

An Analysis on “Peak Oil Demand”

Ken Koyama, PhD
Chief Economist, Managing Director
The Institute of Energy Economics, Japan

A mainstream view on the future picture of energy has been that demand for oil as the world's largest energy source will continue to moderately expand over a long term on the strength of transportation fuel demand growth induced by the diffusion of automobiles mainly in developing countries against the backdrop of world economic growth. Amid the growing expectation and anticipation of a rapid diffusion of next-generation advanced vehicles replacing traditional internal combustion engine vehicles, as symbolized by the rapid electric vehicle spread, however, the possibility of sooner or later peak global oil demand has attracted global interests.

“IEEJ Outlook 2018,” released in October 2017 by the Institute of Energy Economics, Japan, focused on analyzing peak oil demand, indicating that if zero-emission vehicles such as electric and fuel cell vehicles account for 30% of global vehicle sales in 2030 and for 100% in 2050, global oil demand may peak around 2030 and fall back to the present level by 2050. It also provided an analysis on the impacts of peak oil demand including oil price drops, their effects on oil producing economies and carbon dioxide emissions, a falling gasoline share and its effects on the downstream oil sector. I and my IEEJ colleagues have made presentations at various locations in the world to introduce the IEEJ Outlook including the peak oil demand analysis, which has attracted deep interest.

In any field, it is difficult to anticipate the long-term future picture. Various uncertainties are ahead of us. Events or developments that cannot be anticipated at present could occur, leading forecasts to frequently deviate from realities. As we accumulate discussions with oil experts and market players in the world on the difficult prediction of peak oil demand and various factors and uncertainties for consideration, we realize how difficult the prediction is. In this report, I would like to introduce some key points for considering peak oil demand, based on my discussions at various opportunities.

First, attention must be paid to various uncertainties regarding the expectation of advanced vehicles' rapid diffusion that has triggered interests in peak oil demand. In fact, the EV diffusion has gained momentum on rapid battery technology improvements that have led to longer cruising ranges and lower costs. The absence of carbon dioxide and air pollutant emissions during these advanced vehicles' driving has been attracting attention as well. Nevertheless, it is difficult to conclude that EVs and other advanced vehicles are superior to traditional internal combustion engine vehicles in terms of economy and convenience. Hopes are placed on further technology improvements and cost reduction in the future. Attention must be paid to the point that their extent and speed are uncertain as seen from various aspects including technologies and raw materials. Regarding the diffusion of

advanced vehicles, there are problems involving key relevant infrastructure such as recharging facilities and hydrogen stations. These social and economic problems beyond vehicle technologies may also have to be taken into consideration.

A basically important point is how overall fuel efficiency for vehicles including traditional internal combustion engine vehicles could be improved. Given the possibility that internal combustion engine vehicles will continue to be sold and used and remain dominant, their fuel efficiency improvements will be a key factor for the future demand for vehicle fuels.

Another key point for consideration is how advanced vehicles would be used, whichever vehicles are selected, or whether their use would dramatically change from that at present. Not only changes in automotive power trains but also vehicle driving techniques and car sharing services could alter how vehicles are used and have great influence on fuel and power demand. This is a new problem linked closely to social and economic changes resulting from artificial intelligence and various information technologies that are rapidly advancing and attracting great interests. How these would change vehicle use is very difficult to measure quantitatively. Therefore, various possibilities and scenarios may be combined with bold assumptions to quantify impacts on fuel and power demand.

Furthermore, we must remember that the consideration of future vehicle fuels alone is insufficient for analyzing peak oil demand. One of the arguments against the peak oil demand theory is that overall global oil demand may continue increasing as oil demand growth in non-auto sectors offsets a decline in vehicle fuel demand on the diffusion of advanced vehicles. Sectors expected to steadily expand oil demand may include maritime and air transportation, and petrochemical production. In these sectors, however, fuel efficiency improvements and fuel switching could be realized. Oil demand in these sectors in the future will also have great influence on the possibility of peak oil demand.

Given the above points, we find that various problems must be considered for analyzing the possibility of peak oil demand. Depending on future developments involving these problems, future oil demand will be depicted variously.

If oil demand peaks on the development of the abovementioned points for consideration, however, the peaking may be brought about by a comprehensive set of various technological, social and economic changes. A key point is that some major background factors could be required to “trigger” such comprehensive set of changes.

In the first half of the 1980s, global oil demand continued decreasing. A global recession after the second oil crisis was a factor behind the oil demand decrease. Another key factor was that measures to reduce dependence on oil were taken and produced effects in developed countries, then central oil consumers in the world. Given this point, the growing importance of air pollution and climate change countermeasures could drive oil demand to peak out in the long run. The rapid advancement and diffusion of some elemental technologies could alter the world. Another possible “trigger” of peak oil demand would be a crude oil price spike on large-scale oil supply disruptions in major oil supply regions such as the Middle East. These trigger events could prompt China, India and other Asian emerging countries, viewed as the future oil demand growth driver, to take

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full-blown measures to reduce dependence on oil. I would like to be alert to various events having great influence on global oil demand.

Contact: report@tky.ieej.or.jp

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