Tracing the Link between **Climate Justice Action** and the **NDCs in Israel**

April, 2023

جمعية الجليل
The Galilee Society
אגודת הגליל

الجمعية العربية الوطنية للبحوث والخدمات الصحية
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مركز هيشل للاستدامة
Heschel Sustainability Center

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Table of Acronyms

NDCs	- Nationally Determined contributions
INDCs	- Intended Nationally Determined Contributions
GHG	- Greenhouse Emissions
CSO	- Civil Society Organizations
LA	- Local Authority
ETF	- Enhanced Transparency Framework
PV	- Photovoltaic
RE	- Renewable Energy
ToR	- Terms of Reference
BAU	- Business as Usual
MoEP	- Ministry of Environmental Protection
NIS	- New Israeli Shekel
EV	- Electric Vehicles
IEC	- Israeli Electricity Company

Executive Summary

The State of Israel emits 0.14% of the global CO2 emissions, with a per capita emission rate of 6.13 metric tons (2021). Yet, its Nationally Determined Contributions (NDCs), especially its renewable energy targets, lack ambition: the current target is set at 30% renewable energy by 2030, with no specific target established for 2050. NDCs serve as a basis for national policies. Different Israeli governments did make several decisions pertaining to climate change and transition to a low carbon economy. However, to this day, the Climate Bill has yet to be approved, and the implementation of government decisions depends on the attitudes of politicians in relevant governmental offices. Overall, Israeli governments have demonstrated limited commitment and adherence to the NDCs and to international commitments. Multiple ministries have launched various plans and strategies, which have been partly translated into budgeted programs. However, these programs remain fragmented, lacking an overarching perspective and coordination.

The energy sector in Israel, and particularly electricity production, is the country's primary source of greenhouse gas (GHG) emissions. To align with Israel's NDCs, a shift away from fossil fuels is crucial, including a specific emphasis on prioritizing solar energy over gas. However, the renewable energy targets set by Israel are relatively moderate, and even those have not been achieved. The government has attempted to translate its energy targets into policies and strategies. However, the actions taken by government offices are sporadic and fail to demonstrate a deep understanding of the threat posed by global warming or a strong commitment to achieving the set goals. This gap is especially apparent in the financial realm, where regulatory bodies such as the Electricity Authority exclusively prioritize price and market criteria over offering

substantial support, such as subsidies, to promote production of renewable energy. Furthermore, efforts to expand renewable energy, mainly solar energy, encounter various regulative and infrastructural obstacles. Civil society organizations (CSOs) play an important role in both challenging the government to set higher emission reduction objectives and to proactively pursue these objectives. For example, the Heschel Center's Net Zero Emissions (NZO) program and other civil society initiatives are instrumental in promoting the adoption of solar systems within local authorities (LAs)

Tracing the connection between Enhanced Transparency Framework (ETF) communications and local-level climate actions in Israel is a challenging task. Israel's reporting under the United Nations Framework Convention on Climate Change (UNFCCC) has been irregular. The country submitted its first 'national communication' in 2000 and the second in 2010. In 2012, the second communication and greenhouse gas (GHG) inventory were submitted, followed by the Intended Nationally Determined Contributions (INDC) in 2015. In 2016, Israel submitted its first biennial update report and NDC. The third communication report was submitted in 2018, and two years later, Israel submitted a 2020 GHG inventory and national inventory report. Israel also submitted its first *revised* NDC in 2021. However, it has not submitted a strategic plan. At the national level, then, Israel has different institutions and bodies issuing reports in an inconsistent manner. In terms of local implementation reports, local actors, including local authorities (LAs), are not obligated to report on climate action, and most choose not to do so. Therefore, one recommendation is to establish regulations for reporting at both the national and local levels.

Solar energy can play a crucial role in a just transition to a low-carbon economy, if utilized correctly . Photovoltaic (PV) systems should primarily be installed within built areas rather than open lands. These systems should bring benefits to the residents of the areas where they are installed, whether through profit-sharing, electricity consumption, or other advantages such as increased shading in public areas. In Israel, where solar energy is the primary source of renewable energy, a just transition to solar energy is essential. Several renewable energy (RE) projects exist in Israel, but none of them can currently be considered as a 'best practice'. Models such as the *HaPais* model, where loans are offered to low-income local authorities, and the "Jaljulia" model (a leasing model) have their strengths and weaknesses. On the other end,

a bottom-up model initiated in unrecognized Palestinian Bedouin villages in the Naqab region is highly valued in terms of local energy sovereignty and ownership. However, it lacks crucial aspects of a just transition, as this underprivileged community, whose contribution to climate change is minimal, bears a significant burden due to the lack of government support.

Lessons learned from these and other initiatives demonstrate that to be *just* models should adhere to several principles: (1) ensuring the LA receives a fair share of income from its assets; (2) ensuring long-term maintenance of the systems; (3) building capacity within the LA to carry out future projects; (4) maximizing GHG emissions reduction potential within the LA; (5) Engaging local communities; and, (5) recognizing and supporting bottom-up projects.

The scope of this study is as follows:

Study Scope and **Methodology**

Objectives:

1. **Transparency**:
   To analyze the alignment of international climate commitments with climate-relevant policies at the local level in Israel.

2. **Effects**:
   To examine the communication and interaction within and among organizations in Israel, both horizontally and vertically.

3. **Action**:
   To assess the implementation of the Nationally Determined Contributions (NDC) in Israel's energy sector, focusing on social justice considerations and identifying best practice examples.

Methodological approach:

To achieve these objectives, the study employs a "case study" approach, allowing for an in-depth investigation of the research questions. The following research questions were defined in Miseror's ToR:

1. Are NDC targets translated into national law, policies & strategies and further defined in an enabling environment for ambitious climate action (e.g., work-plans, local development plans, sustainable agriculture strategies etc.) at local level? In other words, how are policies stated in/related to NDCs implemented at local level?
2. Can the climate actions reported in the ETF communications be consistently traced back to implemented local level climate actions? Can the achieved effect of climate and energy action reported in the ETF communications be

consistently traced back to implemented local level climate actions?

3. Are government funded energy production projects socially just? Are they equitable according to the RES principles provided by CIDSE? Are there best practice examples to be found within the country's context? What makes them best practices?

In May 2022, a scoping meeting was held with Misereor representatives. During the meeting, the ToR was discussed and a timeframe for submitting the different phases of the study was agreed upon. Consequently, **The Galilee Society** and its consultant **Heschel Center for Sustainability** held several meetings to develop the case study design.

For the first research question:

Data collection involved various sources: a literature review; extensive desk research of governmental and official documents including reports submitted by Israel to the UNFCCC; government decisions; ministerial strategies; legislations and regulations; position papers; news articles and more. Digital presentations by relevant governmental officials on mitigation and renewable energy policies were also included, alongside interviews conducted with government officials.

Data analysis and interpretation: The collected data and information were critically reviewed. A classification of mitigation policies and measures, including governmental decisions, laws and regulations, central government plans and strategies - was outlined and analyzed in accordance with the sectoral targets committed by Israel, taking into account the contextual environment in which these policies are implemented.

Reporting: The reporting phase provided contextual information, presenting the main findings and conclusions regarding the extent of Israeli mitigation targets. Recommendations were also provided to achieve higher targets in the solar energy sector.

For the second research question:

Data collection for this research question encompassed a literature review, extensive desk research of governmental and official reports, including reports submitted to the UNFCCC and reports published by the central government and official bodies such as the Electricity Authority and the State Comptroller's Office. Interviews with government officials were also conducted to gather relevant information.

Data analysis and interpretation encompassed a critical review of the reports, followed by quantitative and qualitative analysis. The collected data was thoroughly analyzed to draw meaningful insights.

Reporting: This phase provided contextual information while highlighting the main findings and conclusions derived from the analysis.

For the third research question:

The selection criteria for the just transition projects were determined based on two factors. First, solar energy projects were chosen due to its significance as a major renewable energy source, with the most potential, in Israel. Second, three different models of solar energy projects were selected: Project 1 (*Hapais Project*) wherein weak local authorities were provided with loans to implement solar energy projects on public buildings; Project 2 (*Jajulia project*), a solar energy initiative of local authorities using a leasing method; and Project 3 (*Naqab projects*), a bottom-up model where local communities in unrecognized villages in Naqab initiated solar energy projects.

Data collection involved a literature review and extensive desk research of governmental and official documents. Digital presentations by relevant stakeholders were also included. Additionally, Heschel Center accompanied the planning and implementation of Project 1, incorporating knowledge and insights gained through the process. For Project 2, interviews were conducted with stakeholders involved in the project, including the engineer responsible for planning and implementation. A guided tour to the Naqab was undertaken for Project 3, during which various solar projects in unrecognized

villages were visited, and interviews were conducted with different stakeholders, including residents, school principals, and activists.

Data analysis and interpretation involved operationalizing the Renewable Energy Sources (RES) principles and analyzing the three projects based on these principles.

Reporting: This phase provided contextual information, along with the main findings and conclusions derived from the analysis.

Background: **Climate Change in Israel**

Climate change and global warming are evident worldwide, and Israel is not exempt from their impacts. The country has already witnessed various changes:

- **Increase in Extreme Temperature Events**:
  The number and intensity of extreme temperature events in Israel have shown a significant rise. There have been instances of consecutive days with temperatures 6°C higher than the average.

- **Warming Trend Across Regions**:
  A warming trend is observable in all regions of Israel, indicating an overall increase in temperatures.

- **Decrease in Precipitation Rate in the Northern Region**:
  The northern region of Israel has experienced a decline in the rate of precipitation, leading to drier conditions.

- **Sea Level Rise**:
  Israel, situated in the Mediterranean basin, is facing a sea level rise of 10 mm per year, which poses a threat to coastal areas.

According to climate models and predictions, the Mediterranean basin, including Israel, is expected to undergo significant climate changes. Researchers, such as Broom (2019), have outlined the anticipated transformations in the region. The Israeli meteorological service forecasts a mean temperature rise of 4°C by the end of this century. Under the Business-as-Usual (BAU) scenario, where current trends continue, a rise of 5°C in the minimum summer temperature is expected. In short, Israel's climate is projected to become hotter and drier, with more

intense extreme weather events and a rising sea level. These changes will have significant implications for the country and its inhabitants.
It is widely acknowledged that greenhouse gas (GHG) emissions are the primary contributors to global warming and climate change. In recent years, there has been a downward trend in GHG emissions per capita in Israel. These emissions have seen an inconsistent decline, ranging from 10.7 tons of CO2-eq per capita in the year 2000 to 8.8 tons of CO2-eq per capita in 2018. This can be largely attributed to the transition from coal to gas-based electricity production, which began in 2012. However, it is important to note that the GHG emissions per square kilometer in Israel are relatively high - as the country is densely populated - standing at 3.6 tons per square kilometer in 2018. This, coupled with the country's population of 9.3 million, results in GHG emissions equivalent to those of a medium-sized country (The State Comptroller and Ombudsman of Israel, 2021). Over the period between 1995 and 2020, there has been an overall increase in GHG emissions in absolute terms. This increase can be attributed to population growth, which has been occurring at an annual rate of 1.9%, as well as the expansion of goods and services production.

International Treaties to combat climate change

The United Nations Framework Convention on Climate Change (UNFCCC) is an international treaty established in 1992 as a framework for global cooperation to address and mitigate the impacts of climate change. Its primary objective is to mitigate global warming and facilitate adaptation to climate change. In an effort to reduce greenhouse gas (GHG) emissions, developed countries established the Kyoto Protocol, which, to date, 192 countries have signed.. In 2015, the Paris Agreement was adopted as a landmark international agreement. Its primary goal is to limit global warming to below 2 degrees Celsius above pre-industrial levels, while striving for a more ambitious target of 1.5 degrees Celsius. The Paris Agreement is legally binding and has been ratified by 196 Parties. Coming into force in November 2016, it operates on a 5-year cycle of increasingly ambitious climate actions.
To achieve the objectives of the Paris Agreement, in 2020 countries were required to submit their NDCs, which outline their planned actions to reduce GHG emissions and build resilience to adapt to climate change. To facilitate communication and assessment of countries' progress in climate change mitigation and adaptation measures, the Enhanced Transparency Framework (ETF) was established. The ETF aims to assess collective progress towards long-term climate objectives

as well as adaptation measures, improve individual country plans, and enhance transparency and accountability in climate actions. Overall, the UNFCCC, the Kyoto Protocol, and the Paris Agreement provide a global framework for international collaboration in combating climate change, with NDCs and the ETF playing crucial roles in driving and monitoring climate actions.

However, meeting the NDCs is not mandatory internationally; Therefore, translating the NDCs targets into national policies is significant to indicate commitment at the national level to specify how those targets will be met.

Transparency of Target Setting

Israel's NDCs

Target setting; NDCs implementation and enabling environment

Transparency in target setting:

Transparency in target setting refers to clarity with respect to how the international commitments in the NDCs are being implemented nationally and locally.

Overview of Israel's international climate-change commitments

From the Paris Agreement onwards

Israel joined the UNFCCC in May 1996 and in March 2004 it joined the Kyoto Protocol. About a decade later, in 2015, Israel signed the Paris Agreement. Israel has defined itself till the Paris Agreement as a developing country, and so did not commit to reach its climate targets. However, during COP 21 in Paris 2015 Israel "made binding international commitments to adopt concrete mitigation targets and enact policies that would reduce its GHG emissions" (Tal, 2020)

Under the Paris Agreement, Israel communicated its INDC on 29 September 2015, and later submitted an updated NDC upon ratification of the Paris Agreement on 22 November 2016. In July 2021, the NDC was updated, after the passing of government decision no. 171 entitled

"Transition to a Low Carbon Economy."
Israel uses the GHG Emissions of 2015 as reference year in its NDC. Per capita GHG Emissions were communicated in its INDC, and later in its updated NDC in 2021 unconditional absolute numbers were used.
In this and the next chapter, we present sectoral mitigation targets from Israel's most updated NDC, dated July 29, 2021.

Table 1: Comparison of mitigation goals: NDC and INDC

	Updated NDC July 2021 (Decision 171)		**INDC** (Decision 542 from year 2015)	
Year	MtCO2eq	Reduction relative to 2015	MtCO2eq	Reduction relative to 2015
2015	79		79	
2030	58	-27%	81.65	+3%
2050	12	-85%		

The updated NDC significantly improved the 2030 GHG emissions goal, from an absolute emissions rise of 3% in the INDC to a reduction of 27% in the NDC. A target of 85% reduction of GHG emissions (compared to 2015) was set for 2050 in the NDC.
Israel has not committed to reaching net zero emissions by 2050; it does, however, communicate a desire to do so, in the context of global efforts to limit global warming to 1.5°C. For that matter, the establishment of 2050 targets will be periodically revisited.
Israel's most updated NDC - July 2021
The sectoral targets of GHG emissions reduction communicated by Israel through the NDC (MoEP, 2022) are as follows:

Table 2: Sectoral mitigation goals according to updated NDC 2021

Sector	2030	2050
Electricity generation	30%	85%
Transport	3.3% increase	96%
Industry	30%	56%
Waste	47%	92%

Israel, then, established specific sectoral targets, milestones, and measures to reduce greenhouse gas (GHG) emissions:

Electricity Generation:

- By 2030: Reduction of GHG emissions from electricity generation by 30% compared to the 2015 measurement of 37.6 MtCO2e, taking into account renewable energy targets set in Government Decision No. 465.
- By 2050: Reduction of GHG emissions from electricity generation by at least 85% compared to the 2015 measurement.

Energy Intensity:

- Set a new energy intensity target to achieve an energy intensity of 122 MWh per NIS 1 million in GDP by 2030.

Transportation:

- Starting from 2026: All new municipal buses purchased will be "clean vehicles", as defined in section 77A of the Transport Ordinance [New Version].
- Limit the increase in GHG emissions from transportation by 2030, ensuring that the total increase in emissions is only 3.3% compared to the 2015 measurement of 17.6 MtCO2e.
- From 2030 onwards: Reduce the amount of GHG emissions from newly registered vehicles weighing up to 3.5 tonnes to 5% of the average of such vehicles registered in 2020. This target will be reviewed in 2025 and adjusted as necessary based on technological advancements, the adoption of electric vehicles in Israel and globally, electricity infrastructure, and the deployment of charging stations in Israel.
- By 2050: Reduce GHG emissions from transport by at least 96% compared to the 2015 measurement.

Waste:

- By 2030: Achieve a minimum of 47% reduction in GHG emissions from solid waste compared to the 2015 measurement of 5.5 MtCO2e.
- Reduce the amount of municipal waste landfilled by 71% by 2030 compared to the 2018 amount of approximately 4.5 million tonnes.
- By 2050: Achieve a minimum of 92% reduction in GHG emissions from municipal waste compared to the 2015 measurement.

Industry:

- By 2030: Reduce GHG emissions from industry by at least 30% relative to the 2015 measurement of 12 MtCO2e.
- By 2050: Reduce industrial GHG emissions by at least 56% relative to the 2015 measurement.

Climate Impacts of Goods and Services:

- Establish a voluntary mechanism for reporting and publicizing information on the GHG emissions associated with products and services manufactured in and imported to Israel.

The following table summarizes Israel's sectoral targets for GHG reduction in MtCO2e and the rate of change, based on its most updated NDC.

Table 3: Detailed sectoral mitigation plans from the updated NDC 2021

Sector	GHG emissions (MtCO2e) in 2015	GHG emissions (MtCO2e) in 2030	Rate of change in 2030 relative to 2015	GHG emissions (MtCO2e) in 2050	Rate of change in 2050 relative to 2015
Electricity generation	37.6	26.3	30%	5.6	85%
Transport	17.6	17	3.3% increase	0.7	96%
Industry	12	8.4	30%	5.3	56%
Waste	5.5	2.9	47%	0.4	92%
Other	6.3	N\A	-	N\A	-
Total	**79**	**58**	**27%**	**12**	**92%**

Israel has submitted updated; Improved; Sectoral; Trajectory (Numerical targets) and Baseline targets
(Baseline year: 2015).

NDCs Implementation: Israel's Policies for Achieving NDC Targets

Policy-Making Processes Regarding GHG Emissions in Israel

Israel deploys various policy instruments, such as legislation, regulation, and taxes, to achieve its policy objectives. However, the utilization of these tools is significantly affected by the Israeli governance structure, which has posed challenges to policy-making and implementation processes (Mizrahi, 2018). Legislation in Israel is passed by the Knesset, the Israeli Parliament. This legislation may originate from the government (Government Bills), one or more Knesset members (Private Bills), or Knesset committees. The Ministry for Environmental Protection has spearheaded a Climate Bill proposal, which cleared the first stage (known as "Readings") in June 2022. This Climate Bill proposal encompasses the following five themes:

1. Setting targets for a 27% reduction in GHG emissions by 2030
2. Mandating the preparation of adaptation plans by governmental ministries
3. Establishing a ministerial committee headed by the Prime Minister
4. Establishing an inter-ministerial committee for climate change as well as a scientific committee
5. Requiring climate risk assessments for projects that have the potential to impact GHG emissions.

Policy Instrument: "Governmental Decisions"

The primary policy instrument employed in Israel is "Government Decisions," which do not have a statutory nature, reflecting formal

agreement among members of the ruling coalition. Since 2015, the Prime Minister's Office has published an annual report on the implementation of these decisions. Over the years, Israeli governments have issued several decisions related to climate change, often coinciding with global events. The major decisions are summarized in the table below (The State Comptroller and Ombudsman of Israel, 2021):

Table 4: Global milestones and Israeli decisions related to climate change – based on State Comptroller and adapted by Galilee Society

	GLOBAL MILESTONES	MILESTONES in ISRAEL
1996	COP2 - Geneva	May: Israel ratified the UNFCCC treaty
1997	COP3 - Japan Kyoto Protocol is adopted	
2004	COP10 - Buenos Aires	March: Israel becomes a party to the Kyoto Protocol after ratifying the agreement on March 15, 2004
2008		September: Governmental Decision 4095 sets electricity efficiency objective of 20% by 2020
2009	Copenhagen· COP15 - Copenhagen Accord acknowledges, for the first time, the intent of keeping global warming within 2 °C increase	January: The government enacts Governmental Decision 4450, which states that by 2020, 10% of electricity generation in Israel will come from renewable energy, with an interim target of 5% by 2014. June: Governmental Decision 474 calls for the establishment of the CEOs' Committee for Preparedness for Climate Change and Reduction of Emissions. This committee is responsible for consolidating recommendations for a national action plan. The plan includes specific targets, recommendations for reduction measures, budgets, schedules, milestones, indicators for outputs and outcomes, and other relevant aspects. December: During the Copenhagen Conference, the President of Israel declares the country's commitment to reducing greenhouse gas emissions by 20% compared to the business-as-usual (BAU) scenario.

2010		January: Israel sends a formal notice to UNFCCC Secretary regarding its aspiration to a 20% reduction in emissions by 2020, compared to BAU scenario March: Governmental Decision 1504 Abolishing the sections in Governmental Decision 474 that deal with greenhouse emissions. Appointing a steering committee headed by the Finance Minister to consolidate an action plan comprising policy measures required for a 20% reduction in greenhouse emissions by 2020. The committee was required to identify barriers and to suggest policy measures, economic tools and allocation of resources. November: Governmental Decision 2508 outlines a national plan for the reduction of greenhouse gas emissions. This decision directs the Committee for Preparedness for Climate Change and Reduction of Emissions (established in 2009) to prepare a comparative analysis of the economic efficiency of projects aimed at reducing greenhouse emissions. Additionally, the ministers for Environmental Protection, Energy, Finance, Transportation, Housing, and Economy - are each assigned to take actions within their respective areas of responsibility. A budget of 2.2 billion NIS is allocated for the implementation of the plan between 2011 and 2020
2013		May: The national plan's budget is frozen for three years, after 106 million NIS were allocated in 2011-2012. The plan's implementation is halted due to the lack of budgets for promoting renewables.

2015	COP21 - Paris	Governmental Decision 378 cancels the implementation of the national plan for reduction of emissions in 2016-2023. Instead, it instructs the ministers for Energy, Finance, and Environmental Protection to present an alternative plan to the government prior to the COP in Paris. The Ministry for Environmental Protection submits a plan, and a Governmental Decision is adopted in 2016
2018		August: Governmental Decision 208, titled 'Transition to Green Energy and Updating Governmental Decision', focuses on overcoming barriers and accelerating the development of solar facilities for electricity production, as well as storage and agro-voltaic facilities.
2021	November COP26 - Glasgow	October: Governmental Decision 4079 establishes the Climate Change Administration, headed by the Ministry for Environment. The Administration is responsible for coordinating activities related to climate change mitigation and adaptation. It first convenes on October 25, 2018. October: Governmental Decision 544, titled "Encouraging Technological Innovation to Combat Climate Change," relates to both mitigation and adaptation efforts, encouraging research and development, among other initiatives. July: Governmental Decision 171 updates Israel's emission reduction targets. The new targets aim for a 27% reduction by 2030 and 85% reduction by 2050. It also includes sector-specific targets (as of 2015).

Transverse Barriers to GHG Emission Reduction Policies

In addition to general policy-making limitations, there are specific transverse barriers that hinder the development of effective GHG emission reduction policies in Israel. These barriers can be summarized as follows:

- Multiple Authorities: Several legislative and administrative bodies play a role in policy-making and implementation regarding GHG reduction actions, including the Ministry for Energy, the Planning Authorities, Israel Lands Authority, Ministry for Economy, Ministry for Environmental Protection, Ministry for Health, Electricity Authority, Standards Institute, and Ministry of Finance responsible for budgeting activities. The complex coordination among these bodies often leads to difficulties in realizing planned initiatives. This is evident, for instance, in establishing solar facilities in built-up areas or on dual-use facilities, as well as transitioning to electric vehicles.
- Conflicting Goals: Each body is guided by different considerations and priorities that may not align with the overarching goal of GHG emissions reduction. Various ministries tend to promote their own areas of interest, sometimes prioritizing them over the objectives of reducing emissions.
- Responsibility vs. Authority Gap: While the Ministry for Environmental Protection (MoEP) is responsible for setting GHG emission targets and monitoring their progress, it lacks regulatory authority over the primary sources of emissions. The Ministry for Energy, Ministry for Transportation, and Planning Administration have jurisdiction over these emission sources. Consequently, the MoEP's ability to deploy policy tools and regulations for reducing emissions from different sources is limited and subject to the considerations of other ministries.
- Influence of the Ministry of Finance: The Ministry of Finance holds exceptional influence over greenhouse gas reduction policies. For example, due to budget limitations, the implementation of the National Plan for GHG Reduction was frozen for three years (2013-2015) as decided by the Ministry of Finance. Moreover, the Ministry of Finance downsized the relatively more ambitious "Climate Bill" proposal.

Attached in the excel sheet is an overview of the main policies regarding Israeli climate change policies.

Israel's NDC policies by sectors

According to the data of the MoEP, the GHG in Israel consists of 88% CO2 and 12% Methane. Electricity generation is the major source for GHG emissions and is expected to remain so in the future. Transportation is the second largest contributor. However, with the transition to electric vehicles, emissions are expected to drop sharply. Waste landfills are the major source of Methane emissions.
The policies implemented between 2015 and 2019 have resulted in an estimated reduction of 10 MtCO2-eq of GHG emissions, as shown in Figure 1 (Ministry of Environmental Protection, 2021).

Table 5 below quantifies the reduction achieved by the implemented policies compared to a business-as-usual (BAU) scenario. The most effective method for mitigating GHG emissions was the reduction in coal usage and its replacement with fossil gas.

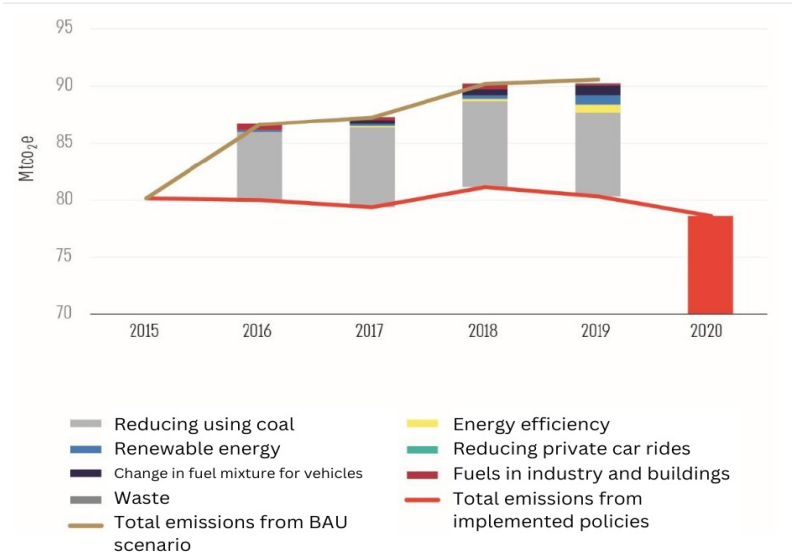


Table 5 Mitigation of GHG emissions in 2019 broken down into means of mitigation with their quantified contribution

Means	Actual mitigation in 2019 (MtCo2-eq)
Reduction in using coal	7.4
Increasing RE	0.8
Increasing energy efficiency	0.7
Increasing fuel efficiency in cars	0.8
Increasing fuel efficiency in industry and buildings	0.1
Reduction in landfilled mixed waste	0.07

The MoEP estimates that if policies established prior to May 2021 are implemented, a reduction of 20% in GHG emissions by 2030 (compared to 2015) is expected, that is, an absolute amount of 64 MtCO2-eq of GHG emissions (see Figure 2); there would be a mitigation of 40 MtCO2-eq by 2030 compared to the BAU scenario. These policies encompass the following measures:

Table 6: List of means of mitigations from existing policies that could lead to a mitigation of 40 MtCO2-eq GHG emissions

Means of mitigation	Related policy
Excluding the use of coal in electricity production by 2026	- Governmental Decision 465 dated 25.10.2020
Increasing the percentage of electricity produced from renewables to 20% by 2025 and 30% by 2030	- Governmental Decision 465 dated 25.10.2020
New strategy for waste: 20% of waste in landfills in 2030, sealing and capturing GHG in landfills	MoEP Plan dated 8.2.2021
Promoting green building practices	Updating Ordinance 5281
Reducing hydrofluorocarbons (HFCs)	Updating ordinance 5281

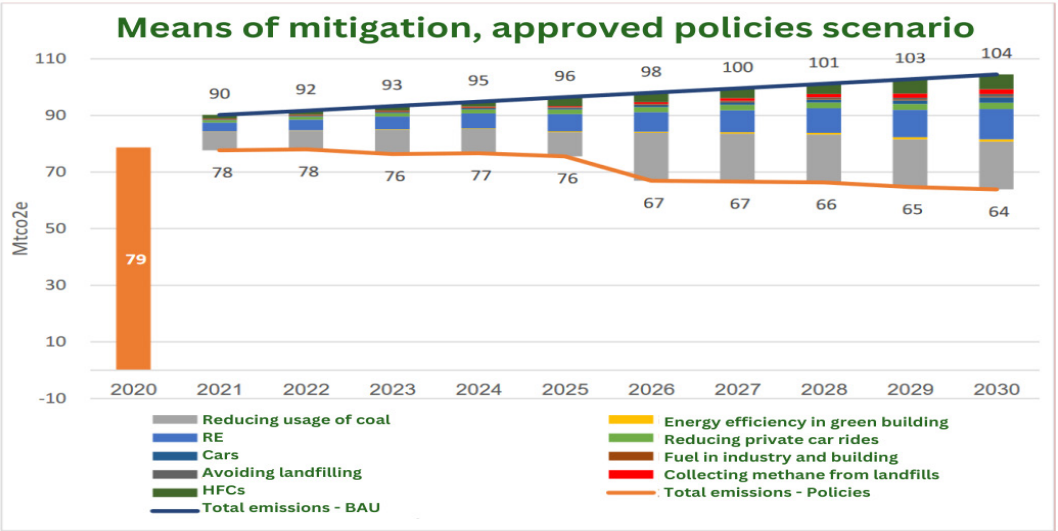


Figure 2 Estimated GHG mitigation according to a scenario where all set policies will be implemented, The Ministry of Environmental Protection, 2021.

The detailed means of GHG mitigation and their quantified contribution list:

Means	**Estimated mitigation in 2030 (MtCo2-eq)**
Reducing in the use of coal	17
Increasing RE to 30%	10.7
Reducing HFCs	5.3
Reducing private car rides	2.2
Increasing fuel efficiency in cars	1.9
Methane collection from landfills	1.7
Avoiding landfilled mixed waste	0.8
Applying green building ordinances	0.8
Changing industry fuel	0.4

Energy Sector

Energy challenges in Israel

The most significant primary energy resources in Israel are oil (mainly for transportation), gas and coal. Compared to the OECD, renewables account for a relatively low percentage, and none from nuclear.

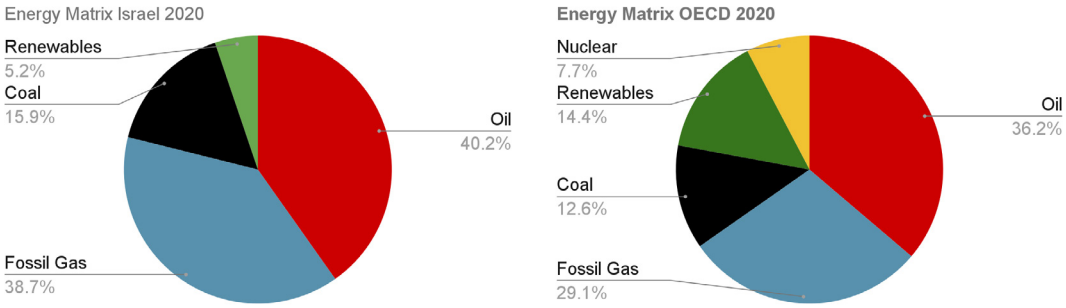
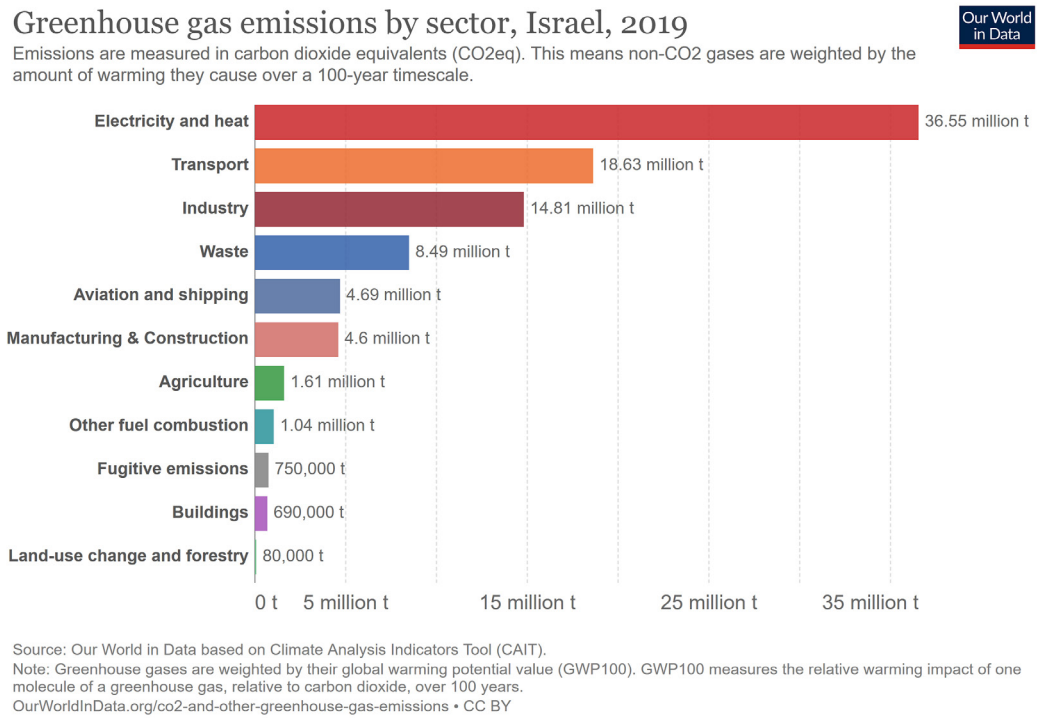


Figure 3 Energy matrix pie in Israel and in the OECD, 2020 (Ministry of Energy, 2021)

Solar energy was the primary source of renewable energy in 2020, accounting for 96.7% of RE share and 5% of the total production of energy. Wind energy contributed only 0.01%, while other renewable energy sources accounted for 0.17%.

The largest consumers of primary energy are electricity production, transportation, and industry. Below is a graph depicting the greenhouse gas (GHG) emissions from each sector in Israel in 2019.

Figure 4: greenhouse gas (GHG) emissions by sector, 2019



Electricity production

In the past two decades, there has been a significant transformation in Israel's electricity production. At the beginning of the millennium, it primarily relied on coal and heavy fuels, but there has since been a radical shift towards natural gas-based production. This shift was driven by the discovery of large gas reservoirs within Israel's territorial waters and has led to a considerable reduction in emissions from electricity generation (MoEP, 2021).

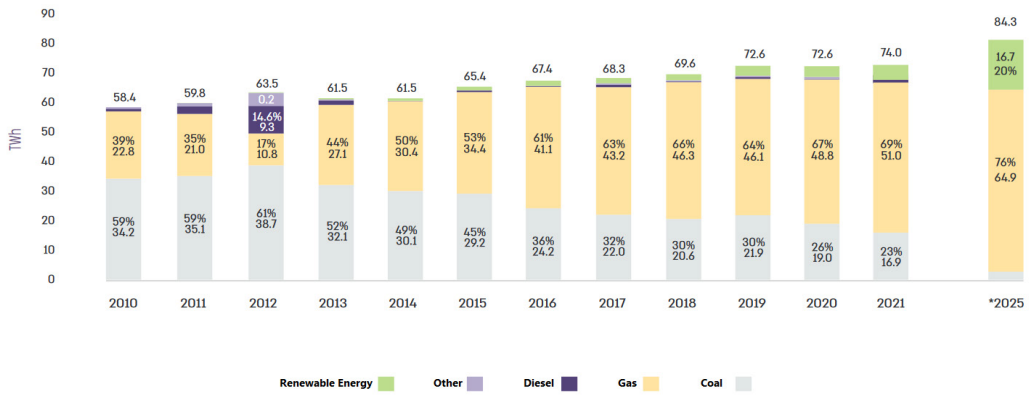
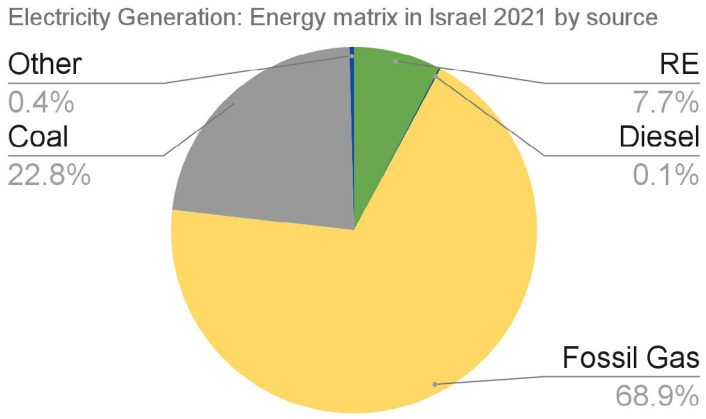


Figure 5: Israel's electricity production energy resources, 2010-2021 (Israel Electricity Authority, 2021)

The fossil gas paradox



While the existence of these large gas reserves has facilitated a rapid decrease in greenhouse gas (GHG) emissions, it has simultaneously hindered progress towards greater utilization of renewable energy sources. In Israel, fossil gas is often promoted and perceived by many officials and the public as a clean energy source that offers energy security, economic benefits, and greater reliability compared to renewables. The ongoing debate about gas exportation to other countries focuses primarily on determining the amount of gas that should be reserved for domestic use (such as whether reserves should be maintained for 25 years or more), rather than whether to exploit this fossil resource or leave it in the ground in order to avoid associated emissions. This contradicts international commitments that obligate Israel to establish goals for transitioning the energy market towards renewable sources.

Renewable energy resources in Israel

Main renewable energy sources worldwide include a wide variety of technologies, approximately two third of which are hydropower and wind: (Electricity Authority, 2020)

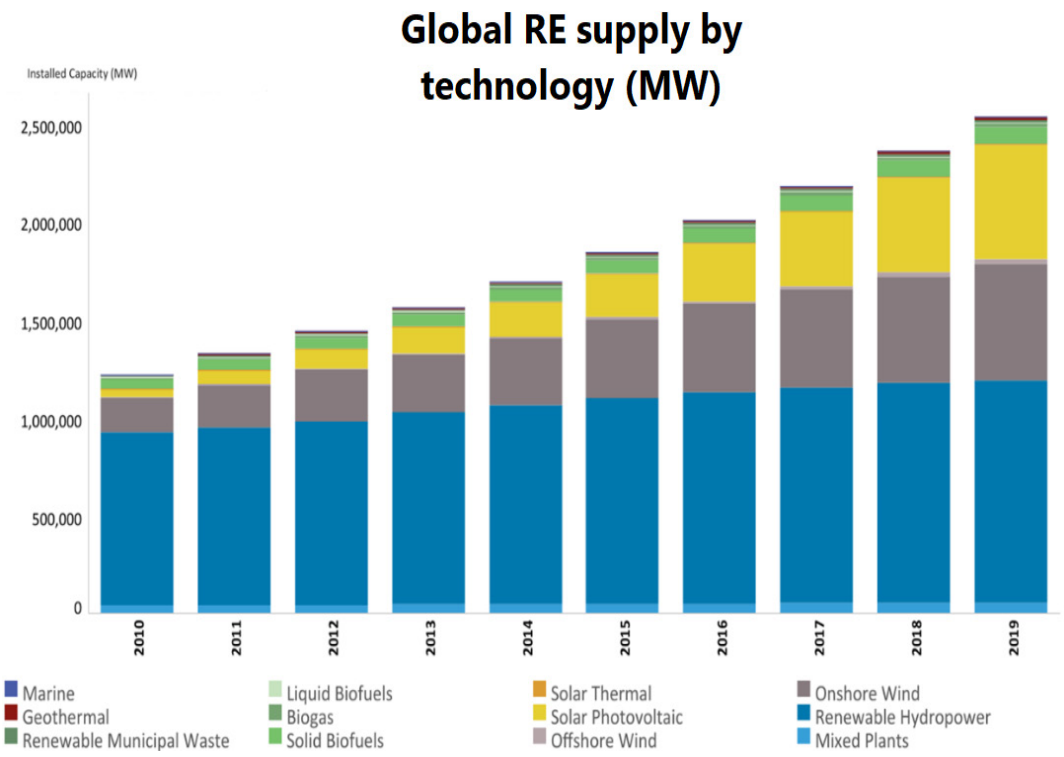


Figure 6 Installed capacity of electricity produced worldwide using renewables by technology

The production of renewable energies in Israel is shaped by the country's unique features:

- **Hydro-electric:** Due to limited water supply, Israel has no significant potential for hydro-electric power generation.
- **Wind power:** Israel has limited potential for wind energy due to relatively weak winds throughout most of the country. As a result of this constraint, the national target for wind power installed capacity by 2030 has been set at only 730 MW out of the total 15.8 GW of renewable energy (approximately 4.5% of the total renewable energy is derived from wind power). Until now, only a few wind projects have been initiated in Israel. This stems in large part from the concerns raised by environmental protection bodies. Israel serves as a crucial migration route for birds, and there are concerns that wind turbines would

have devastating effects on migrating bird populations, as well as on local endangered species such as vultures. Furthermore, objections have been raised by nearby towns and villages due to concerns about possible infra-sound effects on human health. Additionally, the Ministry of Defense has issued reservations against the installation of wind turbines in designated "Sensitive" areas, in close proximity to the borders or to military installations. These factors have had a significant influence on the limited development of wind power in Israel.

- **Hydroelectric pumped storage:** In this technology, a turbine is used to pump water from a low reservoir to a high reservoir, which can then be released to generate electricity when needed. It is widely recognized as one of the most efficient methods for storing large amounts of electricity, with the ability to meet high demand and respond quickly. In Israel, the first pumped storage project, located on the Gilboa mountain, has a capacity of 300 MW. Construction is underway for a second project with a capacity of 330 MW, and a third project is currently in the early planning stages. Once completed, these projects will have a combined capacity of over 900 MW. It should be noted that while hydroelectric pumped storage is not a renewable energy production technology itself, it is considered in relation to renewable energy due to its ability to store and utilize energy from renewable sources.

- **Biogas and waste to energy**: In Israel, biogas and waste to energy are primarily utilized as methods of waste treatment rather than for energy production. The target set for 2030 is to achieve 100 MW of installed capacity. However, despite efforts by the Ministry of Environmental Protection (MoEP) to encourage the construction of facilities, progress has been slow and only a few facilities are currently under construction.

- **Solar**: Solar energy represents the most significant potential source of renewable energy in Israel. There are two main technologies utilized for solar energy production:
  - **Thermo-solar:** This technology utilizes mirrors to collect and concentrate sunlight, generating high-temperature heat that is then used to produce electricity. In Israel, one thermo-solar power station has been constructed in the Negev region. One of its key advantages is the ability to generate electricity for a certain period after sunset, thanks to its stored heat capacity. However, it is important to note that this method of electricity production is generally more expensive compared to alternatives. Additionally,

thermo-solar power stations require a significant amount of physical space and can create a visual hazard due to the dazzling effect produced by the heated thermal unit (as depicted in the photo of Ashalim thermo-solar power station, credited to Haim Horenstein). It is worth mentioning that although this station, along with other renewable and fossil power stations supplying electricity to the national grid, is situated close to the Palestinian unrecognized village of Wadi El Na'am, the village does not enjoy this electricity as it is not connected to the grid due to Israel's policies. This will be discussed in more detail in the "Just transition" section.

- **Photovoltaic (PV):** a technology by which solar panels convert sunlight directly to electricity. Today, this technology is more efficient than other solar technologies both energetically and in terms of land use, thus it is the only solar technology that is currently promoted in Israel. The PV systems in israel are roughly divided into two kinds:
  - **Ground mounted:** where the panels are installed on the ground, thus transforming the usage of the area from open land, agricultural or other, into a solar farm.
  - **Dual use systems:** by which the panels are installed over man-made infrastructures, such as rooftops, industrial buildings, water reservoirs, as a shading method for sport courts, etc.
  - In addition to these two, first pilots for Agri-Voltaic systems are being held, in which the solar panels are to be installed over agricultural corps.

The following figure presents the growth of renewable energy in Israel over the past decade:

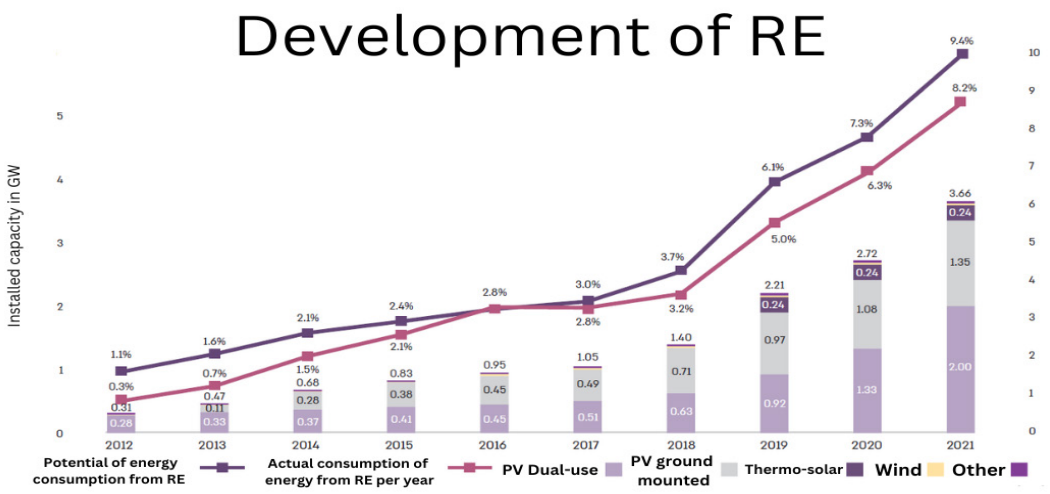


Figure 7 development of renewable energy in Israel, 2012-2021 (Israel Electricity Authority, 2021)

In short, solar energy production is the predominant form of renewable energy in Israel, as the country lacks significant potential for other common renewable energy sources such as hydro-power or geothermal energy. Due to Israel's unique location along bird migration routes, wind energy has limited potential and presents environmental challenges, and is therefore not planned to become a major energy source.

Israel's renewable energy targets

Israel's renewable energy targets were first set in government decision no. 2664 in 2002, aiming for 2% renewable energy out of total production by 2007. However, this target was not achieved. Subsequently, government decision no. 4450 in 2009 set a more ambitious target of 10% renewable energy by 2020. Unfortunately, this goal was also not met, with actual renewable energy production in 2020 amounting to only 6.4% of total electricity production.

On a positive note, GHG emissions from electricity production have significantly decreased since 2012. This decline can be attributed to the shift from coal to natural gas as a fuel source. As reported by the Israel Electric Company, GHG emissions from electricity production in 2021 were 41% lower compared to 2012, despite a 16.6% increase in total electricity production. During the same period, there was a 27% reduction in CO2 emissions according to the Electricity Authority.

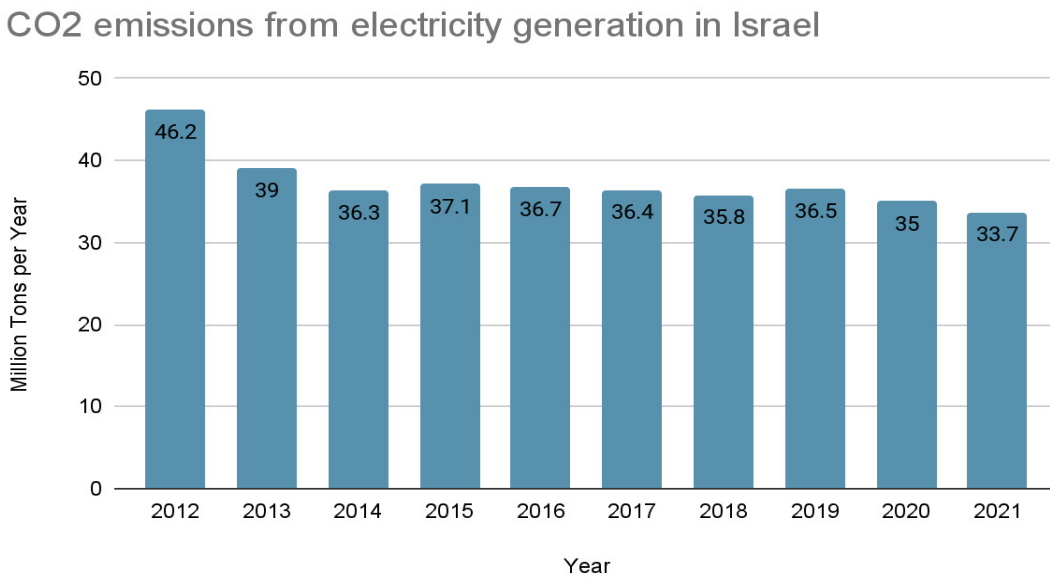


Figure 8 CO2 emissions from electricity generation in Israel

In 2015, government decision no. 542 established a target of 17% renewable energy by 2030. This goal was subsequently updated by government decision no. 465 in 2020 (Prime Minister's Office, 2020), which increased the renewable energy production targets to 30% by 2030. Additionally, this decision set a deadline for the phase-out of coal-fired power generation by 2026. As a result, electricity production from fossil gas is projected to constitute 70% of the total energy mix by 2030. The basis for this decision was the Electricity Authority's report examining the consequences of increasing the share of renewable energy in electricity production in 2020 (Electricity Authority, 2021). According to the report's findings, the installed capacity for renewable energy production by 2030 is expected to be six times greater than the capacity at the end of 2020. This expansion is forecasted to result in a 50% reduction in greenhouse gas emissions per capita. Currently, Israel has not officially set a renewable energy target for 2050. However, in August 2022, the country's Electricity Authority published draft outlines for renewable energy 2050 targets for public review (Electric Authority, 2022).

Civil society groups have proposed more ambitious, detailed roadmaps for a faster and wider transformation of the electricity market. The most comprehensive plan is “NZO 2050” (Heschel, n.d.) by the Heschel Center for Sustainability. This plan advocates for a target of 50% renewable

energy by 2030 and 95% renewable energy by 2050, presenting it as a feasible objective.

Obstacles for implementation of solar energy

There are obstacles to the implementation of solar energy as the primary source of electricity production in Israel. One significant challenge is the issue of availability throughout the day and across seasons. To address this challenge, the construction of extensive **storage** capacity becomes necessary.

Another obstacle is the substantial land area required to install sufficient solar capacity. It has been estimated that approximately 800-850 square kilometers of space would be needed (NZO Heshel, 2021). Considering Israel's status as one of the most densely populated countries and its unique ecological location and biodiversity, it is preferable for much of the solar capacity to be installed in a dual-use manner. This could involve leveraging surfaces such as rooftops of houses, water reservoirs, or providing shade over sports courts, among other creative solutions.

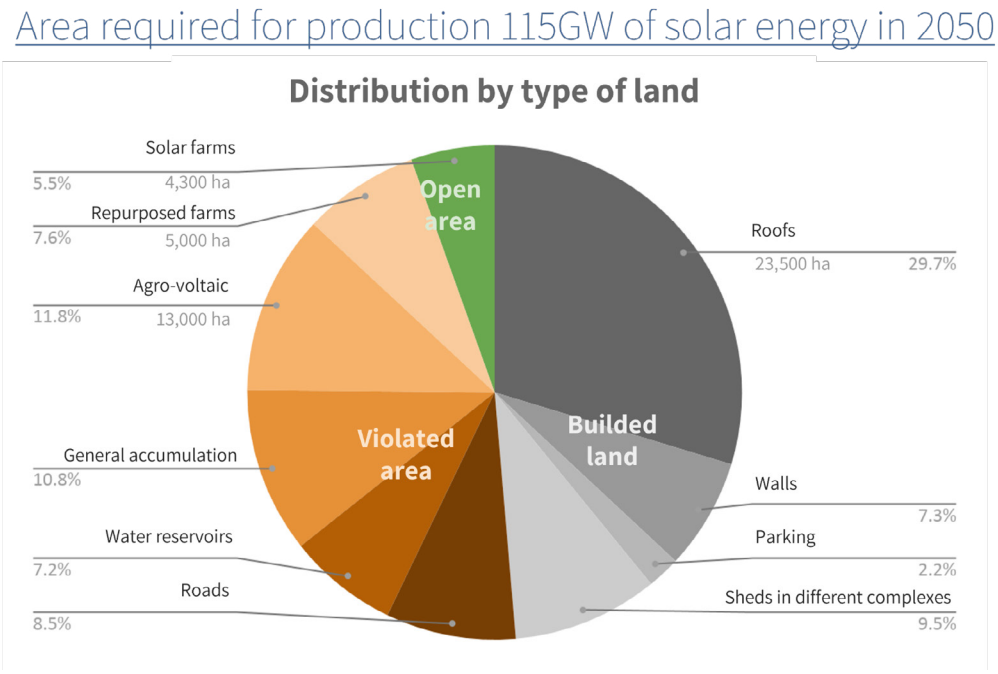


Figure 9: estimated area required for production of 115 GW of solar energy,according to NZO 2050 model (source: the Heschel Center)

Implementation of solar energy in Israel involves several governmental bodies, each with their own policies and responsibilities in facilitating the installation of solar energy over the past few decades. For instance:

- The Electricity Authority establishes production quotas and tariffs for different installation methods, such as ground-mounted and dual-use PV systems.

- The Israel Land Authority regulates the locations and extent of solar facility construction on land.

- The Ministry of Interior Affairs sets regulations on the maximum property tax that municipalities can charge.

- The Ministry of Energy supports PV installations through various means, including providing loans to local municipalities, industry, and businesses, as well as operating an information portal for citizens.

- Local municipalities take initiative in encouraging PV installations by private citizens and businesses.

Despite these efforts, the widespread implementation of solar energy in Israel still faces several obstacles, including:

- **Availability of transmission network:**
  Israel's electricity grid was originally designed to support centralized production from a few large-scale fossil fuel-based power plants located along the coastline, near densely populated cities in central Israel. However, renewable energy production is inherently decentralized, with most potential sites located in the periphery of Israel, far from demand areas. As a result, the current transmission system cannot accommodate large-scale energy production in the periphery, limiting the establishment of new solar facilities in significant parts of the country, particularly in the north and south periphery. To transition to a renewable energy-based market, the transmission grid needs to be redesigned and long transmission lines and switching stations need to be built.

- **Quality of distribution network:**
  Electricity distribution networks within Israel’s cities and villages is often inadequate for current electricity needs, particularly for two

types of settlements: *Moshavim* - agricultural villages, where solar production potential is high, particularly dual-use over agricultural facilities; and, Arab towns and villages - where many connections to the grid were done unofficially (as described below), thus the distribution system cannot support the load.

- **Unauthorized construction and disputes over land ownership:** As per current regulations, the connection of a solar system to the electricity grid in Israel is only allowed if there are no disputes regarding land ownership and if the house was built in accordance with Israel's regulations. In Arab localities, around 29,000 buildings lack permits (Sikkuy-Aufoq for shared and equal society, 2022), and therefore cannot install solar systems. This hinders the exploitation of significant renewable energy potential while also depriving large sections of society from benefiting from solar energy profits. In November 2021, the Knesset Interior Committee passed a bill allowing thousands of illegally constructed homes to be connected to the national power grid. This bill was subsequently incorporated into Israel's Planning and Construction Law in January 2022 (Ministry of Law, n.d.).
- **Energy security and reliability** are also critical considerations. Currently, Israel's electricity grid operates as an "Energy Island" with no interconnections to neighboring countries. Such interconnections could have served as backup during extended periods of limited solar supply that cannot be compensated for by regular storage solutions (e.g., sandstorms, consecutive cloudy days, etc.). European countries, with their interconnected grids, can compensate for electricity production deficits. For instance, Hawaii, another "energy island," has set a goal of achieving 100% renewables by 2045 and has invested in solar storage, which has become increasingly cost-effective, reaching 15 cents/kWh in 2020 (Tal, 2020). To overcome this challenge Israel has to further pursue cooperation projects with neighboring countries, and at the same time invest more in energy storage systems, which are currently economically rentable.

Examples of support programs offered by the government to enhance adaptation and mitigation steps:

Governmental budgets are allocated through the Budget Bill, which has a legislative status. This bill is therefore a major tool employed by the government to implement its policies and commitments. During the past two decades, the government supported various attempts to

encourage solar production and reduce GHG emissions:

- **Ministry of Environmental Protection:**
  - Support for the replacement of asbestos roofs and the installation of solar systems in 2021-2022, allocating a budget of 121.5 million NIS (MoEO, 2021). However, only a small portion of this budget was utilized due to barriers unrelated to funding.

  - Support for Arab municipalities, for the installation of PV systems and energy efficiency measures in 2022.

  - Budgeting municipalities' preparation to climate-change action plans in 2022, including both mitigation and adaptation measures.

- **Ministry of Energy:**
  - Loans for PV installation on public rooftops in municipal authorities (Ministry of Energy, 2020) - 527 million ILS were offered to 141 municipalities, to install PV systems over more than 1200 public buildings. This initiated large-scale interest in municipalities, and today most municipalities in Israel have at least some solar systems installed, which contribute both for GHG reduction and economic resilience.

  - Support for implementation of climate resilience program in LAs (Ministry of Energy, 2022): subsidies are given for storage systems, energy efficiency tools, EV, as well as to "soft" measures such as education and community advocacy for solar systems and energy efficiency, etc.

  - Subsidies for EV charging stations in local authorities (2018, 2020, 2022)

  - In March 2023, the Ministry of Energy allocated a 200 million NIS budget to aid LAs in energy efficiency and solar production.

- **Ministry of Economy:**
  - Support for solar shading in public areas (2022), and for energy efficiency measures in municipalities and in the industrial sector.

Roadmaps for other sectors

Energy Intensity

Energy intensity is defined as the ratio of energy use to GDP, assessing the energy efficiency of a certain economy (Martinez et al., 2019). Israel has set the target of GDP to 122 MWh per 1 Million NIS. In comparison to other OECD countries, Israel currently has low energy intensity.
Israel's action on Energy Intensity is based on the Energy Resources Bill (1989) that mandates the government to update a plan for energy intensity every five years. Till 2020, the plans only dealt with electricity. The Governmental Decision No. 542 (from 2015) determines the target of 17% electricity efficiency by 2030, compared with 2015. However, due to the rapid development of the energy economy that includes transition to electric vehicles and transition to electricity use instead of other fuels (for example, electricity instead of gas for cooking), which will result in increasing the demand for electricity, there was a need to expand to other energy resources.

In November 2020, the Ministry for Energy published an updated plan for energy intensity for the years 2020-2030 that includes different sectors including electricity, fuels, transportation, industry and buildings (commercial and public and domestic). The major new indicator in this plan is improving energy intensity.
The main target of the plan is to improve the energy intensity by 18% by 2030 (reference year- 2015). According to the plan, the highest potential lies in the industry and the commercial and public sectors. The Plan sets the following:

- 122.4 MWh per million NIS GDP in 2030 and an interim target of 131.7 MWh for Milion NIS GDP in 2026.
- To establish a ministerial committee headed by the Ministry of Energy that will be monitoring the implementation of the plan.
- Grants for energy efficiency. The Ministry of Energy will allocate 350 million NIS between the years 2022-2026 for the industrial sector. The MoEP was supposed to allocate 100 million NIS in 2022 to the business and LAs.

According to the Ministry for Energy, the financial gain from implementing this plan is 87 billion NIS. The plan was approved by the government on 24.10.2021 (Governmental Decision 541).

The building sector

The building sector is a major contributor to GHG emissions. The Israeli green building standard was first adopted in 2005, and has been revised several times since. The standard became obligatory following the National Planning Committee in March 2020, which became effective starting 2022 (MoEP, n.d.). It is expected to reduce 30% of the emissions from buildings.

Long before, LAs set climate goals, a major part of which includes high building standards, including methods to facilitate energy efficiency and renewable energy production. Examples:

- The city of Tel Aviv set regulation to carbon-neutrality in new buildings, which requires high energetic efficiency, as well as massive energy production, including rooftop and Building Integrated PV (BIPV).
- Forum 15, the association of Israel's self-government cities, representing approximately 40% of Israel's population, adopted green building standards for new buildings, which are higher than the national requirements.

Transportation

Transportation is responsible for around 23% of GHG emissions in Israel (MoEP, 2020), and private cars account for the majority of GHG emitted from road transportation. Thus, shifting the transportation to be electricity-based and encouraging public transportation is vital.

Between 2015-2018 there was a 15% rise in private transport. It continued to rise in 2019 and later there was a decline during 2020 due to COVID restrictions. The Ministry of Transportation estimated in August 2021 that a significant change in transportation habits will take place when new means to encourage usage of public transportation systems will be implemented (i.e. designated routes for public transportation; parking policy; services additions; changing planning policies in regard to land uses and etc.).

According to the Ministry of Finance, there was an increase in the investment in public transportation infrastructure in recent years. This included investment of 25 billion NIS in Light Trains; A development plan

of the Train's system and electrification of the trains (10.4 billion NIS for the last target); electrification of the busses and terminals (270 million NIS purchase electric buses); installing charging stations for electric vehicles (grants of 30 million NIS). According to the Ministry of Finance, the development budget of public transportation increased from 5.5 billion NIS in 2017 to 8.46 billion NIS in 2020.

Israel plans to limit the rise of GHG emissions from transportation in 2030 to 3.3%, followed by a mitigation of 96% by 2050, compared to 2015. Two strategies were listed to limit the rise of GHG emissions from transportation:

- Municipal buses bought from the year 2026 on will be "clean" vehicles. The definition of a clean vehicle is for the Minister of Environment to set. A new detailed governmental plan for public transport (municipal buses) was issued with milestones for transition to electric buses (Authority for public transportation, 2022)
- Taxies: The Ministry of Transportation has published a law amendment proposal to encourage moving to electric taxis by giving economic incentives. According to the law proposal, 500 licenses will be granted to electric taxis with discounted fees.
- Reducing private car share to 30%- New vehicles up to 3.5 tons that will be registered from 2030 on will emit 5% of mean emissions from new vehicles registered in 2020.

With the rapid development of electric vehicle technologies and markets, targets for 2025 will be updated. As of 2020, electric vehicles accounted for only 0.05% of the total vehicles.

Barriers for Electric Vehicles (EVs): The lack of infrastructure for charging EVs, difficulties in installing charging stations in condos due to legal reasons, lack of information at local authorities (LAs) on charging, and the absence of a plan to encourage public transportation have been identified as barriers (The State Comptroller Report, 2021).

Waste

In 2015, emissions from waste accounted for approximately 7% of greenhouse gas (GHG) emissions. Israel aims to reduce GHG emissions from solid waste by at least 47% by 2030 compared to 2015, including a reduction of 71% in municipal waste compared to 2018. By 2050, Israel plans to achieve a total mitigation of 92% compared to 2015.

These targets pose challenges as Israel's waste generation is relatively high, with about 1.7 KG per person, and an estimated total of 5 million tons of Municipal Solid Waste annually, increasing by approximately 1.7% each year. Israel's municipal solid waste primarily consists of organic waste, which, when not properly treated, becomes a major source of GHG emissions. In 2020, approximately 80% of Israel's municipal solid waste was sent to landfills (compared to 77.6% in 2018), while OECD countries landfilled about 39.3% in 2018 (Center of science and research - Knesset, 2022).

It is estimated that untreated organic waste contributes 10% of Israel's GHG emissions annually. According to the Ministry of Environmental Protection (MoEP), landfills are the main emitters of methane in Israel, with illegal waste burning also being a significant contributor to both GHG emissions and air pollution.
Israel's waste treatment policy has undergone several significant changes in the past two decades, none of which were fully implemented. The most recent policy, published in February 2021, rejected the previous approach promoting municipal solid waste incineration, instead setting new targets to reduce landfilling of municipal solid waste from 80% in 2020 to 20% by 2030. This goal is crucial, especially considering that recent research indicates methane emissions from landfills in Israel are six times higher than previously assumed by the MoEP (Yitzhak, 2022).

One of the most recent policies related to waste management is Governmental Decision 171, issued on September 22, 2022 (MoEP, 2022). The proposed by-laws mandate the treatment of municipal organic waste before landfilling. Additionally, the regulations provide economic incentives (60 million NIS) to establish, upgrade, and operate facilities for organic waste treatment.

Milestones:

- Reduce waste landfilling from 80% in 2020 to 20% by 2030.
- Eliminate landfilling of untreated organic waste, paper, and cardboard by 2030.
- Collect at least 50% of methane from landfills by sealing active landfills and installing methane collection and utilization systems.

Main Findings and Recommendations regarding Israel's NDCs:
The Israeli government has issued various decisions related to climate change and the transition to a low-carbon economy. However, the Climate Bill has not yet been approved, and the implementation of these decisions is subject to the changing attitudes of politicians in relevant governmental offices. In general, Israeli governments have not shown a strong commitment to fulfilling these decisions and international commitments (Shakuf, 2021). Different ministries have launched several plans and strategies, resulting in partially translated budgeted projects. However, these projects remain fragmented, lacking an overall view and coordination.

The energy sector, particularly electricity production, is the main source of greenhouse gas emissions in Israel. To meet Israel's NDCs, a shift away from fossil fuels and prioritization of renewable energy over gas in electricity production is crucial. However, Israel's renewable energy targets are relatively modest, and even these moderate goals are not being met. The government has made attempts to translate energy targets into policies and strategies. However, the actions taken by government offices are sporadic and do not reflect deep understanding of the threat posed by global warming, nor commitment to achieving the targets. This gap is especially apparent in the financial aspects, where regulatory bodies such as the Electricity Authority are committed only to the price and market criteria, and refuse to provide significant support to increase renewable energy penetration through subsidies, for example. Furthermore, efforts to increase renewable energy, mainly solar energy, are facing several regulative and infrastructural obstacles that need to be overcome.

Civil society organizations (CSOs) play an important role in both challenging the government to set higher emission reduction goals and implementing the goals that have been set. For example, the Heschel Center's NZO research work, which outlined a roadmap for

achieving 95% renewable energy by 2050, contributed to the Ministry of Environmental Protection raising Israel's targets from 17% to 30% by 2030 (personal communication). Additionally, support initiatives led by CSOs have been vital in enhancing the acceptance of solar systems within local authorities (LAs). Therefore, the role of CSOs should be strengthened and further enhanced.

NDCs implementation and 'enabling environment:' there is no 'climate law' in Israel. Israel's targets were mostly translated into 'governmental decisions' that have no legal force like laws. There are some policy support systems for NDCs implementation including economic measures; however, they are not suffecient.

Transparency of **Monitoring and Evaluation**

Israel's ETF communications

Including national & local reports on implemented climate and energy activities & projects

Civic Space in Israel:

Israel, as a party to the Paris Agreement, has committed to taking action to limit temperature rise to below 2 degrees Celsius above pre-industrial levels. To ensure transparency and accountability, both the international and local communities need a conducive environment that includes proper communication regarding Israel's actions and their effects. The Paris Agreement established an Enhanced Transparency Framework (ETF) that requires parties to provide "information necessary to track progress made in implementing and achieving its nationally determined contribution under Article 4" (Article 13.7b).

In line with the theme of Environmental Democracy, three conditions must be met to ensure that environmental policies serve the public good: meaningful public participation in environmental policies, free access to environmental information, and access to courts to challenge policies. According to the Monitor-Tracking Civic Space (CIVICUS) report, Israel has been rated as obstructed (last update in 2016). Since then, there has been a continuous shrinking of civic space, particularly within the Palestinian community (INTERACTIVE TIMELINE ON SHRINKING SPACE IN

ISRAEL-PALESTINE). This is also reflected in the disproportionate number of Palestinian-led Civil Society Organizations (CSOs) compared to their size. As of 2019, they accounted for about 7.8% of all active registered CSOs in Israel. Arab CSOs face financial, operational, organizational and other constraints. They rely mainly on foreign funding for designated projects, with very limited support for capacity development.

In March 2023, the new right-wing government initiated the so-called "Judicial Reform," raising concerns about further weakening the separation of powers and undermining the protection of minority rights. Many environmental activists and scholars believe that the judicial overhaul will have adverse effects on environmental policies in Israel, limiting the ability of the Supreme Court to protect the environment from government inaction and negligence, as well as from powerful economic interests. In several countries around the world, courts play a crucial role in holding states and corporations accountable for their climate commitments. However, due to the reform, Israel's Supreme Court may lose its ability to exercise judicial review over the "Climate Bill" if and when it is approved; thereby allowing Israeli governments to evade their commitments. Additionally, the Supreme Court plays a vital role in safeguarding and promoting environmental justice and minority rights, which will be hindered by the reform.

Climate Governance in Israel:

There is currently no comprehensive climate governance framework in Israel. However, several bodies and institutions play specific roles in climate action. These include:

1. **The Inter-Ministerial Committee on Climate Change:** Established in 2010, this committee contributes to national efforts conducted under the United Nations Framework Convention on Climate Change (UNFCCC). It is responsible for GHG emission inventories, reporting on mitigation and adaptation, developing action plans for GHG emission reduction, and formulating recommendations and strategies for both GHG reduction and climate change adaptation. The committee is headed by the MoEP and includes representatives from government ministries, industry, and non-governmental organizations.
2. **The Ministry of Environmental Protection:** The ministry plays a crucial role in climate action in Israel. It established a national system for Measurement, Reporting, and Verification (MRV) of government

measures to reduce greenhouse gas emissions, as required by the Paris Agreement. This system monitors and analyzes relevant data, allowing the government to evaluate the effectiveness of different policy measures and make necessary adjustments. The MRV system is built on three key components:

- Monitoring, data collection & analysis: Annual review is conducted in cooperation with government ministries, and in accordance with international guidelines and standards. This is aimed at allowing Israel to estimate expected GHG reduction in 2025 and 2030 and to review measures taken to meet reduction targets.
- Quality assurance - data verification: Next, steps are taken to assure the quality of the data, that it has been collected and analyzed in-line with the guidelines established by the international criteria and United Nations Framework Convention on Climate Change.
- Reporting: The MoEP prepares and publishes the reports submitted to the UNFCCC as well as domesting reports.

3. **The President's Forum for Climate Change:** Established in 2022 by Israeli President Isaac Herzog, this forum convenes representatives of civil society organizations, academia, government entities, the Knesset (Israeli Parliament), local authorities, and the economic, media and cultural sectors. The forum's aims to bridge the gap between global and national climate targets in Israel, encouraging initiatives across various sectors of society that can lead to policy change, providing a platform for designing intersectoral climate change solutions and serving as an advisory body for the President.

4. **The State Audit Institution:** Israel's State Comptroller Office is the body mandated with monitoring the activities of the executive and administrative authorities. It ensures the legality, regularity, integrity, protection of individual rights, good governance, efficiency, and economic merit of public officials' actions. The external scrutiny and publication of audit findings contribute to the accountability and transparency of public administration.

Israel's reporting under the UNFCCC:

Israel's reporting commitment to the UNFCCC encompasses national communications, biennial update reports, greenhouse gas emissions inventory, and plans for long-term emission reduction strategies. These reports provide important insights into Israel's efforts to address climate change and comply with international obligations:

- *National Communication (NC):* Israel has submitted three national communication reports to the UNFCCC: NC1 in 2000, NC2 in 2010, and NC3 in 2018. These comprehensive reports cover national circumstances, vulnerability assessment, financial resources, transfer of technology, as well as education, training, and public awareness. Parties are required to submit NCs within three years of entering the Convention and every four years thereafter.

- *Biennial Update Report (BUR)*: Israel has submitted two BURs to the UNFCCC. BUR1 was submitted on 18 April 2016, and BUR2 was submitted on 6 March 2023. BURs provide updates on the National Communication, including greenhouse gas inventories and information on mitigation actions, needs, and support received.

- *Non-Annex I Parties are expected to submit their first BUR within the guidelines set by the UNFCCC and subsequently every two years.*

- *National Greenhouse Gas Emissions Inventory:* The Central Bureau of Statistics in Israel prepares an annual inventory of greenhouse gasses in the country. The inventory includes emissions of various greenhouse gasses such as carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrochlorofluorocarbons (HFCs), perfluoro compounds (PFCs), and sulfur hexafluoride (SF6). The inventory reports are published by the UN Framework Convention on Climate Change.

- *Long-Term Strategies:* As per the Paris Agreement, parties are encouraged to develop and communicate long-term low greenhouse gas emission development strategies. Israel has not yet submitted a long-term strategy.

Reports at the national level:

Israel publishes the following domestic reports:

- *Annual Inter-Ministerial Committee Report on GHG Reduction Measures:* The Ministry of Environment in Israel has published three inter-ministerial reports since 2016. These reports were published in 2016, 2017, and 2021, with a gap of three years between the 2017 report and the most recent one in 2021. The latest report, titled *Climate Change and Energy Efficiency: Greenhouse Gas Emissions Reduction 2021 Report*, emphasizes that Israel did not achieve its 2020 targets, observing that only 6% of electricity production in Israel was derived from renewable energies rather than the target of 10% set by Government Decision 4450. Additionally, electricity efficiency reached 4%, which is significantly lower than the target of 20%. The report emphasizes the need for further efforts and additional measures to address these gaps in achieving the set goals. It serves as a critical assessment of Israel's progress in reducing greenhouse gas emissions and highlights areas where improvements are necessary.

- *Voluntary GHG Registry:* Israel launched a voluntary national greenhouse gas registry in July 2010. Organizations and companies of all sectors were invited to enlist in the registry by committing to report their annual greenhouse gas (GHG) emissions - both direct and indirect. Twenty-one companies and organizations participated in what was designated as a pilot project in 2011, the first reporting year. While participation is voluntary, those who choose to partake are expected to calculate and report their emissions using the MoEP's official quantification methods and procedures. Preparation of the voluntary reports gives participants the added benefit of identifying opportunities for saving on energy and resources, and thus cutting costs. It should be noted that owners of heavy vehicle fleets with at least 100 vehicles are *obligated* to report the GHG emissions of their fleets. A protocol was developed which is largely based on the WRI/WBCSD (World Resources Institute/World Business Council for Sustainable Development) protocol for reporting, and is compatible with the International Organization for Standardization's ISO 14064. The protocol consists of guidance for mapping, quantifying, and reporting GHG emissions in Israel and provides a starting point for companies to identify, quantify, and report their emissions. The quantification methods described also assist in forming the

basis of a consistent database for assessing future GHG emission reductions. Data exists for the years 2010-2017 which includes: number of reporting entities; Total emissions from reporting entities) in million tons CO2); Total emissions in Israel (in million tons CO2); Percentage of emissions in Israel from reporting entities.

- *Pollutant Release and Transfer Register:* A Pollutant Release and Transfer Register is an environmental database or inventory of pollutants released to air, water and soil, and transferred off-site for treatment or disposal. There are a total of 114 pollutants or groups of pollutants that must be reported, including greenhouse gasses that are responsible for climate change.

- *The State Audit reports:* In October 2021, the State Comptroller's published an audit report on Israeli climate action, comprehensively reviewing *both adaptation and mitigation measures* adopted by the government.

  Regarding adaptations, the report concludes:

  - Despite governmental decision no. 4079 (2018), which includes measures establishing Israel as highly prepared for coping with climate change's effects, there is yet no budgeted, operational national adaptation plan.

  - Eighty-two percent (82%) of 63 public authorities did not consider climate change in their risk management plans and 77% did not conduct risk assessment regarding the effects of climate change on their operations.

  Regarding mitigation, the report examined the measures implemented between 1996 and 2020 to reduce greenhouse gas emissions in the energy, transportation, and waste sectors. It concluded that Israeli mitigation actions in these sectors varied from lack of progress to deterioration. Specifically, in the energy sector, the report highlights that Israel's target of achieving 30% renewable energy by 2030 is low compared to other OECD countries. Furthermore, it points out the absence of any targets for 2050. The report raises concerns regarding the policymaking process, noting that the 30% target was solely set by the Ministry of Energy and the Electricity Authority without active involvement of other ministries or bodies. These findings underscore the need for stronger and more comprehensive mitigation efforts in Israel. The report suggests

that setting more ambitious targets aligned with international benchmarks and involving multiple governmental entities could drive progress towards a sustainable and lower-carbon future.

- *The Electricity Authority reports on renewable energy:* The Electricity Authority in Israel releases situational reports on renewable energy. To date, five reports have been published. One report covers 2018 and serves as a roadmap for the energy sector, whereas three reports pertain to the year 2022. The stated objective of these reports is to provide the public with relevant data and indicators to monitor the government's progress in meeting the established targets. The latest report presents information on installed capacity, actual production, electricity consumption, and the status of target fulfillment. Notably, these reports primarily focus on presenting data and indicators, and do not provide extensive details on individual renewable energy projects.

  In tandem, the Electricity Company has published an open access map that displays the probability of connecting new solar systems to the grid in Israel. The map uses color-coding to represent different probabilities: dark green indicates a very high probability, soft green indicates a high probability, yellow indicates a moderate probability, orange indicates a low probability, and red indicates a very low probability. A second layer of this map displays areas where connection to the grid is possible only at night time (suitable for systems that combine solar production and storage). The map can be accessed through the following link: https://www.gov.il/he/departments/publications/reports/yehadeie. These reports and the open access map are valuable resources for tracking the development and connectivity prospects of renewable energy in Israel's electricity sector, but, as noted, do not elaborate on renewable energy projects.

- *The Planning Administration* has developed an open access application that allows planners, entrepreneurs, and the public to easily obtain up-to-date information on the extent and geographical distribution of ground-mounted photovoltaic solar systems in Israel. This application is continuously updated in real-time based on data fed into the monitoring system. It is worth noting that in 2020, 20,000 dunams have been allocated for ground-mounted photovoltaic solar systems in Israel until 2030, and in June 2023 this quota was expanded to another 35,000 dunams.

To access the application, please visit the following link: [https://experience.arcgis.com/experience/584d9743ce634debab09396bc901a8f2].

- Lately, the Ministry of Energy has published an index that compares local authorities on percentage of dual-use renewable energy implementation out of the total potential in their jurisdiction. This index aims at encouraging LAs to take an active role in promoting dual-use RE. [https://app.powerbi.com/view?r=eyJrIjoiYmNjY2I5ZmMtYTUxYi00YjZhLWFmZTktOTgyMzE4MDkzZDNmIiwidCI6ImUxYjY2OThlLTlhMTQtNDNkOC05ZWJhLTUzNDBiZjc5MDkxMCIsImMiOjl9]

Local implementation reports:

In Israel, local climate action is primarily implemented through tenders issued by different ministries, with local authorities serving primarily as implementers due to the centralized governance structure. Data exists within these ministries regarding the budgets utilized by local authorities for various climate projects, such as energy efficiency, renewable energy, and adaptation projects. This information can be obtained through freedom of information regulations. However, local authorities themselves are not legally obligated to publish information about climate projects and their impacts, limiting the availability of official reports.

News about local climate projects can be found in various media outlets, although comprehensive reports may be scarce. While a few large cities in Israel have voluntarily adopted climate action plans and allocated budgets accordingly, a significant number of these cities are part of Forum 15, an association of self-governing municipalities that have fiscal autonomy rather than fully relying on annual national grants. In 2008, Forum 15 launched its own Climate Convention, inspired by Local Governments for Sustainability (ICLEI) international convention for climate protection. The 18 major cities that signed the convention committed to reducing their greenhouse gas emissions by 20%, monitoring their emissions, and developing and implementing local climate action plans to address air pollution and greenhouse gas emissions within their boundaries.

Forum 15 has since launched several campaigns to support and promote action on climate change.

Table 7: Summary of the Israeli communication reports:

Report	Level	strength	weakness	Rate
Long term Strategy			Israel did not submit a long term strategy	
National		Covers all sectors of NDCs	Irregular submission	
Biennial Update Report		Covers all sectors of NDCs	Irregular submission	
Annual inter-ministerial report	National	Covers all sectors of NDCs	Irregular submission	
Voluntary GHG registry	National	In 2017, 65 entities submitted information indicating a GHG emissions of 48% of the total emissions in Israel	Not mandatory	
Pollutant Release and Transfer Register	National	Mandatory by law Covers wide variety of pollutants including GHG		
The Electricity Authority reports on renewable energy	National	Show the installed capacity and the production of solar energy.	Have no details on geographical sites etc.	
The Planning Administration Map	National	An Interactive map displaying updated information on ground photovoltaic systems.		
The State Audit reports:	National			
Local	Local	Data can sometimes be obtained through the Freedom of Information regulations	No obligation to publish reports by local (e.g. municipal) stakeholders	

Main finding and recommendations regarding Israel's ETF communications:

Israel's submission of reports under the UNFCCC has been irregular and lacking consistency. Although Israel has submitted various reports over the years - including national communications, biennial update reports, and GHG inventories - the timing and frequency of these submissions have been sporadic. For example, the first national communication was submitted in 2000, followed by the second communication in 2010, and the third communication in 2018. Israel has different institutions and bodies that issue additional reports on climate-related matters, but again, these are not consistently published and/or submitted. Furthermore, local actors, including local authorities, are not legally obligated to report on their climate actions, resulting in limited information about local implementation efforts. To address these gaps, it is crucial to establish regulations at both the national and local levels to streamline and regularize Israel's communications on climate action. This could involve setting clear deadlines and requirements for reporting, ensuring that all relevant institutions provide timely and comprehensive data. By implementing these measures, it would be easier to track and evaluate the link between reported ETF communications and local-level climate actions.

The following recommendations are proposed:

1. Develop regulations for consistent and timely submission of national communications, biennial update reports, and other relevant reports under the UNFCCC framework.

2. Establish clear guidelines and requirements for reporting on climate actions at the local level, making it mandatory for local actors, including local authorities, to report on their climate initiatives.

3. Enhance coordination and information sharing between national and local authorities to ensure that data on local climate actions are appropriately collected and included in the national reports.

4. Improve transparency and accessibility of climate-related reports by publishing them in a centralized and easily accessible platform.

5. Provide support and build the capacities of local authorities to enhance their ability to effectively implement, monitor and report on climate actions.

Local Climate Action

Renewable Energy Projects in Israel: Selected Case Studies

An in-depth investigation of selected renewable energy projects in Israel operationalizing CIDSE's RES principles

Background

Energy poverty and disadvantaged populations in Israel

In terms of average national income for the adult population, Israel is an affluent country comparable to European counterparts like France and the UK. However, it is also grappling with significant income inequality (Chancel et al., 2022), which is particularly prevalent among vulnerable communities including the Ultra-Orthodox Jewish population and the Palestinian Arab minority within Israel, contributing to high poverty rates (OECD Economic Surveys: Israel 2020). Unfortunately, these lower-income groups are more susceptible to the adverse impacts of climate change, with *energy poverty* being a prominent concern[1]. Energy poverty is defined herein as the *inability to access adequate, reliable, and affordable energy to meet fundamental household needs like cooking, water*

1 While we focus on low income in this report, it should be noted that it is not the only variable associated with energy poverty: Vulnerability to energy poverty is affected by age, single parenthood, household size, illness and disability, rurality and ethnicity. See in: Teschner, N., Sinea, A., Vornicu, A., Abu-Hamed, T., Negev, M. 2020. Extreme energy poverty in the urban peripheries of Romania and Israel: Policy, planning and infrastructure. Energy Research & Social Science 66.

boiling, lighting, heating, and operating essential technologies including medical devices (Shapira et al., 2021).

Notably, there is presently no legal definition, criteria, or available data on the extent of energy poverty in Israel[2]. However, a survey conducted by the Central Bureau of Statistics in 2013 revealed that economic concerns forced 41% of adults (aged 20 and older), approximately 2.1 million individuals, to forgo heating or cooling their homes (Central Bureau of Statistics, 2014). Additionally, energy poverty is closely linked to other adverse conditions, such as substandard housing quality. It is estimated that around 2 million pre-1980s residential units in Israel suffer from energy inefficiency. Many of the housing units designated for social housing require excessive electricity consumption to maintain thermal comfort levels (Aviezer, 2022).

The Palestinian citizens of Israel (PCI) today are 1.5 million people around 20% of Israel's population (K. Robinson, 2021). They remained in their homeland after the Nakba (Catastrophe) of 1948 in which over 750,000 Palestinians were expelled from their homes and more than 400 villages were destroyed (Khalidi, 2020). Between 1948-1966 Palestinians in Israel were subjected to military rule, which restricted their freedom of movement and freedom of expression. During this period, there were massive confiscations of Palestinian lands, and the Israeli state has passed laws to transfer the land to a state ownership (73% of Palestinian land) (Bauml, 2011) and created an underclass of marginalized minority that is impoverished and less educated (Sultany, 2012).

Within this context, the PCI faces racial discrimination as part of an institutionalized regime of systematic oppression and domination (Amnesty, 2022), leaving it particularly vulnerable to the impacts of climate change, especially in terms of energy poverty. Discriminatory policies in allocation of resources (land and water) and provision of services (Health and education) has contributed to the lower socio-economic status of PCI comparing to the Jewish Israelis, and to the higher poverty rate; in 2021 38.8% of PCI lived under poverty compared to 21% of the whole population in Israel (National Insurance report, 2021). Adding to that, according to the OECD, PCI are disadvantaged across all well- being dimensions (OECD, . The average monthly household income for Palestinian families in 2018, is 12,700 NIS, which is only about two-thirds of the average Jewish household income in Israel. This income disparity has remained relatively unchanged over the past decade.

2 Teschner et al. Ibid.

While accurate data on energy poverty in Israel is lacking, there is a reasonable assumption that a correlation exists between poverty and energy poverty, suggesting that the Arab community may be disproportionately affected. Additionally, Arab localities face specific barriers in transitioning to renewable energy, primarily due to the government's unwillingness to legalize existing buildings. This limitation hampers their ability to benefit from renewable energy initiatives and exacerbates existing inequalities within the Palestinian minority in Israel.

A just energy transition in Israel

A climate policy that sets ambitious targets for a transition to renewable energy can offer many opportunities to reduce social inequalities, including vulnerability to energy poverty. Lower-income and disadvantaged groups, who contribute least to global warming and are more likely to suffer the repercussions of climate change, are also those with the most potential to benefit most from affordable, clean and safe energy solutions. However, they also face greater barriers to reaping benefits from a transition to renewable energy and can be disproportionately affected by the costs of some policy measures (Bouyé et al., 2020).

At present, *social justice* is not a central principle guiding Israel's climate policy. Israel's official policy articulated in the relevant government decisions does not strive for a *just transition* (following the Paris Agreement). Furthermore, while the Israeli Government in its decision from 14.7.2019 (Government Decision 4631) indicated that the UN Sustainable Development Goals (SDGs) should be integrated into the government's strategic planning processes, the SDGs have generally not been incorporated into the country''s climate policy.

However, there are instances to the contrary. A time in which the effects of climate policy on disadvantaged populations was considered. Government Decision 286 from 1.8.2021 on the pricing and future taxation of carbon emissions (Governmental Decision. 2021), for example, directed relevant Ministries to prepare recommendations on measures mitigating the effects of the potential rise in costs - of electricity, fuel, and other goods - on vulnerable populations[3].
Specific *Just Transition* measures include adoption of *carbon pricing* during

3 A committee was set up and received inputs from the public. Its recommendations haven›t been published to date.

the transition to renewable energy, which directly impacts consumers and can have both positive and negative social impacts. By putting a price on carbon emissions, it creates an economic incentive for industries and individuals to reduce their carbon footprint and shift towards cleaner energy sources. However, the social impacts of carbon pricing depend on how its revenue is utilized and on the existence of measures to mitigate any negative effects on vulnerable populations. Additional measures that can contribute to a more equitable renewable energy transition include reforms in fuel subsidies, home efficiency programs, and the expansion of renewable energy infrastructures. These measures aim to promote energy efficiency, reduce reliance on fossil fuels, and increase the accessibility to renewable energy technologies. For example, the installation of PV systems has garnished significant attention, including in the case studies and analysis presented below. The installation of PV systems offers opportunities for decentralized energy generation and can provide a stable revenue source for private households, small and medium-sized enterprises (SMEs), and local authorities. This potential shift in the electricity market towards a decentralized renewable energy-based model has the potential to contribute to reducing inequality and socioeconomic gaps.

However, the case studies presented below shed light on various obstacles that must be addressed to fully realize the potential of a more equitable renewable energy transition. These obstacles can take the form of regulatory, planning-related, legal, financial, organizational, or knowledge and awareness-related challenges. It is crucial to address these hurdles in order to ensure an equitable transition to renewable energy and enable the widespread adoption of decentralized renewable energy systems. In the following section, then, we delve into three projects that involve the Palestinian citizens in israel (PCI) , each providing a different perspective on the opportunities and challenges of this transition:

- A government initiative that aims to assist LAs in Israel in installing PV systems on municipal properties and benefiting from the resulting revenues.
- A municipal initiative focused on decarbonizing its activities through the implementation of an innovative financial model.
- Grassroots off-grid micro PV projects in unrecognized villages in the Naqab, despite facing objections from the government.

These case studies offer valuable insights into the practical implementation of renewable energy projects and highlight the diverse range of experiences and challenges faced by different communities.

Case Study 1: „The Pais Project"

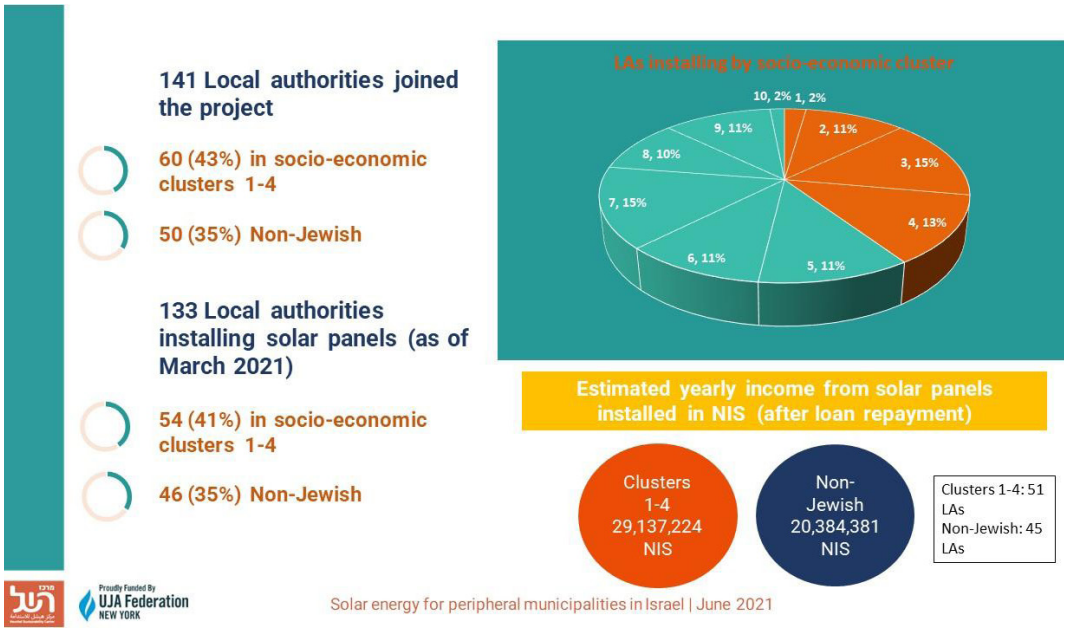
Governmental Support for the establishment of PV systems on municipal properties

A government initiative was launched in December 2019 to provide LAs in Israel with loans for the installation of PV systems on the rooftops of public buildings. The main objective of this initiative, which was a collaboration between the Ministry of Energy, the Federation of Local Authorities, and the Israel Lottery ("HaPais"), was to support the Ministry's strategy of increasing the 2030 target of 30% renewable energy production. Simultaneously, the initiative aimed to improve the economic stability of LAs by enabling them to generate long-term income from selling the electricity produced by the PV systems to the Israel Electric Corporation (IEC) through a feed-in tariff.

This program presented both a challenge and an opportunity for low socio-economic LAs, predominantly Arab LAs, which have limited sources of income to provide social services to residents. By utilizing existing resources within the municipality and generating solar energy locally, LAs can generate income. Moreover, rooftop PV production, compared to constructing large-scale ground-mounted solar projects, does not encroach upon open lands or exacerbate ecological challenges in Israel. *The Pais project*, a component of this wider initiative, offered low-interest loans provided by the Israeli Lottery (*Pais*). Additionally, two non-governmental organizations, the Heschel Center for Sustainability and the Good Energy Initiative, were commissioned by the Ministry of Energy to provide guidance and consultation throughout the process.

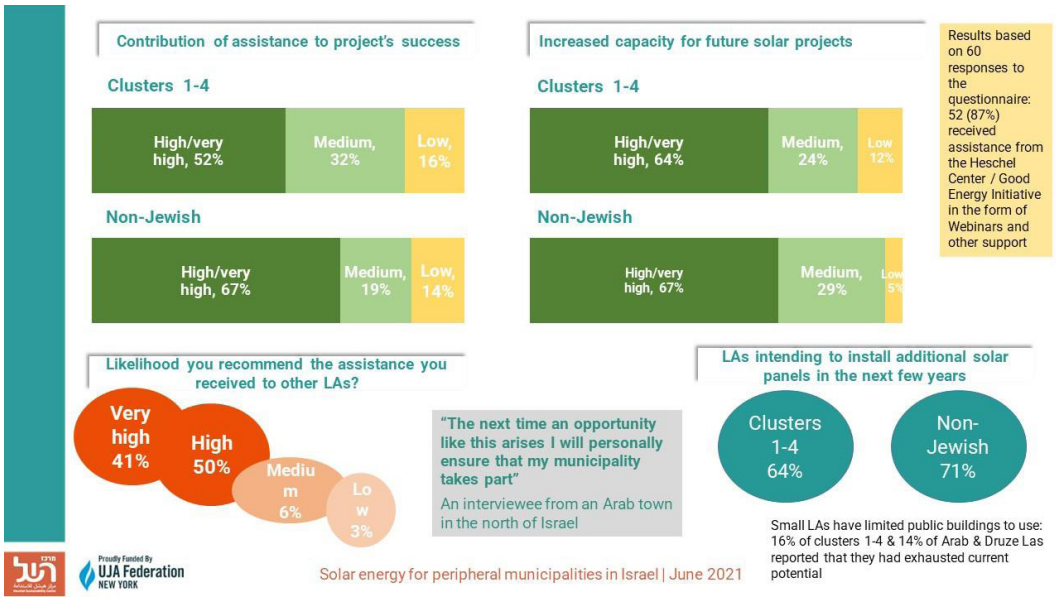
This program comes on the heels of previous research conducted by the Heschel Center, which highlighted the income-generating potential of renewable energy for municipalities. Relying on data from the Ultra-Orthodox municipality of Elad, the study presented an economic model that identified the income-generation potential of renewable energy infrastructure on public buildings. The research furthermore sought to identify and address bureaucratic barriers to local solar energy production. Lessons learned from the process had a significant role in shaping the *Pais* project. Consequently, The National Lottery's call for applications presented a unique opportunity to assist low socio-economic LAs in applying for loans. However, past experience indicated that many LAs might not take advantage of this opportunity due to various obstacles; these include lack of awareness regarding the economic potential, insufficient human and material resources to invest in the application process, and a lack of long-term strategic planning. Simultaneously, the Ministry of Energy recognized the need for a significant shift to achieve its short and long-term renewable energy objectives; and yet, it lacked a comprehensive understanding of solar panels' economic potential for marginalized populations, and existing regulations were not conducive to energy generation within localities.

The project was initially designed to support 10 LAs with a total of 100 million NIS in loans. However, the response was overwhelming, with 141 local and regional authorities applying for the grants, including 50 Arab LAs. The total requested budget amounted to 650 million NIS, with plans to install solar systems on 1,241 public buildings (60% of which are educational institutions), covering a total area of 1,140,260 square meters, and with a total potential installed capacity of 141 KWP. In response to the high demand, the Ministry of Energy and the Israel Lottery increased the loan funds available to 500 million NIS, enabling all 141 LAs to participate in the program.



Out of the 141 authorities that applied for support, 90 requested assistance from the two NGOs involved in the initiative. The types of support provided varied and encompassed informational webinars on the overall process, guidance as to the bureaucratic requirements, assistance with the selection of professional contractors and consultants, and individual and general support throughout the project's implementation. Significant project milestones included registering the rooftops at the Israel Electric Corporation (IEC) by the end of 2020; contracting a solar consultant to address technical aspects and prepare a tender protecting the interests of the LAs; publishing a solar contractor, overcoming bureaucratic challenges; constructing the solar systems; and, ensuring proper maintenance and income distribution to the communities. By the end of 2021, nearly all of the LAs had accomplished the first two milestones. However, some peripheral LAs had their registration requests declined by the IEC due to the transmission network's limited capacity to accommodate new connections. In a collaborative effort, the Ministry of Energy and the NGOs managed to reverse some of these cases, thereby allowing for a fair opportunity for participation. Many LAs had achieved the second milestone - successfully commissioning a solar contractor for the construction of the systems. The NGOs employed several measures to achieve these results, including establishing guidelines for engaging solar consultants and contractors, facilitating the publication of joint tenders through the country's Regional Clusters, and providing continuous

support to the referents at each LA. The ongoing support proved crucial, especially considering that many LAs were dealing with the challenges posed by the COVID-19 pandemic which further limited their capacity to carry out new projects. The personal support, particularly as referents themselves were in isolation or facing health issues, was a key to the overall success of the initiative.



Follow-up research conducted by the Heschel Center demonstrates that the majority of LAs are continuing the project, which enabled the utilization of many public roofs for PV systems. However, the solar energy potential of LAs remains substantial and not fully realized.

Criteria / Relevance	
PEOPLE	
Governance	The LAs own the PV systems. Electricity produced is consumed within the LA area (a less relevant factor in the Israeli context).
Welfare Orientation	Income from the systems goes into the LAs› budget, enabling local residents to benefit from the income.
Gender	There were no direct gender considerations in the project. Indirectly, side benefits such as sealing rooftops from leaking, are expected to primarily benefit women, who comprise the majority of employees at public institutions such as schools.
ACCESS	
Access	Not relevant. Access is guaranteed with or without the system.
Spill-Overs	The central location of the systems contributes to public awareness of PV systems and can help encourage installations of PV systems by private homeowners.
Locally adopted Energy-Mix	At this stage energy is purely solar. Later on, it might be supplemented by electricity storage facilities.
PLANET	
Mitigation	The project directly reduces GHG emissions, through renewable energy production. The rooftop coverage of the solar systems reduces radiation, thus reducing the energy consumption for cooling.
Ecology	Rooftop solar production reduces pressures stemming from establishing solar fields in open areas, thus contributing to the conservation of biodiversity and ecological assets.
Efficiency	Production close to the consumption sites reduces the electricity loss through transmission lines.
Sufficiency	Energy sufficiency is not directly applicable to this project.

Case Study 2:

„Leasing Model for Energy Independence – The Jaljulia Model"

Jaljulia, an Arab village located in the central district of Israel, has a population of 10,654 (as of February 2023) within 2.1 square km. The locality ranks in the country's second-lowest socioeconomic decile. The project implemented in Jaljulia serves as a case study for a municipal initiative aimed at decarbonizing its activities through an innovative financial model. This initiative addresses challenges faced by LAs of lower socioeconomic strata - including Arab LAs - to the implementation of renewable energy and energy efficiency projects while benefiting local residents.

The project aimed to overcome some of the obstacles encountered by low socioeconomic LAs, among which are many Arab LAs:

- Funding: Lower-strata socioeconomic LAs often struggle to secure loans from banks to finance development projects.
- Governmental bureaucracy: Financial models overcoming the need for LAs to obtain bank loans - such as Build, Operate, Transfer (BOT) - often require a lengthy approval process at the Ministry of Interior Affairs.
- Lack of knowledge within the LA: At times, LAs lack knowledge about projects, best practices and methods to protect and advance their interests when designing tenders for consultants and contractors.
- Monitoring and maintenance: Adequate monitoring is necessary to obtain revenue from PV systems, but LAs face challenges in allocating personnel for this purpose.

To overcome these obstacles, the Jaljulia LA planned and implemented *Energy Independence in a Leasing Way* between 2021 and 2022. The project aimed to maximize both energy efficiency and electricity production in

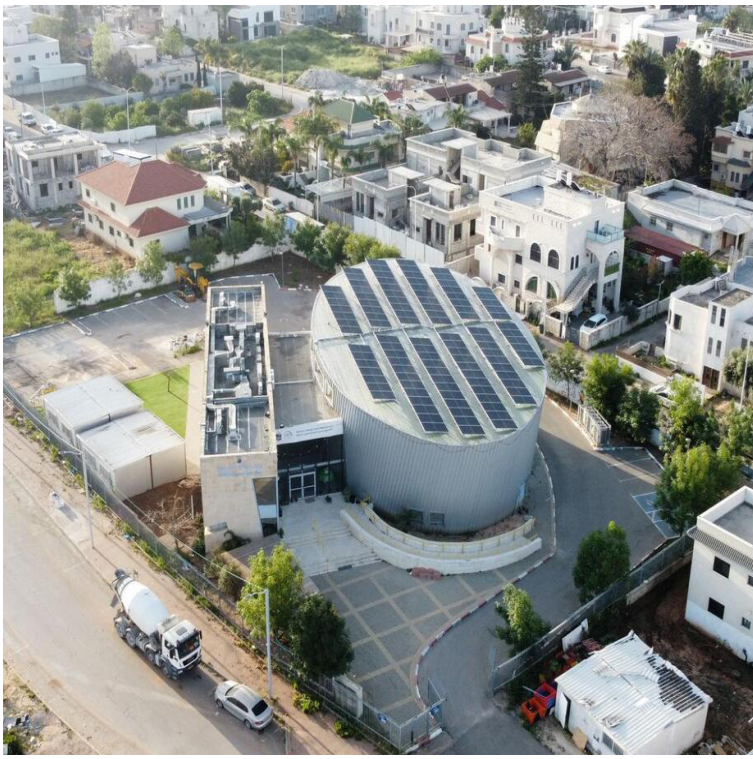
municipal buildings and facilities. It involved a combination of energy production and efficiency measures to reduce consumption.

LAs typically either self-finance energy production projects using bank loans (as described in the previous case study) and consequently receiving all revenues, or, some LAs choose to lease rooftops to external entrepreneurs who assume the risks, and receive rent. As for energy efficiency measures, these are financed by LAs through bank loans or through adopting an Energy Service Company (ESCO) model, where an external entrepreneur invests in the measures and the electricity revenues are divided between the LA and the ESCO company.

Jaljulia LA initiated this project after unsuccessful attempts to implement a PV system project on public rooftops using bank loans offered by the aforementioned *HaPais* framework. To overcome funding and legal approval challenges (posed by tenders and contracts requiring approval by the Minister for Interior), the LA adopted a leasing model as a solution. According to this model, an entrepreneur builds the systems and conducts all the operations, while the LA gradually buys the systems from the entrepreneur, using revenues from the solar electricity sold to the IEC .

The *Energy Independence* project which the municipality shaped, includes four major pillars:

1. Energy efficiency:
   a. Street lighting
   b. Public buildings' interior lighting
   c. Sport yards' lighting
   d. Air conditioning
   e. Buildings' electricity Control Systems



2. PV systems installation:
   a. on public buildings' roofs
   b. Over newly constructed car parks and sport courts shades.
3. Maintenance and ongoing improvement by the entrepreneur.
4. Innovation:

   a. Solar energy storage and electricity supply: an option for building storage capacity once it becomes economical, and establishing a corporation for municipal electricity supply once regulatory conditions are ripe.
   b. Garbage grinders for households - distributing grinders households. Organic waste is transferred to the sewage system resulting in less household waste and thereby contributing to GHG reduction.

The project involved the following steps:
Comprehensive electricity survey: Prior to issuing the tender, the LA conducted a thorough survey to assess the electricity consumption and identify potential areas for improvement.

1. Tender issuance: The LA issued a tender inviting companies to propose and implement energy-related measures as described above.

2. Electricity bill takeover: The company winning the tender assumed responsibility for paying the LA's electricity bills from day one of the engagement.

3. PV system installation: As part of the arrangement, the company is granted the right to install PV systems on the rooftops of public buildings.

4. Energy efficiency measures: The company is motivated to implement energy efficiency measures to reduce the electricity bills it pays, as it directly impacts their financial interests.

5. Revenue sharing: Once the company has recouped its initial investments, the revenues generated from selling the electricity produced by the PV systems are shared between the company and the LA. In the case of Jaljulia, approximately 70% of the revenues go to the entrepreneur company, while the remaining 30% is allocated to the LA.

This model allows the municipality to stop paying electricity bills from the outset. Instead, the winning company takes over the responsibility for electricity payments. The company's financial incentives, coupled with the revenue-sharing arrangement, ensure the long-term sustainability and financial viability of the project.

This project involved major risks to LA, i.e. bankruptcy of the entrepreneur. The contract stated conditions to ensure the LA interests.

The energy survey findings:

The electricity consumption in 2020 was 1830000 KW.

The component	Quantity	Annual consumption (KW)	The current cost of consumption in NIS	Annual Savings KW	The project cost
Street lightings	700	780000	320000	400000	800000
Indoor lightings	1500	450000	270000	300000	1100000
Air conditioning	130	600000	360000	260000	500000
Total		1830000	950000	960000	2400000
Total- without street lightening		1050000	630000	560000	1600000

Estimated investment/cost: 18 million NIS.

Financial Zeroing (benefits)

Expenses	Saving/ benefits
The current situation: **Annual electricity costs:** 630,000 NIS. **Maintenance:** 270000 NIS. **Total:** 900,000 NIS. **The future situation:** After implementing the energy efficiency project, the electricity expenses will drop down to 300,000 NIS. In addition, the local authority will pay the entrepreneur a sum of 240,000 NIS. Maintenance expenses will be 50,000 NIS. The item is therefore budgeted at 590,000 NIS.	**The current situation:** There is no income. The future situation: The local authority will gain an income of 700,000 NIS from solar systems, in addition to a sum of 310,000 NIS savings. Furthermore, the local authority saves various indirect expenses; for example, renewing air conditioners, lightings, sealing of roofs, etc.

Energy survey key findings:

- The project of street lighting: results in 400,000 KW annual saving.
- Electricity consumption in 2020 minus electricity consumption of street lights is 1,050,000 KW.
- The annual electricity saving after energy efficiency (street lighting, indoor lighting, and air conditioning) is 870,000 KW.
- The annual electricity expenses are 400,000 NIS.
- The electricity expenses invoices are transferred to the company. They pay the electricity bills. It is considered as an expenditure which will credit them later in VAT amount. This way the margin of their gain increases.

Economic Viability Calculation:

Project	Quantity	Unit Cost	Total Cost
Solar Energy	3700 KW	2800 NIS/KW	103,600,00 NIS
Roofing of Yards	12000 Meter Square	700 NIS/Meter Square	8,400,000 NIS
Indoor lightings	1500		1,100,000 NIS
Air Conditioning	130		500,000 NIS
Total			20,360,000 NIS

Expected Income:

- Income from solar systems: 2,676,000 NIS.
- Payment for maintenance 70 NIS per KW: 260,000 NIS
- Payment to the local authority for rent: 633,150 NIS
- The Project cost: 17,000,000 (Cost for the contractor)
- Net income: 1,777,585 NIS annually
- Return of Investment: 9.5 years

(This calculation doesn't take into account credits for system depreciation, VAT return for paying electricity bills by the consumers).

To sum up, this project offers lower-strata socioeconomic LA with the opportunity to carry out large scale GHG emission reduction projects, without taking the financial risks usually accompanying such initiatives. It has considerable financial benefits to the LA, and can serve to enhance its economic stability. However, it is yet to be seen how the LA interests are kept in the long term, for example when the need arises to add electricity consuming devices, such as air-conditioning, which is expected to reduce the profits of the company.

Evaluation of the project according to RES principles:

Criteria / Relevance	
PEOPLE	
Governance	This is a Leasing model which means that the owner of the systems is the entrepreneurial company. Electricity produced is consumed within the local authority area (a factor less relevant in the Israeli context).
Welfare Orientation	Income from the systems goes into the local authority budget, leaving local residents as beneficiaries. Moreover, building the capacity of Arab citizens in installing and maintaining solar systems can enhance Arab citizens› employment opportunities.
Gender	There were no direct gender considerations in the project. Indirectly, side benefits such as sealing rooftops from leaking, are expected to primarily benefit women, who comprise the majority of employees at public institutions such as schools. Street lighting contributes to women›s safety.
ACCESS	
Access	Not relevant. Access is guaranteed with or without the system.
Spill-Overs	The central location of the systems enlarges public awareness of the subject and the introduction of an 'innovation culture' among the local authority employees. It is also expected to encourage installations of solar systems by private homeowners. A disadvantage is that storage systems in open spaces have negative ecological effects (Many trees were cut).
Locally adopted Energy-Mix	At this stage energy is purely solar, later on it might be supplemented by electricity storage facilities.
PLANET	
Mitigation	The project directly reduces GHG emissions, through: renewable energy production. Coverage of solar systems reduces radiation, thus reducing energy consumption for cooling. Replacing appliances Reducing organic waste
Ecology	Rooftop solar production helps to reduce pressures to establish open-land solar fields, thus conserving biodiversity and ecological assets. Solar systems in open spaces in Jaljulia has negative impact on diversity (trees has been cut)

Efficiency	Production near consumption sites reduces electricity loss through transmission lines. Replacing appliances (street lightings; air conditioners, etc.) with more efficient ones. The Building Control System reduces unneeded energy
Sufficiency	Not applicable

Case Study 3:

"Community-Based Solar Energy in the Unrecognized Village of Al-Serra in the Naqab"

This case study focuses on grassroots, off-grid micro PV projects implemented in unrecognized villages in the Naqab. These projects aim to address the energy needs of inhabitants in areas that are not connected to the national electricity grid due to discriminatory planning and zoning government policies.

Background on Unrecognized Villages in the Naqab:

The Arab Palestinian Bedouins in the Naqab region are indigenous people who have resided in the area for centuries, predating the Nakba (Palestinian catastrophe) and the establishment of Israel in 1948. During the 1948 war, around 88,000 Arab Palestinian Bedouins were forcibly displaced from the Naqab to Jordan, Syria, and Egypt, leaving only 11,000 remaining on their lands. Following 1948, some Bedouins were further displaced by the Israeli state, which concentrated the Bedouin community in a restricted area around Beer el Sabea (Be'er Sheva), constituting only 10% of their original lands. Between 1968 and 1989, Israel established seven high-density towns, while disregarding the other 47 Bedouin villages and denying indigenous land ownership. As a result, a reality of "unrecognized villages" emerged, consisting of historic Palestinian Arab villages that were not acknowledged by Israel. Some of these villages were established before 1948 and others in the 1950s. The PCI in these villages live under constant threat of evictions, lack access to national electricity grids, water, sewage, transportation, healthcare, and education services. To date, the situation in the unrecognized villages remains challenging, with an increasing number of eviction and demolition orders issued by the Israeli state. Although 11 villages were officially recognized by the state in 1999, this recognition has not

significantly improved the daily lives of the villagers, who continue to face systemic discrimination and a lack of essential public services.

Renewable Energy among PCI in the Naqab.

In recognized Bedouin villages and towns of the Naqab, renewable energy projects are similar to those implemented in other LAs across Israel. These projects include the installation of PV systems on buildings owned by local authorities, private businesses, and households, among others.

There are several types of renewable energy projects initiated in the Bedouin villages in the Naqab, among them:

1. Community-based solar energy projects in both unrecognized and recognized villages: "Bottom-up" projects.
2. Projects initiated by NGOs that target public needs. The most well-known is the *Saeed al Khroumi Initiative* or *Shamsuna* - an NGO that leverages solar energy projects to strengthen the Bedouin community by improving access to energy. One project aims to establish PV systems in schools, rather than the currently-used polluting generators.
3. Ground mounted solar fields - in places where there are no land disputes

This case study specifically focuses on the first type of project established by the Palestinian Bedouin community in an unrecognized village.

Renewable Energy in the Unrecognized Villages of the Naqab:

According to a survey conducted in 2020, 65% of energy needs in the unrecognized villages are met by off-grid solar energy. While this is perceived as an improvement over costly and polluting diesel generators, approximately 60% of Bedouin inhabitants report that the electricity generated from solar energy is insufficient for daily usage. And yet, solar energy systems have positively impacted the daily lives of the villagers. They enable activities such as studying at night, watching television, accessing mobile phones, refrigeration for food and medicine, and more. Solar energy provides a cleaner and more accessible source of electricity, offering extended hours of power during the evenings.

The utilization of solar energy in these unrecognized villages demonstrates the resilience and resourcefulness of the communities. The grassroots initiatives held by the people of the Naqab villages, provide a measure of energy independence and contribute to improving residents' living conditions and opportunities, even in the absence of government recognition and support.

Solar Energy Systems in Al Serra Unrecognized Village:

Al Serra village, established in 1927 in the northeastern Naqab, is currently home to approximately 500 Bedouin citizens. Traditionally, the Bedouin way of life did not heavily rely on electricity. Instead, indigenous knowledge was used to grow and preserve food, manage rainwater, and produce medicines using local plants. However, with the onset of modernization as well as oppressive Israeli policies that undermine the Bedouin traditional lifestyle, the need for electricity and running water in daily life became crucial.

The residents of Al Serra, like those in other unrecognized villages, face daily violations of their basic rights, including housing, water, electricity, sewage, health, planning, education, and transportation (Minority Rights Group International, 2011). To access clean water, the villagers had to privately connect their homes to a water pipe located 6 km away in the village of Kuseife, resulting in frequent water cutoffs. In terms of energy, in 1990, families in El Serra pooled their resources to purchase diesel power generators to produce electricity for the village. However, relying on generators had detrimental effects on the health, environment, and financial conditions of the villagers. They had to contend with the consequences of air and noise pollution, greenhouse gas emissions, and high expenses.

In 2003, the first solar energy system was installed on the roof of a house belonging to Khalil Alamouri, an activist from Al Serra village who initiated the project. Over the following years, many families followed suit, resulting in the village achieving 100% electricity production from PV systems and a storage system by 2023. According to Alamouri, despite the initial high expenses borne by the residents, transitioning to solar energy was a financially wise choice that saved costs associated with fossil fuels. The PV systems received no subsidies or formal support from the state but were made possible through private loans taken by the residents and aid from NGOs, facilitated by the drop in PV system prices in recent years.

Residents constantly monitor their electricity usage to match their needs and the system's capacity. Although this represents an improvement compared to their previous situation, the energy produced is significantly less than the average household consumption in Israel (which stands at around 8,000 kWh annually). For instance, households in Al Serra do not typically have electric ovens, electric kettles, washing machines, or air conditioners. Instead, they rely on natural gas for cooking and biomass (firewood) for heating. This suggests a relative energy poverty in the village compared to the national level in Israel.

Overall, the project exemplifies a community-based approach that reflects energy sovereignty. However, unrecognized villages continue to struggle for energy justice as part of their broader fight for justice. Such projects are often targeted and confiscated by Israeli authorities in all Palestinian villages in the Naqab, as part of the execution of demolition and eviction orders. For example, in 2019, the state demolished approximately 238 structures, including equipment, solar panels, and batteries, through enforcement procedures without a warrant (Negev Coexistence Forum for Civil Equality, 2020).

Analysis of the case in accordance of RES principles:

Criteria	**Solar Energy in the Palestinian unrecognized village "Al Serra" ,Naqab, Israel.**
Context	a community -based solar energy initiative in the Palestinian 'unrecognized village' *Al Serra* in the *Naqab* desert in Israel. The village is home to 500 indigenous Palestinians. The project was launched in 2003 by local activists, expanding to include the entire village and now reaching 100% reliance on solar energy. The village is off-grid, due to Israel's denial of its existence, having previously relied on diesel generators which have caused harmful effects in terms of pollution and noise.
	The project has been developed by the community gradually over the years, as each household installed the solar system separately, with the support of other families when needed. The people of Al Serra have gained the technical skills required to maintain the solar system. There was no financial support from any institutions, but some people had to take out loans.
Welfare orientation	The systems are owned by community members themselves, which has an important effect on their welfare.
Gender	Women in the village still hold the traditional roles in the household. With the SE systems they could rely on electronic devices, such as washing machines, reducing their daily work burden and maximizing time for other activities. Also, women have gained knowledge and skills in the operation and maintenance of the PV system.
Access	100% of households of the indigenous community in the village have no access to the Israeli electricity grid, like the other 36 unrecognized villages in the Naqab. Therefore, the citizens benefited from solar panels, which replaced the polluting installations used previously.
Spill-Overs	- A pre-nursery play group was opened to serve the families of the village, creating 2 jobs for teachers. - A guest house was opened, generating income for families and affording an opportunity to raise awareness about the status of the unrecognized villages. - There is a youth center that was initiated lately, which could be sustained thanks to the solar energy panels.
Flexible Energy Mix	The village relies solely on off-grid solar systems. The lack of alternative energy sources reduces its energetic resilience, leaving it vulnerable to extreme weather conditions such as severe dust storms.

Mitigation	The village fully (100%) relies on solar energy for daily life, thus there was a significant reduction in GHG emissions.
Ecology	The initiative started with a holistic ecological view, which aims to build a sustainable model addressing all aspects of daily life: reducing waste, separation of recyclable materials and composting organic waste, growing food gardens and raising chickens, sheep and goats, and using greywater for irrigation and for planting local trees.
Efficiency	People apply energy saving practices, monitoring and minimizing their electricity usage. The use of electronic devices is limited due to the limited electricity supplied by the solar panels, especially during night time. The residents therefore calculate their usage of electricity. For example, residents avoid using high-energy consuming devices, such as electric kettle and electric oven, thus relying only on gas for heating water and baking. Residents currently consider starting a dry toilet system which can also produce heat for cooking.
Sufficiency	Not relevant.

Main Findings and Recommendations from the Case Studies:

- Solar energy can play a crucial role in a Just Transition to a low-carbon economy if implemented effectively. To achieve this, the focus should be placed on establishing PV systems primarily within built areas, directly benefiting the residents of those areas. These benefits can include income generation, increased shading in public spaces, enhanced energy security and resilience, and more.

- Three different types of renewable energy (RE) projects were investigated. The first, *Hapais* project (project no. 1) offered governmental support to LAs, including better loan conditions and assistance from NGOs. This support encouraged many LAs to embark on RE production and uncovered various obstacles or uncertainties hindering these efforts, including the long-term maintenance of the systems.

- The Jaljulia model (project no. 2) bypasses the need for LAs to secure funds for energy production, efficiency, and system maintenance. However, the LA receives a smaller share of the profits, and it is yet to be seen if its interests are adequately addressed. The bottom-

up, self-organized model in the unrecognized villages in the Naqab addresses residents' basic energy needs and operates on 100% renewable energy (project no. 3). However, the energy produced falls short of meeting the electricity needs of the population.

The findings indicate that just models should address the following aspects:

1. Ensure equitable participation of all segments of the population in energy production and the benefits it generates.

2. Ensure that LAs/residents receive a fair share of the income generated by their assets.

3. Ensure long-term maintenance of the systems.
4. Build capacity within LAs to carry out future projects and actively participate in the transition.

5. Maximize potential for reduction of greenhouse gas emissions within LAs.

The following recommendations are relevant to places with statutory bodies such as LAs:

1. Governmental support is needed to enhance the economic viability of municipal PV projects.

2. Governmental incentives for LAs to promote PV projects, such as offering higher feed-in tariff for the electricity produced.

3. Simplify the bureaucratic process for approving financial contracts, particularly tenders related to energy independence.

4. Create support programs that build the capacities of weaker LAs in operating and maintaining solar energy systems (currently promoted by the Ministry of Energy).

5. Strengthen the role of civil society organizations in assisting weaker LAs by providing guidance, consulting, and support throughout the implementation of PV projects.

However, *in the case of unrecognized villages like Serra*, different recommendations are needed to ensure a just transition to renewable energy:

1. State recognition and compensation for historical injustices.

2. Political and financial support from state authorities to ensure energy security for all residents, even without recognizing the villages themselves. This includes support in funding and operating PV systems to meet basic energy needs.

3. Empowerment of local communities, including women, through supporting programs that build knowledge and skills in the operation and maintenance of PV systems, thus increasing their energy autonomy.

Conclusions and **Recommendations**

In addition to the conclusions and the recommendations presented in the previous sections, summarizes the main recommendations regarding NDC in future submission cycles focusing on transparency, effects and action.

General:

Establish supportive legislative framework and Independent court to strengthen climate transparency, effects and action.
Promote legislative framework (including the Climate Bill) that anchors Israel's targets and commitments regarding climate change.

In order to enhance transparency:

For the central government:

- Prioritize solar energy over fossil fuel sources, specifically gas sources, to drive transition to renewable energy

For civil society actors:

- Advocate for higher NDCs including higher renewable energy targets.
- Monitor the government's progress in the set goals.
- Assist in implementing local climate actions.

In order to enhance effectiveness:
For central government:

- Establish a coordinating body, such as the existing inter-ministerial committee, responsible for publishing information and reports
- Provide accessibility to relevant information in both Hebrew and Arabic.

For local authorities:

- Report on local climate actions

To promote just transition to Renewable energy:

- Identify and map all the populations that might be disproportionately affected by climate change and currently unable to benefit from the transition to a low-carbon economy. Develop plans to include them in the transition process.
- Recognize the role of NGOs representing marginalized communities, including the Arab community, in informing national policies about the specific needs, constraints, and strengths of their communities during the transition to a low-carbon economy. Establish long-term partnerships with these NGOs.
- Support bottom-up initiatives that empower local communities to actively participate in and benefit from the transition to renewable energy.

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