

## Warning for economic society (Rapid urbanization suffered from PM2.5)

According to the United Nations, social and economic development triggers urbanization, and by 2050, about 70% of the global population is likely to live in cities. Rapid urbanization in developing nations causes serious air pollution, which leads to significant health problems for residents and deterioration in their living conditions.

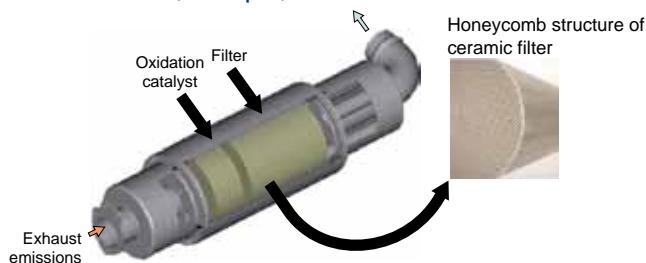
One of the air pollutants is PM2.5, a fine particulate matter which is suspected to cause damage to respiratory and cardiovascular systems as it gets to the lung when inhaled. Therefore Japan took action in 2009 by establishing environmental standards for PM2.5, and is regulating emissions of this pollutant. A monitoring system has also been deployed with the cooperation of local authorities, monitoring PM2.5 levels at over 600 locations around Japan.

In January 2013, significant air pollution occurred in and around Beijing, with PM2.5 being one of the main problems. At that time, PM2.5 levels exceeding environmental standards were observed in western Japan. Interim measures were put together in

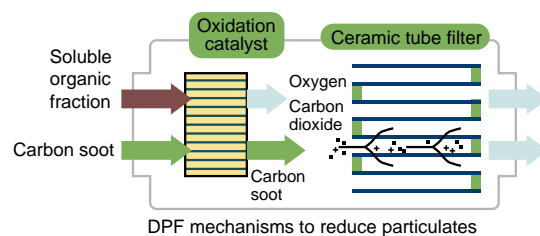
February, and the Ministry of the Environment issued provisional guidelines for alerts to warn people of the situation. Then, in May 2013 the environment ministers of Japan, China, and Korea met and agreed to establish a new trilateral working-level panel to conduct dialogue on the issue.

Japan experienced serious health problems when air pollution became a big problem around the country during the rapid economic growth in the 1960s. However, Japanese industries put their efforts into developing a solution for air pollution, including the deployment of low-sulfur diesel fuel, the development of electronic fuel injectors to facilitate complete combustion, and the development of exhaust system technology to remove sulfur oxides, nitrogen oxides, and particulates. Eventually, Japan has grown to be one of the leading countries that have the world's most advanced technologies to clean up air pollution. This sort of state-of-the-art technology has the potential to contribute a global challenge for air pollution.

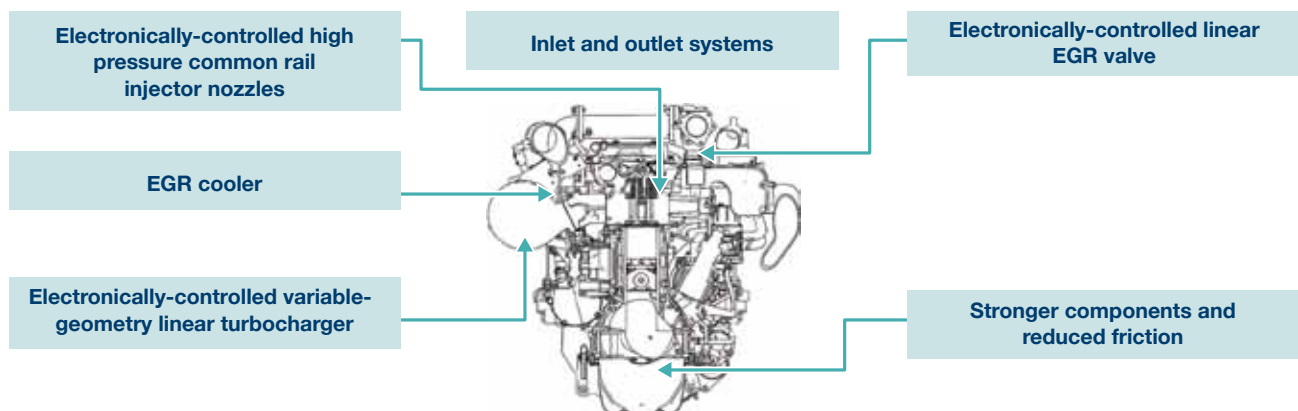
### DPF structure (example)



Source: Particulate matter—From SPM to PM2.5, Japan Automobile Manufacturers Association



### Improvements to engine structure and combustion



Source: Particulate matter—From SPM to PM2.5, Japan Automobile Manufacturers Association