THE STATE COMPTROLLER
AND OMBUDSMAN OF ISRAEL

2021

Chapter 1

Mitigation – Actions to Reduce GHG Emissions

Summary

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Background

The quantity of GHGs emitted into the atmosphere by all countries determines their concentration in the air. A higher concentration means a sharper rise in the temperature on Earth, and this in turn leads to escalation of global climate change phenomena. Since the Industrial Revolution, when people began to use coal and petroleum in industry and transportation and for production of electricity, GHGs have been emitted into the atmosphere in ever-increasing quantities. In recent decades, these quantities have grown at a particularly intensive rate. The main leap in global greenhouse gas emissions took place in the past seventy years, and the level continues to rise today. Current growth of the emissions rate is estimated to be thousands of times greater than during the period preceding the Industrial Revolution, and scientists estimate that the level has yet to reach its peak. The significance of this is a sharp rise in the concentration of GHGs in the air.

In the past few decades, the international community has recognized that global warming caused by greenhouse gas emissions from human activities is one of the severest problems that it must manage. To do so, it must use two main tools: (a) Production of clean energy, meaning energy that is free of greenhouse gas emissions and not from fossil fuels; (b) Energy efficiency, reduction of energy use through more efficient consumption.

While the effect of air-polluting emissions is mostly limited to the geographical area of their sources, the effect of greenhouse gas emissions is not local: each country is impacted by the quantity of emissions produced by other countries. Therefore, to reduce the global quantity of emissions, the international community must work in close cooperation.

The accumulation of scientific evidence on the topic of climate change and the understanding that effective global cooperation is needed to reduce global greenhouse gas emissions urged the international community to formulate in 1992 the United Nations Framework Convention on Climate Change (UNFCCC), which Israel has ratified.

Key figures

2°C

The goal for limiting global warming as defined in the Paris Agreement, with preference for 1.5°C

2050

Target date for carbon neutrality under the Paris Agreement, with ambitious intermediate targets set for 2030

10th out of 29

Israel's place on the list of reviewed OECD nations of emissions per capita in 2016. In 2019, Israel emitted 8.8 CO_{2eq} tonnes per capita

103%

Anticipated increase (absolute) in the quantity of emissions in Israel in 2030 as compared to 1990, under 2015 targets. This compares to an average reduction of 32% in emissions by other OECD countries reviewed

2% of GDP

Israel's investment in infrastructure in 2016, compared to the average rate of OECD nations, which is 3.4%-3.5% of GDP (75% more than in Israel)

+0.9%

Increase in global demand for renewable energy in 2020. Demand for coal decreased by 6.7%, for natural gas by 3.3%, and for petroleum by 8.5% according to IEA

30%

Israel's 2030 goal for renewable energy, compared to targets of 55%-100% in OECD nations surveyed.

As of 2020, Israel's renewable energy use stands at 6.1%

NIS 49.2 billion

Estimate of cost to the energy sector to reduce greenhouse gas emissions for 2050, as indicated by the Ministry of Energy model for the scenario based on renewable energy. This estimate is also the most economical of all the models

Key findings

Per capita emissions in Israel are high compared to other countries: The per capita emissions trend mainly exhibits a downward trend (inconsistent decline from 10.7 tonnes CO_{2eq} per capita in 2000 to 8.8 tonnes CO_{2eq} per capita in 2018). But in comparison to the 29 OECD nations reviewed, Israel was ranked tenth (in the upper third) on the list of countries with the highest per capita emissions rate in 2016. Israel's relatively high emissions rate per km^2 (3.6 tonnes per km^2 in 2018) combined with its population figure of 9.3 million means that Israel emits GHGs at a magnitude similar to that of a medium-size state.

Israel's Actions for Reducing Greenhouse Gas Emissions before 2020

Mitigation (actions for reducing greenhouse gas emissions) - 1996-2009: Israel joined the UNFCCC treaty and ratified it in 1996, and it took 13 years for operative decisions to be made regarding formulation of policy for reduction of greenhouse gas emissions. Even then, the actions required for implementation of the recommendations and for achieving targets in the field of reduction of greenhouse gas emissions were not taken – even though the cost-benefit analyses performed showed that implementing means for reducing greenhouse gas emissions is clearly beneficial.

Setting targets for reduction of greenhouse gas emissions

1. In April 2016, over twenty years after Israel joined the UNFCCC treaty, its government adopted a national plan that set goals for reducing greenhouse gas emissions (general and sectorial). These goals were lower than the conservative recommendation issued by the interoffice steering committee (instead of the recommended 7.2 tonnes CO_{2eq} per capita, the target defined was for 7.7 tonnes CO_{2eq} per capita).

2. Israel set a target for reducing greenhouse gas emissions per capita only, even though developed nations are expected to set absolute and ambitious targets. Setting per capita targets enables Israel to increase the absolute quantity of emissions as long as its population continues to grow, and this is in opposition to the declining trend in most other OECD nations.

3. Israel set a target for reduction of greenhouse gas emissions that was expected to lead to an increase of 103% in emissions as compared to 1990 and 12% as compared to 2005, while the targets of the other nations surveyed (Switzerland, the European Union, Canada, United States, Mexico, and South Korea) were expected to lead to an average decrease of 32% and 33%, respectively.

Therefore, Israel is not taking the lead in setting targets for reduction of greenhouse gas emissions, as required under the Paris Agreement.

- **Fulfilling the reduction potential as compared to the goal of 7.7 Tonnes of CO_2 equivalent per capita:** Comprehensive cost-benefit analyses performed over time have shown that there is significant economic benefit to adopting the many measures for reducing greenhouse gas emissions that were studied (sometimes up to 80%). In practice, fewer such measures were adopted. Therefore, even if all reduction measures in the national plan for reducing GHG emissions are de facto implemented, achieving the set target is likely to lead only to partial fulfilment (efficiency of NIS 50 billion instead of NIS 217 billion, less than one-fourth) of the environmental and economic potential inherent in implementing these measures. In addition, Government Resolution No. 542 (from 2015) regarding Israel's targets for reducing emissions, and the subsequent National Plan for Reduction of Greenhouse Gas Emissions (2016), do not indicate internalization of the economic costs of GHG emissions, whether through a carbon tax or other means.

- **Per capita emissions and absolute quantity of emissions:** From 2015-2020, Israel's absolute emissions increased. For example, in 2018 this measure grew by 2.3 million tonnes CO_{2eq} and in 2019, by 0.3 million tonnes CO_{2eq}, as compared to the quantity of emissions in 2015. As for per capita data, the value of 8.5 tonnes of greenhouse gas emissions per capita as of 2020 reflects a decline compared to 2015, and meeting the target set for 2025, thanks to the trend of reduction in coal use in electricity production that began in 2012. However, the report of the Inter-Ministerial Steering Committee for Monitoring, Reporting, and Verification (MRV) on reduction of GHG emissions headed by the Ministry of Environmental Protection, noted for 2020 that the COVID-19 pandemic led to a significant reduction in economic activity, and that "the COVID-19 crisis contributed to the relatively low level of emissions for 2020." According to the report, this resulted from a decrease in the consumption of fuel for transportation (10% reduction in consumption compared to 2019), reduction in the use of electricity (1.4% reduction in consumption compared to 2019), and reduction in overall consumption.

Evaluation of the progress in achieving sectorial targets: Progress in achieving goals for all sectors ranged on the scale from delay in achieving target to zero.

Various directives in Government Resolution No. 542 of 2015 and Government Resolution No. 1403 of 2016 (in fields such as: economic instruments in addition to the recommendations of the Green Taxation Committee; mechanisms for encouraging energy efficiency in government offices; encouraging public transportation; barriers to constructing renewable energy facilities; and use of electricity bills as clearinghouses), which included both budgetary and regulatory aspects – were not implemented since these decisions were made. Therefore, the Israeli government's sectorial targets for reducing greenhouse gas emissions were not achieved. Following are details:

1. **Target for reducing private mileage by 20%:** Private mileage increased from 42 billion km in 2015 to 50 billion km in 2019. According to the Ministry of Environmental Protection's annual follow-up report of May 2021, "the government is not anticipated to meet the target for the transportation sector for reducing private mileage". In addition, the Ministry of Transportation did not prepare a designated plan for reducing private mileage as required under the 2016 Government Resolution on this issue.

2. **Target for increase of 20% in energy efficiency:** Israel did not meet the targets that it set for itself in Government Resolution 4095 (2008) for 2020, and in practice, energy efficiency stood at 62% less than the target. In addition, out of NIS 800 million budgeted under the Government Resolution 542 for reducing GHG emissions through efficiency, at least NIS 500 million were not utilized.

3. **Target for generating electricity from renewable energy sources:** Israel did not meet the goal of 10% that it set for itself for 2020 (in practice, 35%-40% less than the target set). Progress toward achieving the target of 17% renewable energy for 2030 is slow, (especially compared to the current target of 30%) and as of the end of 2020, reached only 6.1%.

Investment in infrastructure: According to the OECD, from around 1997, Israel's investment in infrastructure was lower than the average investment in OECD nations. As of 2016, investment in infrastructure in Israel is estimated at some 2% of gross domestic product, while the OECD average is 3.4%-3.5% of GDP (75% more than in Israel).

Setting Israel's Targets for Reducing Sectorial Greenhouse Gas Emissions

- **Formulating Israel's strategy for transitioning to a low-carbon economy by 2050:** In the process of "Transitioning to a Low-Carbon Economy by 2050" (Transitioning 2050) led by the Ministry of Environmental Protection, delays have occurred in setting targets, mainly in the field of energy, due to lack of agreement on targets between the Ministry of Energy and the Ministry of Environmental Protection. As a result, the step of integrating all economic sectors in the process has been delayed. As of June 2021, Israel had yet to present a plan for reducing GHG emissions, as expected under the Paris Agreement.

- **Characteristics of climate issue governance:** Multiple legislative and administrative authorities, conflicts between targets of government ministries, and structural gaps between responsibility and authority create built-in difficulties in promoting reduction of GHG emissions. In cases of conflict or potential conflict between the main goals of government ministries and the target for reducing greenhouse gas emissions, the ministries prioritize the promotion of the goals central to their ministerial responsibility over emissions reduction (except for the Ministry of Environmental Protection). Over time, this results in insufficient prioritization of climate change and emissions reduction targets in favor of other goals and ministerial priorities – when formulating targets, budgeting them, and also on the way to achieving them.

The Energy Sector

- **The new goal for renewable energy for 2030 compared to OECD countries and others:** The countries that were reviewed, including OECD countries, set their targets for renewable energy for 2030 at 40% to 100%, while Israel presents its new target as 30% - the lowest of the reviewed OECD countries, which under the Paris Agreement, are supposed to present targets at absolute, ambitious values and lead the global process of decarbonization. Setting targets that will increase the investment in fossil fuel energy infrastructures by 2030 might endanger the process of transition to a low carbon economy by 2050.

- **Participation in Government Resolution No. 465 for target of 30% renewable energy by 2030:** The decision on issues such as the area of land available for photovoltaic (PV) installations (open and dual), technological maturity for storing electricity in PV installations, and cost-benefit analyses on the basis of which the Minister of Energy's decision was made (listed as Government Resolution No. 465 [2020], which states that "the government has recorded the decision of the Minister of Energy on the policy principles affirming that by 2030, 30% of electricity production will be from

renewable energy") were conducted by the Ministry of Energy and the Electricity Authority, with no preliminary participation of government ministries and additional relevant entities (such as the Israel Land Authority, Ministry of the Interior Planning Administration, Ministry of Construction and Housing, and the Ministry of Environmental Protection) in the decision-making. In addition, the Electricity Authority's assessment was limited to the feasibility of a 30% rate of renewable energy, it did not examine the full potential for reducing GHG emissions for 2030, and it did not include the impact of technological advancements anticipated in the coming years.

- **Setting energy sector targets for 2050:** In Government Resolution No. 171, the State of Israel set a target for GHG emissions reduction from the energy sector that reflects a policy of transitioning to a low-carbon economy, and not to a carbon neutral economy, as many OECD countries plan to do. The Ministry of Energy did not set a target for renewable energy for 2050, due to the barriers it listed and uncertainty in setting long-term targets. The Ministry set a target for reducing emissions from the energy sector, but in the roadmap it published in 2021 for public comments and in its policy papers, it did not describe how it intended to reach this target without setting ambitious goals for renewable energy, and in the absence of mature alternative technologies or other technologies now in use (such as CCS technologies for carbon capture, nuclear energy, hydrogen energy, and future technologies). The Ministry also did not outline how it intends to act to promote the use of these alternative technologies or to remove the barriers it described in its policy documents.

- The scenarios presented by the Ministry of Energy demonstrate that it believes that full implementation of the target for emissions reduction of 85% can be achieved through the production of 54% to 90% of the electricity from renewable energy – a broad range that grants it flexibility. The ministry did not suggest this range of renewable energy as a sub-target under the overall target for emissions reduction. Maintaining the mix at 70% natural gas energy after 2030 without setting renewable energy targets for 2050 lays a foundation for planning, development, and investment in further development of the gas sector in Israel, and might negatively affect the future transition to a low-carbon economy.

- **Estimated cost of transition to low-carbon economy:** The cost estimate performed indicated that in 2030, 2040, and 2050, the scenario emphasizing non-solar technologies (such as carbon capture) is the most expensive. The scenario emphasizing solar energy in 2050 – the relevant target date for the transition strategy to a low-carbon economy – has the lowest costs of all the scenarios. This scenario is estimated at NIS 49.2 billion, as compared to the scenario emphasizing non-solar technologies, estimated at NIS 56.9 billion. The Ministry of Energy did not reassess the scenarios, although the data indicates that the technology-based scenario is less economically feasible, and that it should focus on the solar scenario, which has a broad range of flexibility (up to 90% renewable energy) and assess the methods of implementing it. In addition, these

estimates for implementing the various scenarios were not presented in the roadmap for the energy sector for 2050, which was published for public comments in April 2021.

- **Policy for GHG emissions reduction compared to fossil fuel production:** For over a decade, the government has declared a policy of reducing GHG emissions and air pollution. Promotion of fossil fuel production does not align with this policy. The government does promote the struggle against climate change and in favor of clean air, but it is also promoting a policy of maximizing the exploitation potential of resources[1]. This policy should be adapted to the national effort to reduce GHG emissions.

The Transportation Sector

- **Electric vehicles:** As of 2020, electric vehicles in Israel accounted for 0.05% of all vehicles, and measures to increase this share are in the early stages. Following the global COVID-19 pandemic, the Ministry of Energy decided to postpone the target set in 2019 – to prohibit import of vehicles with fuel-burning engines starting from 2030 – by another five years (until 2035), although it did not demonstrate that other countries have acted similarly.

- **Plan to reduce GHG emissions in the transportation sector:** Significant sections of the plan to reduce GHG emissions in the transportation sector promoted by the Ministries of Transportation, Environmental Protection, and Energy remain at the level of recommendations or proposals for actions and policy tools. The Ministry of Transportation has not yet formulated a detailed plan for reducing GHG emissions from this sector that integrates with this ministry's other strategic plans. In addition, the link between the proposed measures and to what extent their adoption will contribute to reduction of GHG emissions, was not established. Examples of recommendations (not yet adopted or budgeted) are: increasing the investment in public transportation infrastructure, especially in mass transportation systems; a policy package adapted for parking management; pricing of road travel per type of vehicle; closing roads to traffic and creating infrastructure to encourage bicycle riding and walking; a national plan to encourage distance work, learning, and shopping.

- **Barriers:** The ministries listed various barriers which impede the implementation of the said measures, and their removal requires involvement of many ministries and supporting units (including the Israel Land Authority, the Planning Administration, the Ministry of the Interior, and local authorities). Examples of such barriers are: the charging infrastructure for electric cars is inefficient; legal issues complicating the installation of

1 Israel has a plan for extracting fuel from the gas fields that it is developing through energy companies; a plan for development and construction of infrastructure and power stations of thousands of megawatts; and a plan for mining, production, and refinement of various fossil fuels, including energy-producing oil shales, petroleum, and gas.

charging points in apartment buildings; local authorities lack knowledge about charging; absence of a plan to encourage use of public transportation.

The Buildings and Cities Sector

- **Israel's targets for net zero energy buildings:** Most of the countries surveyed determined that residential buildings will be required to meet net zero building standards by 2020. In Israel, this requirement is expected to apply as of 2025, and in a partial manner only. For example, structures higher than five stories, expected to represent 80% of residential buildings, and industrial structures are not included in the requirement for net zero buildings. The plan does not include new targets for 2050, except for commercial buildings. In addition, no plan has been established for the implementation of these targets for net zero building and reduction of GHG emissions in the construction sector, nor for the mechanism that will work to achieve them.

- **Energy efficiency in existing buildings:** No targets have been set to require energy efficiency in existing buildings, which in 2050 (according to the Ministry of Energy) are expected to represent 50% of all structures.

The Waste Sector

- The Ministry of Environmental Protection has not set targets for reducing GHG emissions from the waste sector as part of Government Resolution No. 542 (following the Paris Agreement), although according to its own strategy document on the issue, deficiencies were found in reduction of waste quantities and the manner of waste treatment.

Reducing per capita emissions: Per capita emissions are mostly exhibiting a downward trend (inconsistent decline from 10.7 tonnes CO_{2eq} per capita in 2000 to 8.8 tonnes CO_{2eq} per capita in 2018). The 2020 level reflects a decline compared to the 2015 level, and meets the target set for 2025.

Reducing production of electricity from coal: In 2012, Israel's energy sector began to transition from coal-based electricity production to gas-based production (as the primary source), reducing coal-based production. From 2012-2018, use of coal for electricity production declined by 29%, while from 2018-2020, this value declined by an additional 4%. This led to a decline in emission of pollutants into the air and a certain decline in carbon emissions. This decrease is the main factor in the per capita decrease of CO_2 emissions. Continued implementation of this policy will lead to an estimated decrease of 9 million tonnes of GHGs by 2025 and 17 million tonnes of GHGs by 2030.

Initiating a process of "Transitioning to a Low-Carbon Economy by 2050": The Ministry of Environmental Protection has initiated a process of Transitioning 2050 - an inter-ministerial and inter-sectorial process to formulate a vision, strategy, and long-term plan to transform Israel's economy to low emission or net zero emission by 2050. This process requires the cooperation of major government offices such as the Ministry of Energy, Planning Administration, Ministry of Transportation, and the support of non-governmental organizations and entities.

Preparing a sectorial plan for reducing GHG emissions: The Ministry of Energy has prepared a roadmap plan for reducing GHG emissions in the energy sector, which it published for public comments in 2021.

Key recommendations

The audit recommends that the Ministry of Environmental Protection examine Israel's GHG emissions targets as compared to other developed and OECD countries, and formulate absolute targets alongside its per capita reduction targets. It is recommended examining Israel's targets on this issue as compared to 2005 and 2020 data and business as usual (BAU) values, in preparation for 2030. By doing so, Israel will be able to reap the full economic benefits that result, as well as position itself as a leader in the field, as required under the Paris Agreement.

The audit recommends closing the gaps in national infrastructures by improving existing infrastructures and constructing new ones necessary for Israel's capability to reduce GHG emissions. It is further recommended that the Ministry of Finance lead an assessment of the said gaps, presented in the report, and that together with the relevant government ministries, it should integrate targets for development and promotion of infrastructure, emphasizing infrastructure that will accelerate the reduction of GHG emissions and support the transition to a low carbon economy.

The audit recommends that in examining the recommendations of the report of the gas policy team, and reaching a final decision on the issue, the government should do so in consideration of Government Resolution No. 171 regarding the transition to a low carbon economy, while accounting for the effects of these recommendations on Israel's ability to achieve its target for low-carbon economy by 2050.

The audit recommends that the government should recognize reduction of GHG emissions as a national target, and translate this recognition into prioritization of operative tools that will promote its achievement. This includes prioritization of targets such as expanding dual-use PV installations, promoting mass transportation systems and electric car charging stations in the public space. This should be done through broad measures to facilitate achievement – such as easing the planning and construction

regulations for these structures, allocation of dual-use zones and land for them, and granting tax relief or other economic incentives.

Energy

- The audit recommends that the Ministries of Energy and Environmental Protection formulate an agreed policy regarding fossil resources, in accordance with the national effort to reduce GHG emissions and air pollutants. This policy should be based on economic analysis that includes all costs and benefits (including externalities) of the various alternatives and on environmental and climate analysis. If necessary, this policy should be submitted to the government for discussion.

- It is important to establish a collaborative framework for the process of formulating renewable energy targets for 2030 and 2050, particularly the assessment that forms the basis for determining these targets. The audit recommends that this process should be implemented with of all ministries responsible for the relevant fields, including the Ministry of Energy, the Electricity Authority, the Ministry of Environmental Protection, the Planning Administration, the Israel Land Authority, the Ministry of Agriculture, the Tax Authority, and the Ministry of Finance. The decision regarding targets is based on estimates and assessments under the fields of responsibility of all these entities, and therefore it is vital to work toward inter-ministerial agreement on issues, including: potential of the dual-use zones and available lands, location of the available areas, identification of barriers to expanding this potential and measures for addressing them, economic incentives, and level of technological maturity.

- The audit recommends that in addition to the discussion on removing the barriers to the increase of renewable energy, a discussion should be held with all relevant parties, including the Ministry of Energy, the Ministry of Environmental Protection, the Planning Administration, the Israel Land Authority, the Ministry of Finance, and central government entities, regarding the maximum possible increase of the target for renewable energy for 2030. Setting targets that will increase investment in fossil energy infrastructures may endanger the transition process to low-carbon economy by 2050.

- The audit recommends that the Ministry of Energy should set targets for the energy sector for 2050, including in the field of renewable energy, as other countries reviewed have done. To enable some flexibility and adjustment to various technological and economic developments, the ministry can set a range for the renewable energy target for 2050. Alternatively, the ministry may determine the renewable energy target necessary for meeting the set level of GHG emissions reduction, while noting in its policy documents that achieving the targets depends on solutions for technological challenges and removal of barriers. The policy documents should also note that changes may be made in the mix of solutions implemented, in accordance with the technological

developments, and that achieving the targets depends on the measures taken for addressing these barriers.

- The lack of diversity in non-solar renewable energy alternatives in Israel, and its limited land resources make it difficult for the Ministry of Energy to choose the "solar scenario". This requires the government to formulate an action plan on this issue and identify solutions for these limitations, including through development and promotion of means and measures that the various government ministries suggested but have not yet promoted adequately. These include: prioritizing PV installations in dual-use zones; implementing the directives of Government Resolution No. 208 for the removal of barriers to PV installations; maximizing energy production from additional net zero emission sources; maximizing the possibility of connecting Israel's electricity system to neighboring countries and to the European electricity network; and promoting innovation and technological advancements.

- The ability to set ambitious targets for 2030 will influence Israel's ability to conduct the transition to a net zero carbon economy, or at least to a low carbon economy, by 2050. Therefore, the audit recommends that the Ministry of Energy aims to maximize the potential for emissions reduction in the upcoming decade, until 2030. Setting a low target for 2030 and building infrastructure for production of electricity from gas might influence the economic feasibility of transition to a low-carbon economy by 2050. Due to the long-term broad effects and the need to promote the issue as a national goal, the political level should be involved in formulating the government agreements on the targets. The audit further recommends examining how the target of 30% renewable energy by 2030 will enable Israel to complete the transition to a low-carbon economy by 2050, considering the targets of the other OECD countries, and based on this examination, considering the need to update Israel's target.

- The audit recommends that the Ministry of Energy complete the government approval process of the new plan for energy efficiency for 2030, taking into account the targets that other countries have adopted for this issue. Accordingly, each of the relevant entities (including the Ministries of Energy, Environmental Protection, Finance, and Construction and Housing; the Electricity Authority, the Planning Administration, the Israel Land Authority, and the Tax Authority) should act to achieve the plan's goals in all sectors, and the government ministers responsible for these entities should report to the government regarding their actions on the issue, as required by law.

Transportation

- The audit recommends that the Ministry of Transport, in cooperation with the Ministry of Energy and the Ministry of Environmental Protection if necessary, formulate a plan with measurable targets and deadlines for the transition to electric vehicles in Israel.

- The transportation sector is facing changes that will reshape it. Development of a sustainable transportation system that is efficient, rapid, and frequent is vital in the State of Israel, which has limited land resources and a rapid rate of population growth. Such a profound change requires reevaluation of the way Israel plans its spaces and lands, regulates the transportation field, incentivizes, and removes barriers – to enable the required changes in this sector for reducing GHG emissions and pollutants. To fulfill this vision, it should be supported by a strategic government plan that includes detailed targets, schedules, managing barriers, division of roles and responsibilities across the government, budgets, and indicators and compliance measures for the implementation of the plan. All involved entities, including the Ministry of Transport, the Ministry of Energy, the Ministry of Environmental Protection, the Planning Administration, the Israel Land Authority, the Ministry of Finance, the Tax Authority, and the other relevant entities, should cooperate to complete the formulation of such a plan, and act to implement it.

- The audit recommends that the relevant government entities, including the Ministries of Transportation, Environmental Protection, and Energy, formulate a detailed multi-year work plan that is validated and budgeted. This plan will outline the path to achieving the goal of reducing GHG emissions in the transportation sector, to maximize the significant economic, environmental, and health benefits of achieving these targets.

Buildings and Cities

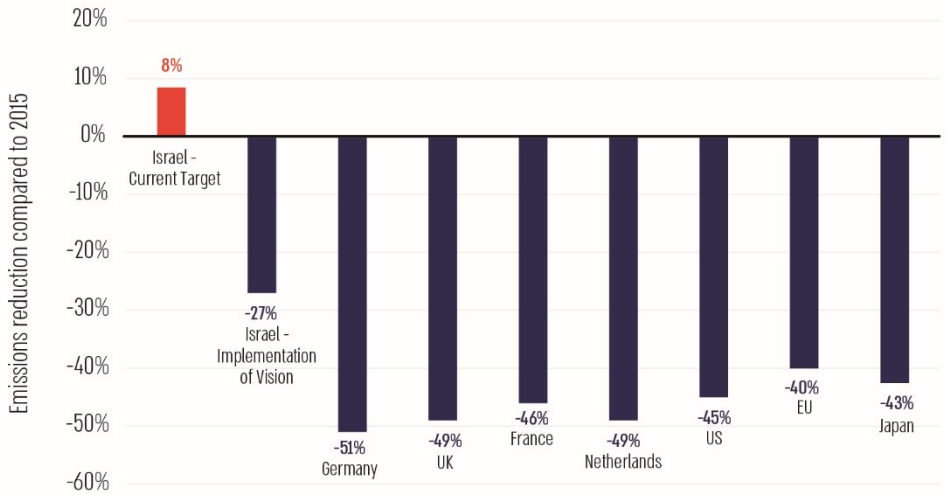
- The audit recommends that the planning administration (with the assistance of the relevant ministries, including the Ministries of Energy, Environmental Protection, and Finance) complete the update of the targets for 2050 and formulate a detailed plan for achieving them – to maximize the full potential for reducing GHG emissions and for economic savings in this sector by 2050. Further, this plan should include a mechanism for updating the targets, in accordance with future technological advancements.

- The relevant entities, including the Ministries of Energy, Environmental Protection, Finance, Construction and Housing, the Electricity Authority, the Planning Administration, the Israel Land Authority, and the Tax Authority, should act to promote targets for energy efficiency and net zero energy in buildings and cities, by determining a mix of appropriate incentives, establishing appropriate standards, and formulating appropriate regulation backed by enforcement. This should be done in consideration of the recommendations

of the report on the potential for emissions reduction in buildings (2017) and the new plan for Energy Efficiency 2030. These entities should also act to implement this.

Other Public Interests Promoted by Government Ministries (competing with GHG emissions reduction)

National Targets for GHG Emissions Reduction by 2030 in Selected Countries, Compared to 2015



Source: Ministry of Environmental Protection, from UNFCCC GHG emissions database; UNFCCC 2020, INDCs, compiled by the State Comptroller.

* The US value is the anticipated reduction based on the announcement made by President Biden in April 2021.

** Israel's 2015 target of 7.7 tonnes CO_2eq emissions per capita.

*** The vision target of Israel (as determined in Government Resolution 171) is based on increasing renewable energy to 40% of total energy use by 2030.

Conclusion

Thirteen years have passed since Israel joined the UNFCCC and began operative actions to reduce GHG emissions. However, as of 2021, although per capita emissions have declined, absolute GHG emissions in Israel increased. As for the sectorial targets set in 2015, progress toward them ranges between "delay in achieving target" to "zero." Regarding setting new reduction targets, the audit found that existing barriers make it difficult for government ministries to formulate a strategic plan for transition to a low-carbon economy.

The effects of the transition to a net zero or low-carbon economy are long-ranging for the sectors of electricity, transportation, construction and urban development, and the Israeli

economy. This transition, if implemented, will have a broad effect on the need for investment in and development of the electricity network in Israel in the coming decades; on planning for state land reserves; planning for urban spaces; budget expenditures for funding the transition to a low-carbon economy; and other areas. These actions will require a series of ongoing, interrelated reforms – over at least thirty years – and thus they require careful planning. To make the transition to a low-carbon economy, many government entities must join forces to: allocate resources that will support the process and develop the electricity network; include new technologies to support changing the profile of electricity production; remove barriers (planning, regulatory, technological, and other) and promote supporting regulation; internalize changes in the operation of the electricity sector; and manage a new set of risks that does not exist for the economy as it operates today.

The audit recommends that the government make the effort to determine these issues and lead Israel toward a low-carbon or even a net zero carbon economy.