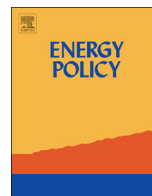




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# The end of Peak Oil? Why this topic is still relevant despite recent denials



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## HIGHLIGHTS

- Key advocates/opponents of Peak Oil reveal their biases.
- Reserve calculation methods are considered, showing flaws.
- Non-conventional oils' viability is critiqued and found wanting.
- Alternative fuels are found to be unsuitable substitutes for oil.
- Demand increases add to the potential for fuel shortages.

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## ABSTRACT

Up until recently Peak Oil was a major discussion point crossing from academic research into mainstream journalism, yet it now attracts far less interest. This paper evaluates the reasons for this and on-going relevance of Peak Oil, considering variations in predictive dates for the phenomenon supported by technological, economic and political issues. Using data from agencies, the validity of each position is assessed looking at reserves, industrial developments and alternative fuels. The complicating issue of demand is also considered.

The conclusions are that, supported by commercial interests, an unsubstantiated belief in market and technical solutions, and a narrow paradigmatic focus, critics of Peak Oil theory have used unreliable reserve data, optimistic assumptions about utilisation of unconventional supplies and unrealistic predictions for alternative energy production to discredit the evidence that the resource-limited peak in the world's production of conventional oil has arrived, diverting discussion from what should be a serious topic for energy policy: how we respond to decreasing supplies of one of our most important energy sources.

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## 1. Introduction

Peak oil is the point at which the global output of conventional oil reaches its maximum level and subsequently flow rates decrease (Bowden, 1985). This is when roughly half the world supply of oil has been produced and subsequent output falls. It is an important topic since oil is critical to the global economy, providing the ingredients for a range of manufactured goods and essential chemicals as well as supplying most of the energy for transportation, ensuring the operation of modern extended supply chains vital for international trade (Atkinson, 2010).

Evidence for the concept of Peak Oil comes in part from the work of Shell Oil geologist Hubbert who predicted that the US production would peak in 1970, closely matching actual peak production in 1971 (Hubbert, 1971; Bowden, 1985). In 1974 he also

suggested that global oil production would peak in 1995 which proved to be inaccurate (Deming, 2003). This approach was also developed separately through Shell scenarios in the 1970s to examine the 'Oil Mountain', the point at which global supplies hit maximum output (Dumoulin and Eyre, 1979). Now named Peak Oil, this is the time when all the cheapest oil has been extracted and costs rise, with serious ramifications for our oil-dependent industrialised societies built upon low energy costs.

The intention of this paper is to collate opinions and the varying views on the date of Peak Oil and consider reasons for variations and the subsequent denial of the phenomenon by the many commentators, taking positions that have serious implications for policy.

## 2. Prediction of the date for Peak Oil

There are a range of predictions as to when oil will peak and the groups can be largely split into those who believe in a late

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(or no) peak – the late-peak advocates<sup>1</sup> – and those who suggest we have, or soon will peak – the early peak advocates. Though this categorisation does not include every commentator on the oil industry, it does encompass those who have voiced strong views on the topic and gives an overview of opinions.

### 3. Late peak advocates

The late-peak advocates examined include the Cambridge Energy Research Associates (CERA), the International Energy Agency (IEA), BP, Shell, the Energy Information Administration (EIA), the Energy Watch Group (EWG), Ged Davis, formerly of Shell, and Leonardo Maugeri, director of Strategies and Development at Eni SpA (Table 1). Within this group there are wide variations with some dates close to those suggested by the early peak advocates.

CERA (2008) believed there was no evidence of a sudden increase in oilfield decline rates before 2017, following on from more optimistic earlier work by CERA's director Peter Jackson (2006) and Jackson and Esser (2004). Similarly BP's Tony Hayward did not believe there would be Peak Oil because of supply, though he suggested there may be Peak Oil caused by demand (Macalister, 2010).

IEA (2010) was not explicit on Peak Oil, but implicitly considered it, looking at alternative energy policies for the future. Shell (2011) saw supply struggling to keep pace with demand by the end of the decade, developing the observations made by Shell senior manager Ged Davis (2003) where he expounded Shell's *Energy Needs, Choices and Possibilities—Scenarios to 2050* (2001). Shell's *New Lens Scenarios* (2013) envisioned no peak under 'Mountains' scenario but saw oil demand 'reaching a long plateau in the 2040s under the 'Oceans' scenario (Shell, 2013, p. 33).

EIA (2010) was more specific than others, proposing that there would be no peak before 2035 with production increases up until that date. This included both conventional and unconventional supplies.

Maugeri (2012) considered the whole concept of Peak Oil as erroneous, declaring that it ignored technological advances and the role of prices to spur innovation. Although BP also foresaw no evidence of a peak in supplies, the firm did point out that 'oil reserves in 2011 were sufficient to meet 54.2 years of global production' (BP, 2012, p. 7).

### 4. Early peak advocates

A more pessimistic view is provided by a number of proponents, many renowned for their staunch defence of Peak Oil predictions. Although there is some corroboration between dates there is no clear consensus (Table 2).

Professor Ken Deffeyes (2010), having written extensively on the topic, used calculations to show that the 2005 peak in world oil production would never be surpassed, now supported by Hallock's recent review of his 2002 model (2013). Bakhtiari (2004) used simulations of the World Oil Production Capacity (Wocap) to propose global oil production peaking from 2006 to 2007. This was reinforced by energy investment specialist Matthew Simmons (2006) who argued that the oil and gas system lacked spare capacity and any minor incident in the industry was likely to cause a major crisis. Also supporting this was The World Energy Council (WEC, 2007), which suggested that we were in the *Second Half of the Age of Oil*, characterised by the decline of supply.

Using research into new discoveries Chris Skrebowski's Mega Projects (2004) observed a decline in large new discoveries of oil

**Table 1**

Summary of dates for late peak.  
Sources: Varied given in references.

Peak oil date	Source and date of forecast
Not before 2017	CERA (2008)
After 2020	Hayward, T., BP (Macalister, 2010)
After 2020	CERA (Jackson and Esser, 2004)
2020 or beyond 2035	IEA (2010)
2020 (for oil and gas)	Shell (2011)
2025 or later	Davis (2003)
2035	CERA (Jackson, 2006)
Not before 2035	EIA (2010)
No visible peak	Maugeri (2012)
No peak but 54.2 years of global production	BP (2012)
'Peak oil theories have been abandoned'	Mountains Scenario
'Oil demand ...reaching a long plateau in the 2040s'	Oceans Scenario (Shell, 2013)

**Table 2**

Summary of dates for early peak.  
Sources: Varied given in references.

Peak oil date	Source and date of forecast
2005	Deffeyes (2010)
	Hallock (2013)
2006–2007	Bakhtiari (2004)
2006 on	Simmons (2006)
After 2007	Skrebowski (2004)
Soon after 2007	World Energy Council (2007)
2009–2031	Sorrell et al. (2009)
Before 2010	Goodstein (2004)
Around 2010	Campbell (2005)
Possibly 2010	Klare (2004)
2010	Aleklett et al. (2010)
After 2010	Skrebowski (2005)
2006–2017	Hiro (2007)
2009–2031	De Margerie, C., Total S.A. (Walt, 2010)
2008–2012	De Almeida and Silva (2009)
2012–2017	Koppelaar (2005, 2006)
2008–2018	Robelius (2007)
2014	Nashawi et al. (2010)
2015	Shell (2008)

putting 2007–2008 as the peak point. With updated research he amended this to after 2010 (Skrebowski, 2005).

This matched the findings of a number of observers such as Klare (2004), who considered total historical global reserves half gone at 2010, and Hiro (2007), using data from the *BP Statistical Review of World Energy* (BP, 2006) to argue for a twin-crested peak from 2006 to 2017. Goodstein (2004) perceived a situation similar to the 1973 oil crises causing him to propose 2010 as the peak date. These researchers tended to concur with one of the key advocates of early peak, Dr. Colin Campbell of the Association for the Study of Peak Oil and gas (ASPO). Writing since the 1990s on the topic he used data from the Gulf War, and Shell's restating of its reserves, to support 2010 as peak date in his book *Oil Crisis* (2005). His more recent research put the global economy now at 'peak demand' (Lewis, 2010).

Further supporting this Christophe De Margerie, CEO of the oil firm Total, suggested that oil supplies could not easily cover demand after 2010, costing increasing amounts to recover (Walt, 2010). This also matched the research of Aleklett et al. (2010), who looked at IEA's data and agreed with 2010. De Almeida and Silva (2009) concluded that market participants (including oil firms) expected a peak from 2008 to 2012 based on a study of oil futures.

<sup>1</sup> For simplicity, the title of the group has been set as late-peak rather than late-and-no-peak.

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