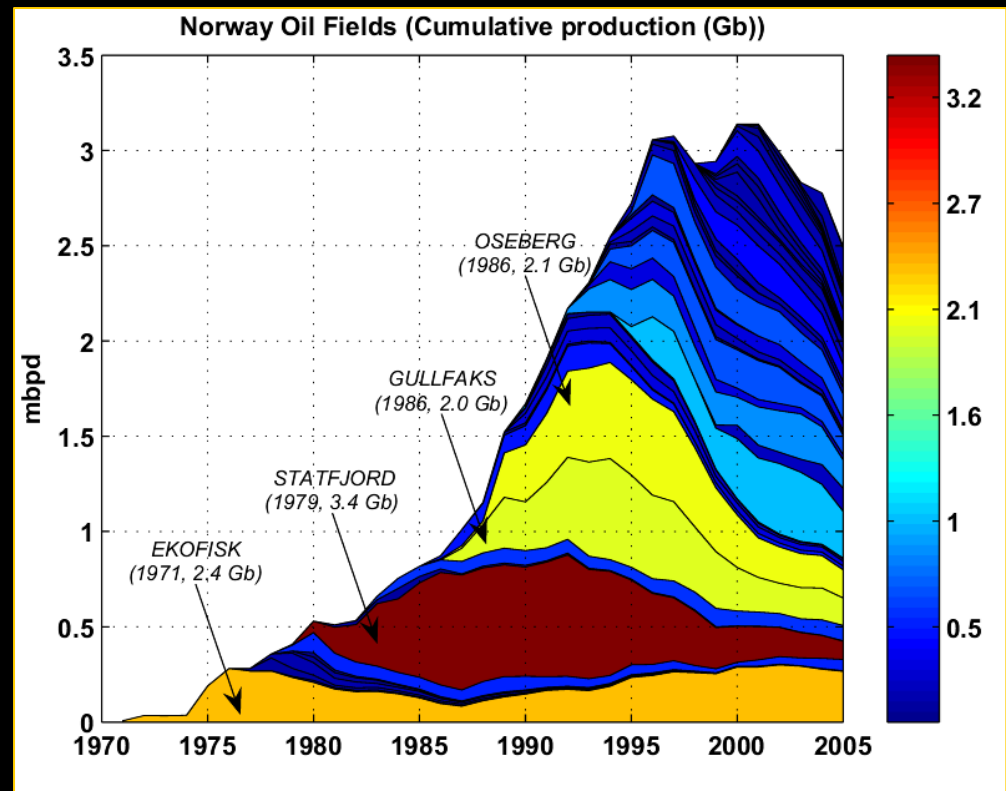


Peak Oil Theory does not state...

- That the world is “running out” of oil;
- That oil production will peak and decline when half of global reserves are left; or
- That oil production has already peaked.

Peak Oil case study: Norway

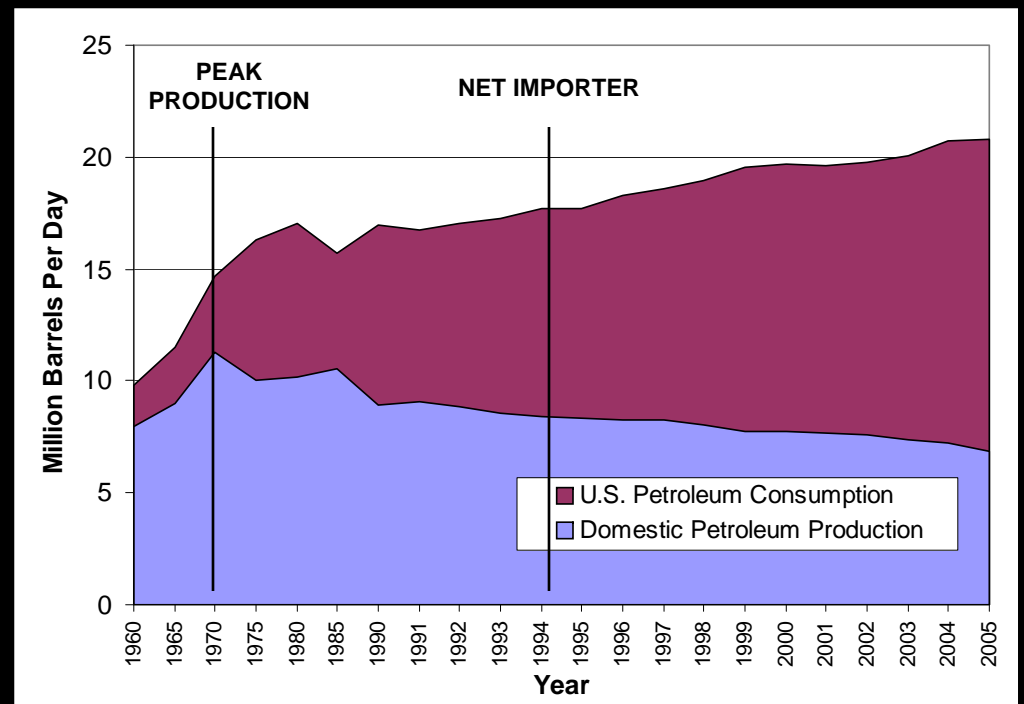
- Big, easy to find, easy to tap wells found first
- Subsequent smaller wells often do not increase production rates; just slow decline rates
- Extraction becomes more difficult and costly over time
- EROEI declines over time



Norwegian oil output expected to fall to 1.6 mbpd by 2013.

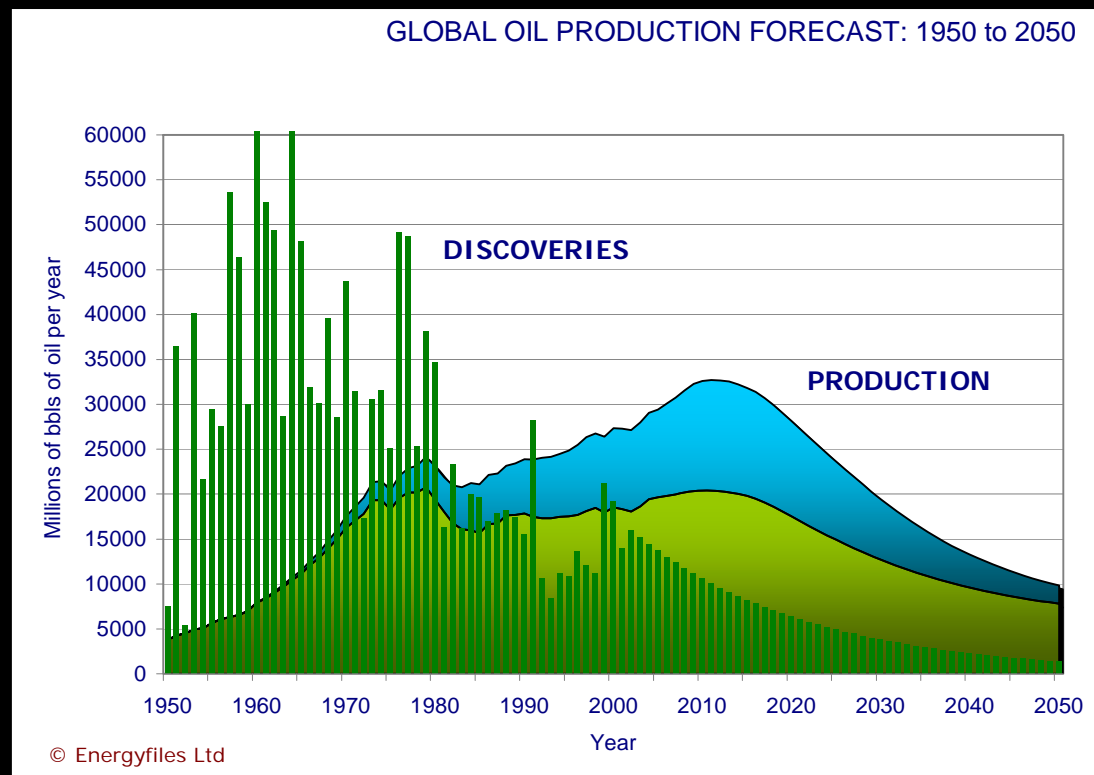
The Domestic context

- Domestic discovery of oil peaked in 1930
- Domestic production peaked in 1970
- Net importer of oil by 1994
- 4% of global population using 25% of oil



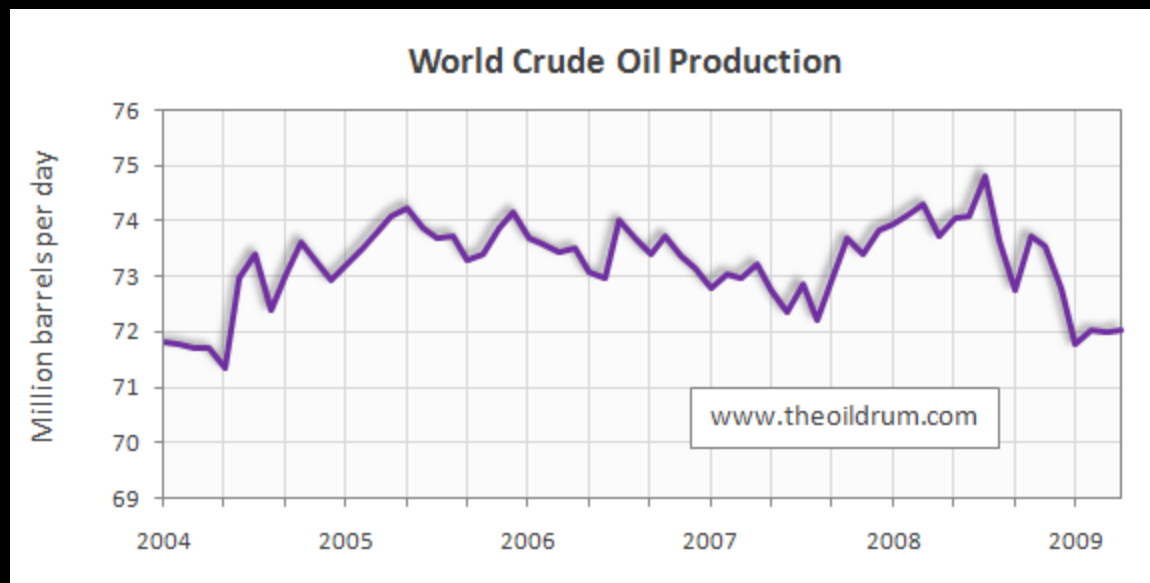
Global context

- Global oil discovery peaked in 1965 and has been declining for over 40 years.
- How long after peak discovery will peak production occur globally?



Not a matter of if, but when...

- Forecasts vary from being on an undulating plateau now to being able to only being able to maintain current production rates for the next 42 years



Timing of Peak Oil

Depends on who you listen to:

Forecaster	Forecast
Matthew Simmons	2007-2009
Campbell (ASPO)	2010-12
CERA	After 2020
Shell Oil Corporation	After 2025
EIA/USGS	2021-2167 (2037)
Hirsch Report (US Dept. of Energy)	Soon (within 20 years)

Timing of peak depends on assumptions related to:

- Ultimate Recoverable Reserve
- Production rates
- Undulating plateau factor
- Demand/Demand destruction
- External factors: war, resource competition, environmental policies, regulation and enforcement, alternative energy investment, research and development

What Peak Oil does mean...

- That the world will face a liquid fuel crisis
- That oil will become increasingly expensive
- Supply disruptions will occur
- That transportation of people and goods will be most impacted
 - Modern food production will also be impacted
- Resource wars and economic upheaval

Mitigating the impacts of Peak Oil

- Conservation and travel behavior change
- Expand use of non-conventional energy sources
- Develop liquid fuel alternatives
- Better integration of land use development and transportation
- Invest in renewable energy sources to generate electricity for transportation



“Unless a mitigation crash program (mega-projects and mega-changes) is started 20 years before peaking occurs, the economic consequences will be dire.”

Dr. Robert L. Hirsch, Consultant for
the US Department of Energy,
Congressional Testimony

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