



UKERC Technology and Policy Assessment

# Global Oil Depletion

Report Launch

7th October 2009, London

**UKERC**



# Question and approach

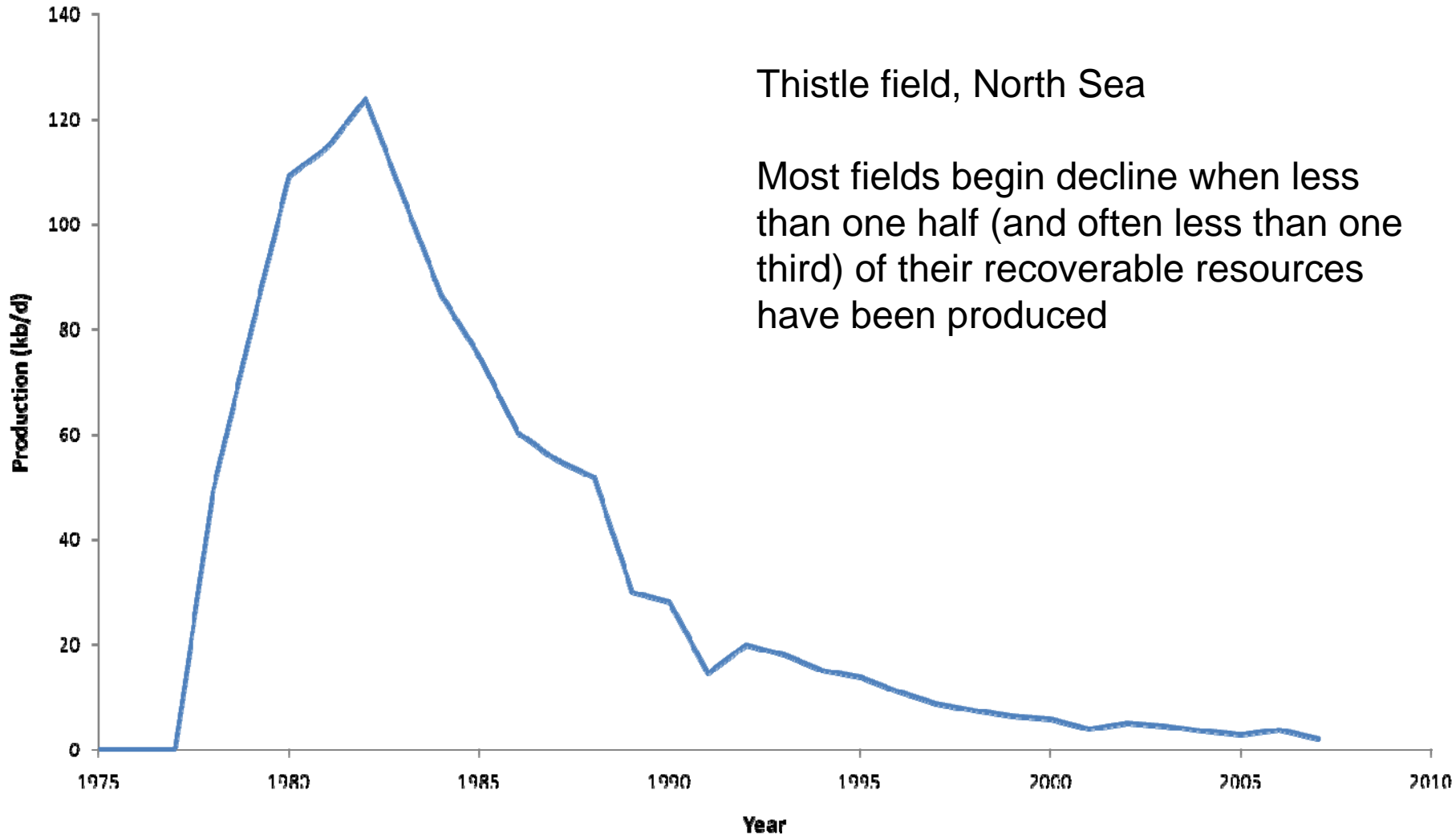
**What evidence is there to support the proposition that global demand for conventional oil will be constrained by physical depletion before 2030?**

Systematic review of over 500 studies, plus analysis of industry database and comparison of global supply forecasts



# Understanding Peaking

# Field 'peaking'



# Field sizes

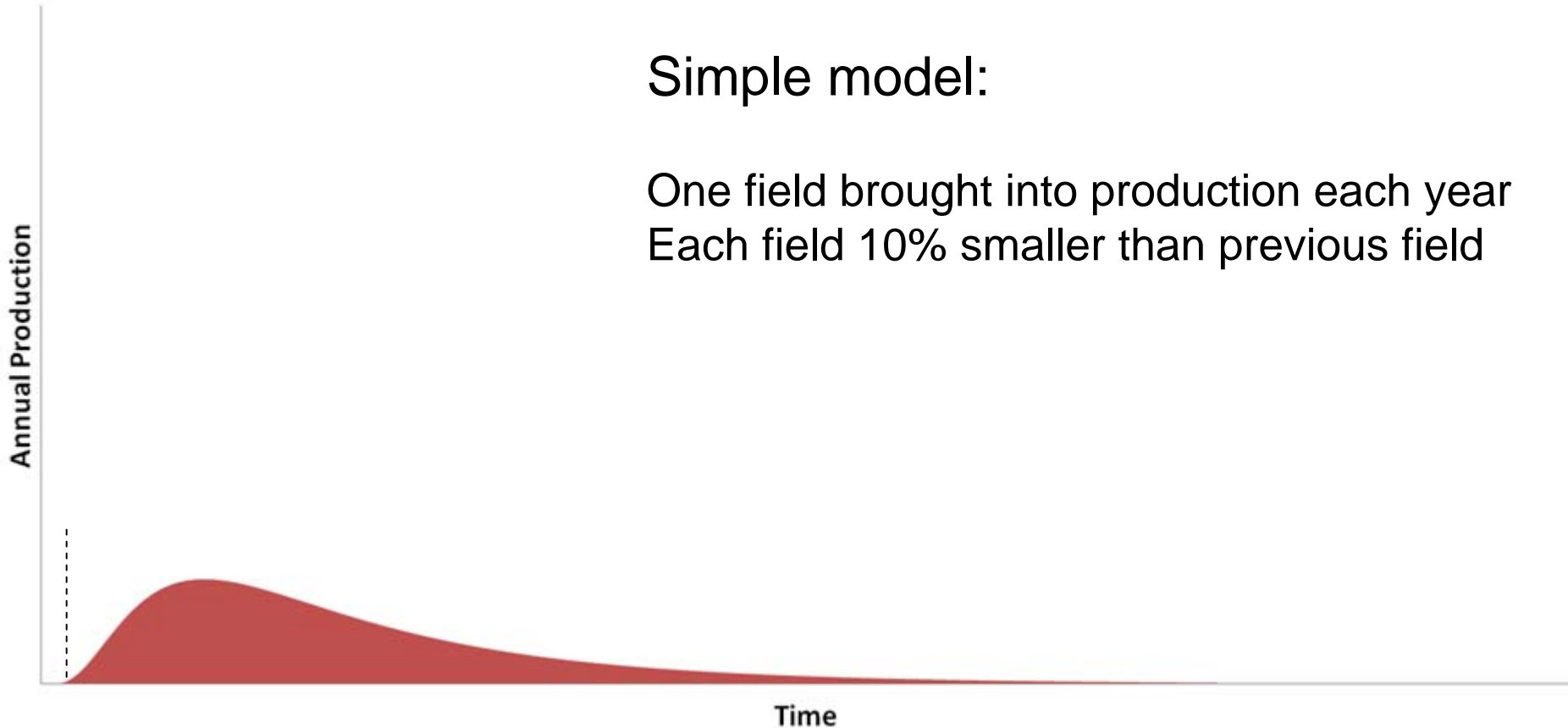
An illustration of an oil pumpjack, a common piece of equipment used in oil extraction, positioned in the upper right corner of the slide.

- In all regions, oil resources are concentrated in a small number of large fields
- These fields tend to be found and developed relatively early
- Globally ~70,000 fields
  - ~20% of production from 10 fields
  - ~50% of production from ~100 fields
  - ~65% of discoveries from ~500 fields
  - Most decades old and many past peak

# Regional peaking

Simple model:

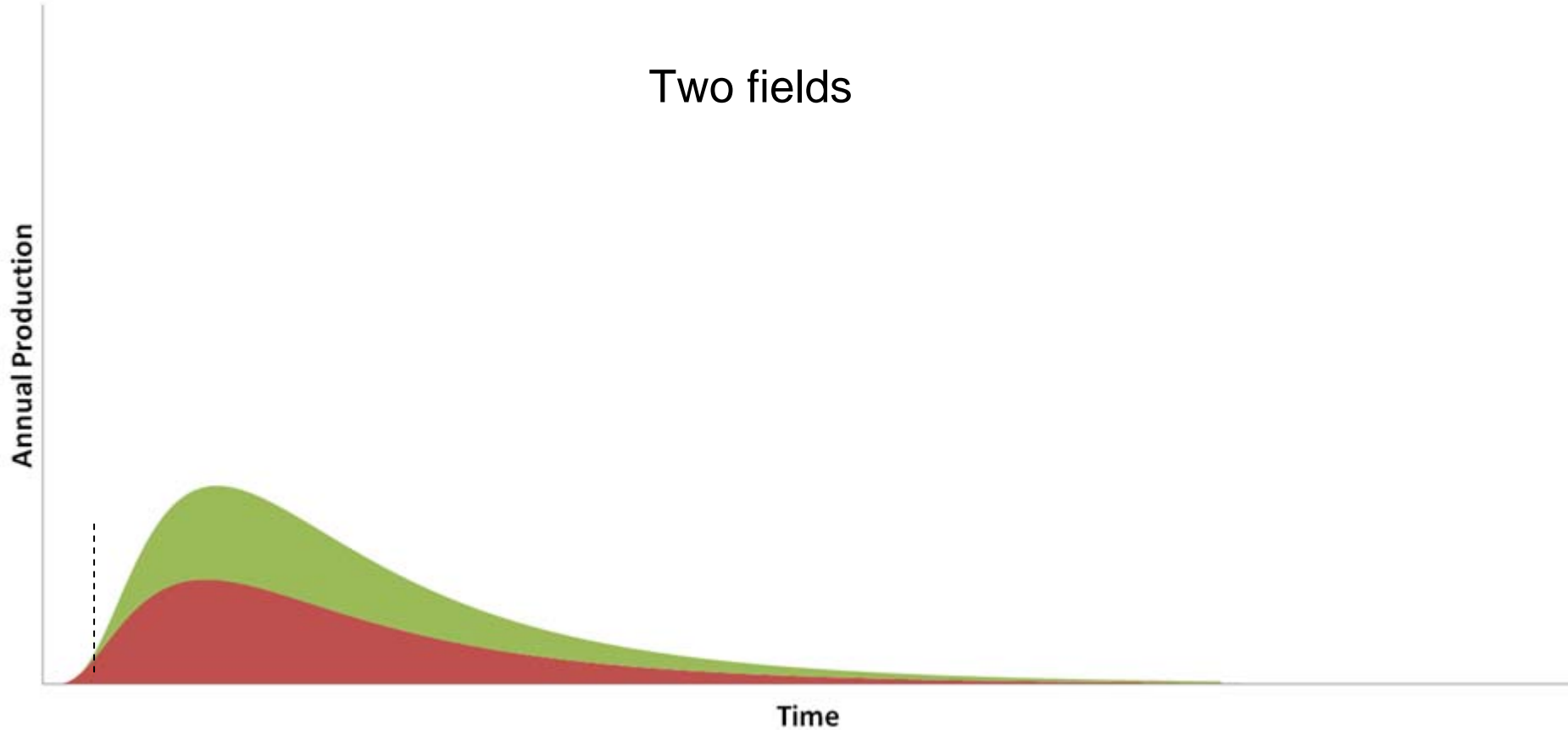
One field brought into production each year  
Each field 10% smaller than previous field



# Regional peaking



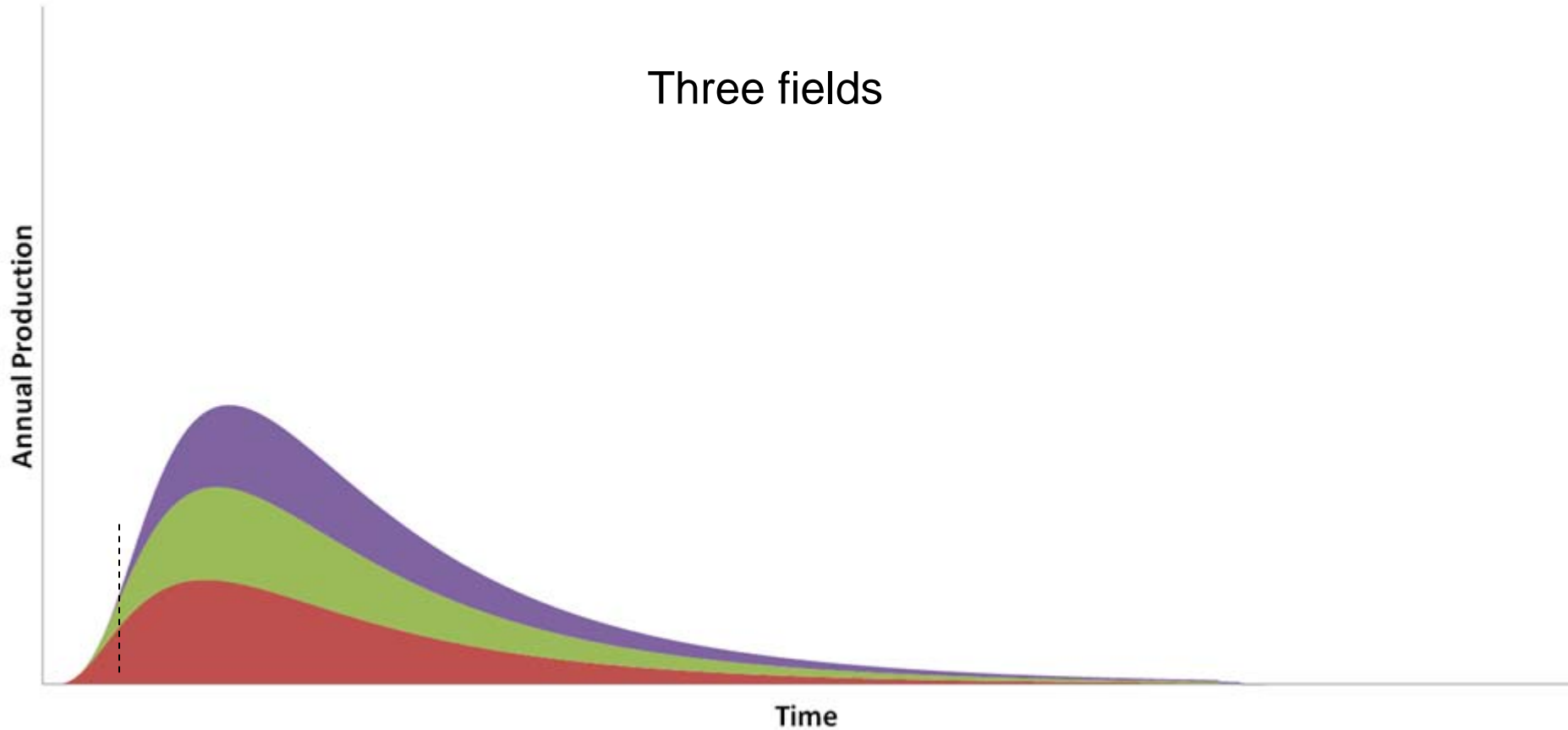
Two fields



# Regional peaking



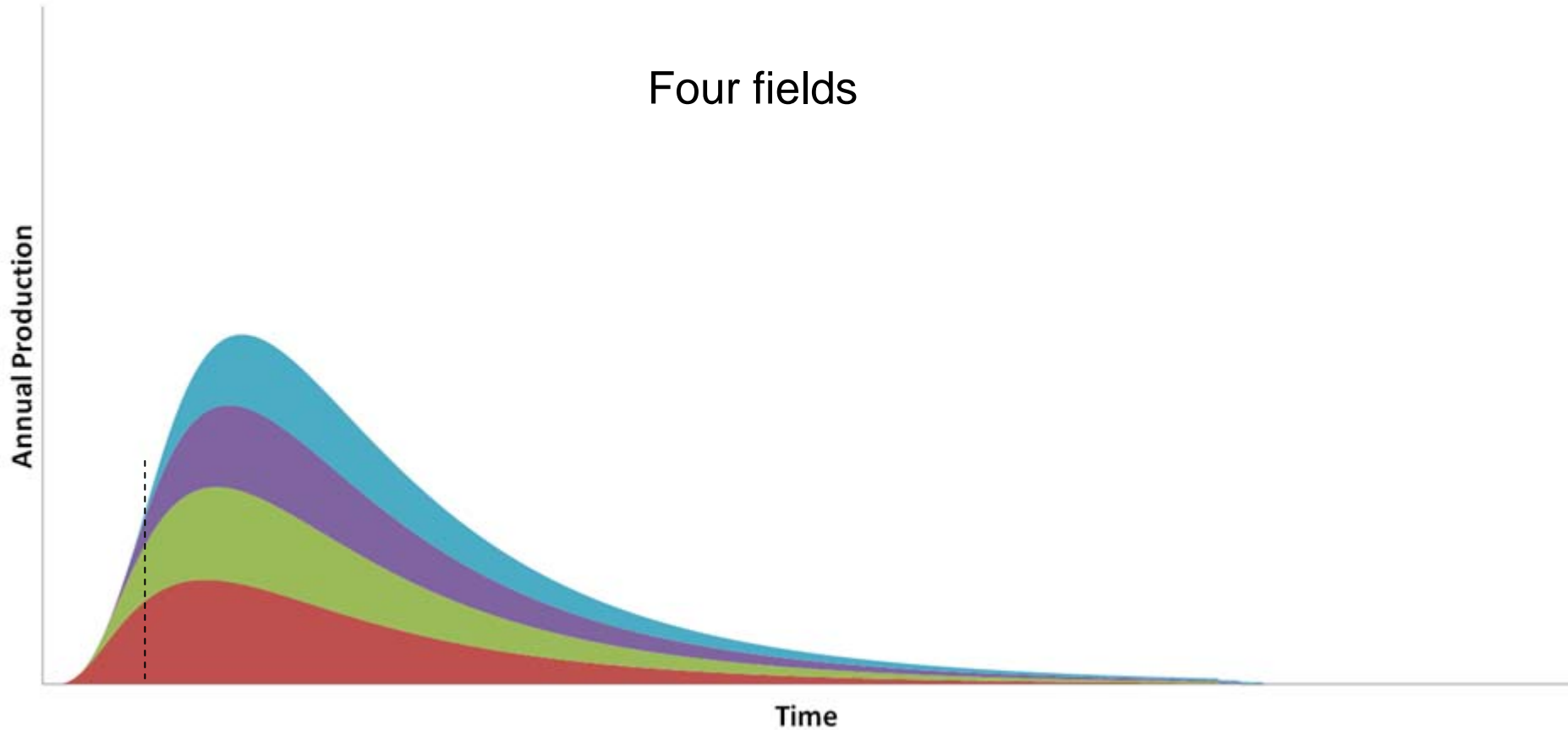
Three fields



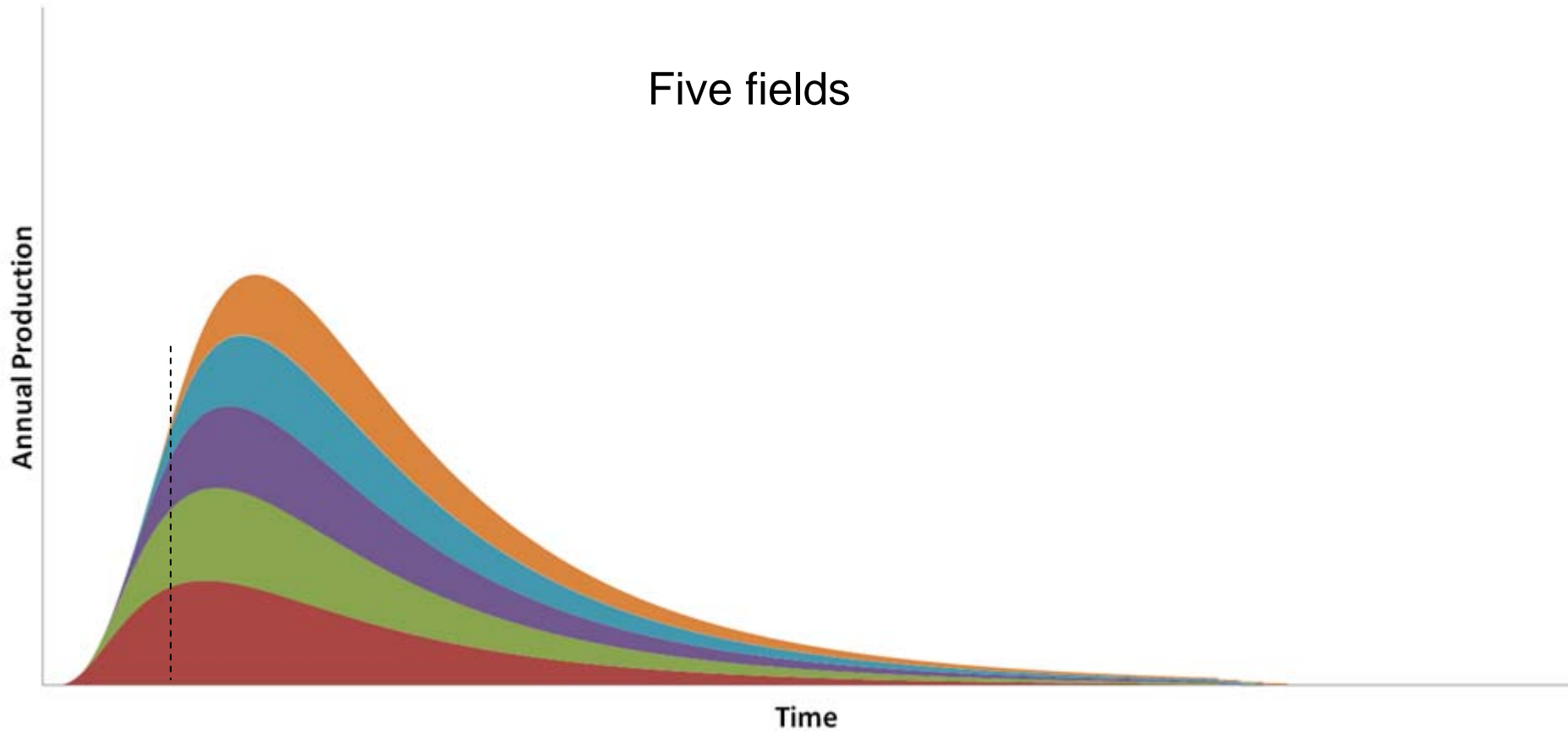
# Regional peaking



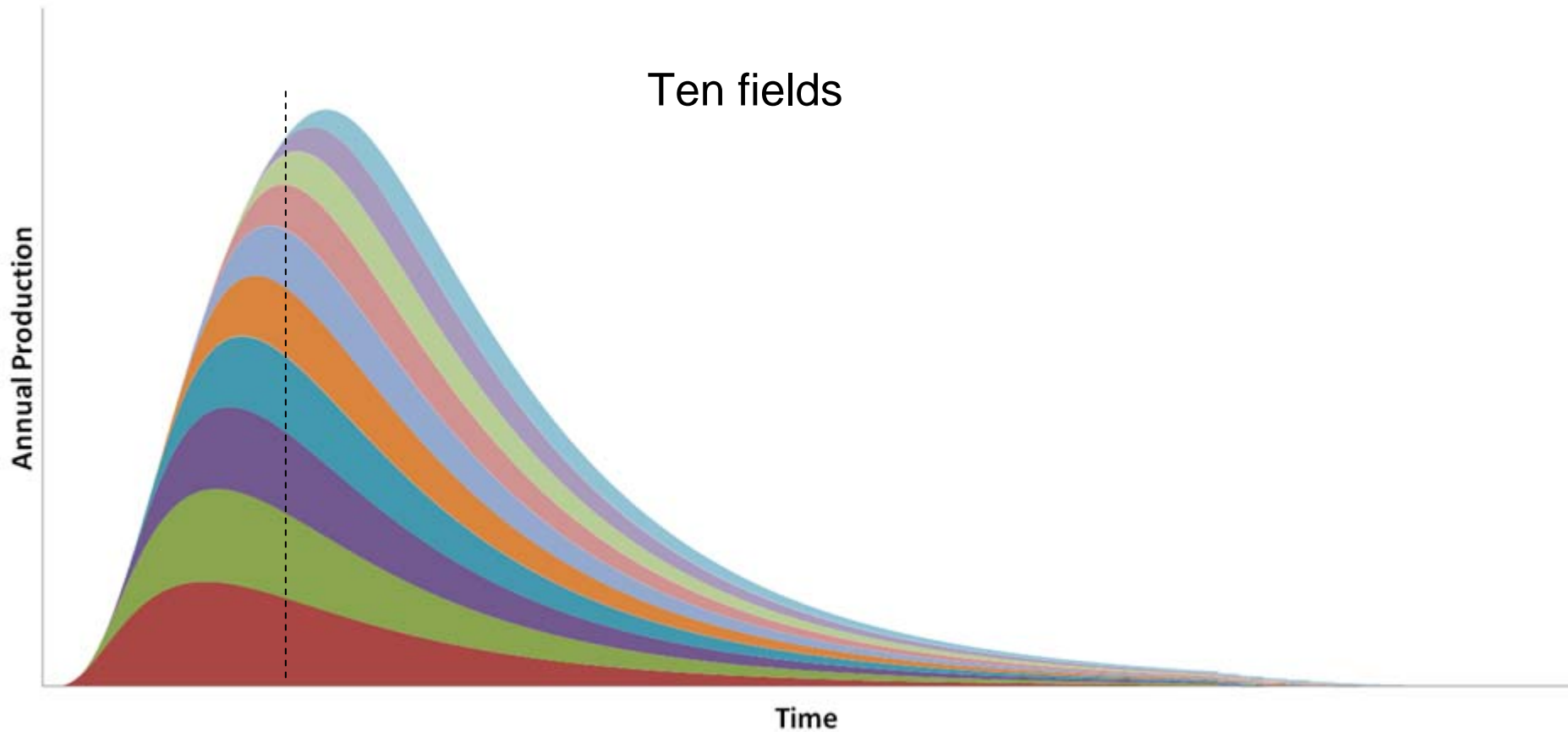
Four fields



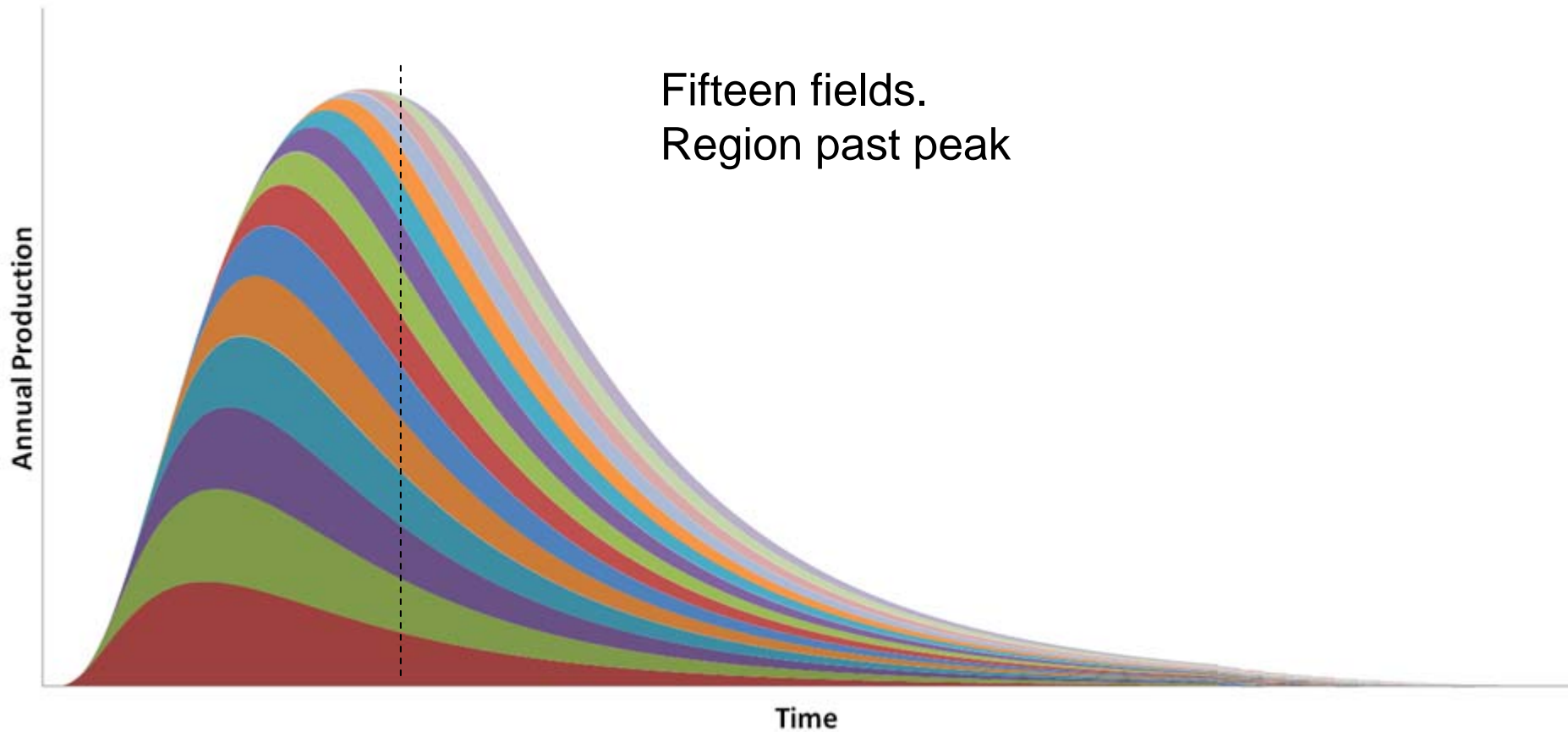
# Regional peaking



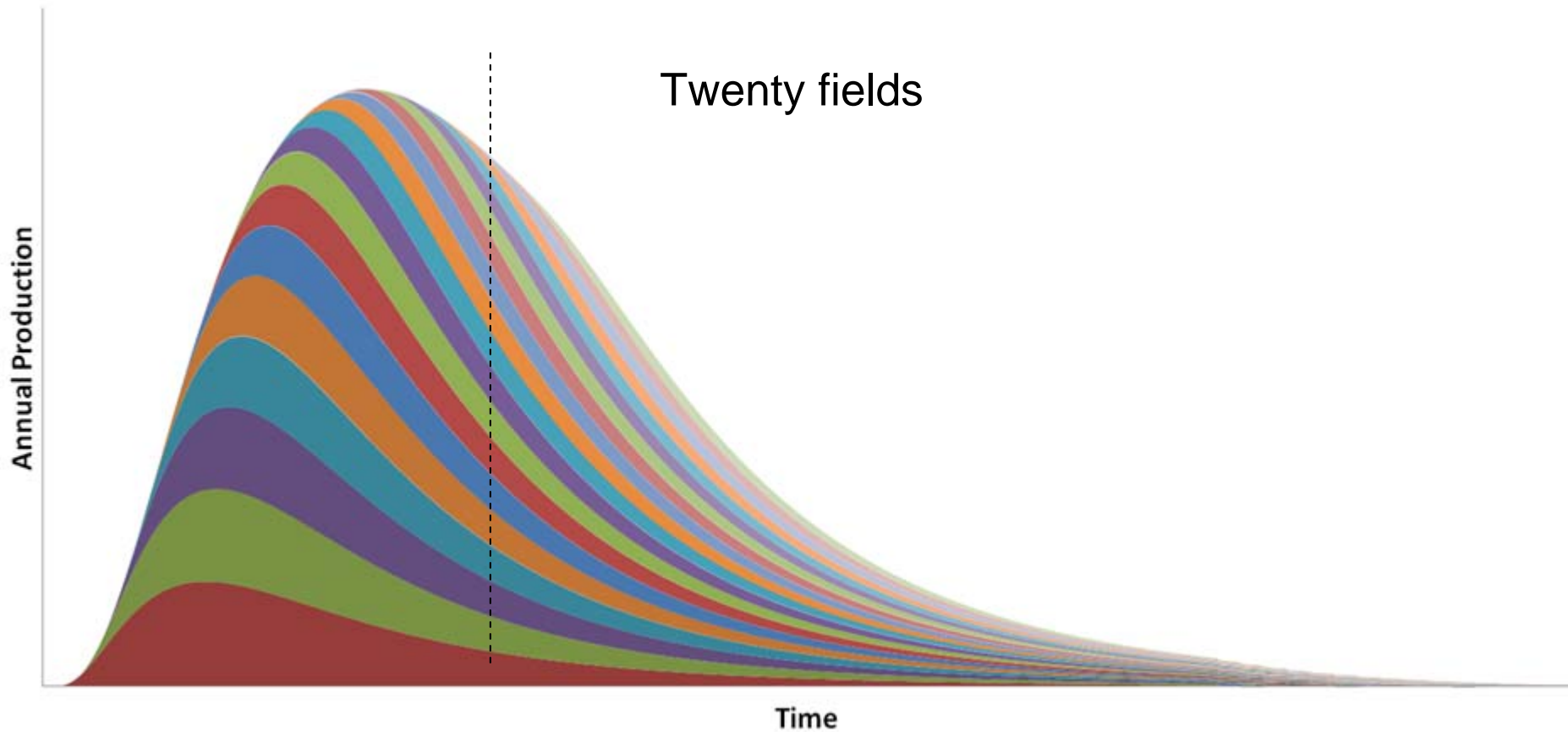
# Regional peaking



# Regional peaking



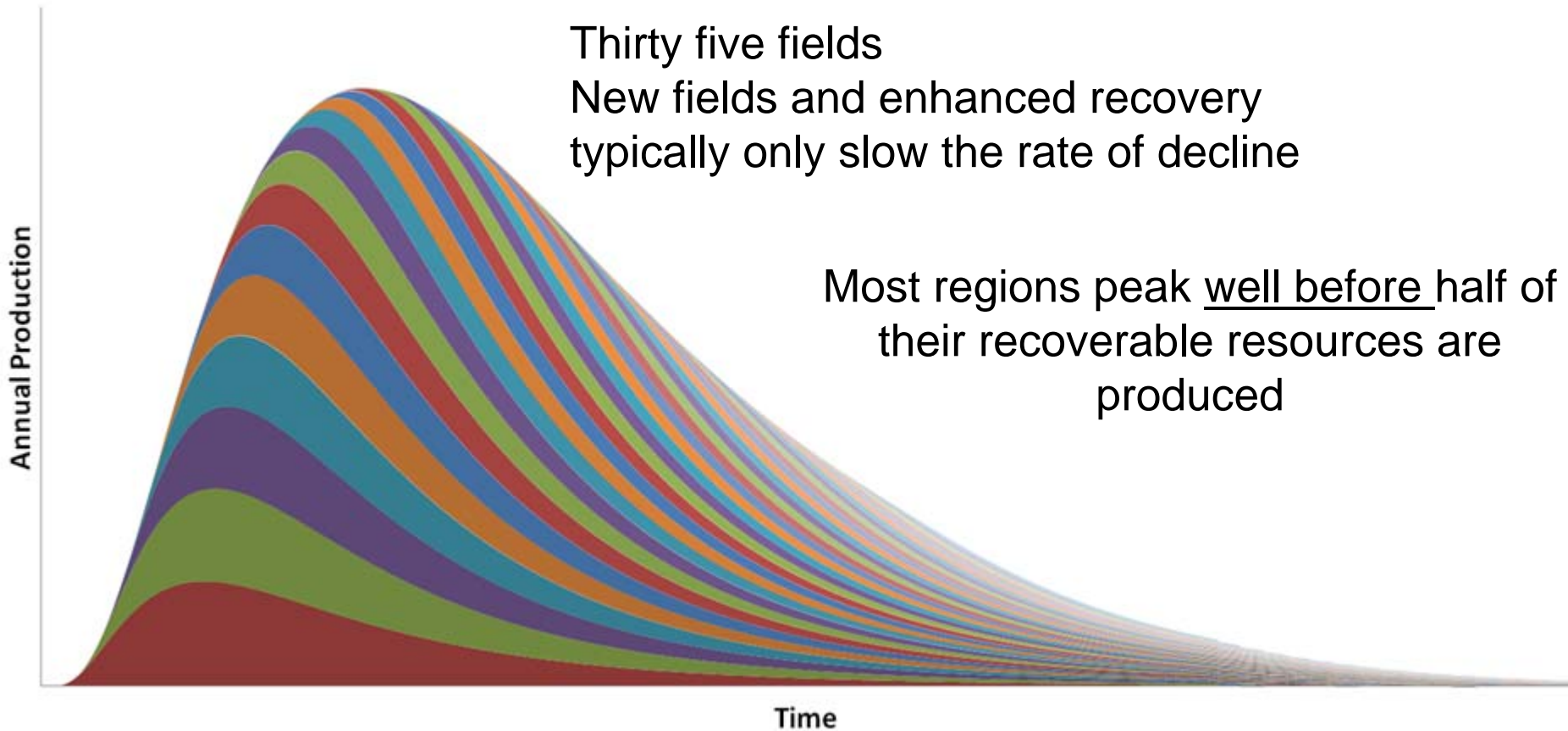
# Regional peaking



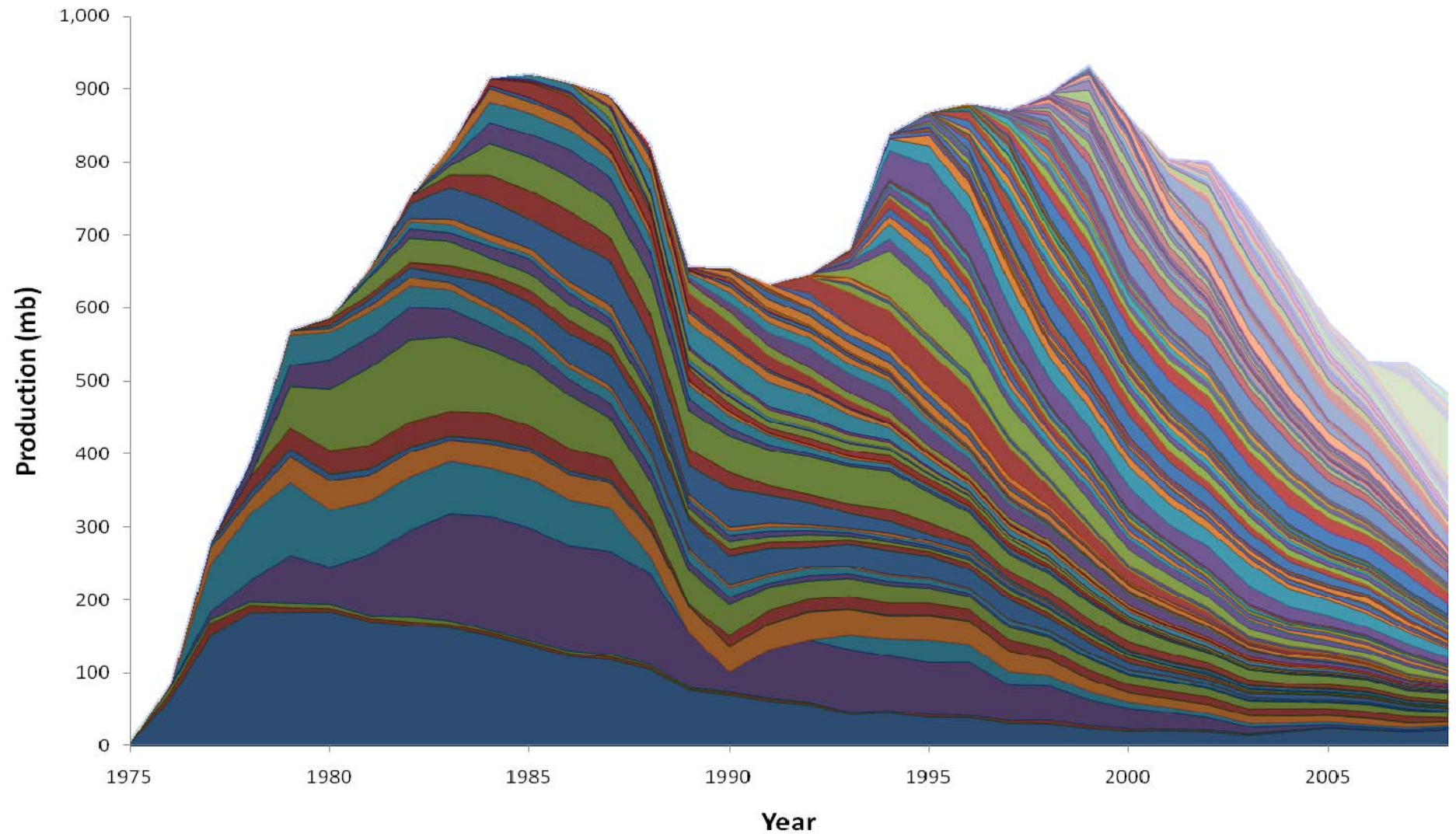
# Regional peaking

Thirty five fields  
New fields and enhanced recovery  
typically only slow the rate of decline

Most regions peak well before half of  
their recoverable resources are  
produced



# UK peaking





# Key Findings

# Global oil depletion is well understood and well advanced

- An increasing number of regions are past their peak of production
- We have used between 28% and 56% of global recoverable resources
- Annual production is significant relative to remaining resources
- A global peak is inevitable. The timing is uncertain, but the window is rapidly narrowing

# Despite uncertainties, the status and risk of global oil depletion can be adequately assessed

- Reserve estimates are uncertain, reporting is restricted, auditing is insufficient, harmonisation is limited, distortions are likely
- Public domain data has serious limitations and is frequently misinterpreted
- Industry data is preferred

# Knowledge is improving in key areas – but the news isn't good

- The rate of decline of production from existing fields is substantial and accelerating (>4% per year)
- Increasing contribution from smaller, newer and offshore fields with higher decline rates
- More than thirds of current capacity may need to be replaced by 2030 to maintain current levels of production

# Methods for resource estimation and supply forecasting have major limitations

- Commonly used 'curve-fitting' methods tend to underestimate recoverable resources
- Lack of transparency, limited sensitivity tests and neglect of key variables all reduce the credibility of supply forecasts
- Precise forecasts are unwarranted and a sharp global peak is unlikely

# Large resources may be available, but make little difference to the timing of the global peak

- Estimates of remaining resources fall within the range 850-3200 billion barrels
- Claims that the optimistic estimates have been discredited are premature
- The primary issue is the rate at which these resources will be accessed
- The discovery of a billion barrels may delay the global peak by only a few days

# The risks presented by oil depletion deserve serious attention

- While many forecasts are too pessimistic, the range of possibilities is relatively narrow
- Delaying the peak beyond 2030 requires assumptions that are at best optimistic and at worst implausible
- There is a significant risk of a peak before 2020
- Even 2030 is not far away, in view of the lead times to develop alternatives



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