

Digital as a Key Enabler for Climate Action

The Israel Perspective



Commissioned by **Google**



Introduction

As an addition to our global study "The Road to Sustainability: Digital Technologies as a Key Enabler for Climate Action," this **regional chapter** further explores how digital technologies can be leveraged to meet the challenge across the three pillars of climate action (Mitigation, Adaptation & Resilience, Setting Foundations). As one out of six regional deep dives, this chapter is intended to adapt global recommendations to the local context and distinct regional dynamics of **Israel.**

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Climate Action in Israel – the current state

As the coming decades will have the greatest influence on future climate stability, there is little time left to deploy and implement climate protection actions. One key component, though not sufficient on its own, is the reduction of greenhouse gasses (mitigation) to meet the Paris Agreement commitments to **limit overall global warming to 1.5 °C.**

According to the Israeli Meteorological Service, the average temperature in Israel has risen 1.4 °C since 1950 and is expected to rise by a further degree by 2050 in an optimistic scenario. This is faster than the global rate.¹ Furthermore, with Israel already under water stress,² rain precipitation is not only projected to drop 15%-20% by the end of the century, but the length of dry periods will likely be prolonged in the future. This means rain will be concentrated into high volume events with an increased risk of flooding and less efficacy for water source renewal. Israel is characterized by its small size, high population density, rapid population growth, and dry climate, resulting in challenges related to both land and water scarcity. Despite **45% of the country being considered arid, 20% of land is used for agriculture.** Israel is also located at the intersection of a number of climate zones, creating a higher level of biodiversity that calls for protection.

Climate KPIs Israel

Measure	Unit
Climate Indicators	
Expected rise in average surface temperatures in a business-as- usual scenario	0.9-1.2 ³
Expected rise in average surface temperatures if all NDCs are	0.1
achieved	
Activity Indicators	
Absolute emissions per year (CO_2e)	80.96M ⁴
GHG per capita (CO ₂ e)	8.8M ⁵
Projected emissions in 2050 if all NDCs are achieved (CO ₂ e)	12M ^{6,7}
Renewables in energy mix (%)	6.5% ⁸
Average yearly economic damage due to extreme weather (USD)	\$96M ⁹

The burning issues

Three paramount issues have been pinpointed that, when addressed collectively, hold the key to propelling sustainable progress and equitability in Israel.



Lack of Prioritization and Consistency in Policies

Climate and sustainability issues tend to be pushed down the public agenda, secondary to other issues that are seen as more urgent. Raising awareness about environmental issues and highlighting the urgency both in decision-making circles and among the general public is important to creating sustainable policies and enable optimal resource allocation to advance climate change related projects.



Increased Weather Changes and Extreme Weather Events

Weather changes and increased instances of extreme weather are threatening human infrastructure with an increase in floods and wildfires. These, as well as more frequent droughts, are adding to the burden on economic systems, especially in the agricultural sector. To ensure a just transition to a low-carbon economy, solutions should be found to ensure the resilience of the economy and people's livelihoods and to build climate resilience for physical infrastructure with attention to equality throughout the country.



Threats to Biodiversity

Israel is located at the intersection between a number of climate zones, making it home to a large number of endemic species and "batting above its weight" in terms of biodiversity. This makes it a high priority to protect ecosystems from both weather changes and infrastructure development as the country develops. The Israeli economy relies heavily on imports and exports but **faces challenges due to limited land-based freight connections**. As a result, it depends heavily on maritime and air routes, with a significant portion of its international trade occurring with the EU. This presents opportunities for technological innovation but also requires compliance with European sustainability standards. Therefore, **the economy is exposed to transition risks from export markets, and dependence on imports also creates a vulnerable supply chain.** As for the construction sector, sustainable building standards were mandated for new construction in 2022, but have not been widely applied to existing buildings.

Israel ratified the Paris Agreement in 2016 and published its first Nationally Determined Contribution (NDC), with an updated NDC submitted in 2021. As of the writing of this report, a renewed draft of its Climate Bill has been tabled for discussion in the Israeli Parliament (Knesset).

Israel's climate goals as defined by its NDC:

- 85% GHG emission reduction by 2050 compared to 2015– bringing total emissions to 12 MtCO₂e (27% by 2030 bringing emission total to 58 MtCO₂e)
- **Transport: at least 96%** reduction of transport emissions by 2050 compared to 2015
- Waste: 71% reduction in waste sent to landfill by 2030 compared to 2018
- Energy: Energy intensity of 122MWh per 1m NIS by 2030
- 30% renewable energy in the energy mix by 2030

While energy has historically been generated from imported fossil fuels, **local natural gas has recently supplemented this energy source and now accounts for 69% of electricity generation.**¹⁰ However, clean energy still represents a small percentage of the energy mix, only 6.5%, despite a large number of solar energy companies operating in Israel, and the fact that solar panels have been a common means of heating water for many years. Increasing this percentage is one of the key goals of climate action in Israel.

While representing a relatively modest contribution to global emissions because of its small size, Israel must nevertheless fulfill its international commitments in the climate space. To achieve this, Israel can leverage digital technology for efficient tracking and reporting, aligning with global mitigation efforts. Additionally, decarbonizing the energy system, vital to reducing emissions, can benefit from technology adoption, including the management of smart grid systems and digital tools, thus promoting energy efficiency in both private and industrial sectors. **Noga**, a state-owned entity, was recently established to modernize the Israeli energy market. This entity aims to enhance grid decentralization and increase the share of renewables in the energy mix, necessitating a strong technological foundation. The head of Noga considers the company one of the country's leading technology firms due to its use of advanced technology and extensive data for electricity market planning and management.¹¹

Israel's semi-arid climate and low-lying coastal geography expose it to droughts and rising sea level concerns. Agriculture, while benefiting from innovative irrigation and water-recycling, still consumes about 55% of drinkable water.¹² Precision agriculture can enhance water efficiency. Desalination plants mitigate water risks but introduce emissions due to energy requirements. Scarcity of fresh water will drive energy demand and associated emissions. Inadequate rain runoff drainage infrastructure raises flood risks, while prolonged dry spells triple the fire risk in some areas.¹³ Digital technology solutions can improve flood and fire response through analysis, prediction, crisis alerts, and more. The Ministry of Environmental Protection is creating detailed risk maps to support effective risk management and climate resilience development.

Finally, changing weather patterns are creating consequences such as invasive species, pests, and changes to habitats and ecosystems. Monitoring these for conservation is made easier with digital monitoring and tracking tools. These tools can be especially useful in building awareness and can make it possible to involve the public in conservation efforts, for example with crowdsourced tracking. Israel has a very developed outdoor culture, and while this does not necessarily translate into environmental and climate awareness, it does get people outside to enjoy nature, a phenomenon that can be leveraged.

In Israel, addressing the foundation of climate action is crucial. Although a significant portion of the public acknowledges the link between emissions and climate change and believes the government should be prepared for climate-related challenges,¹⁴ this understanding has not yet led to major political decisions or changes in voting behavior.¹⁵ Climate change often becomes less prioritized compared to other immediate social and political concerns. As a result, climate action faces challenges in gaining momentum. Surveys also reveal that over half of respondents acknowledge personal responsibility for sustainability, with varying willingness to make changes based on convenience and cost considerations.¹⁶ To establish a solid foundation, policymakers could not only capitalize on existing awareness, promote education, remove barriers, and provide incentives, but also lead national initiatives and drive action in the industry. In this context, digital technologies are instrumental both in defining priorities with data-backed decision-making, and in creating avenues for engagement to educate and raise awareness. They can also be utilized for better enforcement of regulations as well as to offer tools to lower the burden of compliance.

Monitoring the nature continuously

A simple example of crowdsourced conservation already in operation is the "livebulance." An extremely simple system utilizing social media platforms to alert conservation authorities of wildlife that is found hurt or in jeopardy. When an animal in need is discovered, the group is alerted and the animal is transported to the veterinary hospital by whoever is available. More sophisticated systems involving the thousands of hikers, campers, and nature lovers out in Israel's natural spaces include **platforms for monitoring** endangered species of insects, animals, and plants. The information is consolidated for research by scientists in a number of scientific institutions and can be used by national environmental entities such as the national parks authority or the Ministry of Environmental Protection.

A vibrant ecosystem turns its skills to climate action – meet a sample of Israeli companies that have decided to be part of the effort

Mitigation

- Grid 4 C Captures and uses energy usage data from smart meters for gridsize utility clients
- **Datamind.AI** Optimizing manufacturing processes and predicts malfunctions to reduce resources and Co₂
- SeeTree Allows farmers to make decisions on sensors in their fields that track water, time money and energy
- **Greeneye Tech** AI image processing system for agricultural sprayers that identifies in real-time where to spray pesticide

Adaptation

- **Tomorrow.io** Saas to recommend weather changes allowing companies to avoid damages and disruptions
- Simpliigood Produces food (algae) in specially equipped greenhouses that can operate in arid/desert environments
- Asterra Uses Sensors, satellite imagery and AI to provide early detection and ID infrastructural vulnerabilities
- Windward Real-time risk management and predictions for banks, traders, insurers, electric/ shipping companies

Foundational

- Agro Scout Saas for collecting data on plant leaves with high resolution using artificial Intelligence
- **TaKaDu** Central Event Management (CEM) for water utilities to improve operational efficiency
- **BeeHero** Database of field bees for crop pollination and platform for monitoring beehives
- Net-Zero Incubator with emphasis on emission reduction, water management, energy production and water treatment

Digital Transformation and Innovation

Israel exhibits a high level of digital literacy but the state of digital penetration and investment in digital infrastructure reveals a slightly more mixed picture. For instance, the deployment of 5G technology, which plays a key role in supporting advanced IoT solutions, is progressing more slowly compared to several European countries.¹⁷ When it comes to cloud, only 26% of Israeli businesses anticipate adopting hybrid cloud by 2025, a significantly lower percentage than in the rest of the world (49%).¹⁸ As a matter of fact, 28% of Israeli IT departments still operate traditional data centers, while this rate has already dropped to 18% in the rest of the world.¹⁹ Recently, efforts are being made to close this gap through dedicated programs and grants offered by the government and the Israel Innovation Authority, such as financial support for Israeli start-ups conducting R&D in the field of 5G.²⁰

Using innovation to fight large-scale environmental issues has been successful before. Between 2000 and 2015 Israel lowered its absolute water usage by 20% per capita through innovation in water management, including desalination, despite population growth. According to a 2021 report by PLANETech and the Israel Innovation Authority, funding of climate tech solutions as a whole (not specific to digital technologies) in the years 2018 to 2020 was almost 3bn USD.²¹ The Israeli government supplements funding for product development at different stages, totaling 280m USD in funding over the same period. Nonetheless, the ecosystem lacks the desired diversity both in terms of funding sources and their focus areas.²² Despite Israel's robust software ecosystem, a review of Israeli climate tech reveals that digital technologies are not immediately prominent as a distinct category. However, an examination of leading fields, such as precision agriculture, smart transportation, and solar energy, underscores the significance of digital technologies, given their role in supporting data and digital processing power that underlies many of the developed solutions.

One way for the Israeli government to address this lack of funding in the climate tech field is to **establish a public-private partnership similar to the Coalition for Climate Entrepreneurship (CCE) launched by the US Department of State at COP26 in Glasgow.**²³ This structure, which relies on four key pillars: Capital, Expertise, Engagement, and Deployment, can help coordinate large companies, mostly tech players, to support climate entrepreneurs and provide them with the necessary capital as well as technical assistance, access to mentorship, and network building required in the early and growth stages of businesses.

action, it is estimated that today's digital technologies, if well optimized and applied widely, could reduce up to 20% of total emissions.²⁴ The positive impact results from their ability to better connect and communicate, thus enabling better monitoring and tracking and providing us with software that can analyze, optimize, and predict, and supporting us through augmentation and autonomation. Israel can leverage its vibrant and innovative technological ecosystem and high level of digital transformation to leapfrog on sustainability and climate action to not only make up for some of its local sustainability lag, but also to become a leader in technological innovation for climate action. Strategic government involvement can contribute to fulfilling this potential.

Recognizing the potential of digital technologies to enable climate

Climate Forward Government

Governments can effectively handle risks and challenges in environmental action by **setting goals and creating a flexible framework to achieve them**. As a first step, comprehending regional barriers and complexities is key, so that policymakers can tailor their strategies to effectively address them, enabling the acceleration of digital tech-driven climate action.

Barriers to Digital Climate Solutions

Globally, two main overarching barriers to harnessing the potential of digital technologies for climate action have been identified: insufficient innovation and insufficient engagement.

In Israel, the most significant barriers can be traced to prioritization within the public agenda and inconsistent policy due to challenges in the political landscape.

This naturally leads to insufficient funding (both public and private), a smaller activist community, and a growing but still nascent attention from the private sector and research entities. Finally, other barriers prevent the vibrant innovation ecosystem from reaching its full potential, especially with regards to local implementation and rollouts. This leads many local innovators to set their sights on larger markets abroad with more mature attitudes to sustainability and that often larger scale offerings. Specific barriers to scaling innovation include access to capital, regulatory hurdles, go-to-market, and creating cross-sector collaborations.

Policy Goals

In Israel, policies can be developed to leverage the highly developed innovation ecosystem and high level of digital penetration to make up for lost ground on sustainability and climate and align with international best practices. Moreover, if given the right support, Israel can be a leader in digital tech solutions for climate action, much like in other fields such as cybersecurity. With this in mind, the immediate goals for Israeli policymakers can be summarized as follows:

- Use digital tools to advance awareness, train, and offer tools for advancing climate goals
- Lay the required **data foundation for effective policy planning** and development of solutions by collecting and analyzing data and making it accessible, including with nationwide collaborative initiatives
- **Incorporate digital tools** to level up regulations in terms of enforcement, and more importantly, to lower the burden of compliance
- Encourage digital technology innovation with the goal of supporting both development and scale, and roll-out locally

Digital Tech Policy

In presenting the potential policy measures for achieving these goals, the Digital Sprinters Framework by Google offers a structured approach. This framework defines four primary categories: Infrastructure, People, Market Environment and Tech Innovation. Each category addresses specific policy aspects that can facilitate sustainable and inclusive economic growth while harnessing the power of digital transformation.

All the listed recommendations are intended to promote achieving the aforementioned objectives and at the same time to reduce the barriers that currently exist.



Infrastructure

- Incorporate advanced sensing into national utilities and infrastructure to support trustworthy and comprehensive data. This should be done considering privacy and data security protection. Utilizing advanced sensing in grid, building, or highway infrastructures can enhance AI capabilities through real-time data integration. This can then feed back into planning and management with AI-based solutions.
- Establish a national climate and resilience center for standardized climate data. This can build on the work already underway at the Ministry of Environmental Protection involving mapping physical climate risks to enable research. Creating shared, verified, and standardized datasets will enable research collaboration as well as effective and timely dissemination of insights and even warnings.
- Improve trust around data sharing through secured platforms and ad hoc regulatory frameworks for data security and privacy.



People

- Utilize digital tools for climate change awareness and sustainable choices such as digital platforms to facilitate communitybuilding and knowledge exchange. This could be run by a centralized national entity focused on climate education and could provide practical tools and involve experts to enhance credibility. Digital tools can also help with designing campaigns targeting diverse audiences, including professionals, children, and the general public.
- Establish public-private partnerships in the field of climate tech, such as the CCE initiative launched by the US Department of State at COP26, to support climatefocused entrepreneurship, providing essential resources such as funding, expertise, and network building.
- Facilitate access to verified climate data for the general public, decision makers, and the scientific community to enable data driven decisions, deep research, and to develop effective and innovative solutions based on real data.
- Empower consumers through education and campaigns to help them make informed decisions. The use of digital tools can lower barriers to implementing these choices by providing timely information that facilitates action.



Market environment

- Incorporate digital tools in government circles to support datadriven decision-making, planning, and coordination on climate policies. This includes using data to plan more effective and low carbon public transport, to track the roll-out of new initiatives, or monitor for better target-setting.
- Utilize digital tools for more effective regulation. Digital tools can lower the burden of compliance and raise the bar regarding the feasibility and reliability of regulations on transparency which in turn can drive sustainability performance in the private sector forward.
- Incorporate climate considerations and the potential benefits of digital technologies when setting new standards such as in construction or urban planning. Examples of this include energy management systems or EV charging stations. Incentives for incorporating smart solutions can further accelerate this evolution.



Tech Innovation

- Leverage Israel's 'start-up nation' status for digital climate solutions, building upon existing efforts in climate tech.
 Policymakers should explore ways to encourage specialized support for digital technologies, drawing from the knowledge gained within climate tech, software, and cyber ecosystems.
 Additionally, promoting deliberate cross-industry partnerships between hardware and data-driven solutions can drive innovation and enhance operational efficiency in support of climate mitigation objectives.
- Establish POCs and pilots, taking advantage of Israel's small market size. By putting in place structures, and even funding or collaborating with innovators on local pilots, policymakers can support start-ups as they work their way up to scale while enjoying the benefits of innovation locally. This requires a supportive regulatory structure, funding opportunities and creating platforms for cross-industry collaborations especially with utilities and manufacturing companies.

Industry perspectives

Having identified what to do, and how to do it, the next question is where to start. Based on current emission levels and the expertise of interview partners, a special focus on implementing digital technologies leveraging climate action should be placed on the following four key industries: **Energy, Industry, Transportation, and Agriculture.**

Industry	Recommendation ³⁰	Specific action	Priority
Energy	Digital platform for consumer information	Expedite the roll-out of smart energy meters and leverage for consumer empowerment with accessible, user-friendly consumer dashboards	Medium
	Generation of renewable energy	Leverage the restructuring of the electricity market to set up the required regulatory, financial, and cybersecurity environment to	High
	Cyber attacks	enable a highly diversified, clean energy grid, while also using permitting and incentives to utilize urban spaces for clean energy generation	
Industry	Digital tools for improving construction and production processes	Incorporate stringent environmental standards for new buildings and permitting for renovation, bridging short-term costs with incentives or subsidies	Medium
	Subsidization of digital tools	Risk minimization for the transition to sustainable energy sources through grants and long-term financing mechanisms that provide the funding necessary to adopt digital solutions	Medium
Transportation	Legal framework for digital tools in transportation	Expand smart mobility initiatives based on the sharing economy such as last-mile low-carbon solutions	High
	Cross-functional partnerships in the data space	Optimize public transport systems for maximum efficiency and useability to reduce private car use. Incorporate measures such as low emission zones	High
	Transition to EV	Facilitate and optimize EV charging infrastructure	Low
Agriculture	Favorable regulation for smart farming and food classification	Enable sharing of best practices of modern agriculture technologies that enable improved crop, water, and livestock management	Medium
	Sustainable farming techniques	Incentivize sustainable farming techniques that can improve resilience and at the same time reduce chemical inputs and greenhouse gas emissions	Medium
	Centralized information sources for effective management and crisis response	Expedite existing work on physical risk mapping and make the data and actionable insights readily available and actively distributed for timely response	High

Conclusion

In comparison with other advanced economies, particularly in Europe, Israel lags behind somewhat in the fight against climate change. Nevertheless, the country's characteristics, **namely the highly educated population combined with a strong and innovative technological sector**, **place Israel in a favorable position to achieve quick wins, close the gap with other countries, and even eventually become a leader in digitally-led sustainability**.

The potential economic gains from leveraging digital technology innovation for climate action are significant for a country like Israel, which is currently at the start of this evolution. To capture those gains, **governments can create a comprehensive data infrastructure that will lay the foundation for providing reliable and useable insights to optimize decision-making at multiple levels, both in the public and private sectors.** The establishment of a clear and consistent set of environmental and digital metrics is also a key success factor.

In addition, Israel would benefit from removing barriers to digital innovation by facilitating cross-sector collaboration and targeted funding. When used in an educational context, digital tools can also raise awareness among the population and strengthen a bottom-up dynamic that will ultimately anchor the importance of climate action in the political agenda.

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