OFFICE OF THE STATE COMPTROLLER
AND OMBUDSMAN OF ISRAEL

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Chapter | 1

# Mitigation
## Actions to Reduce GHG Emissions

# Chapter 1 | Mitigation – Actions to Reduce GHG Emissions

## Background

The quantity of greenhouse gases (GHGs) emitted by all countries and released into the atmosphere determines their concentration in the air. The primary sources of GHGs are human activities, originating mainly from the combustion of fossil fuels for purposes such as electricity generation, transportation, cooling, and heating. Over the past few decades, GHG emissions have increased significantly, and their concentration in the atmosphere has led to rising temperatures on Earth. Global warming resulting from GHG emissions is recognized as one of the most severe challenges that the international community must address.

The impact of GHG emissions is not localized, and every country is affected by the extent of emissions from other countries. Therefore, to reduce global GHG emissions, close international cooperation is required to decrease them. This can mainly be achieved through: the production of clean energy, which means energy that does not rely on fossil fuels, and comprehensive energy efficiency measures to reduce overall energy consumption. To reduce GHG emissions, countries that participate in international agreements, including Israel, have set national targets for reducing GHG emissions through various means.

The follow-up audit examines how the recommendations for addressing the shortcomings raised in the previous report were implemented. It also assesses other aspects related to the actions of the government and public bodies that were not covered in the previous report.

## Key Figures

**12%**

Forecast for reduction of GHG emissions for 2030: 56% less than the reduction target, which was set at 27%

**19%**

The forecast for electricity production from renewable energy sources in 2030 – instead of the required 30%, as determined in Government Resolution No. 465. The reduction in emissions from the electricity production sector is expected to be only 21% instead of 30%

**+1%**

The percentage increase in Israel's GHG emissions from 2015 to 2022. In 2020, there was a 2% actual reduction in emissions in Israel, which is 5.5-10 times less in comparison to other developed countries that achieved reductions ranging from 11% to 20%

**20%-30%**

The increase in the sulfur content of the coal used for electricity generation in units 1-4 at the Orot Rabin Power Station. The sulfur content is 0.7%-0.8%, while the emission limit conditions allowed a maximum sulfur content of up to 0.6% in coal

**3.38 B NIS**

The external cost in 2022 resulting from polluting emissions at the Orot Rabin Power Station, including NIS 1.626B for GHG emissions

**Just 1.14%**

Percentage of electric vehicles, out of total vehicles in 2022 – 45,270 out of 3,973,310 vehicles, as compared to the target of 25% for 2030

**58%**

The percentage of public charging stations for private vehicles funded by the Ministry of Energy, until April 2023 -1,460 out of a target of 2,500. Only 79 of these are fast and ultra-fast charging stations

**1500 megawatts**

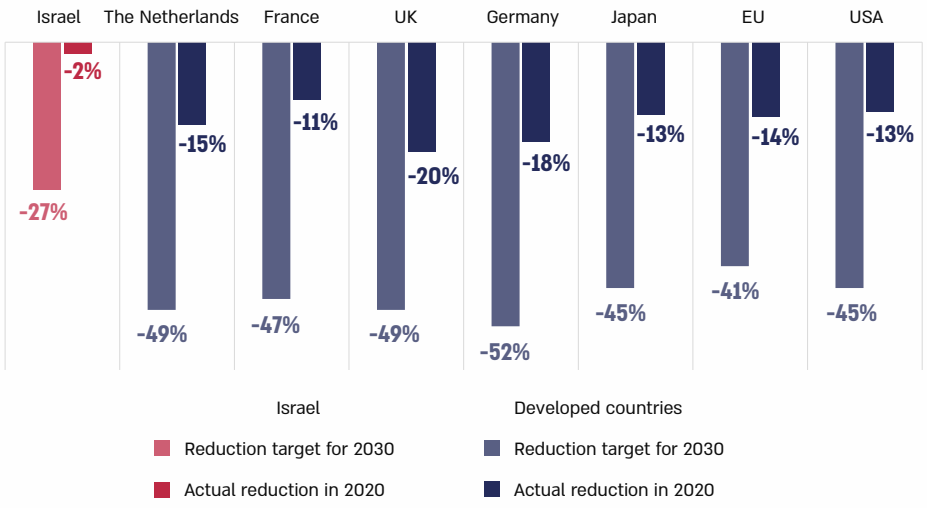
The additional capacity required for the establishment of PV renewable energy production facilities to meet the target of 20% by 2025

# Key Findings

## Setting and Implementing Targets for GHG Emissions Reduction

**Leading country –** In the previous report, it was noted that Israel is not a "leading country" in setting targets as required for developed countries under the Paris Agreement. In the follow-up audit, it was found that **the deficiency was slightly rectified**. Israel is still not a "leading country" in setting targets, and even though some of the updated governmental targets aim to enhance national ambition, such as setting an absolute target instead of per capita targets for reducing GHG emissions by 27% by 2030 and 85% by 2050, they do not align with the existing level of ambition in this matter in other developed countries. As of 2020, there is a significant gap of 52% to 93% between Israel's target for reducing GHG emissions by 2030 (27%) and the reduction targets set by the developed countries listed in the chart below (ranging from 41% to 52%).

**Targets for reducing GHG emissions by 2030 and the actual reduction data in 2020 for developed countries and Israel**




Based on data from the MoEP, adapted by the State Comptroller's Office.

- **Target for carbon neutrality –** The previous report indicated that the Israeli government had formulated a target for GHG emissions reduction from the energy sector that suggested a policy of transition to a low-carbon economy rather than a complete carbon neutral economy as planned by many OECD countries. In the follow-up audit, it was found that **the deficiency was slightly rectified**. The proposed Climate Law by the MoEP seeks to advance the target for net-zero emissions by 2050. As of September 2023, the new bill has been approved in the Ministerial Committee for Legislation and awaits its first reading.[1]

- **Renewable energy targets for 2050 –** The previous report revealed that the Ministry of Energy did not set a target for renewable energy capacity for 2050. The follow-up audit found that **the deficiency has not been rectified –** as of June 2023, the Ministry of Energy has not set a target.

- **Renewable energy targets for 2030 –** The previous report stated that Israel's target rate of 30% for the use of renewable energy by 2030 is relatively low compared to the targets set by other surveyed countries, which range from 40% to 100% (including OECD countries and other nations except China). Israel's target of 30% for the use of renewable energy is the lowest among OECD countries. The follow-up audit found that **the deficiency has not been rectified**. Israel has not presented a more ambitious target for renewable energy by 2030, and it remains at 30%.

- **Setting targets in the waste, construction, and agriculture sectors –** The previous report noted that the MoEP had not set GHG emissions reduction targets for the waste, construction, and agriculture sectors. In the follow-up audit, it was found that **the deficiency was slightly rectified**. Targets were established in the waste sector for reducing solid waste by at least 47% and for reducing GHG emissions originating from urban waste by 92% by 2050 (compared to 2015). However, targets for reducing GHG emissions from the agriculture and construction sectors have not yet been established.

- **Status of meeting GHG emissions reduction targets –** The previous report noted that regarding all sectoral targets for reducing GHG emissions, progress in achieving them ranged from "lagging" to "zero." The follow-up audit found that **the deficiency has not been rectified**. In 2020, Israel recorded the lowest reduction in emissions among developed countries, at a rate of 2% compared to 2015 – a gap of between 5.5 - 10 times the reduction rate in emissions observed in surveyed countries (which reduced emissions between 11% and 20%). In 2021, Israel achieved a slight reduction of 1.5% in absolute emissions compared to 2015. However, in 2022, the amount of GHG emissions in Israel increased, reaching 81.06 million tons of $CO_2e$, representing an increase of approximately 3.5% compared to 2021. This is also reflected in per capita emissions, which increased by about 1.5% during this period. This increase in emissions

1 The "first reading" refers to the first stage of a bill's passage through the Knesset (Israel's Parliament).

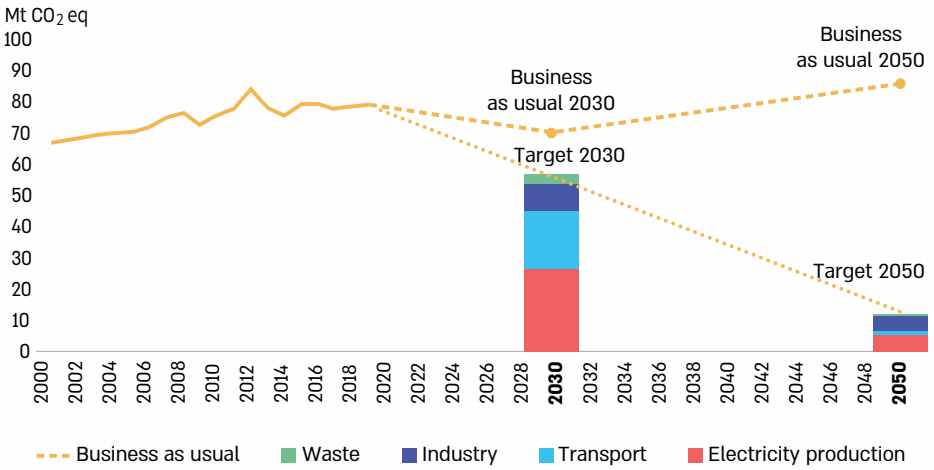
essentially negate the progress made in reducing GHG emissions in Israel., with a total increase of nearly 1% compared to 2015, mainly due to an increase in emissions in the transportation, industrial, and construction sectors. According to the MoEP's forecast, the current implementation rate of government policy will achieve only a 12% reduction in emissions by 2030, compared to the set target of 27% (56% below the target). This means that annual emissions in 2030 would amount to 69.4 million tons of GHGs instead of the target of 58 million tons.

The projection indicating failure to achieve the national target for emissions reduction results from non-compliance with sectoral targets:

- Electricity production from renewable energy sources is expected to be 19% by 2030 instead of 30% as defined in Government Resolution No. 465. Therefore, the reduction in emissions from the energy sector is expected to be only 21% instead of 30% (almost one-third less than the target, assuming coal electricity production ceases at that point).
- In the transportation sector, a 6% increase in emissions is expected, which is almost double the limit set by Government Resolution No. 171 of 3.3% for an increase in GHG emissions (an addition of about 80% to the target). The reduction in mileage of private vehicles is expected to be only 15% instead of the required 20%, which is a quarter less than what is needed.
- In the waste sector, partial achievement of the target is expected, with a reduction of only about 19% in emissions by 2030 compared to 2015, instead of the target of 47% (60% less than the target).
- In the industrial sector, a 17% reduction is expected instead of the target of 30% (about 44% less than the target).

According to the OECD, there is an expected gap between the targets set in Israel for the years 2030 and 2050 and the forecast to achieve them through current policy instruments. The forecast for 2030 indicates that the gap will be around 20%, and it is expected to grow (in a business-as-usual scenario) to approximately 650% by 2050.

**OECD forecast for the gaps between Israel's GHG emissions reduction targets for 2030 and 2050, as compared to the forecast for achieving them under a BAU scenario**




Source: OECD Survey of Environmental Performance, 2023.

**Status of implementing government resolutions –** The follow-up audit revealed that the level of implementation of the provisions in government resolutions on mitigation, whose execution deadline has been reached, is not high: for only 8 provisions out of 42 (19%), the relevant entities agreed that they were fully implemented; regarding 3 provisions, the entities agreed that they were not implemented; for 7 provisions, all parties agreed that they were only partially implemented, and for 24 provisions (over half), the relevant entities provided conflicting answers regarding their implementation.

## Energy Sector

**Continued use of coal for electricity production –** As of the end of June 2023, the government has not implemented Resolution 4080 from July 2018, which was intended to cease the ongoing operations of Units 1-4 at the Orot Rabin Power Station. Over a year past the deadline set in the government decision, these units have not been shut down, and they continue to generate electricity using coal as their primary fuel. Furthermore, due to the global shortage of coal, Units 1-4 are operated using high-sulfur coal, leading to increased pollution levels and GHG emissions, even higher than those emitted in the past, despite the consistent level of electricity production from coal in those units. Additionally, the follow-up audit found that due to considerations related to the continuity of the electricity supply, these units will be retained for preservation,

meaning that emissions from them will not be completely terminated, and Israel will not meet its sectorial and overall goals for reducing GHG emissions.

- **Economic damages resulting from the continued operation of Units 1-4 of the Orot Rabin Power Station –** The delays in ceasing activity of the units and increased global coal prices have caused, in addition to the environmental costs, a noticeable increase in electricity prices. Between May 2022 and January 2023, electricity prices saw a significant rise of approximately 19%, leading to an estimated additional cost of over NIS 1.5B to Israeli consumers.

- **Production of electricity from renewable energy sources –** The previous report noted that Israel did not meet its self-set target of 10% for renewable energy consumption in 2020, achieving only around 6%. The follow-up audit revealed that this **deficiency has not been rectified**. While Israel has set relatively low targets compared to other OECD countries to begin with, it managed to achieve this goal only in 2022, when 10.1% of the consumed electricity was generated from renewable sources. However, the MoEP estimates is that by 2025, the share of electricity generated from renewable sources out of total consumption will be approximately 14% (which is about 30% less than the intermediate target of 20%). This situation is a result of fundamental governmental practices and barriers that have persisted for years, and which the Israeli government has faced challenges in removing, as highlighted in the previous report and this follow-up audit.

- **Energy efficiency –** The previous report noted that the government had not yet approved a national plan for energy efficiency. The follow-up audit found that **this deficiency was slightly rectified**. In October 2021, the government adopted Resolution No. 541, which endorsed the National Plan for Energy Efficiency. However, the funding of the plan and its implementation were contingent on obtaining income from a carbon tax that was not approved. Consequently, the National Plan for Energy Efficiency was not implemented as originally intended. The audit also found that some of the provisions in Government Resolution No. 541, which did not necessarily depend on approval of the carbon tax, were either partially implemented or not implemented at all. (For example, the first provision in Government Resolution No. 541, which called for relevant ministries to convene and create a joint task force, was not implemented. Additionally, the provision regarding budgeting for industry in the amount of NIS 300M was not implemented).

- **Targets for energy efficiency and intensity –** The absolute target for energy efficiency was canceled, and instead, a relative target dependent on GDP (Gross Domestic Product) was set, of 122.4 megawatt-hours per NIS M of GDP for the year 2030. Transition to an energy intensity target[2] tied to GDP will not reflect the absolute growth in electricity consumption and, consequently, the increase in emissions resulting

2 Energy intensity calculates the amount of energy required in a country to produce a unit of GDP, so that using less energy to produce a product reduces the intensity.

from it. This consumption, according to the Ministry of Energy, is expected to rise due to increased use of electricity in economic activity.

## Transportation Sector

- **Quantifying the scope of GHG emissions reduction –** The previous report mentioned that the Ministry of Transport's plan to reduce GHG emissions from the transportation sector does not link the recommendations and tools provided in it to their contribution to reducing emissions. The follow-up audit revealed that this deficiency has not been rectified. The transportation sector's plan does not quantify the scope of emissions reduction and the actual impact of each policy tool and action included in the plan on the quantity of emissions generated by this sector. In this situation, it is not possible to assess the effectiveness of the plan and whether its implementation will indeed lead to achieving the goal of reducing 96% of GHG emissions by 2050.

- **Penetration of electric vehicles –** Israel shows a gap of approximately 90% in the penetration of new electric vehicles into the overall new vehicle market, as compared to the average in European countries, and their percentage is still very low, at only about 1.14% of the total number of vehicles. Furthermore, there is a noticeable gap between the current percentage of electric vehicles in the total vehicle market and the target the government set for 2030 of 25%, and it is doubtful whether this gap can be bridged within seven years.

- **Charging infrastructure for private vehicles in buildings –** The previous report noted that there are obstacles to implementing measures to reduce GHG emissions in the transportation sector, including the lack of efficient charging infrastructure for electric vehicles and legal difficulties in installing charging points in buildings. The follow-up audit found that **the deficiency was slightly rectified –** amendments to regulations were made that will help establish charging infrastructure in new buildings. However, the legal status of charging stations for electric vehicles in existing buildings remains unregulated, in contrast to Government Resolution No. 208.

- **Public charging stations for private vehicles –** By April 2023, only 1,460 (58%) charging points were installed in public charging stations for private vehicles, funded by the Ministry of Energy, while the Ministry's target for this date was 2,500 points. The vast majority of the installed stations are slow charging stations, suitable for long-term parking. These stations are not designed for fast charging for drivers on extended trips, similar to refueling at a gas station. They do not provide a reliable, continuous electricity supply network for long journeys and, therefore, do not alleviate "range anxiety" resulting from the limited distance that an electric vehicle can travel on a single charge. Furthermore, the Ministry of Transport has not provided guidelines for the proper use of public charging stations, nor tools for their enforcement. Consequently, alongside the installation of public charging stations for private vehicles, there has been no legal

regulation of the parking spaces next to them, and any driver can park in them without a time limit.

- **Electric public buses –** The Ministry of Transportation plans to convert only urban public buses to electric vehicles, while urban public buses account for only about 18% of all buses and minibusses traveling on Israeli roads. Furthermore, the Ministry of Transport has no plans to convert non-public urban buses, intercity buses, and minibusses to electric vehicles. According to the Ministry of Transport, most of these are currently powered by diesel.

- **Mass transport –** As of August 2023, only one out of three light rail lines in the Tel Aviv metropolitan area has begun operation, and there is an expected delay of two to three years in the activation of the two additional light rail lines. The metro is still in the initial planning stages. This continuous delay and uncertain end date hinders the process of reducing private car travel and complicates the reduction of GHG emissions from the transport sector.

## Buildings and Cities Sector

- **Energy efficiency and energy neutrality in the construction sector –** The previous report noted that no targets were set for mandatory energy efficiency improvements in existing buildings, and plans for implementing these goals for energy neutrality and GHG emissions reduction in the building sector were not formulated. The follow-up audit has shown **that these deficiencies have not been rectified –** as of July 2023, no targets have been set for the construction sector, and plans for their implementation have not been developed. Additionally, no progress has been made promoting energy efficiency in existing buildings. As for the requirement for solar power installations, it was found that the 2023 Arrangements Law only requires preparation for PV and not its installation, which limits the promotion of energy neutrality in buildings to some extent.

- **Setting absolute goals for GHG emissions reduction instead of per capita goals –** The previous audit report noted that Israel set a target for reducing GHG emissions per capita only, while developed countries typically set absolute mitigation targets. The follow-up audit found that **the deficiency was fully rectified –** Israel set absolute reduction targets for GHG emissions. According to these targets, the annual amount of GHG emissions in 2030 will be approximately 58 million tons, and in 2050, it will be around 12 million tons.

- **Actions to remove barriers to promoting renewable energy –** The State Comptroller's Office acknowledges the work of the Ministry of Energy in preparing the

"Roadmap for Renewable Energy in 2030," which includes key steps to address barriers, promote the establishment of renewable energy facilities, and examine future technologies that will help achieve emission reduction goals. The Ministry of Energy is also preparing the strategic plan for integrating hydrogen into the Israeli energy sector. Implementation of the roadmap and this strategic work is expected to advance achievement of the targets set for electricity production from renewable sources.

# Key Recommendations

## Setting and Achieving Targets for Reducing GHG Emissions

- It is advisable that the MoEP continue to promote the anchoring of the national target for carbon neutrality by 2050 through legislation, ensuring that Israel transitions to a carbon-neutral economy rather than merely a low-carbon economy. Additionally, it is recommended that the government set targets for reducing GHG emissions from the agriculture and construction sectors, both for 2030 and 2050. Furthermore, all relevant ministries, including the Office of the Prime Minister, the MoEP, and the Ministry of Energy, should work together to remove barriers in establishing ambitious targets aligend with the OECD-aligned, leading Israel toward a carbon-neutral economy.

- The MoEP and the Ministries of Energy, Transport, Economy, and the Planning Administration, as well as any other relevant government bodies, are urged to take the necessary actions and implement the policy measures outlined in government decisions to narrow the gaps in achieving GHG emission reduction targets. They should also work towards meeting the goals set for the primary sectors responsible for GHG emissions, including the energy, transportation, industry, and waste sectors.

## Energy Sector

- The Ministry of Energy and the Electricity Authority, which are responsible for electricity production processes under the Electricity Sector Law, are advised to be deeply and continuously involved in the processes of ending electricity production through coal. This includes conducting in-depth examinations of the factors that led to the delays in ending coal-based electricity production and taking action to ensure that these factors do not continue to be obstacles in the process of discontinuing the operation of the coal units.

- To meet the demand for increased electricity supply and reduce GHG emissions while addressing significant challenges to solar energy in Israel arising from limited land and intermittent energy sources, the relevant authorities, including the Ministry of Energy and the Electricity Authority, should examine, encourage, and promote electricity production processes through a variety of additional clean energy technologies. This includes exploring options such as nuclear energy or hydrogen, as mentioned in their respective ministry

plans. Additionally, the audit recommends that these authorities consider accelerating regional cooperation to address the challenge of limited land for PV facilities and assess the possibility of expanding Israel's connection to the European electricity grid to provide energy security during periods when solar energy is not available due to weather conditions.

- The audit recommends that the Ministry of Energy promote an amendment to Government Resolution No. 541 regarding energy efficiency and GHG emissions reduction, with budget sources that are independent of a carbon tax.

- Due to the nature of the energy intensity target, which allows for an absolute increase in GHG emissions from electricity generation as a derivative of GDP growth, the audit recommends that the Ministry of Energy and the MoEP examine additional targets and benchmarks for energy efficiency prevalent globally, including an absolute target for efficiency. Furthermore, the audit proposes that the Ministry of Energy consider updating the energy intensity target, as it appears this target was achieved much earlier than the set date.

## Transportation Sector

- The audit recommends that the Ministry of Energy, the Ministry of Transport, the Ministry of Justice, and the Ministry of Finance examine the targets set for the penetration of electric vehicles and address the barriers to continued penetration. They should also make every effort in bureaucratic, legal, and technical fields to promote the installation of charging stations for private cars, including: completing the installation of already planned public charging stations for private vehicles; planning and installing fast charging stations for long-distance drivers; and establishing regulations for parking at public charging stations.

- The audit recommends that the Ministry of Transport thoroughly analyze and assess in advance the estimated reduction in GHG emissions for all policy measures it intends to employ in its mitigation plans (including the light rail and metro projects), to ensure that the policy instruments determined in the above-mentioned government resolutions do indeed achieve a comprehensive 96% reduction in GHG emissions by 2050. The Ministry should also conduct ongoing monitoring of their implementation.

## Buildings and Cities Sector

- The audit recommends that the Ministry of Interior and the Planning Administration, in cooperation with the Ministries of Energy, Environmental Protection, Construction and Housing, and Finance, complete their joint work and progress towards setting targets for energy-neutral construction of buildings, as decided in Government Resolution No. 171 of July 2021. The audit also recommends consideration of a requirement to install PV facilities in new buildings. Furthermore, it is advisable that the Ministry of Energy lead a holistic approach to change in existing buildings in terms of energy production, conservation, and externalities.

## Coal for Electricity Production at Orot Rabin Power Station, May 2023

Photographed by the audit team, May 2023.

## Level of Correction of the Main Deficiencies Identified in the Previous Report

| Report chapter | Auditing entity | Deficiency in previous report | Level of correction of deficiency as identified in the follow-up report | | | |
|---|---|---|---|---|---|---|
| | | | Not Rectified | Slightly Rectified | Significantly Rectified | Fully Rectified |
| Setting targets: absolute reduction of GHG emissions | The government, Ministry of Energy | Absolute targets for GHG emissions were not set | | | | → |
| Setting targets: carbon-neutral economy and renewable energy | The government, Ministry of Energy | Lack of targets for carbon-neutral economy | | → | | |
| Setting targets: renewable energy | The government, Ministry of Energy | Renewable energy targets for 2050 were not set | → | | | |
| Setting targets: renewable energy | The government, Ministry of Energy | The 2030 target is not ambitious | → | | | |
| Setting sectorial targets: waste, construction, and agriculture | MoEP, Ministriy of Agriculture, and Planning Administration | Targets were not set for waste, construction, and agriculture sectors | | → | | |
| Meeting and implementing GHG reduction targets in the electricity, transportation, and construction sectors | MoEP, Ministries of Energy, and Transport | Failure to meet defined targets | → | | | |

| Report chapter | Auditing entity | Deficiency in previous report | Level of correction of deficiency as identified in the follow-up report | | | |
|---|---|---|---|---|---|---|
| | | | Not Rectified | Slightly Rectified | Significantly Rectified | Fully Rectified |
| Energy: producing electricity from renewable energy sources | MoEP, Ministries of Energy, Finance, Health, Prime Minister's Office, Israel Land Administration, Planning Administration | Failure to meet target and to encourage construction of production facilities for renewable energy | → | | | |
| Energy: efficiency in energy use | Ministry of Energy | Israel did not meet the targets set for 2020 on this issue and did not confirm the energy efficiency plan | | → | | |
| Transportation: quantifying the connection between actions to reduce GHG emissions and the contribution to overall reduction | Ministry of Transport | Quantification of the connection was not carried out | → | | | |
| Transportation: infrastructure for charging private electric vehicles | Ministries of Energy, Transport, Justice, Interior, and Planning Administration | There are barriers to installing charging infrastructure, and particular difficulties in installing charging points in residential buildings due to legal impediments | | → | | |

| Report chapter | Auditing entity | Deficiency in previous report | Level of correction of deficiency as identified in the follow-up report | | | |
|---|---|---|---|---|---|---|
| | | | Not Rectified | Slightly Rectified | Significantly Rectified | Fully Rectified |
| Buildings and Construction: targets for reaching carbon neutrality emissions and efficiency in new and existing buildings | MoEP, Ministries of Energy, Finance, Construction and Housing, Planning Administration, Israel Electric Authority, Israel Land Authority, Tax Authority | Plans and targets for carbon neutrality in new buildings were not formulated; targets were not set for requiring energy efficiency in existing buildings | ➡ | | | |