

IEA-Advanced Motor Fuels ANNUAL REPORT

2019

Israel



Israel

Drivers and Policies

The distribution of energy sources in the Israeli final energy consumption can be seen in Figure 1. The dominant parts are electricity (32%), fuels for local transportation (21% gasoline, 18% diesel) and fuels for industrial use (most of the rest). Renewables are mainly residential solar water heating systems (see Fig. 1). The transportation sector is the primary consumer of oil—more than 95%. In 2011, the government declared a national effort to decrease the reliance on imported oil in transportation (decision number 5327). Under this decision, the Fuel Choices and Smart Mobility Initiative¹ was established.

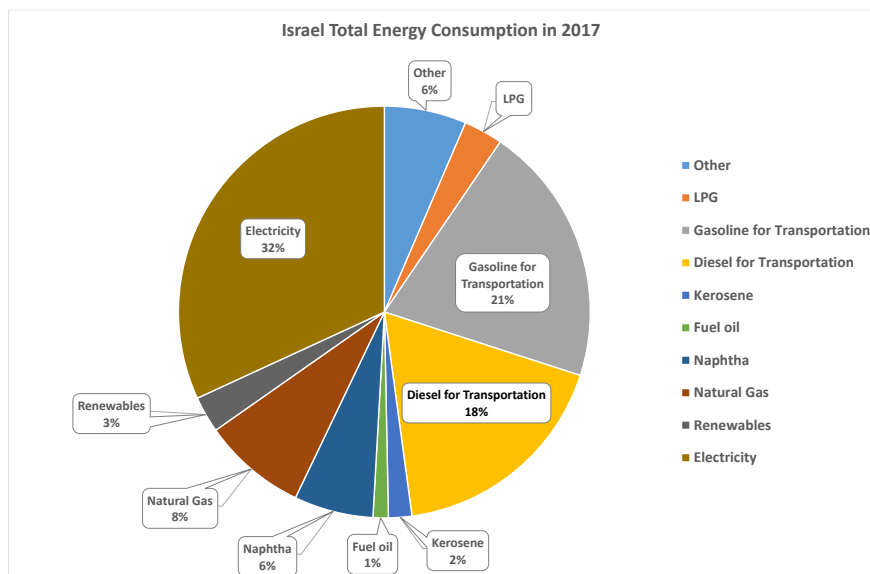


Fig. 1 Israel Total Energy Consumption in 2017

The Ministry of Energy,² together with the Fuel Choices and Smart Mobility Initiative, encourages entrepreneurship and innovation in the field of alternative fuels by supporting research and development along their development stages. This formal support is present from the academic research stage, continues through preliminary implementation, and is maintained through pilot and demonstration projects. Biodiesel, fuel

¹ <http://www.fuelchoicesinitiative.com/>

² https://www.gov.il/en/departments/guides/projects_science

emissions, biochemical conversion, algae, natural gas based fuels and others, are part of the support program in Israel.

Motor Fuels Statistics

There is a total of about 3.5 million vehicles in Israel. Figure 2 shows data on segmentation of fuel consumption in 2018. The data indicate that most vehicles use gasoline (more than 80%), but there is also strong growth in hybrid vehicles.

In order to accelerate the penetration of electric vehicles (EV) in Israel, several measures were taken. The Ministry of Energy published an ambitious plan for 2030, where 100% percent of new vehicles will be all electric. In pursuit of that objective, the Ministry published four different tenders with a total budget of about 30 million NIS (\$8.4 million US) to support the installation of EV charging stations around the country, including more than 100 fast DC charging stations. In addition, reduced tax rates for hybrid and electric vehicles are offered. The excise tax on BEVs is only 10% compared with up to 84% on Internal Combustion vehicles.

The Ministry of Environmental Protection established a “Low Emission Zone” in two central cities in Israel—Haifa and Jerusalem. In these zones, the entry of heavy diesel trucks (without catalytic convertor) is not allowed. This measure is part of the national plan for air pollution reduction in Israel.

SEGMENTATION OF VEHICLES BY FUELS - 2018

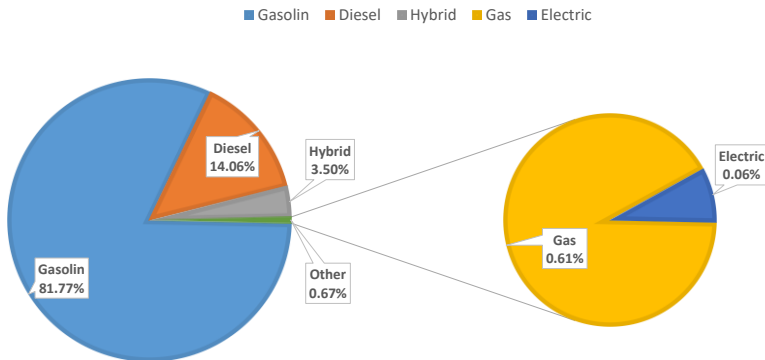


Fig. 2 Israel segmentation of vehicles by fuels in the year 2018³

³ Israel, Central Bureau of Statistics, <https://old.cbs.gov.il/publications19/1762/pdf/t12.pdf>

Research and Development

Between 2016 to 2019, the Ministry of Energy together with the Fuel Choices and Smart Mobility Initiative, supported 67 alternative fuels projects with total grants of about 78 million NIS (\$21.8 million US). Figure 3 presents the grants' distribution between the subsectors, including grants for biofuels, natural gas, hydrogen, fuel cells and electric vehicles, from academic research through start-up and demonstration projects. Some examples from the biofuels projects are as follows:

- *Implementation of 100% methanol as fuel for light and heavy duty engines.* This project, among others in the past 10 years, is representative of Israeli effort for the development of methanol as an alternative fuel. Promoting methanol mixtures, not only with gasoline for light vehicles, but also as a primary fuel in heavy duty vehicles and generators is a key initiative for Israel. In addition, the Standards Institution of Israel created the first standard for low methanol percentage fuel (M15) which was adopted in several countries worldwide. During 2018, Israel adopted two standards, EN 14214 and EN 16709, for biofuel vehicles.
- *Exhaust emissions of compression ignition engines fueled with dimethylether (DME).*
- *Design and construction of microbial electrolysis cell for hydrogen generation from wastewater.*
- *Mini-electrosomes biofuel cells.*
- *Development of continuous biodiesel production from grease trap wastes.*
- *A novel emulsion-based biocatalytic microreactor for conversion of cellulosic biomass to biodiesel.*
- *Develop a continuous Hydrothermal Liquefaction (HTL) reactor for rapid and effective conversion of biomass into bio-crude.*

Additional initiatives include:

- *CNG Refueling Stations.* Currently, Israel has two CNG refueling stations and 5 mobile stations. In addition, the government subsidized about 20 CNG refueling stations around the country. They are expected to be completed by the end of 2021. In order to promote the use of CNG, a new tender will be published in 2020 to build additional CNG refueling stations.
- *CNG Fueled city buses.* There are 85 CNG city buses operating in the Tel Aviv area.
- *CNG Garbage trucks.* There are 34 CNG garbage trucks active since 2018.
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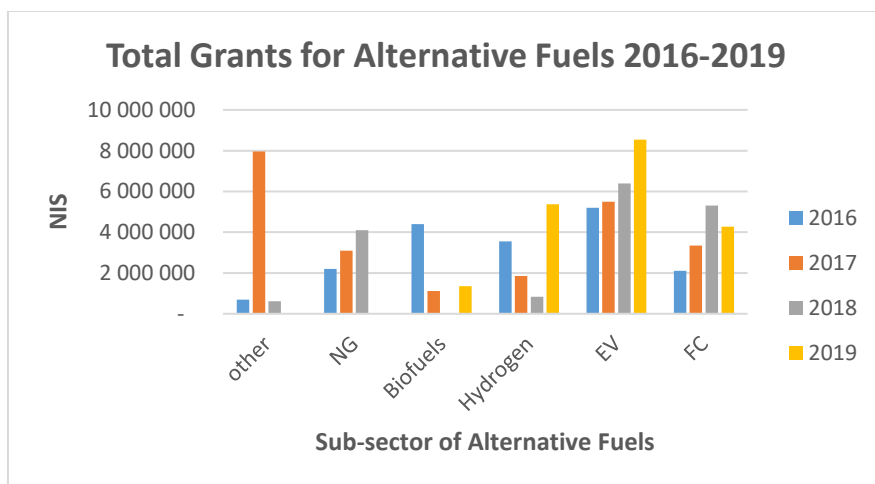


Fig. 3 Total grants for alternative fuel projects in 2016-2019

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- *LNG Activities.* Currently, the Ministry of Energy is examining LNG standards adaptation and construction of four LNG refueling stations.
- *Ministry of Environmental Protection⁴ Activities:* Starting in 2016, the Ministry of Environmental Protection has launched programs aimed at reducing vehicular air pollution. The aims of the programs include: encouraging shift to hybrid vehicle (HV) taxis and electric buses, installing particle filters on garbage trucks, promoting electric car ride shares, reducing commutes in private cars, and establishing low-emission zones. As part of these goals, the main measures were as follows:
 - *HV Taxis.* Supported the purchase of hybrid taxis. Currently, there are about 725 new hybrid taxis.
 - *EV Buses.* Supported the purchase of 79 electric buses. A new tender with a total budget of 17 million NIS (\$4.75 million US) is planned for the end of 2020 to support about 60 additional electric buses into the public transportation system.

Pilot and Industrial Demonstration Example

Development, production and marketing of an intercity CNG bus

A grant of 2.6 million NIS (\$727,000 US) was approved in 2019 for the pilot of a CNG intercity bus. This project will contribute to the development of a CNG-based transportation market. The development of a CNG intercity

⁴ <https://www.gov.il/he/departments/topics/transportation>

bus will enable public transport operators to experiment and operate intercity long range lines while relying on local natural gas, saving fuel costs and significantly reducing air pollution.

Benefits of Participation in the AMF TCP

Participation in the AMF TCP has given Israel access to information on alternative fuels and helped to build collaboration with other countries. It is important to have a worldwide knowledge sharing platform, especially when all countries are seeking to achieve similar solutions.