



## Moving toward Electric Vehicles Will Cause Dramatic Changes in Oil Consumption: Rising Dependence on the Middle East and Geopolitical Risks



Oil prices will fall and relative dependence on the Middle East will increase as a result of changes, such as the global movement away from gasoline-fueled cars. Photo: Public Domain

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Oil occupies a central position in the global energy market. In the 2000s (2000 to 2007), global demand for oil grew at an average rate of 1.3 million barrels per day (Mb/d) due to such issues as brisk demand in China. At that time, peak oil theory (theory of an oil supply peak) received wide coverage. Excess liquidity in financial markets caused crude oil prices to soar, resulting in a tight supply and demand balance, which emphasized concern about a supply peak.

Policies and lifestyles will continue to change in response to trends in the Reference Scenario in the IEEJ Outlook 2018 prepared by the Institute of Energy Economics, Japan (IEEJ). Accordingly, global oil demand will grow from 90 Mb/d in 2015 to 122 Mb/d in 2050.

Demand for oil will decrease by 9 Mb/d in Organisation for Economic Co-operation and Development (OECD) member states due to the spread of energy conservation efforts and renewable energy, among others. Meanwhile, there will be a substantial increase in non-OECD Asian countries, centered on India, the Association of Southeast Asian Nations (ASEAN) and China, where demand will expand by 10 Mb/d, 6 Mb/d and 5 Mb/d, respectively. Therefore, oil consumption for cars will account for 9 Mb/d of the projected demand expansion to a total of 32 Mb/d.

The theory of an oil supply peak disappeared following events such as the shale revolution. However, the theory of an oil demand peak emerged as a replacement, according to which oil consumption will peak from the demand side prior to resource constraints. This theory originated from the view that the promotion of energy conservation and a greater shift to renewable energy in response to climate change issues will curb oil consumption.

Movements away from traditional gasoline and diesel fueled cars to electric vehicles (EVs) have begun with a background of decreasing air pollution, resulting in greater attention to an oil demand peak. Last year, the governments of France and the United Kingdom announced plans to ban conventional car sales by 2040, demonstrating the progress of the movement toward electrified vehicles in Europe. However, similar events have occurred in China and India, which will account for about 30% of the global car market in 2040.

Reflecting such policy trends, car manufacturers are also beginning to move toward electrified vehicles. For example, Volkswagen announced its plan to introduce more than 80 EV and plug-in hybrid vehicle (PHV) models by 2025. Toyota also announced its intention to offer electrified vehicles for all models by around 2025 and to manufacture 5.5 million electrified vehicles by 2030. Seven of the largest car manufacturers in 2016 stated a policy to move toward electrified vehicles.

How will the rapid movement toward electrified vehicles affect oil demand? The author speculated on its effects, assuming that the ratio of zero-emission vehicles (ZEVs) to new cars sold worldwide will rise to 30% in 2030 and 100% before 2050. (ZEVs include EVs, PHVs and fuel cell vehicles [FCVs], and exclude hybrid cars.)

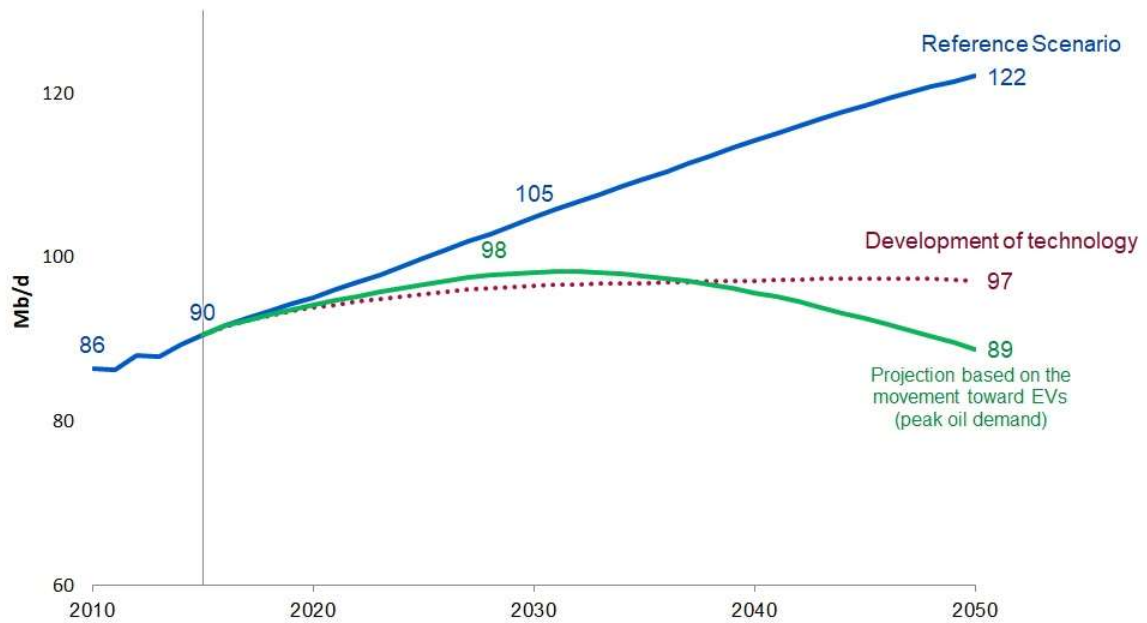
This is the pace of diffusion at which the 30% ZEV share in global new car sales, set as a target in the EV30@30 Campaign adopted by the Clean Energy Ministerial, consisting of major countries, will be achievable on a global scale by 2030. The pace will also match the assumed global implementation ten years from 2040 of policies, such as the aforementioned ban on conventional car sales in France and the United Kingdom by 2040. However, the ratio of ZEVs to owned vehicles will be 14% in 2030 and 74% in 2050, because people drive the same car for ten years or longer on average.

Demand for oil used for cars will decrease to 15 Mb/d in 2050, less than 40% of the current demand, according to this assumption. Meanwhile, natural gas- and coal-fired power generation will be the main sources of power, assuming thermal power generation completely covers the increase in power demand attributable to ZEVs. An increase in demand for oil used for power generation will be limited to 2 Mb/d.

## **Decline in Crude Oil Prices to Promote the Movement toward EVs**

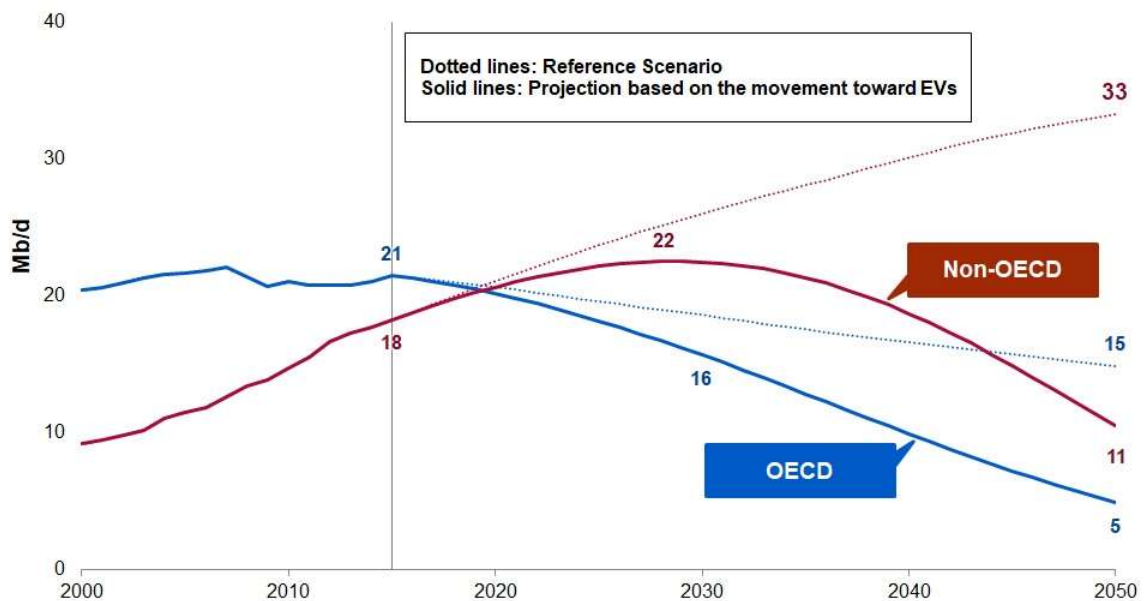
Total demand for oil will start to fall around 2030 and will drop to 89 Mb/d in 2050. (Refer to the following graphs.) In other words, a whispered peak in oil demand will actualize if and when ZEVs spread rapidly worldwide.

**Consumption of oil used for cars will also decrease for non-OECD members.**



Source: Created based on the IEEJ Outlook 2018 published by the Institute of Energy Economics, Japan

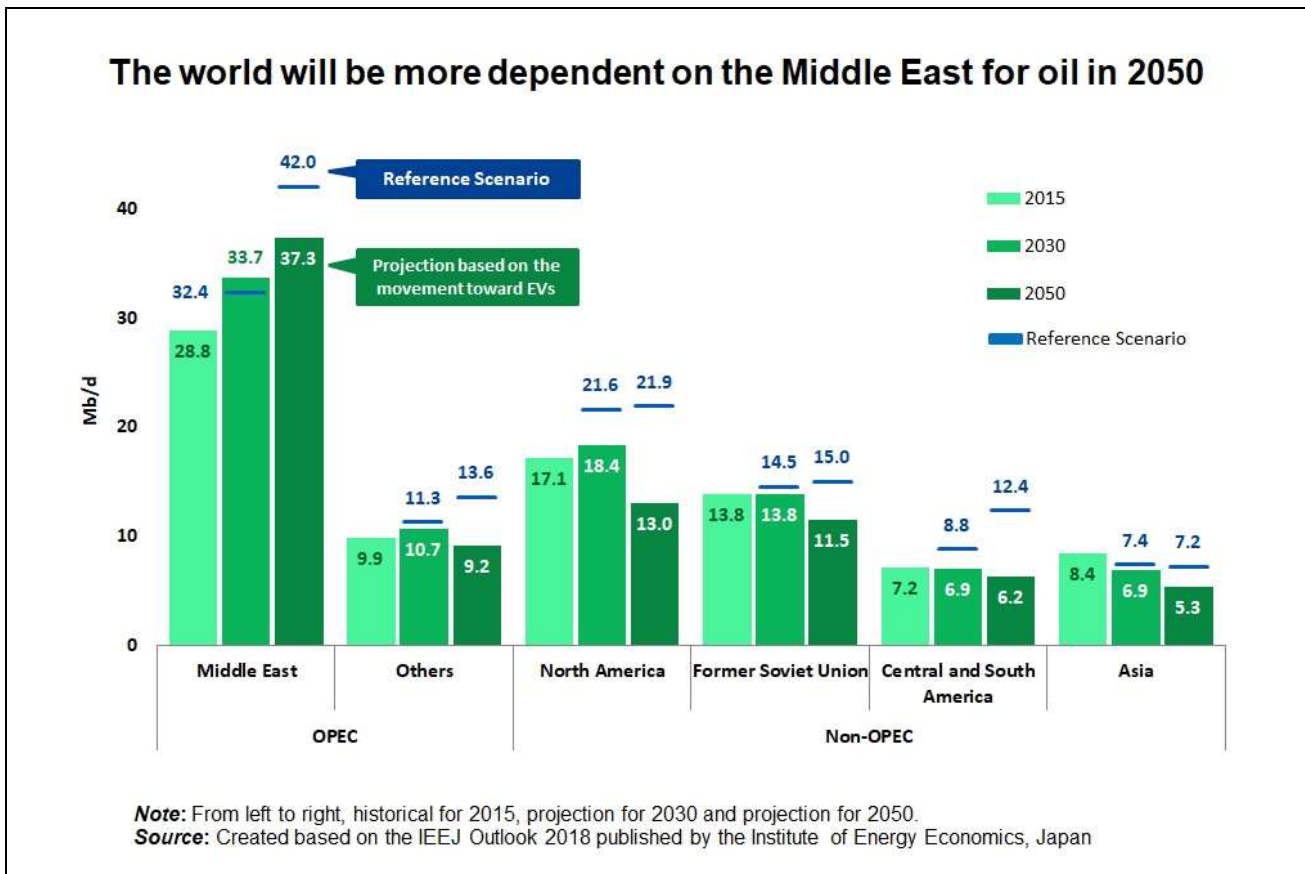
**Global oil consumption will fall substantially from standard projection due to the advancing movement toward EVs.**



Source: Created based on the IEEJ Outlook 2018 published by the Institute of Energy Economics, Japan

Today, many crude oil price forecasts assume that the supply cost will increase, because global demand for oil will keep increasing. In that case, it is perfectly conceivable that the oil demand peak will be a sort of game changer, and cause crude oil prices to plunge with pressure to ease the supply and demand balance and a background of changes in market awareness.

Under long-term low prices, regions where production cost is comparatively high will become less competitive. The volume of production will drop sharply in the Americas, where supply sources, such as shale oil in the United States and pre-salt in Brazil, have high potential. In the meantime, the volume of production will fall below the level in the Reference Scenario in Middle Eastern countries belonging to the Organization of Petroleum Exporting Countries (OPEC), but those states will be the only region to maintain the current upward trend. As a result, the OPEC members' production share will rise from 42% in 2015 to 46% in 2030 and 54% in 2050. (Refer to the following graph.)



This change may affect the bolstering of OPEC's pricing power. However, aggressive price hikes will stimulate crude oil production in other regions. Temporary backlash is possible, but it will be difficult to overturn the downward pressure on prices in the medium and long term.

The substantial relaxation of the oil supply and demand balance will be good for importing countries. However, low crude oil prices produce huge risks for guaranteeing oil supply on a medium- and long-term basis. According to the International Energy Agency (IEA), global investments in oil and gas field development fell 44% from 2014 to 2016, when crude oil prices plunged sharply. There is concern that an unstable oil supply may actualize in the 2020s under the effects of the investment decline. Likewise, low oil prices may impede sufficient investments for supply in a case where demand for oil reaches a peak. As a matter of course, a peak in demand may lower the possibility of a tight supply and demand balance. However, stable supply will remain at risk if upstream investments stay low enough that they cannot cover soft demand.

## Rising Geopolitical Risks

The change in the structure of crude oil supply will cause geopolitical risks for stable supply to rise in two ways. First is greater dependence on the unstable Middle East. As recent events show, such as Saudi Arabia's confrontation with Iran and the severed ties with Qatar, the situation in the Middle East remains fluid. Needless to say, greater dependence on this region will increase risks.

Second is the further destabilization of the Middle East under downward economic pressures. The Middle East will achieve relative gains among oil producers with its rising production share. However, net oil exports will fall 1,600 billion US dollars from the Reference Scenario in 2050. The decrease will correspond to 13% of the nominal gross domestic product projected for the same year.

These countries rely on a high degree of oil exports. It is difficult for them to balance their budgets under conditions such as an oil demand peak. Initiatives to reduce budget deficits, such as curbs on public investment and subsidies, are rational. However, they may increase public anxiety and worsen the situation not only for oil producers but also the entire Middle East. This possibility cannot be denied.

Demand for oil may follow a downward turn depending on the diffusion trend for ZEVs. However, the oil demand peak is extremely challenging, because it assumes that ZEVs will spread at a considerably rapid pace. It may also be interpreted as suggesting the possibility that demand for oil will not decrease easily. However, we should not overlook the point that such a forecast based on the development of EV vehicles is based on the view that oil will be sought in 2050 on a scale not very different from the current situation.

Neglected investments for supply based on an excessively pessimistic view of the future may cause consumers to move away from oil while threatening energy security if and when such condition occurs. Not only initiatives taken by oil producing countries themselves but also the roles of consuming countries, such as the financing of resources and investments, remain important in the consideration of risks for a stable supply attributable to the rising degrees of dependence on crude oil from the Middle East. At the same time, consuming countries must support oil producers' initiatives for reforming their economic structure, which have reportedly stagnated, such as Saudi Vision 2030.

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*Translated from "Global Economy: EV-ka de Gekihensuru Sekiyu-shohi, Takamaru Chuto-izon to Chiseigaku Risuku (Moving toward Electric Vehicles Will Cause Dramatic Changes in Oil Consumption: Rising Dependence on the Middle East and Geopolitical Risks)," Wedge, February 2018, pp. 44-46. (Courtesy of WEDGE Inc.) [February 2018]*

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