

TECHNOLOGY FACTSHEET
INCREASE THE USE OF CLEANER FUEL (I.E. LIQUID NATURAL GAS (LNG)/ COMPRESSED NATURAL GAS (CNG) AND BIOFUELS)¹

- 1. Sector:** Transport
- 2. Introduction:** Transport sector is a major GHG emitting sector in Sri Lanka. About 60% of the air pollution (especially in Colombo City) comes from this sector (AirMAC, 2009). The main way of transportation is through the road network, which is supplemented by rail, air, and water transport means. Out of passenger transport, buses carry about 50% and railways carry about 4% of the passengers, while the rest of the passengers are carried by the other modes (Jayaweera, 2011). Road transport accounts for about 96% of passenger transportation and 99% of freight transportation (Jayaweera, 2011). Currently, the transport sector in Sri Lanka utilizes petroleum-based fossil fuels, leading to significant amounts of CO₂ and other GHG emissions (e.g. N₂O, CH₄) considered under the United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol. Technology transfer, defined as the flow of experience, know-how and equipment between and within countries, is one of the priorities under the United Nations Framework Convention on Climate Change (UNFCCC). Technology needs assessment (TNA) is a key element of the technology transfer, and is carried out with the intention of moving towards cleaner, less GHG emitting technologies.
- 3. Technology name:** Increase the use of cleaner fuel (i.e. Liquid natural gas (LNG)/ Compressed natural gas (CNG))
- 4. Technology characteristics:** Currently the vehicles used in Sri Lanka use petroleum fuel such as unleaded petrol (gasoline), diesel, or LPG. Natural gas has lower CO₂ emission level, compared to the above fuels, and currently used worldwide as a cleaner fuel. Natural Gas is about 80 percent methane (CH₄), and can be temporarily converted into liquid form (LNG) at minus 160 degrees Celsius for ease of transport and storage. CNG and LNG are appropriate for spark ignition engines. The high octane rating (i.e. ~120) allows a higher compression ratio compared to what is possible for gasoline, and it also enhances the engine efficiency. CNG is suitable for cities with high pollution due to its reduced emission levels. Biofuels are considered zero CO₂ emitting; ligno-cellulosic sources in biomass such as grasses and woody material are converted to biofuels. Crop residues such as wheat and rice straw, corn stalks and leaves, and energy crops can be utilized. Ethanol, methanol, and biodiesel can be produced from fermentation of these other crop material or wood-waste. Cellulotic crops have much higher yields per ha than sugar and starch crops (IEA, 2006). The production of crops however requires large harvesting areas.
- 5. Country specific/ applicability:** Applicable island wide.

¹ This fact sheet has been extracted from TNA Report – Mitigation for Sri Lanka. You can access the complete report from the TNA project website <http://tech-action.org/>

6. Status of the technology in the country and its future market potential: The Ministry of Petroleum Industries in Sri Lanka has plans for installing an LNG pipeline in Colombo and suburbs, and vehicles are planned to be converted to run on CNG. Although vehicles that run on biofuels are considered to have zero GHG emissions, currently Sri Lanka does not have any biofuel use. Although countries like Brazil have large areas of sugar cane that are being used for production of bioethanol, Sri Lanka does not have enough biomass production from sugarcane; feasibility of using rice stover has not been properly studied yet. A committee appointed by the Ministry of Science and Technology has identified policy measures to facilitate the use of biofuels as an alternative option for fossil fuel. This committee has examined the possibility of using compressed bio methane in transport; the committee has identified a private company to clean, compress, and use biogas produced from a municipal garbage digester facility. The Ministry of Science and Technology has also conducted trials on Jatropa, to determine yields, for possible future pilot studies on biodiesel.

7. Barriers: -

8. Benefits

- a. Socioeconomic:
 - Cheaper and cost effective with higher fuel use efficiency.
 - Cleaner air
 - Health benefits
- b. Environmental
 - Low GHG emissions due to better fuel use efficiency

9. Operations: -

10. Costs: Initial costs ~US \$600 million. The total annual savings from fuel switch to LNG has been estimated at US \$ 572 million, with more than 50 percent coming from electricity generation.

11. References

- AirMAC 2009. Clean Air 2015. Air Resource Management Center. Ministry of Environment & Natural Resources, Sri Lanka
- IEA, 2006. Energy Technology Perspectives 2006: Scenarios & Strategies to 2050. International Energy Agency, Paris.
- Jayaweera, D.S. 2011. Analysis on effectiveness of fiscal strategies introduced on hybrid vehicles and market response- policy reforms on clean air. Presentation at the Center for Science and Environment Conference, India, held on September 28-29,2011