

## **Challenges for Heavy-Duty Alternative Fuel Engines and Prospective Technologies in Japan**

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The air pollution situation in Japan is serious, particularly in major metropolitan areas, and the main cause is the nitrogen oxides (NO<sub>x</sub>) and particulate matter (PM) emitted by heavy-duty diesel trucks. For that reason, the Japanese government has repeatedly strengthened its emission regulations for heavy-duty diesel vehicles. At the same time, attempts have been made to popularize low-emission vehicles such as compressed natural gas (CNG) trucks and hybrid trucks. However, these low-emission vehicles have poorer fuel economy and shorter cruising ranges than diesel vehicles, and these factors interfere with both their widespread acceptance and large vehicle development. This paper describes the trends in the research and development that is being carried out in order to solve these technical problems. A brief overview is also presented of the development strategy for next-generation large vehicles announced by the Ministry of Land, Infrastructure and Transport in December, 2001, which sets near-zero emissions as its target.