Israel

Drivers and Policies

In 2011, the Fuel Choices and Smart Mobility Initiative,[1] Israel's national program for alternative fuels and means of transportation, was launched as a joint governmental effort headed by the Prime Minister's Office. The Initiative aims to establish Israel as a showcase to the world for knowledge and industry in alternative fuels and smart mobility. Together with 11 partner government ministries, the Initiative aims to create a business-supportive environment for the market through simplification of bureaucratic processes and a means to quickly respond to market changes and needs. It supports Israel's interdisciplinary nature and Israeli entrepreneurs' operational agility, as well as cutting-edge academic research and exceptional cooperation between academic institutions and industry. The scope of work performed by Initiative partners within the various government ministries and related agencies is immense and affects about 550 companies, 300 research groups, and hundreds of entrepreneurs (see Table 1).

Table 1 Growth of Israel's Alternative Fuels Research Groups, Industry, and Investment, 2011–2018

Year	Research Groups	Companies	Cumulative Investments (€ million)
2011	45	60	250
2018	300	550	4,500

Standardization

A committee composed of Initiative members, including the Ministry of Environmental Protection, the Ministry of Energy, and the Ministry of Transport, works together with government agencies such as the Standards Institution of Israel to:

- Create standards and regulations for new vehicle types,
- Adopt new fuel and mobility standards,
- Support training for industry professionals,
- Enable applied experiments of innovative solutions and technologies, and
- Promote propulsion and vehicular technologies.

[1] http://www.fuelchoicesinitiative.com/our-goals

Recent Standards

During 2016, the Standards Institution of Israel issued a new standard for M15 (85% gasoline with 15% methanol) — the first standard for low methanol percentage fuel issued outside of China. This standard is currently being adopted by different countries. Additional steps were taken in order to promote the usage of M15 in the local market such as suitable taxation and M15-compatible vehicles approval.

During 2017, several new standards regarding electric vehicle (EV) charging stations were issued or revised. In addition, National Outline Plan No. 18 was adjusted to include criteria for compressed natural gas (CNG) fueling stations. Furthermore, standardization of hydrogen transport, storage, and fueling was initiated. All standards and methods regarding implementation for CNG vehicles, fuel stations, and vehicle repair shops were also issued in the last few years.

Taxation

In March 2016, the 3rd Green Taxation Interministerial Committee released comprehensive policy recommendations to promote the use of oil substitutes through economic incentives, a focus on environmental benefits, and an emphasis on the country's energy security. The recommendations include a differentiated taxation policy ("Green" Progressive Taxation) for the three fields related to energy for transportation — infrastructure, fuel types, and motor vehicles. In March 2018, the finance committee of the Israeli parliament approved new taxation recommendations.

Research and Demonstration Focus

Fuel Choices and Smart Mobility Initiative activities, some in cooperation with local authorities, include the following:

- *CNG refuelling stations*. In March 2018 the Ministry of Energy published a public tender offering financial support for building CNG refuelling stations. The total budget was 100 million NIS (€248 million, $280 million US), and 37 proposals were selected, offering a nationwide distribution of stations.
- *Alternative fuel shuttle buses.* In a governmental resolution passed in early 2017, the government mandated that all shuttle buses in future fast lane projects surrounding Tel Aviv must be powered by CNG or electric power.
- *Promotion of public transportation tenders.* Resolution 1837 of the Israeli government called for a provision of 50% mandatory electric or CNG buses in all future public transportation operator tenders. Considering the high mileage covered by buses, the use of alternative

fuel buses will make a significant contribution toward reducing pollutant emissions and dependence on oil. During 2018, few new tenders for operating public transportation have been released with this requirement. Prior to the resolution, the Ministry of Environmental Protection encouraged the purchase of electric buses, resulting in about 65 fully electric buses operating in Israel.

- *CNG garbage trucks.* Resolution 529 of the Israeli government called for reducing air pollution and environmental risks in Haifa Bay. In accordance with this goal, the Ministry of Environmental Protection, together with the Municipality of Haifa, acquired 25 CNG garbage trucks. These trucks have operated in Haifa since March 2018.
- *EV car sharing.* The Fuel Choices and Smart Mobility Initiative, together with the Ministry of Environmental Protection, started an EV car-sharing initiative in urban environments. So far, the initiative has proven successful in Haifa and Netanya, where 150 electric car-sharing vehicles are currently operating.
- *Deploying EV charging infrastructure in Israel*. The Ministry of Energy, along with the Fuel Choices and Smart Mobility Initiative, is supporting the deployment of about 2,000 EV charging stations. The charging infrastructure will be composed of both direct current and alternating current stations and is forecasted to be in place by the end of 2019.

Major Research Centers

- The Israel National Research Center for Electrochemical Propulsion (INREP) is a multidisciplinary center dedicated to the research and development (R&D) of electric mobility. R&D areas of focus include advanced materials and technologies for EVs, batteries, and fuel cell-based propulsion for transportation.
- The Israeli Fuel Cells Consortium (IFCC) was formed in October 2016 to advance fuel cell research in Israel, with an emphasis on solutions for electro-mobility. The IFCC is composed of 12 leading labs from 4 universities in Israel. It is funded by the Fuel Choices and Smart Mobility Initiative and works under the umbrella of INREP. In addition to research, it is tasked to train new scientists and engineers in the field and support Israeli industry.
- The National Research Centre for Smart Transportation has a goal to promote and develop ideas and ground-breaking research in the field of smart transportation, both from an academic and an entrepreneurial aspect. The research center will be established in one of Israel's universities and will start its operation in mid-2019.

Ministerial Research Grants and Programs

- The Ministry of Energy holds different programs that encourage entrepreneurship and innovation in the field of alternative fuels. The programs support R&D in several stages of the development process, from academic research through support of pre-seed ideas, all the way to pilot and demonstration projects. In addition, the Ministry has a student scholarship program for academic institutions in Israel and abroad that aims to develop the human resources pool for different areas of expertise in the alternative fuel professions and research areas.
- The Israel Science Foundation (ISF) has developed several programs aiming to promote, encourage, and support excellent research in the field of oil alternatives for transportation, including individual research grants and grants for holding international workshops.
- Through the ISF, the Center of Knowledge program encourages interdisciplinary research in the fields of hydrogen and synthetic fuels, as well as photo-electrochemistry.
- The Ministry of Science, Technology, and Space established a national foundation for engineering and applied sciences in order to bridge the gap between basic research and industrial research in different fields related to energy, big data, and smart mobility. The Ministry is also in charge of international scientific cooperation at the governmental level. It creates bi-national agreements and represents Israel in international scientific organizations (e.g., Horizon 2020).
- The Ministry of Transport and Road Safety promotes research projects for the advancement of scientific and technological innovation in the transportation sector, such as sustainable transport. In addition, it promotes tools to enrich data required for efficient and sustainable transport planning and encourages the application of innovative systems.
- The Ministry of Environmental Protection promotes research projects and coordinates knowledge in relation to the environmental impact and aspects of fuel alternatives for transportation.

Pilots and Industrial Demonstrations Program

The Fuel Choices and Smart Mobility Initiative and the Ministry of Energy through its Chief Scientist Office encourage entrepreneurship and innovation in the field of alternative fuels by supporting R&D in various stages. The Pilots and Demonstration tool of the Ministry of Energy enables companies to scale their innovative products or solutions to full production deployment. As of 2017, this grant supported more than 30 active projects.

To encourage demonstrations in the field of smart mobility in Israel, together with the Ministry of Transport and Road Safety, the following steps are taken:

- Advancing the establishment of a testing centre for autonomous vehicles for supporting smart transportation, and
- In collaboration with the Innovation Authority and the Fuel Choices and Smart Mobility Initiative, advancing field experiments and pilot projects for new technologies and operational concepts in the transportation sector with the potential for reducing congestion, traffic accidents, use of petroleum, or encouraging the use of public transportation, with the aim of streamlining and improving transportation, both in Israel and abroad.

Industrial R&D TEPS (MAGNET Program)

Transportation Electric Power Solutions (TEPS) is an Israeli consortium of industries and academia initiated and sponsored by the Fuel Choices and Smart Mobility Initiative and the Magnet Directorate Chief at the Israel Innovation Authority. Its objective is to incubate and promote generic innovative industry-oriented technologies for power sources for electric vehicles. TEPS industrial members, including Elbit, Tadiran, ETV, and Electric Fuel, closely collaborate with Israeli academia to pursue innovative solutions in the field of energy storage and electrical propulsion.

Benefits of Participation in the AMF TCP

Participation in the AMF TCP has given Israel greater access to the most relevant and up-to-date information and research on alternatives to traditional transport fuels. Leveraging this international expertise has helped Israel build its national research capabilities in support of its current and projected strategies.