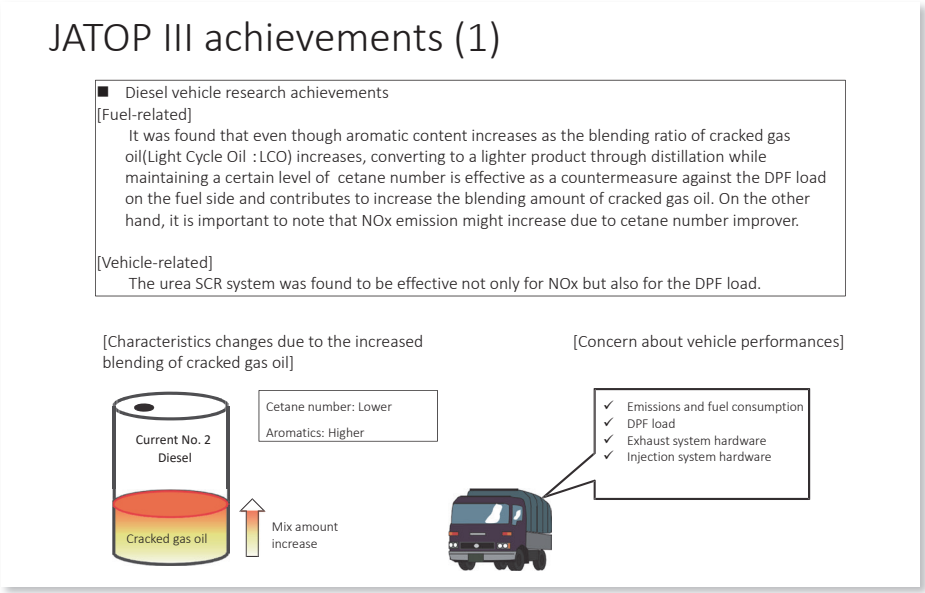
Ⅱ Development of Fuel Utilization Technologies

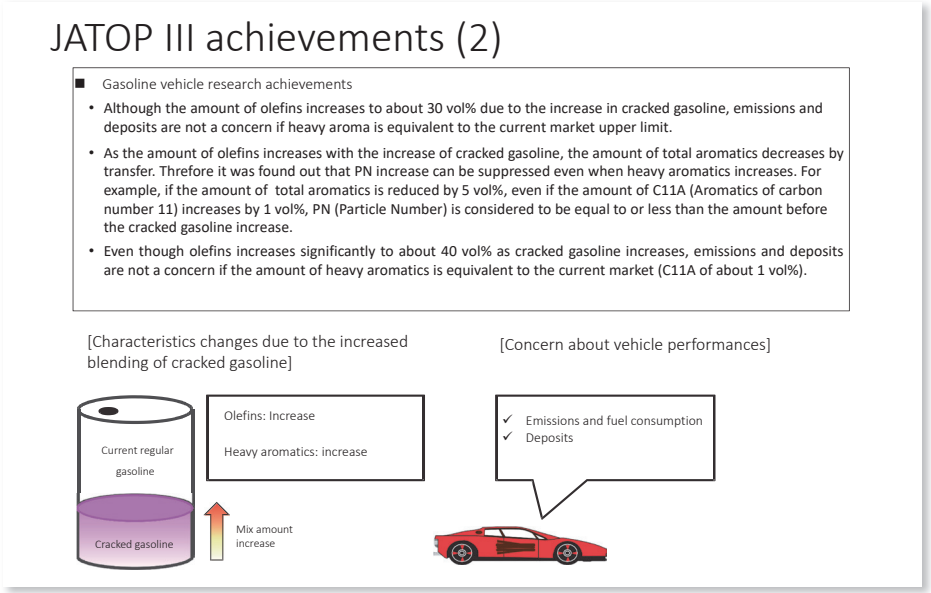
To meet domestic demand for petroleum products while reducing crude oil processing amounts and reducing carbon dioxide emissions over the medium to long term, in the harsh environment surrounding future petroleum products such as increases of residual oil due to heavier crude oil and reduction of residual oil demand because of environmental regulations and so on, we are conducting impact assessment tests for automotive use of fuel with a higher mixing ratio of fractions obtained by cracking residual oil and so on. To comply with global regulations for sulfur in marine fuel and accomplish stable supply of marine fuel, . we are conducting combustion tests in order to determine whether the change in oil properties associated with sulfur content reduction may impact on marine engines using current C fuel oil.

1． Automotive Fuel and Marine Fuel

Japan Auto Oil Program: JATOP is a collaborative research project between the automobile industry and the petroleum industry that aims to solve technical issues regarding future automobiles and fuels. Following JATOP I (2007-2011) and JATOP II (2012-2014), we have worked on the JATOP III project, a three-year plan from 2015.

As domestic petroleum product demand is predicted to decline significantly for heavy oil, and because the ratio of cracked fractions will increase through enforcement of the Act on Sophisticated Methods of Energy Supply Structures, further study for the effective use of cracked fractions as automobile fuels was deemed necessary, leading us to conduct studies on the use of cracked gasoline as automobile fuels, in addition to studies on the use of cracked gas oil as automobile fuels from JATOP II.

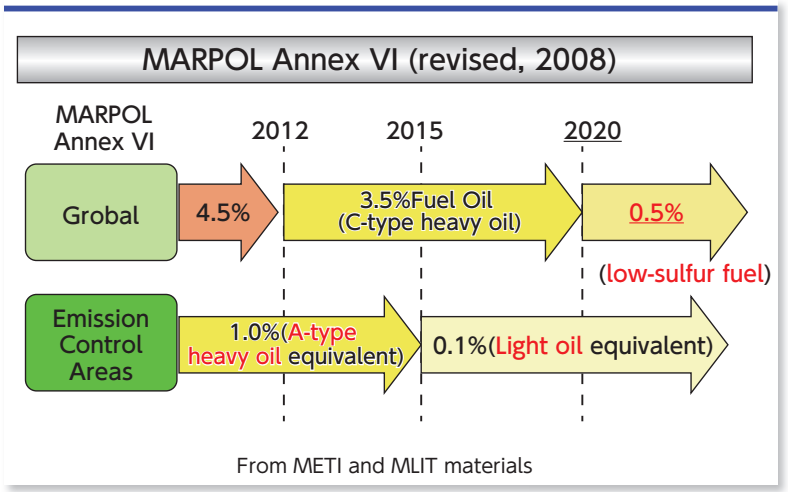




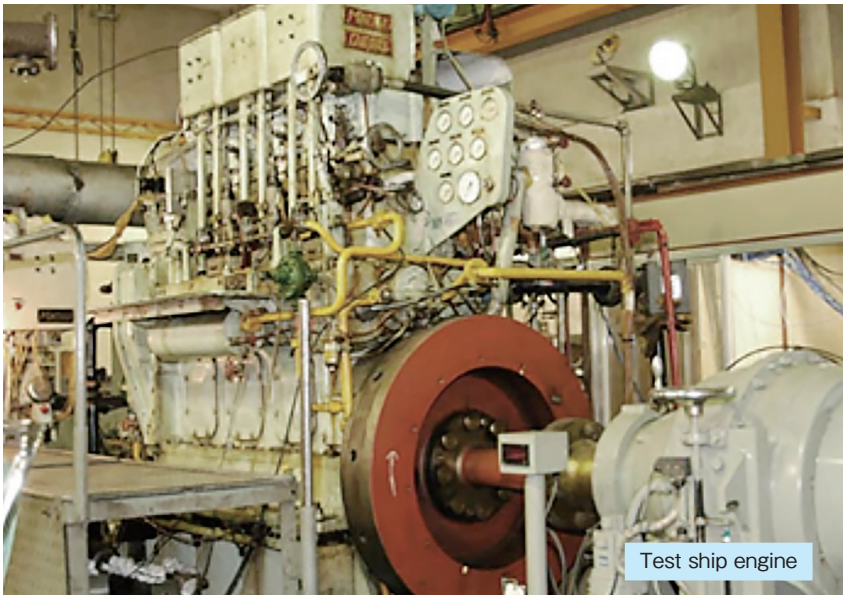
From 2018 onward, we conduct research on technological issues in the next-generation automobile fuel field as well as research on fuel utilization technologies for low-sulfur marine fuel. The project name is 'Japan Marine and Auto Petroleum program: J-MAP'.

In automobile fuel research, we are working on solutions to issues that were identified in JATOP III.

Further, as research on marine fuel quality that meets low-sulfur requirements for marine fuels in general sea areas (current 3.5% sulfur concentration limit to be reduced to 0.5% by 2020), we are studying the impact of marine fuel property changes resulting from sulfur content reduction on the combustion performance of marine engines.



From METI and MLIT materials


Test ship engine