

# **INNOVATION CENTRE DENMARK**

An Overview on Israel's Green Agenda –  
with a Focus on R&D Technologies



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## Introduction

Israel has advanced considerably in environmental issues in the past 20 years. However, it is still lagging behind most of the OECD and developed world in this field. Different from many other sectors Israel does not pride itself on having this area as one of its strongholds nor is their GHG emission targets or fulfilments of these very impressive. However, we do see new tendencies and initiatives coming out of Israel, especially within the development and production of new environmental technologies, which produces new opportunities for Danish-Israeli collaboration.

Furthermore, there are specific fields related to environmental issues where Israel has strongholds such as water technologies, agriculture and alternative energy (especially solar energy). Israel has throughout its 70-year history had a strong focus on research within agriculture and water technologies. This has been due in part to a need to be as self-sustaining as possible, and due to the tough and predominantly arid land conditions of the country itself. Even before the formation of the state of Israel, the area was home to great activity within agricultural, alternative energy (especially solar energy) and water technology research, and since the inception of the state of Israel leading Israeli universities have had these research areas as a high priority.

In recent years, there has been an impressive growth in Israel's private sector and the vibrant start-up scene has drawn a lot of attention. Over the past few years, several actors in Israel are actively seeking to merge Israel's agricultural, energy and water technology capabilities with this start-up scene in order to convert Israel into a global leader within the CleanTech area. This momentum is promoted effectively by the government in the last decades.

This report provides an overview of the green agenda in Israel. It focuses on concrete collaboration possibilities between Denmark and Israel. Apart from describing the political agenda and key stakeholders the main part of the report focuses on R&D development in new environmental technologies.

*Israel's Green Agenda seen in light of the corona lock down and the current political situation*

In Israel a new government is being formed after the third election (due to a

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close raise between the two leading candidates Gantz and Netanyahu). At the same time the Corona crisis have had a severe impact on the Israeli economy. The information presented in this report was relevant for the pre-corona world. It is still unclear what the consequences of the global pandemic and the political situation will be. In the short-term (1-2 years), due to a following economic crisis and limited governmental funding for green R&D the sector might suffer from major cutbacks and medium- and long-term climate change mitigation strategies might be suspended. On the other hand, the pandemic might shift the public opinion to acknowledge major global threats to our society and health. After a short-term recovery period, this shift might increase governmental and private investments and commitments towards climate change mitigation (and other green) R&D, especially towards resilient enhancing technologies (renewable\ low maintenance energy facilities, energy storage, green and passive buildings, water technologies).

The lock down period that dramatically reduced allkinds for transportation and daily commuting might in the long-term create a paradigm shift by supporting the development of ICT and cyber security technologies. Converging the Danish expertise within green R&D and the Israeli ICT and cyber security sector could be an interesting way for how to enhance Danish-Israeli collaboration.

## **Political and Organizational Factors, Regulation and Financing**

### *National GHGs laws and regulations*

Israel does not have a national law regarding GHGs emissions. However, it has a national plan to reduce GHGs emissions, in line with the 2015 Climate Paris Agreement, and it has ratified the 2015 Paris Climate agreement. Having said that, its commitment is one of the lowest within the OECD. The government committed only to a reduction of ~30% GHGs in 2030 compared to a business as usual scenario. Moreover, ~30% of this national GHGs emissions reduction plan, was calculated from switching from coal to natural gas in electricity power production. This calculation considers only the expected reduction in CO2 emission reduction and ignores methane emissions from the natural gas sector. These extra methane emissions are expected to offset the expected reduction in CO2 emission reduction.

The transfer from coal to natural gas is happening late in Israel and was mainly

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motivated by the large offshore natural gas discoveries in Israel. It will probably shackle Israel to this energy source to the next decades and will prevent (or at least greatly delay) a transition from fossil fuels to low carbon energy sources. This delay is apparent in Israel's plan to produce only 5% and 10% of its electricity from renewables by 2015 and 2020, respectively. Even this humble plan was not achieved yet. But, in the last 3 years the government is investing more in this field, by reducing regulatory burden and encouraging rooftop PV installation. It is plausible that the 10% renewable electricity target will be met by 2021. In the last year there was even a first tender for installing a PV+storage facility. One should note that during 2019, the government stated that it will revise the national GHGs emissions reduction plan and will examine ways to increase renewable energy electricity production from 17% to 30% in 2030. Renewable energy promotion was inserted into the electricity sector law at 2018, but targets and rate of implementation were not set, and are dictated by the government.

During 2019, for the first time, the Ministry of Environmental Protection (MoEP) initiated GHGs emissions regulation in the energy sector. This regulation requires methane emissions reduction plan for offshore natural gas rigs (Tamar and Leviathan). Besides that, Companies and organizations can voluntarily report their GHGs emissions. GHGs emissions from large emitters are not monitored, but are estimated based on models, for the MoEP PRTR system. Through official landfills regulation, methane collection is performed in landfills and some methane emissions are reduced.

The Israeli standard for green buildings can achieve reduction of 20-30% of buildings energy use. It was obligatory in most new building that have been built in the past 5 years in the strongest 15 cities. In 2018, 60% of all new building were built by that standard. From 2021 and on, all new buildings are obliged to be built with this standard. However, there is still no regulation regarding near\ zero energy buildings. In the last 4 years, the government has invested 300 million NIS in energy efficiency projects in the public and business sectors. The projects are expected to leverage 1.5 billion NIS of investments in this field and save 170 million kWh annually. In the last 3 years, the MoEP shifted its waste policy, and is now promoting waste to energy facilities more enthusiastically, including thermal energy to waste facilities.

### *Green R&D Research Funding*

The Israeli national annual investment in civilian R&D was 58 billion NIS (~110 billion DKK) in 2017, which is 4.5% of the GDP. Israel was leading the national annual investment in R&D as a percentage of its GDP, within the OECD (and the world) since the early 2000s. Most of the civilian R&D investment is carried out by international funds (55.6%) and the Israeli business sector (29.5%). The upside of this reality is that foreign companies and markets are acknowledging Israel's R&D capabilities and investing in it. The downside is that a low public investment makes it difficult to promote national R&D goals.

A UN report recommended raising the governmental investment in civilian R&D to ~30% of the total national annual investment in civilian R&D as is the OECD average, to allow the government to direct the national R&D according to its strategic goals<sup>1</sup>. This would mean raising the Israeli governmental investment in civilian R&D to 1.3% of the GDP (16 billion ILS, or 30 billion DKK).

The average national governmental investment in environmental R&D in the OECD is 2.5% of the total governmental investment in civilian R&D; while Israel's is only 0.9%, or 68 million ILS (129 million DKK). To achieve these UN and OECD recommendations and to become a global environmental R&D player, the Israeli government should invest at least 403 million ILS (765 million DKK) annually in environmental R&D (0.0325% of 2017 GDP). It should be noted that the actual annual governmental investment in environmental related R&D is actually higher than these numbers, as some of the budgets for other sectors such as energy, transportation and agriculture is related to environmental R&D.

The government did initiate a green growth program (green procurement, circular economy, green R&D) for the business and the industry sectors. Since 2018, the government is investing more in green R&D mainly through the Israel Innovation Authority (operating under the Ministry of Economy and Industry). Also, after a decade of really low commitment to renewable energies and lowering GHGs emissions, the government is raising its renewable energy target to 25-30% of the power supply in 2030. This is still lower than in most OECD and developed countries, but it is a significant improvement. These trends can promote Israeli green R&D.

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<sup>1</sup> <https://unesdoc.unesco.org/ark:/48223/pf0000244059>

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The key governmental actor is the *Israel Innovation Authority*: The Innovation Authority is the major governmental unit that is responsible for industrial R&D. The authority is focused on promoting high-tech R&D. Between 2012-2018, the authority invested 98 million ILS (~185 million DKK) in R&D renewable energy projects, through the Eilat-Eilot Renewable Energy Technology Center. This is an average annual investment of 14 million ILS (~26 million DKK).

Apart from the Israel Innovation Authority a range of other governmental bodies are key actors in the Israeli Green R&D landscape. Among those are the Chief Scientist Office in both the Ministry of Environmental Protection, Ministry of Agriculture and the Ministry of Energy.

*Ministry of Environmental Protection, Office of the Chief Scientist*: All the R&D promoted by the Ministry of Environmental Protection is green R&D. Unfortunately, the ministry has no regular annual R&D budget. Most of its R&D budgets, are a result of responding to environmental crises (e.g. oil spills, wildfires), or a part of non-green governmental budgets (e.g. Fuel choices and smart mobility initiative). However, thanks for the global green R&D trend, Israel lately decided to invest more in green R&D, and reserved a budget of 35 million ILS (~66 million DKK) for green R&D pilot programs for 2018-2020, and 14 million ILS (~26 million DKK) in 2019 for a green R&D innovation lab (both jointly with the Innovation Authority). Moreover, due to the natural gas explorations and extraction in the Mediterranean Sea, the Ministry initiated a 10-years monitoring program (2019-2028) with a budget of 55 million ILS (~104 million DKK, jointly with the Ministry of Energy). The Ministry initiated a program for establishing a center for industry resource efficiency with a budget of 51 million ILS (~97 million DKK, jointly with the Ministries of Economy and of Finance).

*Ministry of Agriculture, Chief Scientists Office*: The Ministry has a relatively large R&D budget- 6%, or ~450 million ILS (~850 million DKK), of the governmental investment in R&D. Israeli agriculture has a few environment related R&D goals: eco-friendly plants pest eradication, water efficiency, agroecology, organic agriculture, natural resources. However, eventually, a low fraction of the budget does go to fund environmental goals that are not the water efficiency goal.

*Ministry of Energy (MoE), Chief scientist*: The Ministry has an annual R&D budget. The MoE R&D goals that relate to green R&D are fuel choices, biofuels, bioenergy, fuel cells, energy storage and conversion, renewable and alternative

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energy, energy efficiency, emissions reduction, energy and waste. The Ministry has budgets both for research and for startups, pilot and demonstration facilities. In 2016-2017, the MoE invested 106 million ILS (~201 million DKK) in R&D, of which 1.5 million ILS (~3 million DKK) were specifically defined as green R&D (4 projects- municipal agricultural and industrial waste, wastewater, ground pollution), and 64 million ILS (~122 million DKK) was for projects related to green R&D (73 projects- fuel substitutes, energy efficiency, renewable energy).

### **Strongholds, Effort Areas and Financing of This**

Israel's strongholds are mainly in a combination of security and high-tech industries. However, due to its strong entrepreneurial culture and the specific sector focus Israel has done quite well in the field of CleanTech (defined as environmental technologies that involve products, processes or services that reduce the negative environmental impacts of various industries or improve the efficiency of the use of natural resources). In Israel several hundred start-ups work in this area (in 2019 the Start-up Nation Central had listed 214 startups in the climate change mitigation area and 392 startups in the environmental industry area). The main sectors include renewable energy production, energy efficiency, water resource management, recycling and waste management, streamlining the use of materials in industry and sustainable transportation.

The Israeli government has acknowledge that despite a strong high-tech sector (which account for 46% of Israel's export) and a high rate of R&D investments in environmental technology firms face special challenges before they might benefit environmental protection, energy efficiency and reduction of GHG emissions. Such challenges relate to the transition from the R&D laboratory stage to the demonstration stage of commercial-scale technology. Two barriers are considered the main obstacles: Financing (the demonstration stage is costly and characterised by low financing from the industry and VCs) and regulatory impediment (secure compliance with the emission standards that the plant is required to comply with and cost of getting new technologies authorized through tests, expert studies etc.).

The Israeli government seeks to address these challenges by implementing programs to promote and empower the Israeli cleantech industry. The goal of the programs is to expand the areas of players and business activities. The goals is twofold: *to enhance a striving innovation ecosystem for the benefit of the Israeli economy and to secure innovative solutions to improve the environment in Israel.* The hope is that, while these technological developments mature and

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succeed in developing business on a commercial scale, they will be able to continue to develop into international markets. Israel has been very successful in implementing this model in other sector areas like cyber security and artificial intelligence.

The government has launched a range of initiatives supporting the above-mentioned targets, which include the following initiatives with a budget of 150 NIS:

*Assistance in establishing pilot environmental technology facilities:* The Beta Sites Project was launched in 2018 this project support the construction of pilot facilities (the first demonstration of technology on an industrial scale), selected on a competitive basis and granted financial and regulatory support. The success rate in the first round of applications were 50 total submissions out of which 15 projects were approved.

*Support to start-ups developmental phase:* Financial instruments for supporting start-up technologies at their pilot demonstration stage and for the penetration of technologies into the Israeli market and foreign markets. In addition, creation of a designated financial instrument for supporting companies at their initial commercial demonstration stage. The program is operated by the Israel Innovation Authority in conjunction with Israel Investment Center and the Ministry of Environmental Protection. The objective is to encourage demand for innovative Israeli cleantech technologies and to develop Israeli high-tech industry in the field of energy efficiency and reduction of greenhouse gas emissions. The incentive program is intended for entities engaged in initial application of new Israeli technologies. Participating companies receive financial support of 40% of the cost of installation.

*Trial programs in the field of environmental protection (CleanTech):* The program supports R&D and trial programs in the field of environmental protection and is operated jointly by the Innovation Authority and the Ministry of Environmental Protection. The objective is to develop and implement innovative technologies and evaluate their feasibility on an industrial scale and among relevant clients. Other objectives include: development and implementation of technologies that lead to a reduction in the use of natural resources and/or to a reduction in pollutant emissions and the cultivation of complete and sustainable environmental protection companies in Israel by promoting innovative technological solutions. Israeli companies can receive

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financial support of between 20%-50% of the approved pilot's expenditures. A support rate of 75% of approved R&D expenditures will be awarded to programs with a potential for proving an exceptional impact on the environment. Regulatory assistance may be given from the Ministry of Environmental Protection in the implementation of a trial program including temporary regulatory flexibility during the trial period. The program also entails complementary tools, including evaluation and recommendations for regulatory changes needed to remove barriers and additional tools to promote the industry, and access to government-owned trial sites and facilities.

Other concrete initiatives worth mentioning as part of the Israeli government's support for the invention and commercialization of new technology is:

*Israel New Tech Initiative:* The program was founded as a national initiative by the Ministry of Economy and Industry, and is supported by a number of Israeli governmental bodies. It aims to support the water and renewable energy sectors by supporting academia and research, encouraging implementation in the local market and helping Israeli companies to internationalise. The program brings all stakeholders – start-ups, entrepreneurs, companies, multinationals, academia, regulators, policy makers and investors together to cooperate in order to deliver smart solutions to global challenges in the cleantech arena. The goals are: attracting international investments, promoting relevant R&D programs (to promote Israel as an international beta-site by encouraging technology innovation), strengthening human capital by investing in academic programs, research scholarships and professional training, increasing international awareness by means of hosting delegations, conferences and international events. The Israel New Tech program is currently being restructured and awaits formation of the new government in Israel.

*The Environmental Technology Innovation Lab Project:* This program is implemented through an open innovation model where an industrial corporation (could be a joint venture of two or more companies) can apply through a tender. The corporation is granted a license to operate an environmental innovation lab with financial support to establish the physical infrastructure and running the lab for three years. The corporation commits to recruit start-ups and support their development (government funding is provided for up to 85% of the costs to host and train the start-ups). The innovation lab will serve as a platform for cooperation between entrepreneurs, investors and manufacturing companies in order to increase the number of projects in cleantech that meet the environmental challenges of traditional industry. The license-holder gets the

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benefit of early insight into R&D projects outside their own organisation and to get to influence the technological development to respond to their own needs (and early investment opportunities by obtaining equity).

### *Clean Energy*

The Office of the Chief Scientist at the Ministry of Energy advances systematic technological issues such as fuel alternatives for transportation, electric vehicles, a smart electrical grid, renewable energy, and nuclear energy, among others. The OCS also funds and supervises R&D operations in the fields of energy both in academia and in industry through public proposals in different research stages, from inception to implementation. It supports academic research in the amount of 20 million NIS annually; it offers overseas grants to postdoctoral researchers to study energy disciplines that are lacking in Israel; it supports pre-seed startups (prototypes and proof of concept), pilot and demonstration projects to encourage and innovate energy and fuel industry in Israel.

### *Agriculture and Water*

Thanks to its semi-arid to arid climate, lack of resources, and innovative spirit, Israel became a global agriculture R&D leader. 6%, or ~450 million ILS (~850 million DKK), of the governmental R&D budget in 2017 went to agriculture R&D, which is the largest governmental budget for an R&D sector after high-tech and industrial technology. The Ministry of Agriculture is not supporting R&D in GHGs emissions reduction directly but is focuses on water efficiency, water reuse for agriculture, and crops improvements.

A new and growing field in Israel is Agro-Food Tech. Several institutes and centers in the north of Israel have been set up to provide the necessary knowledge infrastructure to promote innovative and sustainable technological and manufacturing processes. One such center is the Food Research and Innovation Institute supported by the Israel Innovation Authority. The institute will operate in the Galilee in the north of Israel and serve as a hub for the development of new food technologies and encouragement of entrepreneurship in the food industry (see section the following section outlining relevant Israeli actors).

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## *Fuel Choices and Smart Mobility Initiative*

Israel's national program for smart mobility and sustainable transportation is a joint effort of ten government ministries: Energy, Transport, Economy, Environmental Protection, Science and Technology, Finance, Defence, Agriculture, Foreign Affairs, and finally, the Prime Minister's Office, which now leads the initiative. It is a multidisciplinary and internationally oriented initiative. In January 2017, the government of Israel approved 250 million NIS, to be spread over five years as part of the national plan. The program has two main objectives: first, to strengthen Israel as a center of knowledge in terms of smart mobility; and second, to promote innovative solutions for transportation in Israel. The initiative is merged with and therefore complements the national plan for alternative fuels. Initiatives under this program includes:

- Establishing a testing centre for connected and autonomous vehicles
- Providing access to open source data and high-resolution mapping in Israel
- Creating a smart mobility research centre to encourage collaboration of academia and industry
- Supporting pilot demonstration and deployment projects integrating new technologies and operational concepts in the transportation sector with the potential of lessening congestion, reducing traffic accidents, decreasing the use of petroleum and encouraging the use of public transportation.
- Creating a supportive and innovative regulatory framework

## **Actors**

The key actors of relevance to Danish Israeli collaboration is centred on high-tech R&D within green technologies. Such actors represent different parts of the Israeli innovation ecosystem such as university research centres, public/private incubators, public government bodies and VC funds.

### *Governmental Institutions*

*Israel Innovation Authority:* This government body is the main actor responsible for development of new environmental technologies (see the description above). The authority also host bilateral agreements with foreign countries.

*The Ministry of Environmental Protection (MoEP), the Chief Scientists Office:* The Office supports green R&D with the following goals. To support projects from

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science to policy, promotion of innovative technologies, climate change adaptation, providing access to environmental data to the Ministry employees and to the public, environmental health. Most of such projects are done by promoting relationships with academia and expand the ministries international relations (to which they have a budget to facilitate knowledge exchange etc.)

*Ministry of Science & Technology:* The Ministry is responsible for the State of Israel's investment in scientific research in fields of national priority and serves as a link that connects academic research with industrial development. The Ministry strives to improve Israel's knowledge and research infrastructure, to maximize the benefit from the knowledge amassed by researchers at Israel's research institutions in order to facilitate research with the potential for realistic application. There is no allocated budget for green R&D but the ministry has recently prioritized environmental sciences, agriculture and the water field by increasing their bilateral agreements with foreign countries.

*The Planning and Budgeting Committee (PBC):* The committee is responsible for funding the Israeli system of higher education. They define the regular budget allocated for the academic institutions as well as their development budgets, while considering social and national needs and priorities. The current multiyear plan budget stood at 12 billion NIS allocated to five flagship initiatives. The next multiyear plan will be launched in 2022. Environmental issues are currently being discussed as one of the future flagship areas.

### *Incubators and VC funds*

*Environmental R&D Lab:* The above mentioned innovation lab focusing on environmental protection and sustainability (supported by the Israel Innovation Authority) is being established in Haifa by ESIL Technologies (a partnership between Bnnovation/Bazan Group, EDF Renewables, and Johnson Matthey). The lab will with a 14 million NIS budget. The program will help entrepreneurs and early-stage startups to achieve proof of concept via access to technical infrastructure, experimental facilities in Israel and abroad, and to achieve market awareness and go-to-market channels and expertise (in the fields of environmental sustainability and protection, with an emphasis on developing innovative technologies which are not based on fossil fuels). Projects that are accepted can receive funding of up to 85% of the budget for a period up to one year.

*FoodTech incubator in the north:* Israeli crowdfunding platform OurCrowd, global agrifood investment firm Finistere Ventures, Israel's largest food manufacturer

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Tnuva, and Israeli beverage company Tempo Beverages launched the “Fresh Start” FoodTech Incubator in northern Israel. The incubator operate with a budget of 1 billion NIS and is expected to invest in over 40 advanced technology startups that will drive the sustainable food industry. The consortium is also expected to take the lead on attracting follow on investments at an estimated 800 million NIS provided by partners in the consortium, venture capital funds and global companies.

*Jerusalem Venture Partners:* JVP is Israel’s biggest and most influential investment fund. They have created and invested in over 140 companies in Israel and abroad through a theme-based approach. One such theme is AgriFood Tech supported by the establishment of an international hub for agricultural and food technology in Israel. The aim is to help build an agri-food ecosystem in the North of Israel.

### *University Departments*

*Porter School of Environmental Studies, Tel Aviv University:* The Porter School of Environmental Studies (PSES) at Tel Aviv University is the first graduate school dedicated to the research, teaching and sharing of environmental knowledge in Israel. The school teaches an extensive array of topics such as: renewable energies, climate change, air pollution, stream and river rehabilitation, environmental justice, sustainable urban planning, environmental economics and more. The school fosters an interdisciplinary approach collaborate with environmental organizations, government ministries, industry and other research institutions in Israel and around the world. This include expert advisory to the Israeli government on environmental and juridical issues.

*National Center for the Promotion of Smart Transportation Research:* The Technion Institute of Technology and Bar-Ilan University have received a NIS 25 million grant from the PBC to establish a national center for smart transportation research. The center aims to encourage research and development, initiatives and industry in the field of smart transportation as well as streamline transportation services through the integration of advanced technology. The center will work to encourage cooperative ventures between all interested parties, including researchers from academia and R&D centers, in Israel and overseas, in fields relevant to smart transportation. Likewise, the center will work to encourage and promote cooperative ventures between Israel’s scientific

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community, on the one hand, and entrepreneurs and industry in the transportation field, on the other, from Israel and abroad. The establishment of the center significantly contributes to the implementation of the government resolution in the national plan for smart transportation, that is being jointly advanced by the Ministry of Transport and Road Safety and the Prime Minister's Office.

*Center for Research in Environmental & Water Resources, The Technion Institute of Technology:* The institute specializes in technology related to intelligent use of water, research and development of innovative applications, water distillation and recycling. The institute trains engineers to respond to challenges of water shortage, which relates to water delivery and supply systems, dispersion and trace pollutants in water bodies, water treatment, sewage treatment, sewage treatment and recycling for use in agriculture, reservoir systems, efficient use of water resources and development of new water sources. International programs are part of their training and research courses.

*Ben Gurion National Solar Energy Center, Ben Gurion University:* The Center is dedicated to conducting renewable energy research and graduate training programs. The research scope ranges from harvesting solar energy to storage, material science, optics, and surface physics, such as high concentration photovoltaics, physics of solar cells at very high efficiency, organic photovoltaics, highly concentrated electrolytes for super-capacitors and batteries, light-matter reactive metamaterials, and electro-molecular surfaces. The center has testing facilities for new product development of high international standard and has recently announced the opening of an entrepreneurship workshop focusing on desert-related technologies.

*Agro-Food Tech Research Institute:* Tel Hai College and Migal Research institute are the academic research arm for advancing the Agro-Food field in the north of Israel (see the description of JVP and the newly established Agro-Food Tech incubator). The research collaboration between the two academic institutions enables development and advancement of multi-disciplinary academic programs within the fields of biotechnology, biochemistry, nutrition etc. New research infrastructure will be established, which includes an analytical research lab, a food sensory lab and a product development kitchen.

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## Other Actors

*Eilat-Eilot:* Eilat-Eilot Renewable Energy is a non-profit organization aimed at promoting renewables and green R&D in the Eilat-Eilot region. It has a laboratory center, technology incubator, technology validation site and is hosting a bi-annual international conference.

*The Israel Society for Ecology and Environmental Sciences (ISEES):* The ISEES aims to promote environmental sciences and ecology in Israel. It is running long term initiatives: implementing environmental science in the government, experts' committees, environmental science news agency, a scientific journal and an annual environmental science conference.

## **International/Bilateral Collaboration**

Israel is part of the publicly-funded intergovernmental network EUREKA and very active in promoting EuroStars cfp with other countries.

Israel has been a very active participant in the current Horizon2020 framework program. It is expected that Israel will participate at that same level as other member states (like the current situation). However, the negotiation hereof awaits the formation of a new government in Israel.

The ISERD (Israel-Europe Research & Innovation Directorate) operating under the Israel Innovation Authority is responsible for coordinating Israeli companies' participation in Horizon 2020, in EUREKA for industrial R&D Cooperation, in Bi-National (Israel & European countries) programs for industrial R&D Cooperation and in Enterprise Europe Network (EEN) for SMEs. Israel has bi-national funds that support joint R&D projects of Israeli and non-European companies. Currently there are joint funds with: USA, India, Singapore, South Korea and Canada. Some of these funds' programs are related to green R&D. From 2018, and on, the Innovation Authority added more budgets for green R&D.

The Ministry of Science and Technology also facilitates bilateral agreements with foreign countries in targeted research areas within basic and applied research. Currently, the ministry has several agreements focusing on environmental issues. These for Danish-Israeli collaboration have been discussed, among others: water technology, solar energy, smart transportation and agro-food tech.

## Danish-Israeli Collaboration

Taking the current development around invention and promotion of new environmental technologies Danish and Israeli collaboration would centre around such activities.

*Start-up exchange and co-development projects.* Via the new environmental technology innovation lab Denmark could establish a landing path for Danish start-ups developing green technologies. This would create a unique opportunity for Danish startups to access testing facilities and get support to the demonstration phase. The end goal would be to create an Israeli inspired incubator in Denmark based on the expertise gathered through the pilot program.

Government to government collaboration with the Israeli Ministry of Science and Technology and the Israeli Ministry of Environmental Protection. Danish technologies and research are in demand in Israel. Both ministries have asked to collaborate with Denmark and suggested a joint agreement with bilateral founding from both countries. A specific sector should be selected and promoted as pilot for our joint effort. Other initiatives to be promoted with the ministry are joint bilateral summer schools, researcher workshops, student camps and research exchange programs.

*Bilateral agreement on basic research programs with the PBC and the Israel Science Foundation (in connection with the launch of the next multiyear plan in 2022).* The quality of basic research in selected areas (mentioned under section xx) are of high international standard and Israeli can provide access to excellent testing facilities. At the same time Denmark has proved itself as a driver in many fields within environmental sciences and is considered an attractive research partner. The Planning and Budgeting Committee (PBC) and the Israel Science Foundation (ISF) supports basic research in Israel. PBC defines the national research priorities for five years and allocates the budget to ISF. Both institutions are considered to be important collaborators for future Danish-Israeli research collaboration. The PBC has mentioned the possibility of establishing a bilateral research fund for Danish-Israeli basic research within a targeted area. The green agenda and climate change is a topic that is currently under consideration as one of the main areas in the next multiyear plan. A first step could be to include the PBC and ISF in current discussions and conference planning around the green agenda.

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*Promotion of student entrepreneurship camps with the National Center for Energy, Ben Gurion University.* The center has excellent testing and innovation facilities. They have experience with training students within solar energy to promote and test their entrepreneurial ideas. To bring Danish students to participate in such camps and expose their ideas of the Israeli VC funding landscape, learn the pitching techniques etc. would be of great benefit to the Danish innovation ecosystem within solar energy. The Danish entrepreneurship foundation and relevant universities could be Danish participants.

*Smart Mobility Tripe Helix Initiative.* With the research center and innovation facilities being established as part of the national alternative fuels and smart mobility plan one possibility is to establish a long-term collaboration in this area. The Danish partners could include BLOXHUB, Gate 21 and Real Dania. The product could be with multiple tracks for start-ups to enter the Israeli VC landscape and testing facilities, researchers to co-develop project proposals and co-publications, joint graduate degree program and the development of a corporate venture alliance between Denmark and Israel.

*A Danish-Israeli Agro-Food Tech Venture fund.* The Israeli VC JVP is interested to upscale their international activities and has for a long period been looking towards Denmark as a country with which to co-invest. Possible partners could be the Danish Innovation Fund or the Danish Growth Fund.

### **Summary**

Israel has advanced considerably in environmental issues in the past 20 years. However, it is still lagging behind most of the OECD and developed world in this field. Different from many other sectors Israel does not pride itself on having this area as one of its strongholds nor is their GHG emission targets or fulfilments of these very impressive. However, we do see new tendencies and initiatives coming out of Israel, especially within the development and production of new environmental technologies.

In recent years, there has been an impressive growth in Israel's private sector and the vibrant start-up scene has drawn a lot of attention. Over the past few years, several actors in Israel are actively seeking to merge Israel's agricultural, energy and water technology capabilities with this start-up scene in order to

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convert Israel into a global leader within the CleanTech area. This momentum is promoted effectively by the government in the last decades.

This development creates new collaboration opportunities for Danish-Israeli collaboration around the development, testing and demonstration of new environmental technologies. The Danish innovation ecosystem could benefit from launching joint funds for the promotion of bilateral research projects within targeted areas, facilitating access to Israeli test facilities and demonstration activities as well as promoting Danish start-ups to the Israeli VC scene.