Conversion from FO to Methanol: Economical & Green Electricity

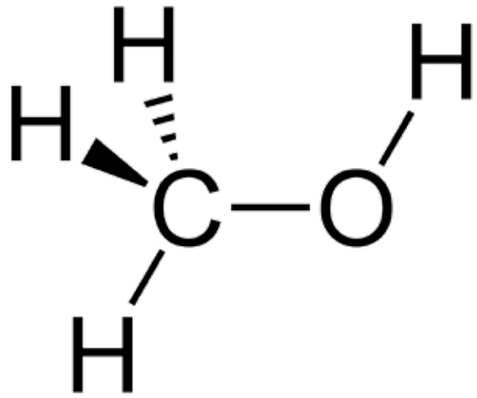
חברת החשמל
Israel Electric

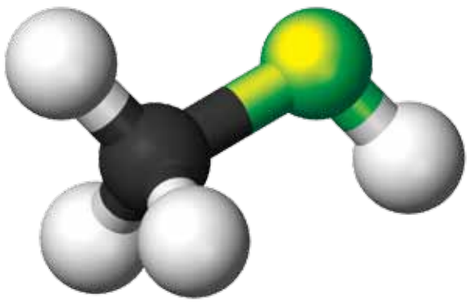
DOR
Creating chemistry with the environment

Generating cost-effective, environment-friendly electricity

Generating electricity with minimal impact on the environment is the main challenge faced by utility companies today. This becomes even more of a challenge in distant power stations, where natural gas is unavailable and there is still dependency on fuel oils and diesel oils.
Oil-based fuels fluctuate in cost according to the price of oil. LNG is only a viable solution where huge quantities are required and even then - the cost will be high. Converting natural gas to LNG necessitates cooling to a subzero temperature of minus 160 degrees centigrade, a costly process made even more expensive because of the special materials required to store and transport LNG. Methanol is a viable alternative to both LNG and available oil-based fuels; it is eco-friendly, and comes at a competitive price.

Methanol



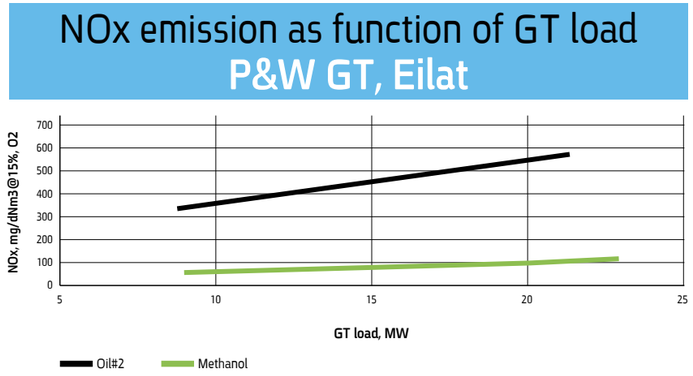


Methanol is a synthetic alcohol and therefore it is free from foreign materials and can be considered a noble fuel.
Methanol is available worldwide as a commodity. It can be produced from a variety of raw materials, including coal, natural gas, and oil distillates.
Unlike LNG, methanol remains liquid at room temperature and thus it can be stored and transported relatively easily.

Methanol filters in the Eilat GT site

An eco-friendly fuel

Emissions from methanol firing are significantly lower than emissions caused by firing diesel oil. The combustion temperature of methanol is lower than the combustion temperature of diesel oil, resulting in an 80% decrease in nitrogen oxides [NOx] emissions. Additionally, methanol contains absolutely no sulfur, reducing sulfur dioxide [SO2] emissions to zero. Particulate emissions are also significantly lower than with diesel, with almost nil emissions.
These advantages make methanol a very environmentally-friendly fuel.



Overview of the Eilat GT site converted to metanol

A cost effective alternative

The market price of methanol is determined in the futures commodity exchanges and is therefore not influenced by fluctuations in the price of oil. Its price is linked to changes in the tariff of one of the raw materials used to produce it. By switching between raw materials, manufacturers can control the cost of production and keep the price stable.
Methanol is a viable and cheaper alternative to diesel, while taking into account that equivalent double quantity of methanol is required to produce the same caloric value.

Easily convert existing facilities

Switching to methanol is easy and cost-effective: with minor modifications, existing generating facilities can be converted to utilize methanol, in order to reduce emissions while retaining the same output and efficiency.

Israel Electric Corporation (IEC) and Dor group - a winning team

The IEC and Dor Chemicals have joined forces by converting a diesel oil fired gas turbine in Eilat, Israel to run on methanol.

IEC is the main provider of electricity to the state of Israel and as of March 2014 employs more than 13,000 people and owns assets totaling more than 21 billion USD. With over 91 years of operations, the corporation generates, transmits, distributes and supplies all the electricity used in the country. The corporation serves residential customers, as well as commercial, agricultural and industrial customers spread throughout the State of Israel. The IEC gained rich experience in converting and upgrading facilities to using different fuels and in handling fuels safely and according to regulations.

Dor group, founded in Israel in 1964, is engaged in manufacturing and trading of chemicals, logistics and innovative solutions to environmental demands and alternative sources of energy. Dor leads a project of using methanol as a green fuel for vehicles, in collaboration with the Israeli Ministry of Transportation. Dor also pioneered the use of methanol to fuel power plants, with the Israeli Ministry of National Infrastructures, Energy and Water Resources. Dor has ongoing cooperation with academic institutes such as the Technion - Israel Institute of Technology, Ben Gurion University and MIT in projects of developing new green energies and technological solutions for ecological problems.

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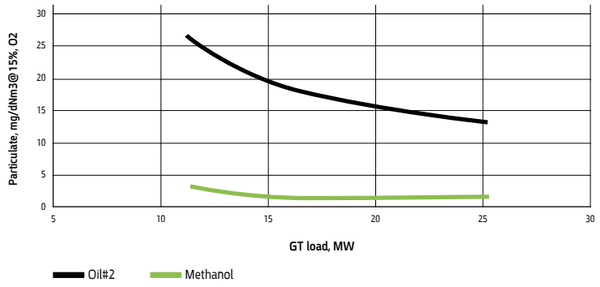
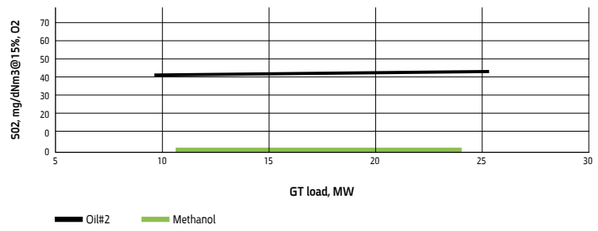
Eilat at night

A pioneering solution: Converting GT turbines from diesel to methanol

Particulate emission as function of GT load
P&W GT, Eilat



SO2 emission as function of GT load
P&W GT, Eilat



In October 2014 the southern city of Eilat in Israel inaugurated one of the first gas turbines converted to run on methanol or diesel oil instead of diesel oil only. The city of Eilat is a popular national and international tourist resort and so minimizing air pollution and preserving the environment are key to its flourishing.
Dor began promoting the construction of a 500,000 tons-per-year methanol plant in the country in 2010. The IEC has decided, as part of its environmental research and development activity to examine the implementation of methanol as an alternative to diesel oil.
Apart from the environmental consideration, Eilat is located far from Israel's natural gas pipeline and was thus a natural candidate for conversion to methanol.
The unit is now fully operational, and is being dispatched according to the local grid demands.

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