

How to Reduce Air Pollution with Cleaner Fuels and Cleaner Vehicles

The course was presented by Mr. Michael P. Walsh, a MacArthur Fellow. Mr. Walsh gave an extensive overview of air pollution caused by vehicles powered by fossil fuels, and discussed alternative fuels and technologies for reducing these emissions. Mr. Walsh described the key products of fossil fuel combustion: lead, hydrocarbons, carbon monoxide, oxides of nitrogen, carbon dioxide, particulates, pollutants, and water vapor, and other vehicle emissions such as brake linings, tire wear, and fluid leaks. He stressed that fuel composition is important because it affects emissions directly, if changed it can have immediate impact on air quality and emissions, and it can enable or disable pollution control technology. The pollutants that produce the most adverse effects on air pollution and human health are Green House Gases, Haze, Particles (NO_x, SO_x, ROG, ammonia), Carbon Monoxide (CO), Ozone (ROG+NO_x) and Toxics (diesel particles, benzene, chromium and asbestos). Human health problems related to air pollution range from asthma attacks to cancer and premature deaths. Mr. Walsh illustrated the strong correlation between air pollutants and human health with figures that show the negative effects that lead absorption can have on the intellectual development of children. Studies have demonstrated that children's IQs are severely affected when living or attending schools in proximity to heavy traffic zones with high concentration of lead in the air.

Mr. Walsh talked about the "Technology Enabling" fuels story in Europe. He covered the regulatory exhaust emission standards for passenger cars in the European Union, the relationship between vehicle technology and introduction of unleaded gasoline in Europe, the introduction of lower sulphur levels, and the relationship between vehicle technology and sulphur in gasoline and diesel fuel, among others. He further elaborated on the conclusions by the International Council on Clean Transportation (ICCT) on the use of manganese in the production of catalysts and its recommendation that countries delay any use of MMT in gasoline, pending the outcome of ongoing health-based studies and further review of the vehicle impacts.

In the view of Mr. Walsh, the path to cleaner cars will materialize as long as cleaner fuels become available, tighter vehicle standards are put in place, and vehicle inspection and maintenance is properly followed through. The trends in the American vehicle sector have demonstrated that economic growth can coexist with clean air and low energy consumption. In order to succeed in the transition to cleaner vehicles, emission control reductions in new vehicles require a systems approach. The critical role that inspection and maintenance play in such process was underlined. The purpose of a vehicle inspection and maintenance programme is, among others, to assure that vehicles are properly maintained and used, and that dirty and unsafe vehicles are identified and repaired. The positive effects of such a programme have already been witnessed in some cities.

While significant advances have been made in the path to cleaner vehicles, the same cannot be said about the bus and truck industry. Tighter policies in terms of emissions and cleaner technologies, among many other measures, need to be applied and monitored closely in this particular sector.