המשרד להגנת הסביבה
الوزارة لحماية البيئة
Israel Ministry of Environmental Protection

ISRAEL'S FIRST BIENNIAL UPDATE REPORT

SUBMITTED TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

DECEMBER 2015



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This report was prepared by the Ministry of Environmental Protection and EcoTraders Ltd on behalf of the Israeli government

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EXECUTIVE SUMMARY

The Government of Israel hereby submits Israel's First Biennial Update Report (BUR) on Climate Change as part of the country's reporting commitments under the United Nations Framework Convention on Climate Change (UNFCCC). Israel has been a party to the UNFCCC since 1996 and a party to the Kyoto Protocol since February 2004.

In accordance with Decision CP.17, the scope of BUR is to provide an update to the most recently submitted National Communication in the following areas:

- Information on national circumstances and institutional arrangements, relevant to the preparation of the national communications on a continuous basis;
- The national inventory of anthropogenic emissions by sources and removal by sinks of all greenhouse gases (GHGs) not controlled by the Montreal Protocol, including a national inventory report;
- Information on mitigation actions and their effects, including associated methodologies and assumptions;
- Constraints and gaps, and related financial, technical and capacity needs, including a description of support needed and received;
- Information on the level of support received to enable the preparation and submission of biennial update reports;
- Information on domestic measurement reporting and verification;

01

National Circumstances

Since publication of the Second National Communication in 2010, Israel has continued to experience strong economic growth and a rapid population increase relative to other OECD member states.

Israel's GDP grew by 3.8% annually over the 2010-2014 period, and in 2014 reached an all-time high, surpassing the NIS 1 trillion mark, or $268,537 million (2010 prices). GDP per capita also increased during this period at an average annual growth rate of 1.9%, reaching $32,700.

The unemployment rate in 2011 fell to 5.6%, increasing slightly to 5.9% in 2014. Further, Israel has maintained a surplus in its balance of payments since 2003. Despite a brief decline in 2011-2012, the surplus has since recovered, and was $11,234 million in 2014.

Israel's population has continued to grow at rates significantly higher than other OECD member states. Population grew at an average rate of 1.8% annually, to 8.3 million individuals by the end of 2014; this, in stark contrast to the average population growth in OECD countries, which was 0.7% over the period of 2005-2014.

Israel's population remains highly urbanized, with 91% of the population living in cities. The country's population density is 366 people/km^2.

The growth in population and GDP has led to an increase in both electricity consumption and generation capacity. Consumption grew 16% since 2008, reaching 56.9 million kWh in 2013, with peak demand increasing to 11,590 MW. Installed generating capacity at the end of 2014 was 15,581 MW, a 30% increase in installed capacity since 2008, with 580 MW of this from renewable sources (primarily PV).

Total water consumption in Israel in 2013 was 2,076 million cubic meters (MCM), or some 257 m^3 per capita. Approximately 25% of Israel's water consumption was sourced from treated effluents, used mainly in agriculture. Of the remaining water demand (approx. 1,500 MCM), 25% was supplied by desalinated water; desalinated water production, an energy intensive water production method, increased by 182% between 2007 and 2013, from 123 MCM to 347 MCM. The water production and supply sector is a large consumer of electricity, accounting for 4.2% of total electricity consumption in 2014.

The total number of vehicles in Israel increased by 24% between 2008 and 2013 to almost 3 million, of which 83% are private cars. Petrol remains the dominant fuel for private vehicles, with 96% of private vehicles powered by petrol in 2013 (down only slightly from 2008, when 97% of private vehicles were petrol vehicles). With respect to other vehicles (i.e taxis, buses, and trucks), the share of vehicles powered by diesel fuel has increased from 81% in 2008 to 88% in 2013.

In addition to strong economic growth and a growing population, an additional key development since publication of the Second National Communication has been the significant uptake of natural gas in both Israel's power sector and heavy industry. Total natural gas consumption has doubled since 2008 from 3.8 BCM to 7.5 BCM in 2014, almost exclusively locally extracted. The most significant uptake has been in the power sector; the share of natural gas in the generation fuel mix has increased from 26% in 2008 to 40.6% in 2013. In addition, heavy industry that connects directly to transmission infrastructure has already switched to natural gas; additional uptake in smaller factories and large commercial entities is expected in the coming years. The uptake of natural gas has both lowered production prices and reduced GHG emissions.

Israel is about 470 kilometers (km) in length and 135 km in width at its widest point. Just 22,000 km^2 in size, Israel nonetheless has a varied topography and climate. Arid zones comprise 45% of the area of the country, while the remainder is comprised of plains and valleys (25%), mountain ranges (16%), the Jordan Rift Valley (9%) and the coastal strip (5%).

Recent years have seen an increase in mean temperatures. The daily minimum and daily maximum temperatures for January and July were measured for six geographically-distributed cities. In all but one case, the average temperature was higher for 1995-2009 than for 1981-2000. The average changes in temperature for January were +0.5°C (daily lows) and +0.7°C (daily highs). The average changes in temperature for July were +1.1°C (daily lows) and +0.9°C (daily highs). In addition, in each of the cities measured, the average number of extreme hot days (days above 30°C) was greater for 1995-2009 than for 1981-2000.

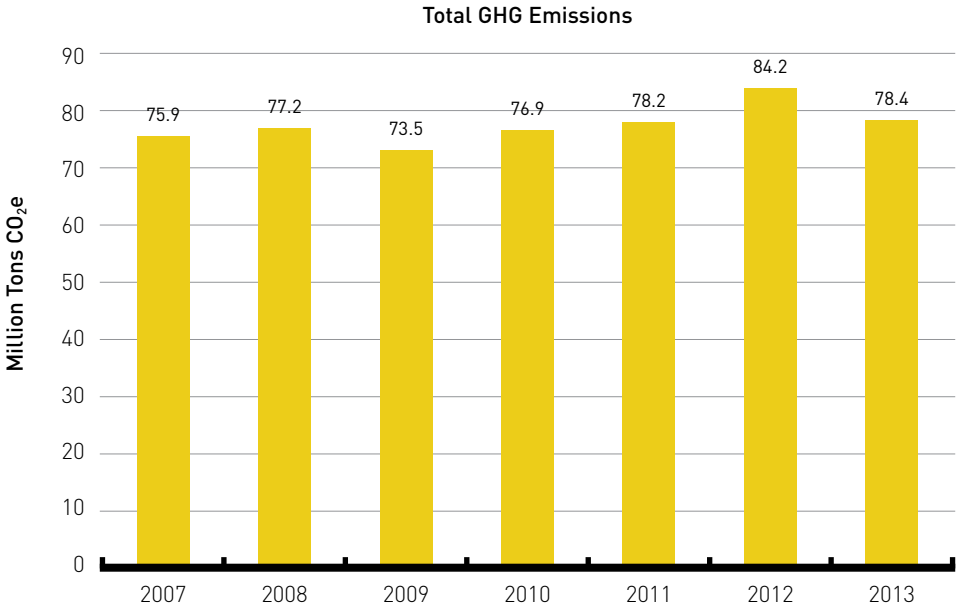
Finally, afforested land in Israel has increased by 17% between 2008 and 2014. Israel is one of the few countries in the world that has more trees now than it had a century ago.

02›
GHG Inventory

Israel's national greenhouse gas inventory includes emissions and removals of the three main greenhouse gases – carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) as well as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6), which have been included in the inventory since 2008. In addition, the inventory also includes emissions of indirect greenhouse gases which are precursors of tropospheric ozone – carbon monoxide (CO) and oxides of nitrogen (NO_x) – as well as sulfur dioxide (SO_2), an aerosol precursor which has a cooling effect on climate. While not included in the national inventory, the CBS also publishes data on international bunker (aviation and marine) emissions.

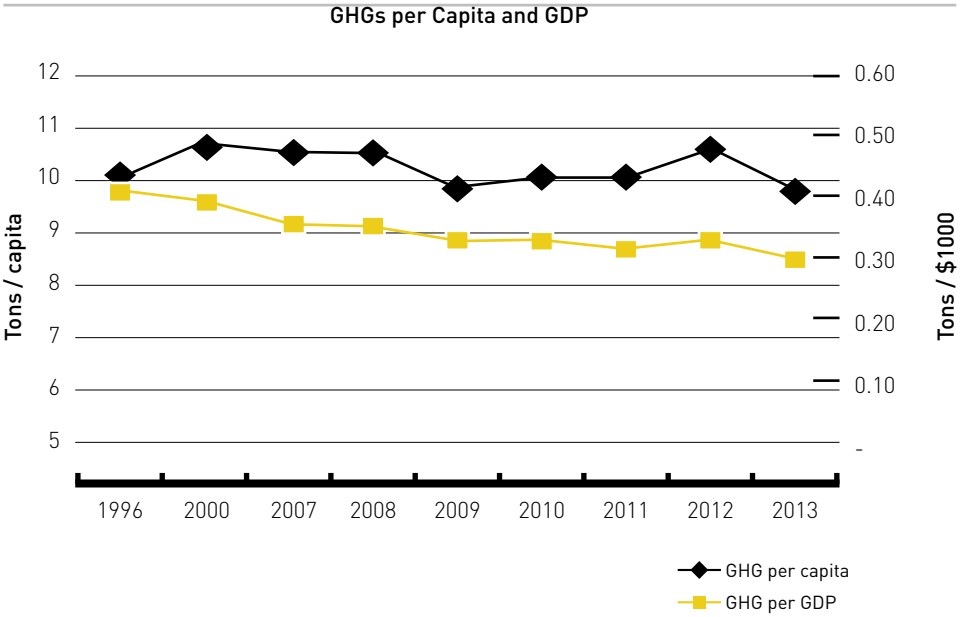
Total GHG emissions in Israel in 2013 were 78.4 million tons CO_2e, or 9.7 tons CO_2e per capita. GHG emissions decreased by almost 6 million tons CO_2e from the previous year, due primarily to a resumption in the supply of natural gas after a disruption in 2012, which resulted in an increase in diesel oil and fuel oil consumption in that year.

Figure 1 › Current and historical GHG inventory



Despite Israel's relatively high population and economic growth rates, GHG emissions have remained relatively stable in recent years. That is to say, GHG emissions intensity – in terms both of per capita emissions and emissions per unit of GDP – has steadily improved. In 2013, per capita and per GDP emissions were the lowest levels since the inventory was first published in 1996, reaching 9.72 tons per capita and 0.30 tons per $1000 GDP:

Figure 2 › GHG emission intensity



Fuel consumption represents the largest source of GHG emissions in Israel, accounting for 85% of Israel's total GHG emissions. The following sectors account for the highest proportion of each greenhouse gas:

- Carbon Dioxide (CO_2) – Energy industries (63%)
- Methane (CH_4) – Disposal of solid waste (77%)
- Nitrous Oxides (N_2O) – Agriculture (48%)

Total CO_2 removal from forests in 2013 was 380,000 tons, a decrease of 24.3% from 2007.

03

Mitigation Policies and Actions

As per Israel's Intended Nationally Determined Contribution (INDC), submitted to the UNFCCC on September 29th, 2015, the Government of Israel has approved an economy-wide unconditional GHG emission target of 7.7 tCO_2e per capita by 2030, which constitutes a reduction of 26% below 2005 levels of 10.4 tCO_2e per capita. An interim target of 8.8 tCO_2e per capita has been approved for 2025.

Under a Business As Usual (BAU) scenario, GHG emissions are expected to increase to 105.5 $MtCO_2e$ in 2030, or 10 tCO_2e per capita. Implementation of Israel's national target will result in a reduction of 23.85 $MtCO_2e$ in 2030 bringing total emissions down to 81.65 $MtCO_2e$.

Israel plans to reach its target through the following sector specific targets:

- Energy efficiency: 17% reduction in electricity consumption relative to BAU levels by 2030
- Renewable energy: Renewables will account for 17% of generation by 2030
- Public transport: 20% shift from private to public transportation.

The next steps and action plan to meet the above targets are as follows:

- **Energy efficiency:** The government approved a budget of NIS 800 million for various financial mechanisms that will be used to leverage private sector investments in energy efficiency. Other measures include the facilitation of construction of new buildings that will meet the Israeli green buildings standard and consideration of more stringent minimum efficiency standards for electric appliances.
- **Fuel switch:** The government is working to further increase the share of natural gas and biofuels in the electricity fuel generation mix, thereby reducing the GHG intensity of power generation. Among the measures that have been proposed are increasing the tax on coal in order to fully incorporate externality pollution costs, issuing power plant-specific emission limits, and co-firing of biomass in existing coal-fired units.
- **Renewable energy:** The government is working to remove bureaucratic, planning and other barriers in order to promote the renewable energy market, including investment in renewable energy installations, as well as additional tenders and quotas.
- **Clean-tech industry:** The government is working to develop an action plan to assist Israeli companies that develop cutting-edge technologies in energy conservation and management, renewable energy and storage and other relevant areas, in the development and demonstration of their solutions at proto-type and commercial-scale facilities.

In November 2010, the Government of Israel approved a target to reduce greenhouse gas emissions by 20% by 2020, relative to a business as usual (BAU) scenario, which was formally adopted following the Copenhagen Accord in 2009. Reducing emissions by 20% relative to a BAU scenario translates into an emissions target

of 87.2 MtCO_2e in 2020. In addition, the government separately approved two key supporting targets, namely a 10% renewable energy target for electricity generation, and 20% reduction in electricity consumption, both to be reached by 2020.

As part of the GHG emission reduction target, the government established and approved a National GHG Emissions Reduction Program which was budgeted at NIS 539 million (about $138 million) for the years 2011-2012. In 2015 the program was replaced with Israel's updated GHG reduction targets.

Between 2010 and 2014, major actions were undertaken in Israel to reduce GHG emissions, both within the context of the National GHG Reduction Program as well as within the context of additional government decisions and initiatives. These actions can be categorized into the following fields:

- **Energy efficiency –** Israel has reduced electricity consumption by 6% relative to business-as-usual levels projected in 2010, through a combination of scrapping programs, government grants, and more stringent efficiency standards:
  - **Scrapping programs**: Approximately NIS 200 million were invested in household appliance scrapping programs, with estimated electricity savings of 265,000 MWh/year, equivalent to GHG emission reduction of approximately 183,000 tCO_2e in 2014.
  - **Government grants**: An energy efficiency and GHG emission reduction grants program was implemented over 2011-2013, providing grants to 206 energy efficiency projects estimated to reduce electricity consumption by 265,000 MWh in 2020, resulting in a GHG emission reduction of 442,000 tCO_2e in 2020. The program distributed NIS 106 million of government grants, leveraging a further NIS 471 million of private investment.
    In addition, as part of ongoing activities for energy conservation in the private and municipal sectors between 2011 and 2014, approximately 270 projects received a total of NIS 47 million in government grants, leveraging a further NIS 201 million in energy efficiency investments. These projects reduced electricity consumption by 140,000 MWh/year, resulting in an annual emissions reduction of approximately 96,000 tCO_2e.
    Grants were also provided for implementing energy efficiency audits in factories and SMEs, to identify and quantify potential energy efficiency improvements.
  - **Efficiency standards:** Energy efficiency has been achieved through updating minimum efficiency standards. Stricter standards for commercial chillers and for light bulbs yielded an estimated electricity savings of 93,000 MWh (approximately 64,000 tCO_2e) and 152,000 MWh (approximately 105,000 tCO_2e) per year, respectively.
- **Renewable Energy –** Israel has increased its renewable electricity generation share to approximately 1.8% in 2014, reducing GHG emissions by approximately 758,000 tCO_2e. Israel is currently promoting renewable electricity generation

through the following primary policy tools:

a. Fixed feed-in tariffs: Approval of fixed tariffs for specific technology types and scale, and which are valid for set time periods and capacity quotas.

b. Direct land tenders: Tendering process for the construction of renewable energy plants at pre-approved sites.

c. Net metering: Power plants (up to 5MW each) are established by energy consumers, and the monetary value of the generated electricity is used to offset the electricity bill.

- **Natural Gas Fuel Switch –** The share of natural gas in the electricity generation fuel mix has increased to over 40%, with an estimated savings of approximately 2.35 million tCO_2e in 2013. In addition, heavy industry has also switched to natural gas. Finally, the government has provided NIS 20 million in grants to factories in order to help defray conversion costs, while factories have invested a further NIS 100 million.
- **Waste –** Israel is experiencing a Recycling Revolution. The government has invested over NIS 1 billion in grants to municipalities for the construction of infrastructure including facilities for waste separation at the source, construction of new sorting facilities, and construction of end-use facilities (such as anaerobic digesters). Currently, 20% of solid waste is recycled, with a target in place to reach 50% recycling of solid waste by 2020. Additionally, 450,000 households, or 20%, separate their waste at the source. These measures decrease the percentage of total waste that reach landfills, leading to a reduction in the amount of methane released from waste.
- **Transportation –** The Government of Israel has implemented green taxation for vehicle purchases, a differential purchase tax based on vehicle emissions. Green taxation, along with updated vehicle standards, has reduced annual emissions from new vehicles purchased in 2014 by an estimated 164,000 tCO_2e. The government is also spending large sums to increase public transportation, especially in metropolitan areas; the government budget for mass transit projects in metropolitan areas was NIS 1.7 billion in 2014.

The following table summarizes Israel's progress in meeting its key 2020 targets described above:

Table 1 › Israel's progress in meeting its 2020 key targets

National Target	Latest Reported Value and Year	Target Value (2020)
National GHG Emission Reduction Target	78.4 $MtCO_2e$ (2013) 80.2 $MtCO_2e$ (2014, estimated[1])	87.2 $MtCO_2e$
National Energy Efficiency Target	5.9% (2014)	20%
National Renewable Energy Target	1.8% (2014)	10%

(1) This value is a Ministry of Environmental Protection estimated value developed as part of determining Israel's 2030 GHG emission target. This estimate was not developed by the CBS, charged with Israel's official GHG inventory, nor is it based fully on monitored activity data.

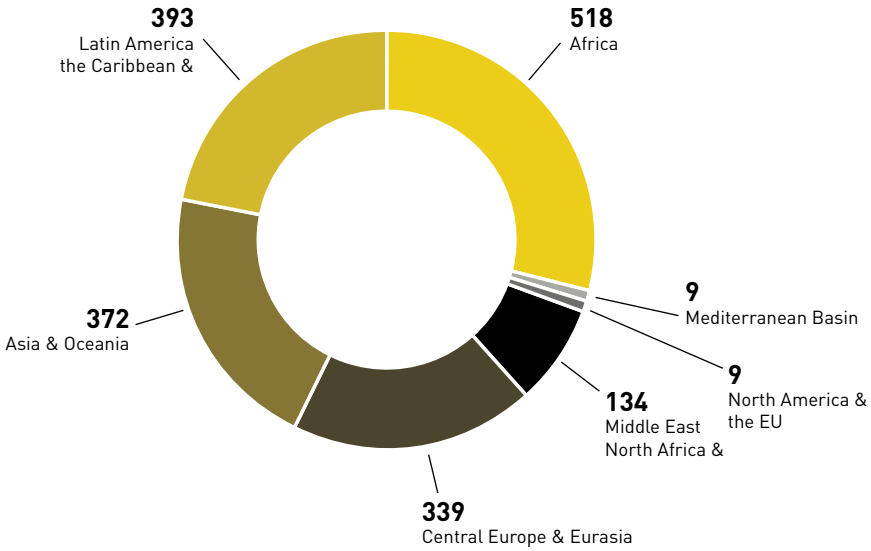
04

Financial, Technology, and Capacity Building Needs and Support Received

Despite its status as a non-Annex I country, Israel is an OECD member state, and receives little climate change related international aid. Israel provides aid to a number of countries and is actively involved in the international climate community. Israel also participates in a number of international protocols and conventions.

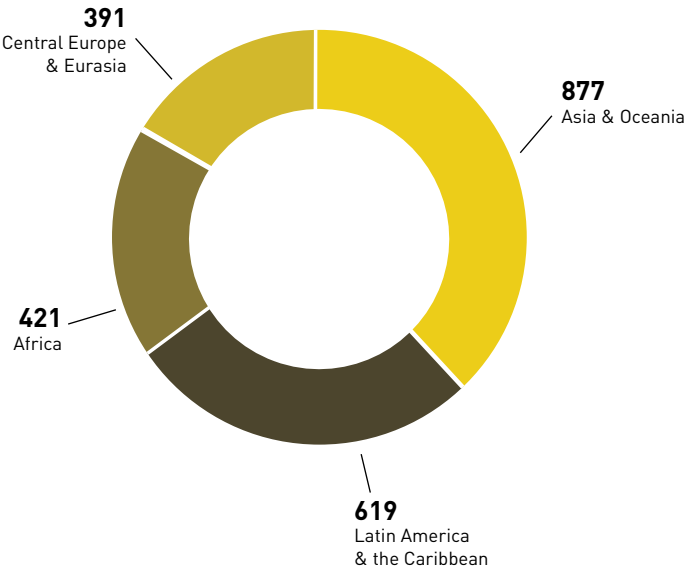
Additionally, Israel participates in technology transfer and international development activities, bilateral climate cooperation activities, and international cooperation on climate change. MASHAV, Israel's Agency for International Development Cooperation, which is a division of the Ministry of Foreign Affairs, and The Keren Kayemeth Le-Israel – Jewish National Fund (KKL-JNF), a non-profit, quasi-governmental organization, provide these programs and projects, hosting projects and workshops both locally and abroad. Many countries have benefited from the State of Israel's international humanitarian aid and technological transfers. In 2014, 1,774 participants partook in activities in Israel, with agricultural and educational courses attracting the greatest number of participants:

Figure 3 › Participants in MASHAV courses in Israel by region



In addition, 2,308 professionals took part in 44 in-situ courses offered in a total of 22 host countries in 2014. As with courses taking place in Israel, agricultural courses attracted the greatest number of participants in courses abroad:

Figure 4 › Participants in MASHAV abroad courses by region



CHAPTER 1:

NATIONAL CIRCUMSTANCES

The following table summarizes key economic, demographic, and geographic figures for the state of Israel. The last year for which data was included in the National Communication (NC) was 2008. As with other charts in this report, data from the last year reported in the NC has also been included here as a reference, alongside updated figures up to and including the most recent year reported:

Table 2 › Key data

	2008	2009	2010	2011	2012	2013	2014
Population (at end of year) (thousands)	7,419.1	7,552.0	7,695.1	7,836.6	7,984.5	8,134.5	8,296.9
Population density per square kilometer[2]	323.1	328.7	334.5	347	353.1	359.4	366.2
Area (square kilometers)	22,072	22,072	22,072	22,072	22,072	22,072	22,072
GDP (million $) (2010 prices)[3]	219,641	222,427	234,699	246,504	253,604	261,849	268,537
GDP (PPP, million international $) (2011 prices)[4]	208,775	212,730	224,963	234,391	241,413	249,225	256,151
GDP per capita (million $) (2010 prices)	29,879	29,728	30,797	31,753	32,072	32,504	32,700
Land area used for agricultural purposes (square kilometers)	2,892	2,948	2,832	2,892	2,983	2,923	3,098
Urban population as % of total population	91.1	91.7	91.6	91.4	91.4	91.4	91.2
Livestock population: Laying hens (thousands) Cattle (thousands)	8,000 416	8,972 400	9,005 421	9,418 442	8,994 435	9,113 465	8,865 461
Total planted forest area (thousand dunams)[5]	980	1,024	1,036	1,057	1,107	1,118	1,126
Afforested area (total)	840	875	880	899	934	968	980
Coniferous	498	495	495	497	490	490	490
Thereof: Pines	409	410	413	414	408	409	407
Thereof :Cypress	31	31	32	32	31	31	31
Eucalyptus	81	81	82	85	83	84	83
Other species total	262	299	302	317	361	394	407
Broadleaves & orchards	122	128	135	141	148	150	156
Natural groves & shrubs	81	113	109	118	154	185	192
Unemployment rate (%)	6.1	7.5	6.6	5.6	6.9	6.2	5.9
Life expectancy at birth (years) Male Female	79.1 83.0	79.6 83.3	79.7 83.6	79.9 83.5	79.9 83.6	80.3 83.9	80.3 84.1

(2) Area used for calculating population density excludes lakes and other water bodies, which are included in Israel's 22,072 km^2 of area

(3) Monthly average exchange rate for 2010 was 3.733 NIS/$ according to the Bank of Israel. Original data provided in NIS (2010 prices).

(4) Data from The World Bank - http://data.worldbank.org/indicator/NY.GDP.MKTP.PP.KD

(5) Total planted forest area refers to forest area handled by the Jewish National Fund (JNF), and excludes natural forests.

Source: CBS, unless otherwise noted

01

Government Structure

Israel is a parliamentary democracy consisting of legislative, executive and judicial branches. The Knesset (parliament), the government (cabinet of ministers) and the judicial system are the main bodies.

The cabinet of ministers is the main body concerned with policymaking. The ministries are as follows:

- Agriculture and Rural Development
- Communications
- Construction and Housing
- Culture and Sport
- Defense
- Diaspora Affairs
- Economy
- Education
- Environmental Protection
- Finance
- Foreign Affairs
- Health
- Immigration and Absorption
- Information
- Intelligence and Atomic Energy
- Internal Affairs
- Jerusalem Affairs and Heritage
- Diaspora Affairs
- Justice
- National Infrastructures, Energy and Water Resources
- Public Security
- Regional Cooperation
- Religious Services
- Science, Technology, and Space
- Social Equality
- Strategic Affairs
- The Development of the Negev and Galil
- Tourism
- Transportation and Road Safety
- Welfare and Social Services

The most important ministries for climate and the environment are the Ministries of Environmental Protection (MoEP), National Infrastructures, Energy, and Water Resources (Ministry of Energy), Transport, Agriculture and Rural Development, and Finance.

The MoEP was established in 1988 and currently has around 600 employees. It works at the national, district, and local levels to create integrated and comprehensive government policy aimed at protecting the environment. Natural resource protection, education, industry and licensing, waste, enforcement, and planning and policy are the main focuses for the MoEP. Since 2010, a number of laws have been passed that are pertinent for climate and the environment. These include setting limits on asbestos and harmful dust, defining responsible parties for packaging waste, and establishing protocol for the disposal of electrical equipment and batteries. Israel has also passed government decisions regarding climate change, which will be discussed in greater detail in Chapter 3 - Mitigation Policies and Actions. The MoEP is Israel's representative to the UNFCCC.

The Ministry of National Infrastructures, Energy, and Water Resources is responsible for the energy sector and national resources of the State of Israel, including: electricity, fuel, cooking gas, natural gas, energy conservation, water, oil and gas exploration, soil and marine research and more. Energy and water efficiency, as well as energy security and reliability, are priorities for the Ministry, and are achieved through legislation, regulation, and various demand reduction and management projects. For example, the Ministry cooperates with the Standards Institution of Israel to promote energy efficiency standards for electric appliances and energy consuming equipment.

Among its wide range of tasks, the Ministry of Agriculture and Rural Development oversees forestry initiatives, which contribute to climate change mitigation. The Agricultural Research Organization and other branches of the Ministry of Agriculture and Rural Development work to improve irrigation technologies and water-limited agriculture in arid areas.

With regard to climate and energy, the Ministry of Finance is involved in levying taxes on fuels, vehicles, and water extraction. The Ministry is actively involved in governmental policy-making with regards to the fuel economy and to competition enhancement.

The Central Bureau of Statistics (CBS) is responsible for collecting and publishing data from the public and business sectors, while ensuring it safeguards the confidentiality of the data it collects. The CBS publishes an annual Greenhouse Gas Inventory and related information, and was instrumental in providing needed information for the formulation of the National Reduction Target as well as preparation of this report. It also is also expected to be an important partner in Israel's national Measurement, Reporting and Verification (MRV) system.

Israel has been an OECD member since 2010. Since 2003, OECD government ministries have been required to prepare sustainable development strategies. This requirement has helped to raise awareness within the ministries of how ministry policy might negatively impact the environment, and how these impacts can be mitigated[6].

(6) http://www.oecd.org/env/country-reviews/oecdenvironmentalperformancereviewsisrael2011assessmentandrecommendations.htm

02

Climate

Israel is a small country, but temperature and rainfall vary greatly across the country. The south of Israel is characterized by desert, which is inherently hotter and drier. Mean annual rainfall in Israel (1981-2010) varied in the six major cities from 22 mm in Eilat (south) to 671 mm in Zefat (north). Similarly, the number of mean annual rainy days is lowest in Eilat (10) and highest in Zefat (74). Haifa, Tel Aviv, and Jerusalem are located in the middle of the country above the desert and therefore have relatively high annual rainfall (537-583 mm) and mean annual rainy days (56-61). Beer Sheva is further south and in the desert and experiences an annual rainfall of 195 mm and 41 mean annual rainy days.

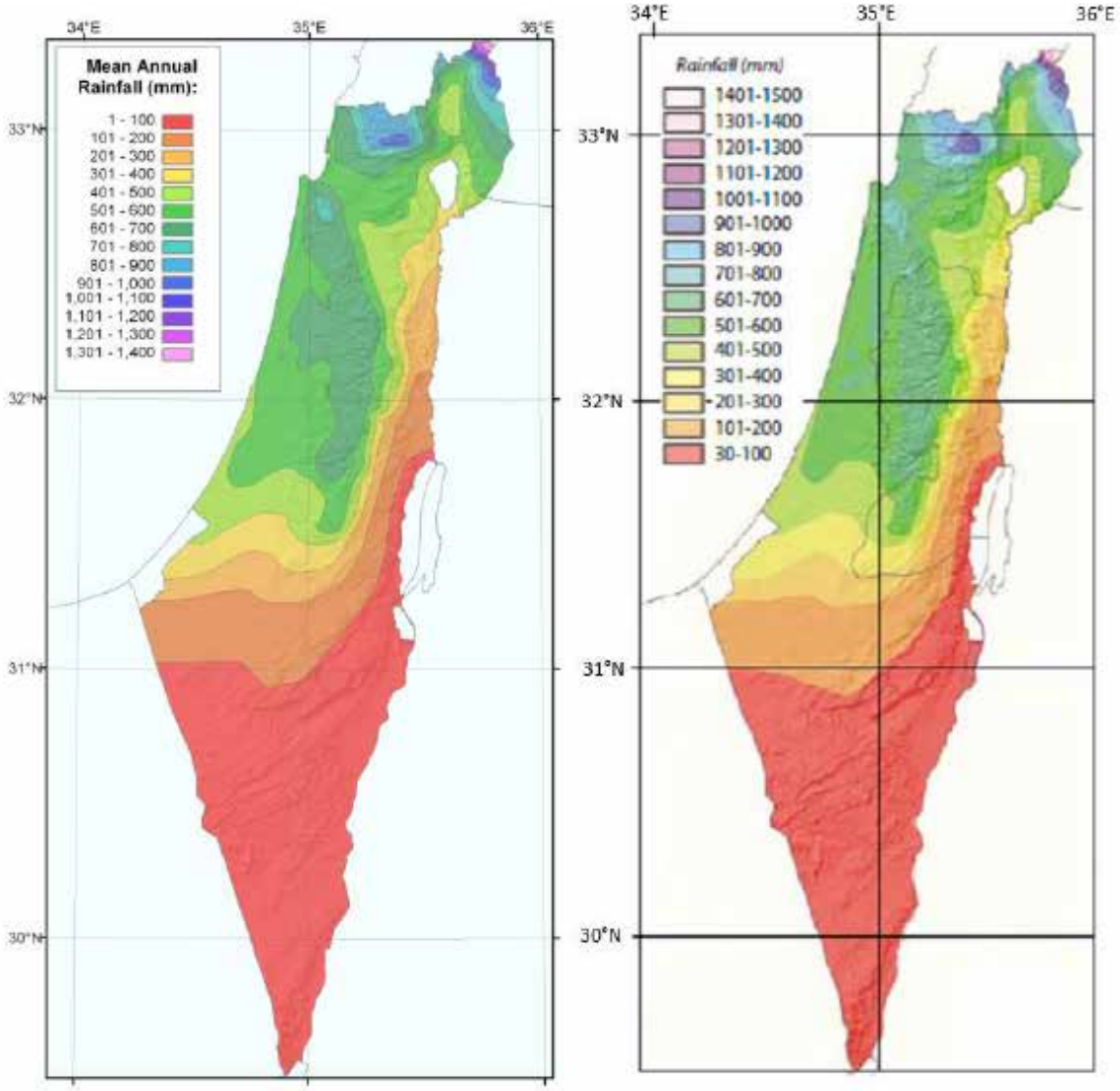
Table 3 › Mean rainfall in major cities/regions

Region	Mean annual rainfall (mm) (1981-2010)	Mean annual rainy days (1981-2010)
Zefat	671	74
Haifa	539	61
Tel Aviv	583	56
Jerusalem	537	60
Beer Sheva	195	41
Eilat	22	10

Source: Israel Meteorological Service

Average precipitation has not varied much since 2010. Israel's precipitation map for 1981-2010 looks much like it did for 1961-1990, as can be seen from the maps below. Average annual rainfall for 1981-2010 is shown on the left and average annual rainfall for 1961-1990 on the right:

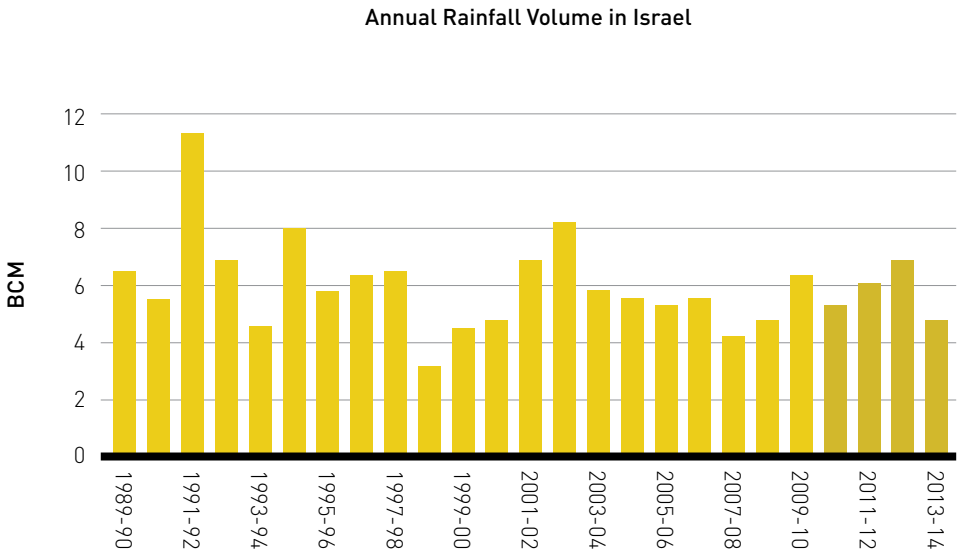
Figure 5 › Precipitation map, average annual rainfall



Source: Israel Meteorological Service

The average annual rainfall volume in the period 1990-2010 was 6.0 BCM. Average annual rainfall over the period 2011-2014 has been slightly lower, at 5.74 BCM.

Figure 6 › Annual Rainfall Volume in Israel (BCM), red bars show data since 2010



Source: Israel Meteorological Service

Mean temperatures have increased in nearly all cities. The daily minimum and daily maximum temperatures for January and July were measured for six geographically-distributed cities. In all but one case, the average temperature was higher for 1995-2009 than for 1981-2000. The average changes in temperature for January were +0.5°C (daily lows) and +0.7°C (daily highs). The average changes in temperature for July were +1.1°C (daily lows) and +0.9°C (daily highs).

Table 4 › Mean temperatures (°C) in major cities

Station	Average monthly temperature							
	January				July			
	Min (1981-2000)	Min (1995-2009)	Max (1981-2000)	Max (1995-2009)	Min (1981-2000)	Min (1995-2009)	Max (1981-2000)	Max (1995-2009)
Jerusalem	6.4	6.9	11.8	12.8	19.4	20.2	29.0	30.0
Tel Aviv	9.6	10.2	17.5	17.6	23.0	24.2	29.4	29.9
Haifa	8.9	10.0	17.0	17.8	23.0	24.4	31.1	31.6
Zefat	4.5	5.1	9.4	10.2	18.8	19.9	29.8	30.7
Beer Sheva	7.5	7.1	16.7	17.7	20.5	21.3	32.7	34.7
Eilat	9.6	10.4	20.8	21.3	25.9	27.3	39.9	40.4

Source: Israel Meteorological Service

In each of the six cities measured, the average number of extreme hot days (days above 30°C) was greater for 1995-2009 than for 1981-2000. The increase ranged from 5 days in Eilat (south) to 29 days in Beer Sheva (south-central). The reverse trend occurred for the average number of extreme cold days (days below 10°C): the average number of days below 10°C was less for 1995-2009 than for 1981-2000. Tel Aviv and Haifa (central, coastal cities) each had an average of 20 fewer days below 10°C, while there were 15 fewer days below 10°C in Eilat, and 7 in Jerusalem.

There have been several specific extreme events in Israel in the past few years. Winter 2013-2014 was unusually cold. Winter storm Alexa hit the Middle East in December 2013 and was the worst storm the region has seen in 60 years.[7] In some regions of Israel, snowfall was up to 70 cm. In Jerusalem, snow accumulated to a height of 40 to 60 centimeters, breaking the Jerusalem snowfall record set in 1879.[8] The unexpected snowfall left many without electricity.

In August 2015, a heat wave stuck across the Middle East, causing Israel to experience extremely high temperatures. Temperatures in the Jordan Valley were reported to reach 49°C.[9] This led to an increase in peak electricity use, and set a new peak record of 12,800 MW.[10] According to the Israel Meteorological Service, August 2010 and August 2015 were the two hottest months in the past 75 years.[11]

Table 5 › Average number of days with temperatures above 30°C and below 10°C in major cities

Station	Average number of days with temperature			
	Over 30°C (1981-2000)	Over 30°C (1995-2009)	Under 10°C (1981-2000)	Under 10°C (1995-2009)
Jerusalem	44.0	59	116	109
Tel Aviv	41.0	55	52	32
Haifa	87.0	95	67	47
Zefat	51.0	61	146	142
Beer Sheva	126.0	155	102	101
Eilat	202.0	207	44	29

Source: Israel Meteorological Service

(7) http://www.theguardian.com/weather/2013/dec/13/middle-east-snow-storm-alexa

(8) http://www.kkl.org.il/eng/about-kkl-jnf/green-israel-news/december-2013/rescue-storm-alexa-israel/

(9) http://www.haaretz.com/israel-news/1.671439

(10) http://news.walla.co.il/item/2878598 (Hebrew)

(11) http://www.ynetnews.com/articles/0,7340,L-4696627,00.html

03

Demography

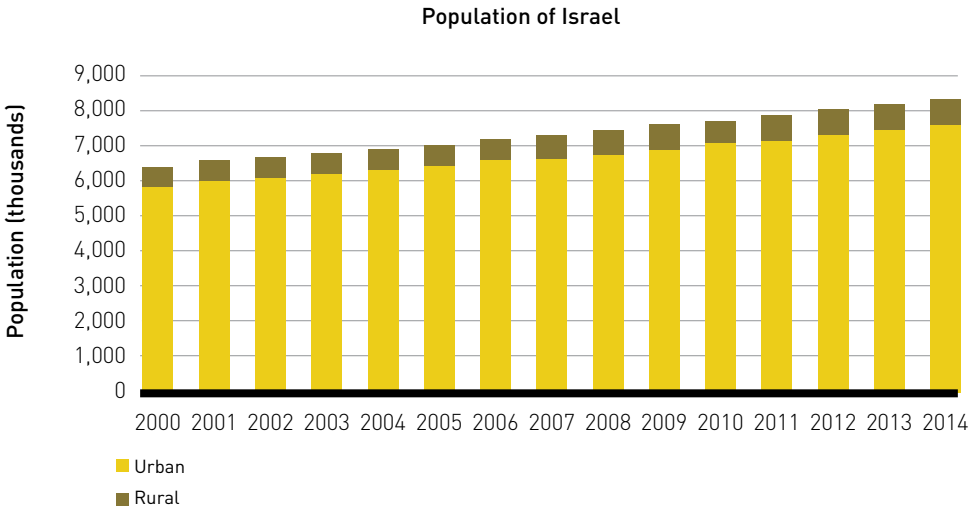
Rising steadily since the year 2000, Israel's population reached 8.3 million in 2014. The average annual growth rate for 2009-2014 was 1.9%, which is consistent with the average annual growth rate for 2000-2008. By comparison, the average annual growth rates of all 34 OECD countries over the period of 2005-2014 was 0.7%.

Table 6 › Population and growth rate

	2008	2009	2010	2011	2012	2013	2014
Population (thousands, end of year)	7,419.1	7,552.0	7,695.1	7,836.6	7,984.5	8,134.5	8,296.9
Growth rate (%)	-	1.79	1.89	1.84	1.89	1.88	2.00

In 2014, 91.25% of the Israeli population lived in urban localities, with little change over the last decade. The largest cities by population are Jerusalem (849,800), Tel Aviv (426,100), and Haifa (277,100). All three major cities have grown slightly since 2008; Jerusalem, Tel Aviv, and Haifa grew by 90,100, 23,500, and 12,800 residents, respectively. Israel is known for its kibbutzim and moshavim, rural cooperative communities that are often agriculturally-based. Inhabitants of kibbutzim and moshavim made up 5.73% of the population in 2014, while the remaining 3.02% of the population lived in other rural localities. The percentage of people living on kibbutzim and moshavim has increased slightly from 2008, when it accounted for 4.9% of the population.

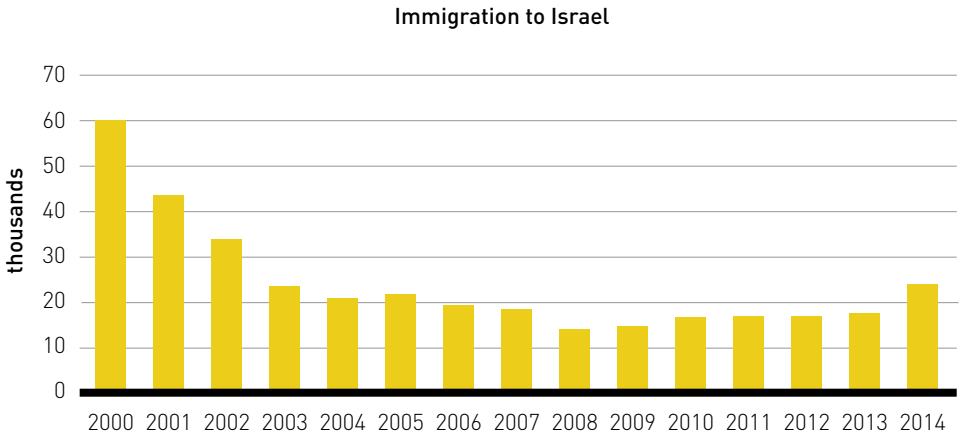
Figure 7 › Population, by locality



Source: CBS

Immigration to Israel fell from approximately 200,000 in 1990 to just 13,701 in 2008; thereafter, immigration remained relatively constant, before increasing to 24,112 in 2014. Average annual immigration over the past decade (2005-2014) was 17,800.

Figure 8 › Immigration



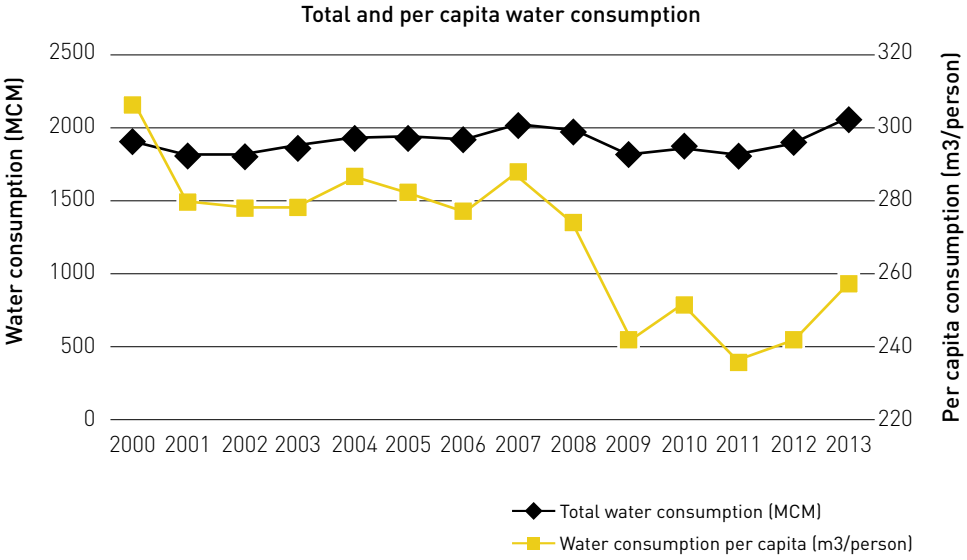
Source: CBS

The increase in population and growth of major cities drove a 13.3% increase in Israel's average population density (from 323 people per km^2 in 2008 to 366 people per km^2 in 2014), with the population density in the two central cities of Tel Aviv and Jerusalem reaching 7,841 people/km^2 and 1,584 people/km^2 in 2014, respectively, an increase of 7% in Tel Aviv and 14% in Jerusalem since 2008.

04›
Water Resources

Total water consumption in Israel has remained generally stable in recent years, and in 2013 was 2,076 million cubic meters (MCM) (an increase of approximately 8% since the year 2000). Water consumption per capita fell significantly over the 2007-2009 period (decreasing by approximately 16%), and in 2013 was 257 m^3 per capita.

Figure 9 › Water consumption



Source: CBS

This reduction is likely linked to the nationwide multi-media awareness campaign that the Israeli Water Authority launched in 2008. The goal was to convince citizens to reduce water consumption by emphasizing the severe depletion of Israel's water resources. The campaign reached citizens through television, radio, newspaper, and the internet. While the cost-effectiveness (cost relative to volume of water saved in that year) of the campaign was US $0.10/$m^3$, the conservation mentality has been engrained, and the public continue to conserve water even though the campaign has ended.[12]

According to the Water Authority, approximately 25% of the water supply is recycled water from treated wastewater, of which the vast majority is used in agriculture. Of the remaining water supply, 50% is from groundwater, 25% from surface water, and 25% from desalination. In 2006, as reported in the NC, 59% was supplied from groundwater, 33% from surface water, and just 8% from desalination.

Desalination increased 182% between 2007 and 2013, from 123 MCM to 347 MCM. Electricity consumption in the water production and supply sector in 2008 accounted for 5.5% of the total electricity consumption for Israel, with this share remaining steady through 2013, before declining to 4.2% of total electricity consumption in 2014. Israel is also the world leader in water recycling, recently achieving a 75% recycling rate.

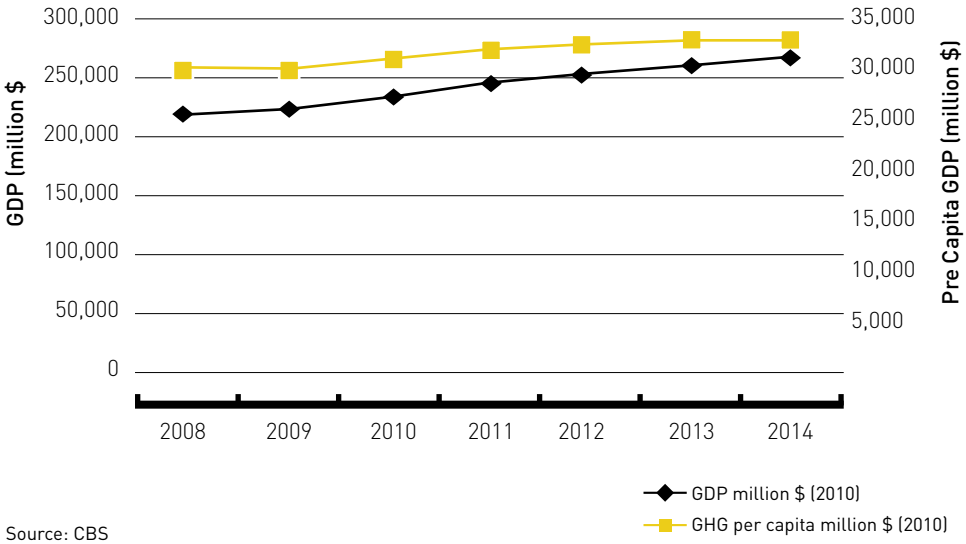
(12) The State of Israel: National Water Efficiency Report, Water Authority, 2011

05

Economy

From 2004 to 2007, Israel experienced rapid economic growth (average annual rise in GDP of 5.4%) unseen since the early 1970s. Despite the economic crisis of 2008-2009 when GDP growth fell to just 1.3% in 2009, Israel's growth has continued to be positive, and over the period 2010 - 2014 the country has experienced average annual growth of 3.8%, amounting to a total GDP growth of 14.4% for that period. Per capita GDP growth in 2010-2014 was 1.9% per year on average.

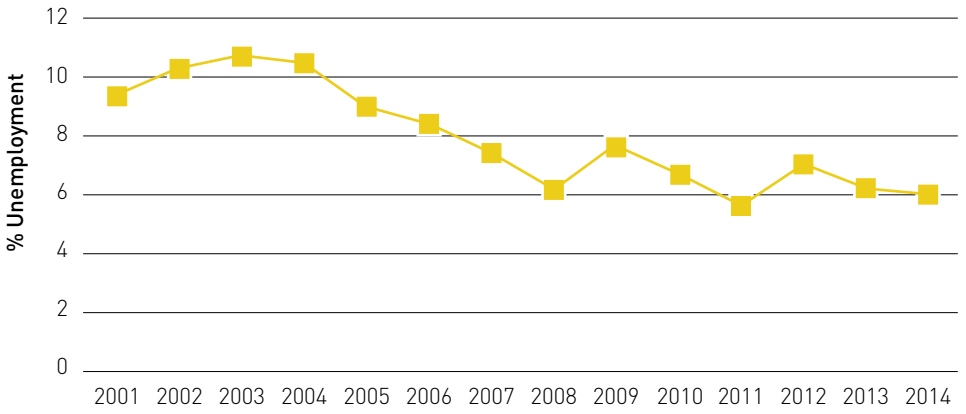
Figure 10 › Trends in per capita and real GDP (2010 prices)



Source: CBS

One of the key drivers for this recent economic growth has been the falling unemployment rate. Israeli unemployment is near its lowest levels in the past decade; falling to just 5.9% in 2014.

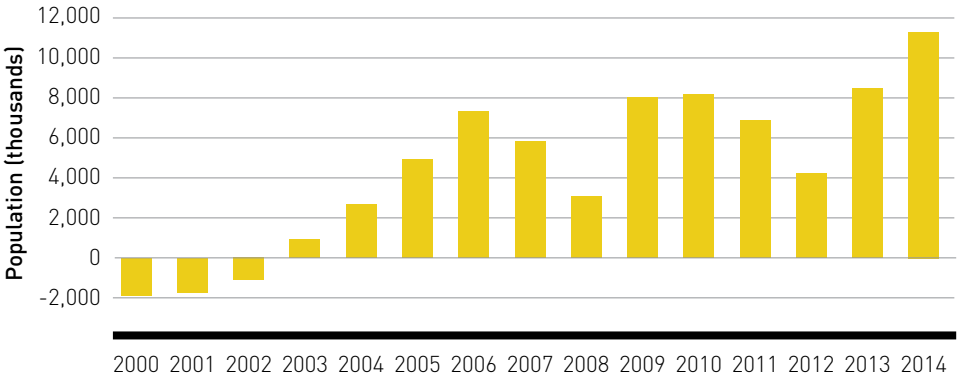
Figure 11 › Unemployment rate



Source: CBS

A small economy with a relatively limited domestic market, Israel cannot significantly expand its economy without increasing exports. Israel's balance of payments has shown an annual surplus since 2003, with 2010 featuring an historic high with a surplus of $8,139 million. Between 2010 and 2011, Israel's surplus declined 16% to $6,831 million, and declined a further 38% in 2012. 2013 and 2014 showed significant recoveries, reaching a new all-time high of $11,234 million in 2014.

Figure 12 › Balance of Payments



Source: CBS

Exports of goods and services grew 18% between 2008 and 2014. Goods and services combined have helped to increase economic growth, but exports of goods actually declined by 3.4% in 2012. Exports returned to positive growth in 2014 (1.1%). The growth in export of services has made up for the small decline in the export of goods; exports of services rose 12% in 2012, after increasing 16% in 2011.

The manufacturing industry (including high-tech) is key to Israel's economy. In 2014, 14% of total employees in Israel worked in the manufacturing industry. Its share of the net DP was around 12.4% (at 2010 prices) and the share of total exports of services and goods was 51%. While high-tech has seen gains, these metrics for the manufactuing industry have all declined since 2008 as follows: employees working in the manufacturing industry fell from 16% in 2008 to 14% in 2014, manufacturing's share of the net DP declined from 15.6% in 2008 to 12.4% in 2013, and manufacturing's share of total exports of goods and services declined from 65% to 51%.

Israel exports to countries on all six continents. Israel's main export destinations are the European Union ($15.2 billion in 2013), the United States ($10.3 billion in 2013), and Asia ($10.0 billion in 2013). Exports to other regions were less than $5 billion each. The US market has been affected in recent years by a decrease in pharmaceuticals exports. Meanwhile, increases in electronics and chemical exports have helped to bolster exports to Asian markets. While Israel has seen moderate growth or decline in most markets, exports to Turkey increased 79% in 2013, due in large part to exports of oil distillates and chemicals. [13]

In 2014, China surpassed the US in imports (by country of origin) to Israel. In 2002 China represented 3.2% of imports and the US held 19.0%, while in 2014 China represents 12.8% and the US just 11.7%. Germany, Belgium, Italy, Turkey, India, Russia and Switzerland held the next largest shares of imports to Israel.[14]

Overall, the growth in Israeli exports can be linked almost entirely to the growth of the 10 biggest exporters. In 2013, these large companies accounted for more than half of exports (excluding diamonds), up from 42% in 2008. Between 2008 and 2013, total exports of the ten biggest exporters grew by 36.5% in dollar terms, reaching $23.9 billion. In contrast, exports of other exporters fell 3.2%, to $23.4 billion.[15]

As can be seen below, the share of domestic product (DP) of most sectors has remained largely unchanged over the period 2008-2014. Notably, the electricity and water supply, sewage, and waste management sector declined from 1.5% to 0.8% of DP from 2010-2014, a 48% decrease. In the same time period, financial & insurance; real estate; professional, activities scientific & technical; administrative & support service sectors gained 20% (20.6% to 24.8% of DP); while human health and social work activities lost 28% (6.8% to 4.9% of DP). Total domestic product grew 7% from 2008-2010, and grew a further 10% from 2011-2014.

It should be noted that, from 1993-2010, economic activities were classified based on the United Nations International Standard Industrial Classification of All Economic Activities Rev. 3 (1993 Classification). When the UN updated its Standard in 2011, Israel followed suit and changed its classification system. An effort was made to adapt categories of activities in the 1993 Classification to fit as closely as possible to the 2011 Classification, so as to minimize the effect of these methodological changes. However, some categories now include additional sub-sectors that were not included before, and vice versa. Therefore, in order to present updated data, the data is presented in two tables, one for 2008-2010 (old classification, and one for 2010-2014 (new classification).

(13) Developments and Trends in Israeli Export, Israel Export and International Cooperation Institute, March 2015

(14) CBS press release, http://www1.cbs.gov.il/www/hodaot2015n/16_15_138e.pdf

(15) Developments and Trends in Israeli Export, Israel Export and International Cooperation Institute, March 2015

Table 7 › Share of domestic product (2005 prices) by industry for 2008-2010 according to 1993 classification

	Year (Reporting Year)		
Classification	2008 (2010)	2009 (2012)	2010 (2012)
Agriculture, forestry and fishing	1.7	1.9	1.6
Manufacturing	15.0	14.3	14.7
Electricity and water	1.6	1.8	2.4
Construction (building and civil engineering projects)	5.1	5.1	5.3
Commerce, restaurants and hotels	11.1	11.1	11.3
Transport, storage and communications	7.8	7.5	7.5
Thereof: Communications	2.9	3.7	3.5
Finance and business services	25.3	25.3	25.1
Housing services	9.6	9.7	9.4
Public administration	7.4	7.4	7.0
Education	7.8	7.9	8.0
Health, welfare and social work	7.0	7.0	6.5
Personal and other services	4.0	4.3	4.3
Imputed value of bank services	-3.6	-3.3	-3.2
Domestic product (2005 prices, million NIS)	**524,000**	**534,189**	**561,689**
Domestic product (2005 prices, million $)[16]	**116,761**	**119,031**	**125,159**

Source: CBS

The new classification applies to data from 2011 onwards. It has also been applied to 2010 data to allow an overlap. Therefore, a data table for 2010-2014 is included using the new classification:

(16) Monthly average exchange rate for 2005 was 4.4878 NIS/$ according to the Bank of Israel

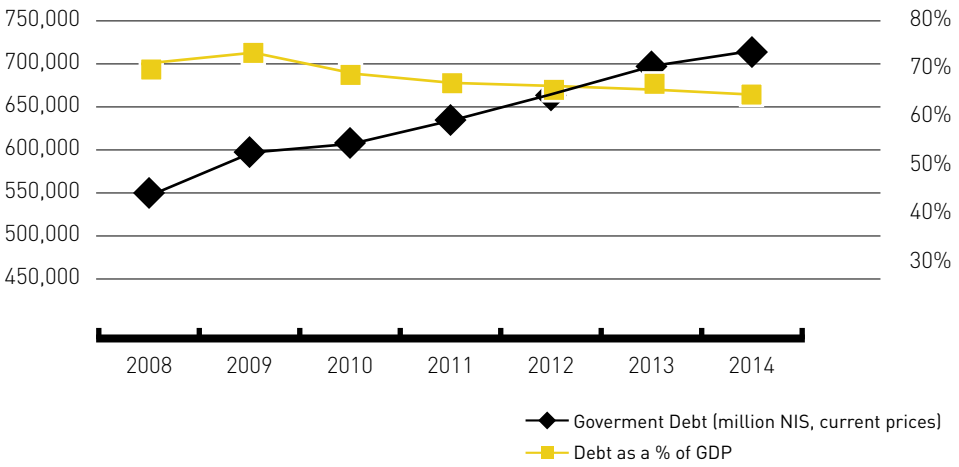
Table 8 › Share of domestic product (2010 prices) by industry for 2010-2014 according to 2011 classification

Classification	Year (Reporting Year)				
	2010 (2013)	2011 (2014)	2012 (2015)	2013 (2015)	2014 (2015)
Agriculture, forestry and fishing	1.7	1.8	1.6	1.5	1.4
Manufacturing; mining and quarrying	12.3	12.2	12.2	12.0	11.9
Electricity and water supply, sewage and waste management	1.5	1.3	0.4	0.8	0.8
Construction	5.6	5.9	6.1	6.3	5.9
Wholesale & retail trade & repair of motor vehicles; accommodation & food service activities	10.4	10.0	9.9	9.6	9.4
Transportation, storage, postal and courier activities	3.6	3.1	3.1	2.4	2.3
Information and communications	9.2	8.9	9.4	10.1	10.8
Financial & insurance; real estate; professional, activities scientific & technical; administrative & support service	20.6	23.1	24.5	24.5	24.8
Housing services	10.6	10.2	10.3	10.3	10.3
Local, public and defense administration and social security	6.6	6.3	6.0	5.8	5.9
Education	7.3	6.9	6.7	6.8	6.8
Human health and social 'work activities	6.8	6.3	5.6	5.2	4.9
Arts, entertainment and recreation; other service activities	3.7	3.9	3.9	3.8	3.9
Domestic product (2010 prices, million NIS)	**653,373**	**687,113**	**715,237**	**738,804**	**756,674**
Domestic product (2010 prices, million $)[17]	**175,026**	**184,065**	**191,599**	**197,912**	**202,699**

Source: CBS

The total amount of government debt has grown 31% since 2008; however, the amount of debt as a fraction of GDP has dropped from 70% to 65% over the same period.

Figure 13 › Government debt



Source: CBS

(17) Monthly average exchange rate for 2010 was 3.733 NIS/$ according to the Bank of Israel

06

Social Services, Health, and Education

Government expenditure on health care in 2014 was 7.6% of GDP (at 2010 prices), whilst government expenditure on education represented 7.9% of GDP. In 2008, expenditure on health as share of GDP was slightly lower than in 2014, at 7.3%, while expenditure on education as a share of GDP in 2008 was the same as in 2014, at 7.9%.

In 2014, 24.1% of all families in Israel were living below the poverty line, an increase from 20% in 2006. The poverty line in Israel is defined as half the median disposable income, weighted by household size.

Enrollment in the primary education system in 2013-2014 was 947,637, up from 846,000 in 2008. In post-primary schools there were 671,271 pupils, including 276,435 pupils in junior high schools. There has been an increase in enrollment in primary, post-primary, and junior high schools since 2008, by 10.1%, 9.6% and 9.2%, respectively. There were 264,844 students enrolled in universities and colleges in 2013/2014. Enrollment in higher education is coupled with investments in R&D. The R&D intensity (% of GDP dedicated to R&D) for Israel in 2014 was 3.9%, the highest in the world.[18]

Table 9 › Population, health, and education

		2008	2009	2010	2011	2012	2013	2014
Population (thousands, end of year)		7,374.0	7,552.0	7,695.1	7,836.6	7,984.5	8,134.5	8,296.9
Life expectancy	Female	83.0	83.3	83.6	83.5	83.6	83.9	83.9
	Male	79.1	79.6	79.7	79.9	79.9	80.3	80.3
Infant mortality (per 1000 live births)		3.8	4.0	3.7	3.5	3.6	3.1	-
School population (thousands)		1,448.7	1,473.3	1,508.9	1,533.6	1,565.1	1,593.0	1,618.9
Literacy rate (% of ≥15 years old who attended more than 4 school years)		96.4	96.4	96.5	96.6	96.6	96.6	97.0

Source: CBS

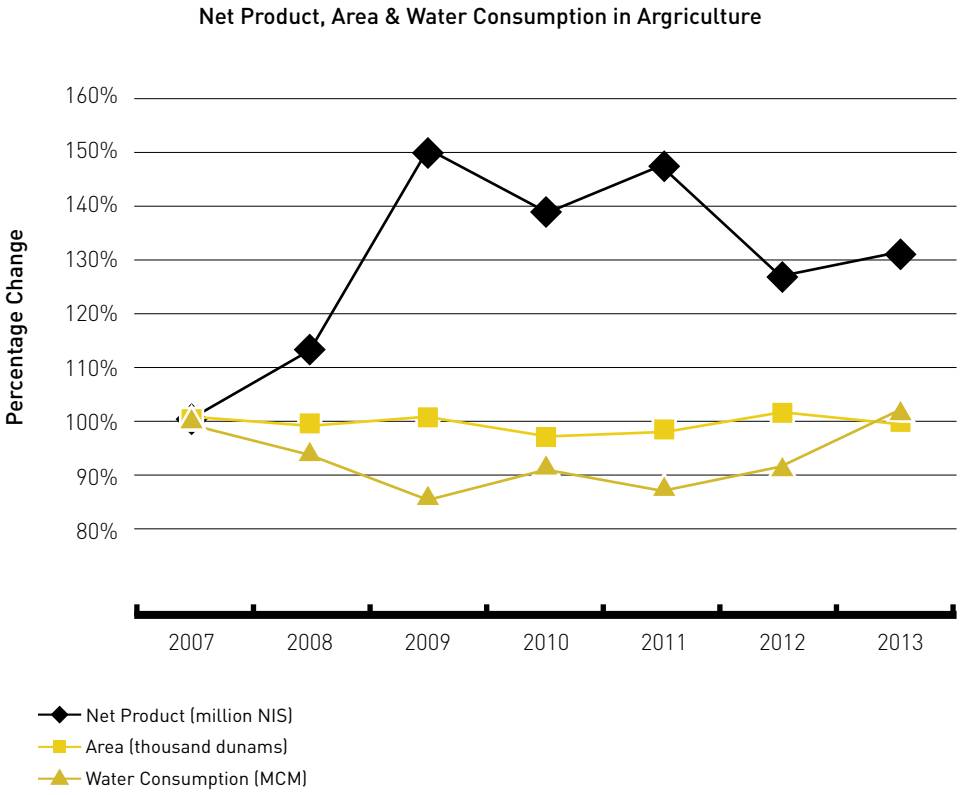
(18) http://www.bloomberg.com/news/2014-01-22/in-global-innovation-race-taiwan-is-tops-in-patents-israel-leads-in-r-d.html

07›
Agriculture

Israel maintains an intensive agricultural production despite challenges such as intense heat and water scarcity. Scientists, farmers, and others have worked together to advance Israel's agricultural sector. In 2013, agriculture accounted for 1.1% of the total workforce, 1.6% of net domestic product and 58% of water consumption. Water efficiency (defined as water consumption per NIS output) improved 14% between 2008 and 2012 and 28% between 2007 and 2012.

Over the last two decades, the agricultural sector has undergone a substantial structural change. The number of farms and self-employed farmers has significantly decreased as farms have become larger and more efficient. Employment in agriculture fell nearly 10% between 2010 and 2013, but in the same period, agricultural area grew by 3%.[19]

Figure 14 › Major indices in agriculture



Source: CBS

(19) Ministry of Agriculture, http://www.moag.gov.il/agri/files/Israel's_Agriculture_Booklet.pdf

When measured as the share of total agricultural output, vegetables, fruits, and meat goods are Israel's main agricultural products, with each comprising approximately one-fourth of the total output. These proportions have remained relatively constant over the past decade, with fruit output growing slightly. In current prices, 2014 total agricultural output has risen 19% since 2008.

Key vegetables are peppers, potatoes, and tomatoes. Citrus fruits and grapes make up the greatest portion of fruit production and poultry dominates meat production.

Table 10 › Agricultural products

	2007	2008	2009	2010	2011	2012	2013	2014
Total output (million NIS, current prices)	22,984.5	24,979.9	25,581.3	26,512.3	28,476.4	29,165.8	29,845.2	29,931.0
Total output (million $, current prices)	5,594.9	6,962.4	6,504.9	7,102.1	7,958.5	7,563.9	8,265.8	8,365.5
	% of total agricultural output							
Field crops	7%	6%	6%	6%	7%	7%	8%	10%
Fresh vegetables, potatoes, melons	25%	22%	24%	22%	22%	21%	22%	21%
Fruits (incl. citrus)	22%	23%	25%	25%	25%	24%	23%	24%
Flowers and garden plants	5%	4%	3%	4%	3%	4%	3%	3%
Misc. Crops	3%	3%	3%	3%	4%	4%	4%	4%
Meat products	20%	22%	21%	22%	21%	21%	21%	20%
Milk	10%	12%	10%	9%	11%	10%	11%	11%
Eggs and chicks	6%	6%	6%	6%	6%	6%	6%	6%
Fish	2%	2%	2%	2%	2%	2%	2%	2%
Misc.	0.5%	0.4%	0.4%	0.4%	0.4%	0.7%	0.3%	0.3%

Source: CBS

08

Forestry

Israel prides itself on its success in creating and maintaining afforested lands. It is one of the few countries in the world that has more trees now than it had a century ago and it has one of the highest ratios of planted forests to natural woodlands (2:1) in the world. The Keren Kayemeth LeIsrael – Jewish National Fund (KKL-JNF) and other forestry groups have continued to plant trees and advocate for regulations to ensure the proliferation of forests. KKL-JNF works in four main areas: (1) afforestation and reforestation in Mediterranean and semi-arid zones, (2) ecosystem goods and services from planted forests, (3) community forests, and (4) international cooperation and capacity-building. As a result of these efforts, the total amount of afforested land in Israel has increased by 17% between 2008 and 2014. In particular, the total area of natural groves and shrubs have increased by 137% from 2008-2014.[20]

09

Transport and Communications

The transportation, storage, postal, and courier activities sector's share of exports of goods and services has remained relatively constant at approximately 5% between 2010 and 2014. The number of telecommunications jobs fell by 36% from 2011-2014 from 43,500 to 27,900, a loss of 15,600 jobs. Computer programming, consultancy, and related activities made up the difference; the number of jobs in this sector grew 18% from 2011-2014, from 87,300 to 103,300, a gain of 16,000 jobs.

The total number of vehicles in Israel in 2013 was 2,966,000, including 2,457,000 private cars, which account for 83% of total vehicles. Total vehicles increased by 24% between 2008 and 2014, with the share of private cars gradually increasing from 78%.

Petrol remains the dominant fuel for private vehicles, with 96% of private vehicles powered by petrol in 2013 (down only slightly from 2008, when 97% of private vehicles were petrol vehicles). With respect to other vehicles (i.e taxis, buses, and trucks), the share of vehices powered by diesel fuel has increased from 81% in 2008 to 88% in 2013.

In 2014, the length of paved road surface was 19,052 km, which marks only a 5% increase since 2008. There continues to be a disproportionate increase in number of vehicles compared to the amount of road surface, creating increasing amounts of traffic and congestion. The distance traveled by buses on scheduled routes has increased 27% since 2008, from 428 million km traveled in 2008 to 544 million km traveled in 2014.

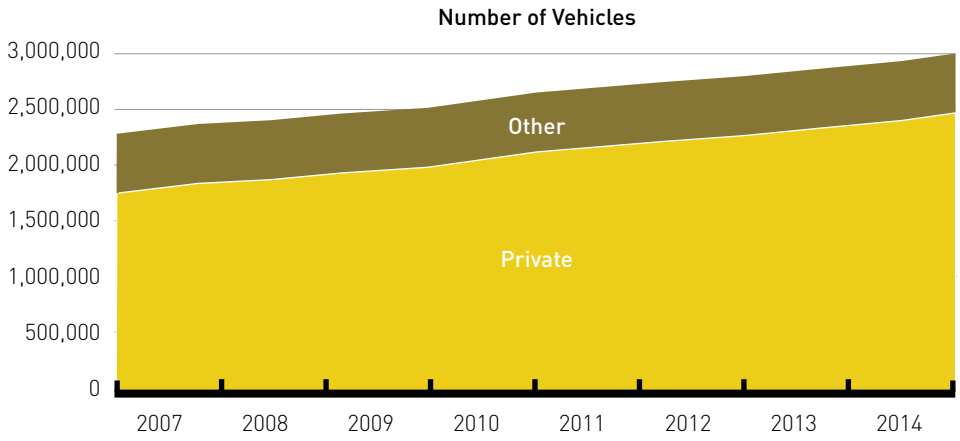
(20) Afforestation in Israel – reclaiming ecosystems and combating desertification, David Brand et al., JNF-KKl

In order to manage the congestion problems, Israel is expanding and adapting public transportation:

- In 2010 and 2011, Tel Aviv metropolitan-area bus lines were reorganized to provide more efficient service. A "fast lane" was also established on the main highway leading into Tel Aviv in 2011, which can be used for buses, carpools, and paying private vehicles.
- Jerusalem Light Rail opened for service in 2011 and carries approximately 130,000 passengers daily over a 13.9 km route.
- Haifa's bus rapid transit system Metronit began operating in 2013 and carries approximately 92,000 passengers daily over 40 km of designated roadways.
- Over the next several years, Israel will construct a light rail that will run through the Tel Aviv Metropolitan Area, consisting of sections both above and below ground.
- Israel is expanding its rail lines. Various new lines have been opened in recent years, and others have been expanded. A high speed line is currently being constructed between Israel's two largest cities, Jerusalem and Tel Aviv.

In 2014, hybrid cars made up only 1% of private cars. The government has employed tax benefits to encourage the use of low-pollution vehicles, including hybrid and electric cars as well as lower-polluting standards for internal combustion engines.

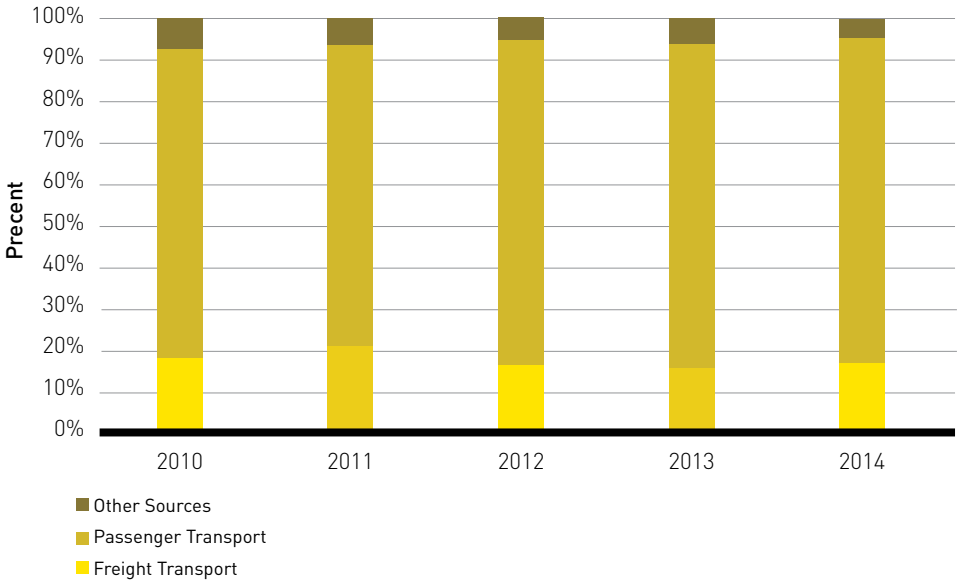
Figure 15 › Private and other transportation



Source: CBS

There were over 48.5 million railway passengers in 2013, an increase in ridership of over 13 million passengers since 2008. Railways receive revenue from passengers, freight, and other sources. The proportion of railway service revenue from passenger transport has increased from 76% in 2010 to 79% in 2014, while revenue from freight transport has decreased from 17.5% to 16%.

Figure 16 › Railway revenues

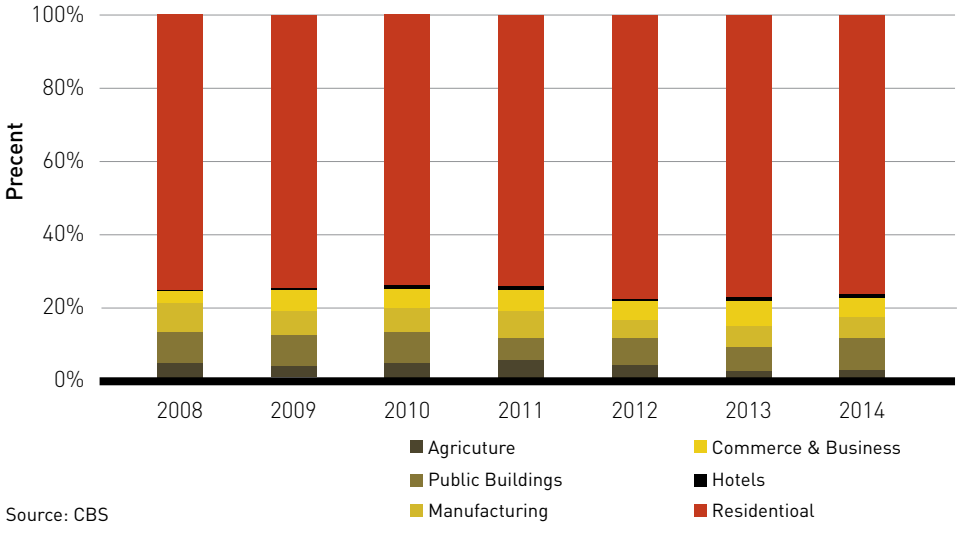


Source: CBS

10›
Construction

The residential sector accounted for 77% of total construction completed in 2014, followed by public buildings at 9%, and commerce and business at 6%. This split has remained relatively constant since 2008, with the share of residential, public, business and commercial buidings slightly increasing, while the proportion of manufacturing and agriculture buildings has slightly declined.

Figure 17 › Share of completed construction



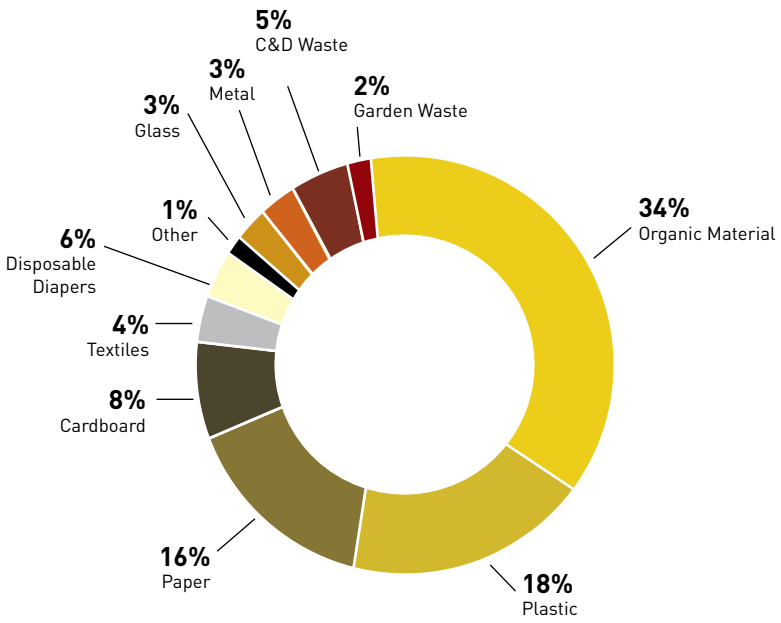
Source: CBS

The contribution of construction to Israel's net domestic product was 5.9% in 2014, the same as it was in 2011; in 2013, it reached 6.3%. The number of jobs in the construction sector grew 22% from 2008 to 2012. Additionally, the average construction wages rose nearly 7% (in current prices) between 2008 and 2012.

11 Waste

Israel generated approximately 5.4 million tons of waste in 2014. The average Israeli generates 1.7 kg of waste per day and total waste produced is growing at a rate of about 1.8% per year, in line with population growth. Of waste generated, 80% is municipal and commercial waste and 20% is industrial waste. In 2012, organic material (34%), plastic (18%), and paper (16%) were the main components of the municipal solid waste (MSW) stream by weight.

Figure 18 › Solid waste composition



Source: MoEP

Solid waste is disposed of in several ways, but the majority (80%) is landfilled. The remaining 20% is recycled using various methods. Sixty percent of industrial waste is recycled.

In 2010, the MoEP began a Recycling Revolution. The plan aims to reduce landfill waste by recycling and recovering useful material. Israel hopes to achieve a 50% recycling rate by 2020. In order to increase the recycling rate, local authorities are switching to waste separation at the source (at homes). Organic waste (34% of all MSW) and dry waste are separated by residents into two different streams. Israel has also introduced a number of laws employing the Extended Producer Responsibility system, which places the responsibility of removing and recycling waste products

on the manufacturer or importer. Packaging waste and electronic waste laws were passed in 2011 and 2012, respectively. The third tactic the MoEP has used to decrease landfilling is to increase the landfill levy, which was passed in 2007. The landfill levy is meant to make other treatment methods competitive with the cost of landfilling. The 2015 landfill levy was set at NIS 108.85 per ton for mixed waste.

Waste management has long been a challenge for Israel's Bedouin communities. Recognized and unrecognized villages both suffer from a lack of collection and disposal infrastructure. Bedouins typically burn their waste or dump it into streams. These disposal methods can cause severe air pollution and groundwater contamination, posing a health hazard to Bedouin and other communities. In July 2013, a Government Decision allocated about NIS 40 million (approximately $10 million) for waste management in the southern Bedouin sector (the Bedouin population is around 200,000 people) for 2013-2017. New programs/projects that have been funded include biogas facilities, modern trash bins, education and awareness campaigns, removal of contaminants from waterways, reduction of pollution in general, and enforcement of environmental laws.

12› Energy Production

Since 2008, the Israeli energy production sector has undergone two major changes. First, Independent Power Producers (IPPs) have entered the market, with a total generating capacity of cogeneration and conventional power plants (not including renewable energy) reaching 1,964 MW by March 2015. Second, the discovery of natural gas reserves (see next section) has changed the energy production fuel mix significantly.

Installed generating capacity at the end of 2014 was 15,581 MW, including IPP capacity. This is a 30.4% growth in Israel's grid capacity since 2008, when it had 11,953 MW of installed capacity. The peak load in 2014 was 11,294 MW. In 2013, approximately 56% of total power generated came from coal, down from 61% in 2010, and 40% came from natural gas, up from 37% in 2010. The other 4% came from diesel oil (2.5%), renewables (1%), and a small amount of fuel oil (0.5%).

In 2014, installed generation of renewables totaled 580 MW, including 551 MW from solar PV plants, 6 MW from wind energy, 16 MW from biogas and 7 MW from hydropower.

Between 2009 and 2013 electricity consumption increased from 49 million kWh to 56.9 million kWh. Over the same period, peak demand increased from 9,882 to 11,590 MW. Consumption per sector between 2008 and 2012, as provided by the Israel Electric Corporation (IEC), is presented in the following table:

Table 11 › Electricity consumption by sector (billion kWh)

Year	Residential	Public & commercial	Agricultural	Industrial	Water pumping	E. Jerusalem & P.A	Total
2008	15,201	15,499	1,827	11,218	2,749	3,666	50,161
2009	15,117	15,625	1,690	10,329	2,404	3,783	48,947
2010	15,591	17,132	1,614	10,647	3,029	3,966	51,977
2011	15,909	17,202	1,731	10,987	3,015	4,225	53,067
2012	17,245	18,433	1,837	11,849	3,175	4,547	57,085

Source: IEC

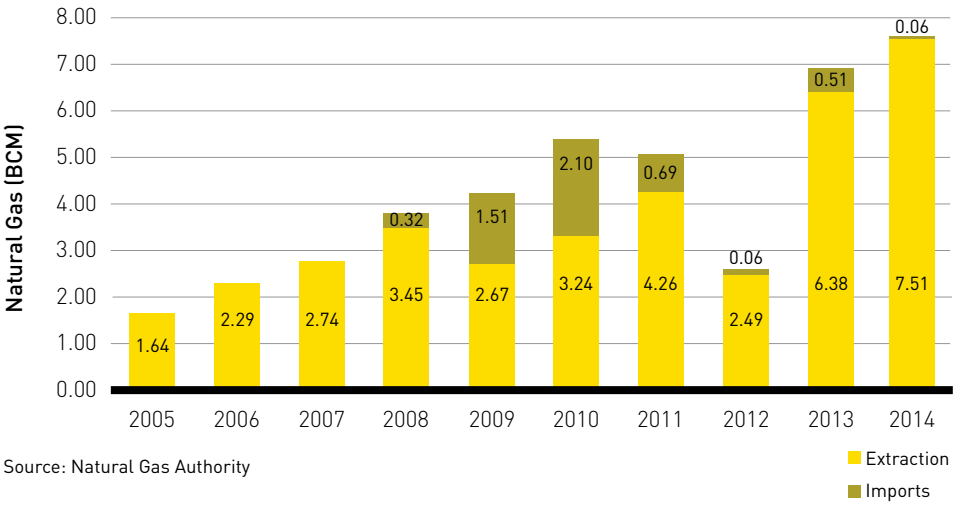
13

Discoveries of Natural Gas Reserves

Israel only began using natural gas in 2004, after two small reserves were discovered in 1999 and 2000. Since then, natural gas has quickly become a dominant fuel for electricity generation. Recently, offshore natural gas reserves have been discovered with major ramifications for the Israeli market. These reserves – specifically the Tamar and Leviathan fields – are significantly large and of very high quality (over 99% methane). They are expected to provide sufficient natural gas to meet Israel's demand in the coming decades.

According to the Natural Gas Authority, over the past decade (2005-2014), there has been a 358% increase in the amount of natural gas extracted in Israel, from 1.64 BCM in 2005 to 7.51 BCM in 2014. Concurrently, natural gas imports have dropped. After increasing from 0.32 BCM in 2008 to 2.10 BCM in 2010, imports dropped to just 0.06 BCM in 2014, as Israel became more reliant on domestically-produced gas. The uptake in the power production and industrial sectors has been immediate, with these two sectors consuming over 7.5 BCM of natural gas in 2014.

Figure 19 › Natural Gas Supply from Extraction and Imports



Source: Natural Gas Authority

There was a drop in natural gas use from 2011 to 2012 due to a disruption in the natural gas supply, leading to increased reliance on coal, fuel oil, and diesel oil.

In 2013, the Tamar field began producing gas for Israeli consumption and use of gas increased again. In the same year, Israel nearly eliminated the use of fuel oil for electricity generation. The table below represents electricity generation by fossil fuel type, as reported by the Israel Electric Corporation. Note that this does not include renewable energy generation, which accounted for approximately 1% of generation in 2013.

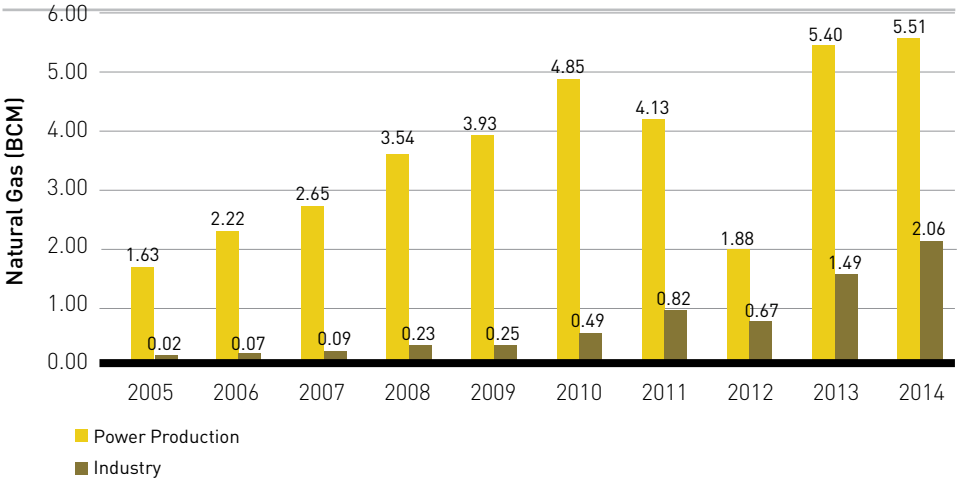
Table 12 › Electricity generation by fossil fuel type

	2011	2012	2013
Coal	61.3%	63.4%	56.2%
Fuel oil	1.6%	7.1%	0.6%
Natural gas	32.5%	14.3%	40.6%
Diesel oil	4.6%	15.2%	2.6%

Source: IEC 2013 annual report, IEC data

Natural gas consumption has also increased in the industrial sector, with factories replacing petroleum-based fuels such as fuel oil and diesel oil with natural gas. In 2014, natural gas consumed for purposes other than electricity generation surpassed 2 BCM.

Figure 20 › Natural Gas Consumption



Source: Natural Gas Authority

CHAPTER 2:

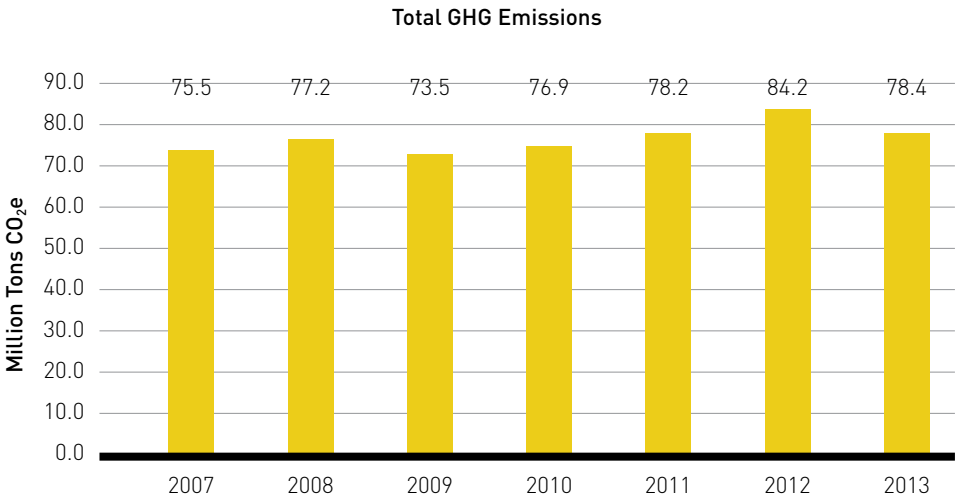
NATIONAL GHG INVENTORY

01›
Introduction

In accordance with the guidelines for National GHG Inventories, Israel's national inventory includes the following sectors: Energy, Industrial Processes, Agriculture, Waste and Wastewater, and Forestry. The inventory includes emissions and removals of the three main greenhouse gases – carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) as well as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6), which have been included in the inventory since 2008. In addition, the inventory also includes emissions of indirect greenhouse gases which are precursors of tropospheric ozone – carbon monoxide (CO) and oxides of nitrogen (NO_x) – as well as sulfur dioxide (SO_2), an aerosol precursor which has a cooling effect on climate. While not included in the national inventory, the CBS also publishes data on international bunker (aviation and marine) emissions. As noted above, the inventory is prepared and published by the CBS.

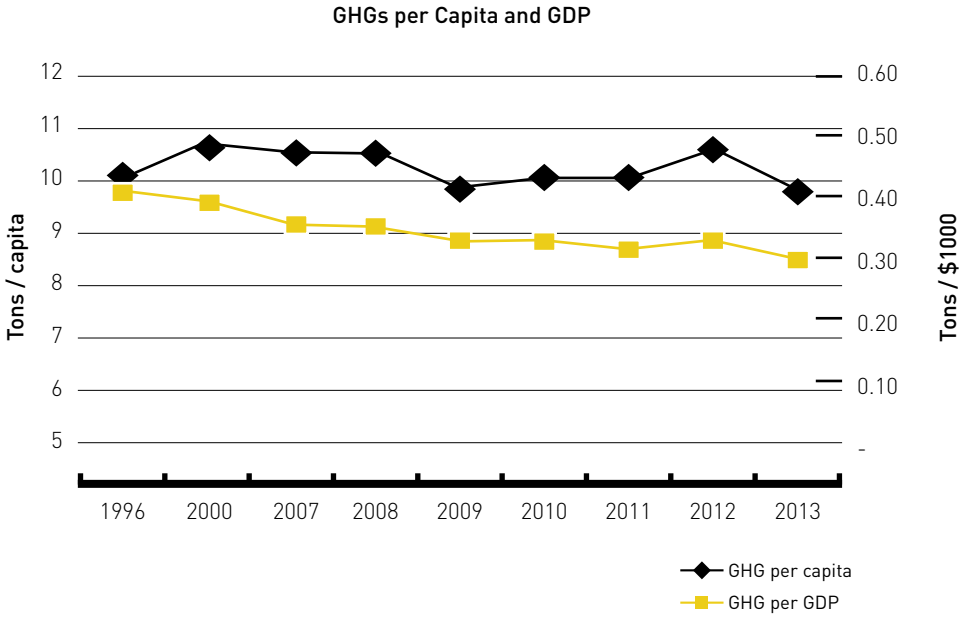
Total GHG emissions in 2013 were 78.4 million ton CO_2e, representing an absolute reduction of nearly 6 million tons relative to 2012 GHG emissions. This was largely due to a reduction of greenhouse gas emissions from the power sector, which peaked in 2012. As noted above, in 2012 Israel experienced a natural gas shortage, which resulted in an increase of diesel oil and fuel oil consumption to compensate. Once supply resumed in 2013, emissions from the power sector declined from 47.9 tons in 2012 to 41.7 tons of CO_2e in 2013.

Figure 21 › GHG emission trends



Emission intensity has shown an overall declining trend since 1996 both in terms of GHG emissions per capita and in terms of GHG emissions per GDP, with 2013 values reaching their lowest levels since the inventory was first published in 1996, at 9.72 tCO_2/capita and 0.30 tCO_2/$1000 GDP.

Figure 22 › GHG emission intensity

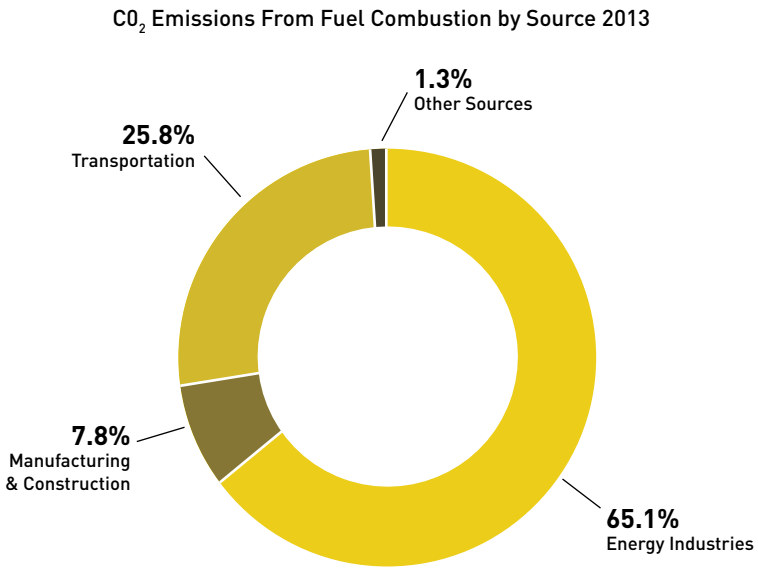


02

Energy sector

Energy industries remain the largest source of CO_2 emissions from fuel combustion, accounting for 65% of the emissions; transport is the second largest source, accounting for 26%

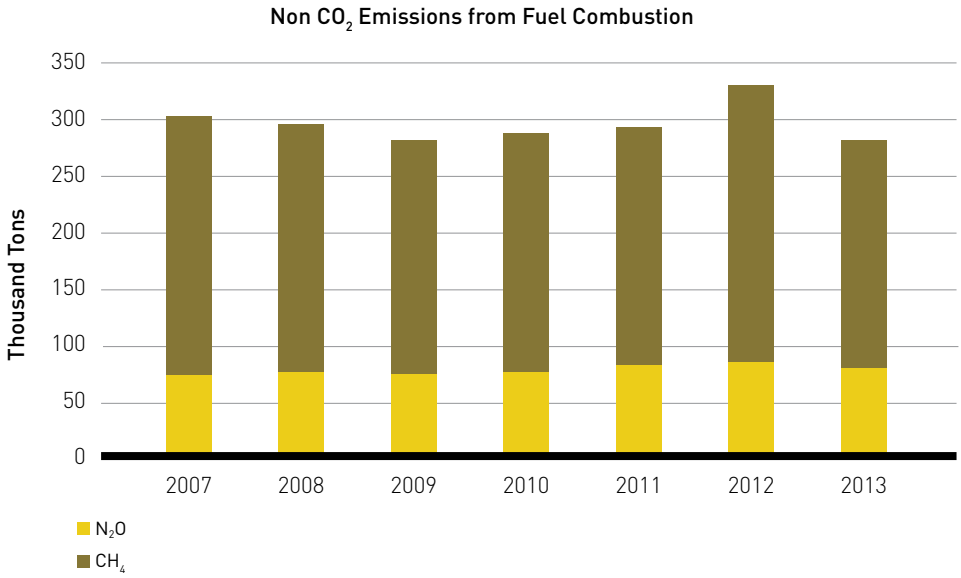
Figure 23 › CO_2 emissions by source



The 'other sources' above include fuels used for heating and other purposes in the residential, commercial and public sectors.

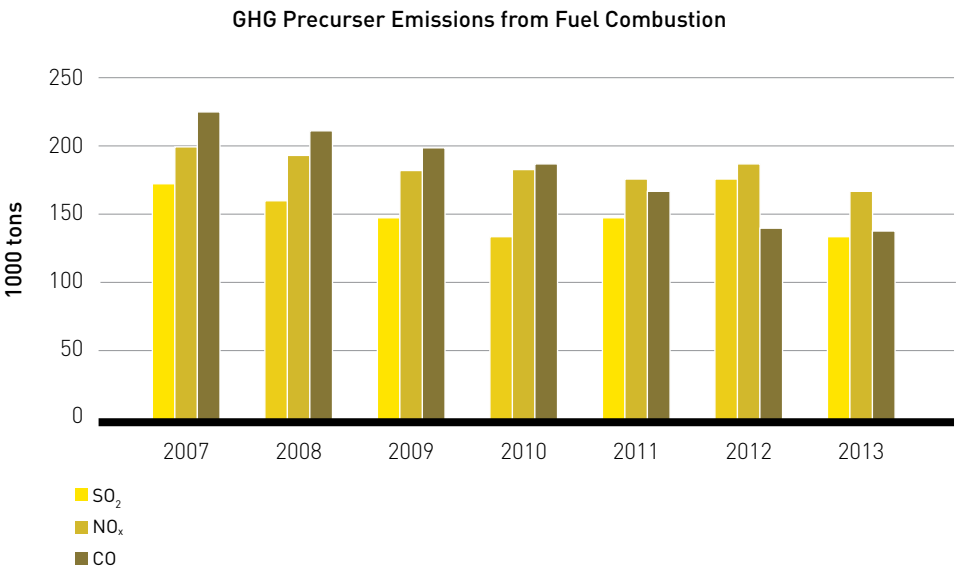
Non-CO_2 GHG from fuel combustion, namely N_2O and CH_4 have remained relatively stable since 2007, with an average of 218 thousand tons N_2O and 78 thousand tons CH_4 annually. The contribution of both of these GHGs from fuel combustion is considered minor. The higher values in 2012 can be attributed to the fact that due to a disruption in the natural gas supply, Israel consumed a higher proportion of diesel oil and fuel oil in the electricity generation fuel mix, which emit higher levels of N_2O and CH_4.

Figure 24 › CH_4 and N_2O emissions (in CO_2e)



The following figure shows GHG precursor emissions from fuel combustion. Emissions from SO_2, NO_X, and CO have decreased by 21%, 16%, and 38%, respectively, over the period of 2007-2013:

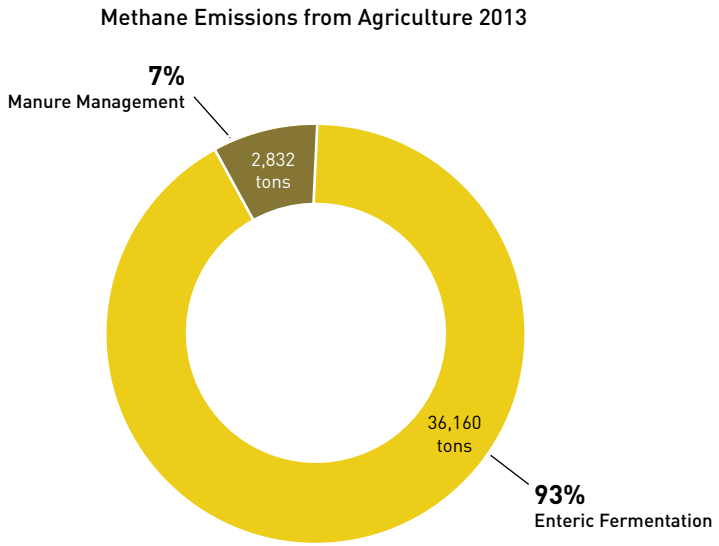
Figure 25 › Indirect GHG emissions



03
Agriculture

Almost 93% of the total methane emissions from agriculture are contributed by enteric fermentation while manure management contributes the remaining 7%. Total methane emissions from manure management have decreased since 2007 by 73% (from 10,405 tons CH_4 to 2,832 tons CH_4), while emissions from enteric fermentation have grown by 7% (from 33,953 tons CH_4 to 36,160 tons CH_4).

Figure 26 › CH_4 emissions from agriculture



In 2013, emissions from agricultural soils amounted to 2,033 tons N_2O, which represents a 53% decrease since 2007. In 2013, total N_2O emissions from agriculture were 3,800 tons, a decrease of 26% from 2007.

Table 13 › Total N_2O emissions from agriculture

Source	2007 (1000 tons N_2O)	2013 (1000 tons N_2O)
Agricultural soils	4.29	2.03
Manure management	0.87	1.77
Total	5.16	3.80

04
Waste and Wastewater

The quantity of municipal solid waste in Israel in 2013 was 4.8 million tons, generating 5,438 tons of CO_2e emissions. It should be noted that in 2013, the CBS altered the methodology for calculating methane emissions from waste, using the IPCC order decay (FOD) model instead of the IPPC mass balance method used in previous reports.

In 2013, methane emissions from domestic wastewater totaled 6,619 tons CH_4 and emissions from industrial wastewater totaled 26,815 tons CH_4, an increase of 12% and 20% since 2007, respectively. N_2O emissions from household wastewater totaled 811 tons N_2O, an increase of 11% from 2007.

05
Forestry

In 2013, Israel's forest area included 72,604 hectares of plantations (including 49,046 hectares of conifers, 8,360 hectares of eucalyptus and 15,198 hectares of broad-leaved trees) and 110,138 hectares of natural woodlands. Although only a relatively small area is planted with eucalyptuses, it contributes about 15% of the CO_2 removals.

Total CO_2 removal from forests in 2013 was 380 thousand tons, a decrease of 24.3% from 2007.

Table 14 › Calculation of CO_2 removal by forests

Tree type	Area (ha)	Growth Rate (tons dry matter/ha/year)	Commercial Harvest (m^3 roundwood)	CO_2 Removal (1000 ton)
Conifers	49,046	4.5	102,017	196
Eucalyptus	8,360	5.5	11,662	57
Broad-leaved	15,198	1.55	1,752	36
Natural woodlands	110,138	0.55	5,314	91
Total	182,742		120,745	380

06

Inventory Summary

The following table summarizes the emissions and removals of CO_2, CH_4 and N_2O from the different sectors, as estimated for the years 2000 and 2007-13. Methane and nitrous oxide emissions are converted to CO_2eq. Total emissions rose only 1.5% between the years 2008-2013.

Table 15 › Summary of GHG inventory

(1000 tons, unless stated otherwise)	2000	2007	2008	2009	2010	2011	2012	2013
Total	66,949	75,855	77,181	73,489	76,869	78,154	84,214	78,361
Tons per capita	10.65	10.56	10.56	9.82	10.08	10.06	10.65	9.72
Tons per GDP (2010 prices)	0.39	0.36	0.35	0.33	0.33	0.32	0.33	0.30
Carbon Dioxide (CO_2)	60,855	66,862	66,298	63,595	65,912	67,096	72,535	66,147
Methane (CH_4)	3,888	6,043	6,268	6,413	6,790	6,800	6,958	7,043
Nitrous Oxides (N_2O)	2,206	2,950	2,797	2,566	2,619	2,142	2,476	2,434
Sulfur hexafluoride (SF_6)	-	-	1,107	166	87	122	73	73
Hydrofluorocarbons (HFC'S)	-	-	660	720	1,352	1,889	2,093	2,557
Perfluorocarbons (PFC'S)	-	-	51	31	109	104	78	106

In 2013, CO_2 emissions accounted for 84% of total GHG emissions; whilst CO_2 remains the predominant GHG emitted in Israel, its share of emissions has steadily declined over recent years, from 91% in the year 2000, gradually decreasing to 88% in 2007, and 84% in 2013. In 2013, Israel emitted 66,147 tons of CO_2, a 10% decrease from the previous year (as explained at the beginning of this section) and a similar level to 2008 CO_2 emissions.

Table 16 › CO_2 emissions by sector

	2000	2007	2008	2009	2010	2011	2012	2013
Total emissions and removals	60,855	66,862	66,298	63,595	65,912	67,096	72,535	66,147
From fuel combustion	58,765	64,807	64,297	61,999	64,146	65,092	70,409	64,091
1. Energy industries	36,412	42,654	42,255	40,226	41,917	42,648	47,906	41,722
2. Manufacturing, industries and construction	6,759	5,858	5,716	5,278	5,240	5,437	5,208	4,975
3. Transport	14,018	15,198	15,346	15,550	16,186	16,079	16,379	16,554
Other	2,090	2,055	2,002	1,596	1,765	2,004	2,126	2,056

The following table presents methane emissions for the period 2000-2013. Methane emissions account for 9% of total GHG emissions, rising gradually from 6% in 2000. In the period between 2007-2013, methane emissions increased by 17%, due in large part to the annual increase in waste disposal, as noted above.

Table 17 › CH_4 emissions by sector

	2000	2007	2008	2009	2010	2011	2012	2013
Total emissions	3,888	6,043	6,268	6,413	6,790	6,800	6,958	7,043
From fuel combustion	73	74	75	74	77	79	84	79
From solid waste disposal	2,682	4,440	4,641	4,831	5,031	5,187	5,334	5,438

The following table presents nitrous oxide emissions for the period 2000-2013. N_2O emissions account for approximately 3% of total GHG emissions, and decreased by 17% over the period 2007-2013. The main source of N_2O emissions is agriculture:

Table 18 › N_2O emissions by sector

	2000	2007	2008	2009	2010	2011	2012	2013
Total emissions	2,206	2,950	2,797	2,566	2,619	2,142	2,476	2,434
From fuel combustion	215	226	218	208	209	215	245	201
From agriculture	1,300	1,599	1,496	1,423	1,396	1,147	1,147	1,178

The following table presents emissions of indirect GHGs for the period 1996-2013. Between 2007-2013, emissions of NO_x, CO and SO_2 decreased by 15%, 38% and 17%, respectively.

Table 19 › Precursors emissions by sector (thousand tons)

	2000	2007	2008	2009	2010	2011	2012	2013
NO_x total From fuel combustion	237 232	201 200	196 195	184 183	186 185	177 177	189 188	170 169
CO total From fuel combustion From transport	376 376 367	226 226 215	214 214 203	199 199 189	187 187 176	169 169 157	143 143 131	140 140 128
SO_2 total From fuel combustion From Industrial processes	284 264 19	210 174 36	196 162 33	179 150 30	175 142 33	183 149 34	210 178 32	174 137 37

07

International Bunkers

Emissions from international bunkers are not included in the national inventory. Emissions of direct and indirect GHGs from international bunkers peaked in 2008, before generally declining until 2013. During that period, CO_2e emissions decreased 11%:

Table 20 › International bunkers

Thousand tons	1996	2000	2007	2008	2009	2010	2011	2012	2013
Direct (CO_2e):	2,225	2,803	3,485	3,659	3,534	3,617	3,570	3,450	3,289
CO_2	2,207	2,781	3,460	3,633	3,509	3,590	3,544	3,425	3,263
Aviation	1,924	2,298	2,400	2,434	2,413	2,549	2,571	2,420	2,494
Marine	283	483	1,060	1,199	1,095	1,041	973	1,005	769
CH_4	0.7	1	1.8	2.0	1.9	1.8	1.7	1.7	1.4
Aviation	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Marine	0.4	0.7	1.5	1.6	1.5	1.4	1.3	1.4	1.1
N_2O	17.4	21.3	23.6	24.2	23.8	24.9	24.9	23.7	23.7
Aviation	16.7	20.1	21	21.3	21.1	22.3	22.5	21.2	21.8
Marine	0.6	1.2	2.6	2.9	2.7	2.5	2.4	2.5	1.9
Indirect: NO_x	13.7	19.3	31	33.9	31.8	31.3	30.1	30.1	25.7
Aviation	8.1	9.7	10.2	10.3	10.2	10.8	10.9	10.3	10.6
Marine	5.6	9.5	20.9	23.6	21.5	20.5	19.2	19.9	15.2
NMVOCs	2.1	2.9	4.5	4.9	4.6	4.5	4.4	4.4	3.8
Aviation	1.4	1.6	1.7	1.7	1.7	1.8	1.8	1.7	1.8
Marine	0.8	1.3	2.8	3.1	2.9	2.7	2.6	2.6	2.0
SO_2	6	9.3	15	14.7	13.7	13.3	12.3	11.9	10.7
Aviation	3.7	4.4	4.6	4.6	4.6	4.8	4.9	4.6	4.7
Marine	2.4	4.9	10.4	10.1	9.1	8.4	7.4	7.3	6.0
CO	6.5	9.6	17.3	19.2	17.8	17.3	16.4	16.7	13.6
Aviation	2.7	3.2	3.4	3.4	3.4	3.6	3.6	3.4	3.5
Marine	3.7	6.4	13.9	15.7	14.4	13.7	12.8	13.2	10.1

CHAPTER 3:

MITIGATION POLICIES AND ACTIONS

01

Israel's INDC and National GHG Reduction Target for 2030

In September 2015, the Government of Israel approved an economy-wide unconditional target to reduce per capita greenhouse gas emissions to 7.7 tCO_2e by 2030, constituting a 26% reduction relative to 2005 emissions of 10.4 tCO_2e per capita, and amounting to an expected 81.65 $MtCO_2e$. The Government of Israel further approved an interim target of 8.8 tCO_2e per capita is expected by 2025.

As part of its commitment to working towards an ambitious international agreement on climate change, on September 29th, 2015, Israel submitted this target as its Intended Nationally Determined Contribution (INDC) to the Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP). The scope of the INDC covers six greenhouse gases: Carbon Dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur Hexafluoride (SF_6). The time period for implementation will be from 2016 to 2030. As with Israel's emission inventory, the INDC used the revised 1996 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories and the Global Warming Potential (GWP) values from the IPCC Second Assessment Report (1995).

Taking into consideration its national circumstances, Israel believes its target to be fair and ambitious, reflecting genuine efforts to move forward in a sustainable manner to facilitate the transition to a low-carbon and climate-resilient economy. Israel's projected annual population growth is 1.8% - considerably higher than the OECD. In addition, Israel's annual growth in GDP per capita is also higher than the OECD average. Further, Israel is a small and densely populated country facing both land and water scarcity, as arid zones comprise over 45% of the country. Israel has no access to a number of widely used low-carbon sources of energy such as nuclear, hydro-electric and geothermal power, and the country is an energy island. As such, electricity generation is based primarily on fossil fuels.

Israel plans to reach its target through the following sector specific targets:

- Energy efficiency - 17% reduction in electricity consumption relative to BAU scenario in 2030
- Renewable energy – 17% of the electricity generated in 2030 will be from renewable sources
- Public transport – 20% shift from private to public transportation.

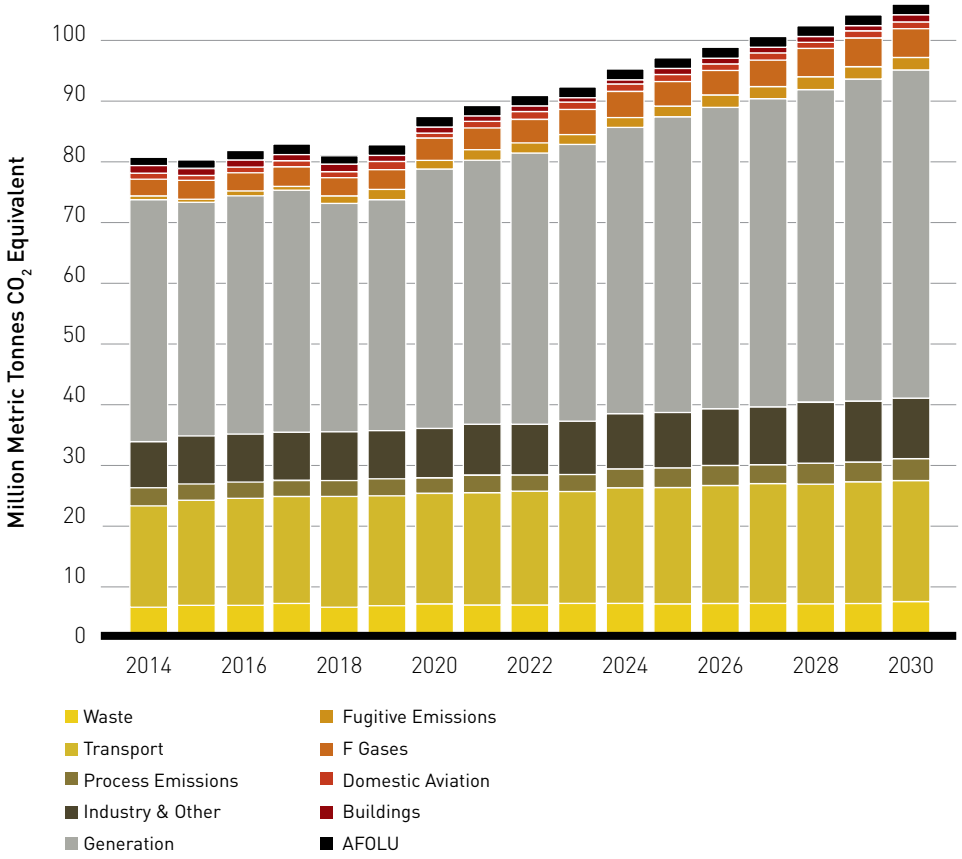
The formulation of the national reduction target involved a planning process directed by a dedicated inter-ministerial committee which examined the potential for reducing greenhouse gas emissions in 2030. The committee was chaired by the MoEP director-general, and consisted of representatives from all relevant government ministries, public utility companies, industry and commerce, local government, environmental and non-governmental organizations, academia and other national and international experts from various disciplines.

In order to facilitate a deeper and comprehensive understanding of the emission profile of Israel and potential reduction, six specific working groups were formed of representatives from the following sectors: Power Sector, Buildings Energy Efficiency, Industrial Sector, Transport Sector, Waste and Agricultural Sector, and Innovative Israeli Technologies.

The decision making process was supported by a joint team of local and international experts from EcoTraders Ltd. (Israel) and Ricardo Energy and Environment (UK), along with the Ministry of Environmental Protection. The team developed emissions projections for Israel on the basis of extensive local and international data and using the Long-Rage Energy Alternatives Planning System (LEAP) modelling program, a widely used and accepted energy tool developed by the Stockholm Environment Institute and used by approximately 80 governments around the world.

Under a Business As Usual (BAU) scenario, GHG emissions are expected to increase to 105.5 $MtCO_2e$ in 2030, or approximately 10 tCO_2e per capita.

Figure 27 › GHG emissions (Mt CO_2e) to 2030 under 'business-as-usual'



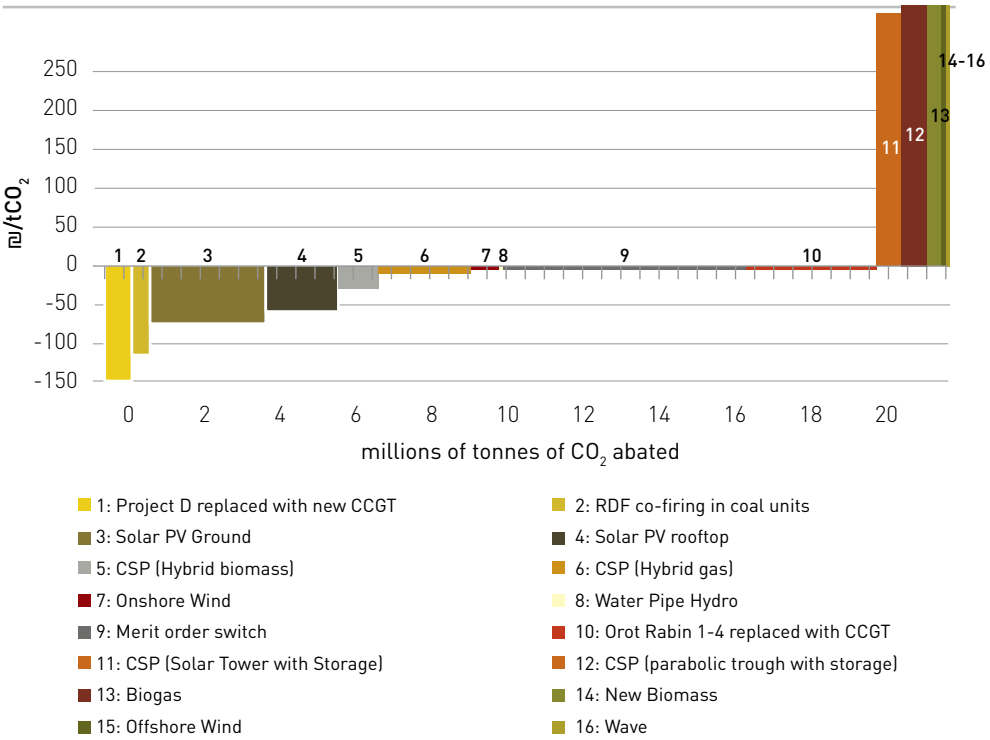
Implementation of Israel's national target would therefore result in a reduction of 23.85 $MtCO_2e$ in 2030 bringing total emissions down to 81.65 $MtCO_2e$.

While the INDC is economy wide, GHG reduction was based on a thorough examination of the emission reduction potential, and associated economic costs, in the following sectors:

1. Power generation
2. Residential building energy consumption
3. Commercial/public building energy consumption
4. Industry
5. Transportation
6. Waste
7. 'Other' (including fugitive emissions and f-gases)

For each sector, abatement measures were assessed, taking into account, inter alia, the cost of implementation, uptake rate in both a BAU scenario and in a mitigation scenario, and reduction potential. In total, over a hundred abatement measures were assessed. The associated abatement costs were assessed via development of Marginal Abatement Cost Curve (MACC), such as the power sector MACC shown below:

Figure 28 › Marginal abatement cost curve for the power sector for 2030, including externalities and costs of storage



In order to meet the national reduction target, the government approved an initial budget of NIS 300 million (approximately $75 million) for years 2016-2019, along with an additional NIS 500 million (approximately $125 million) earmarked for government guarantees to be used for emissions abatement and energy efficiency finance. The government further instructed the Ministers of Energy, Environmental Protection, Finance, and Economy to submit for government approval the specific actions necessary to meet the target. These will likely include:

- **Energy efficiency:** The government approved a budget of NIS 800 million (approximately $200 million) for various financial mechanisms that will be used to leverage private sector investments in energy efficiency. Other measures include the facilitation of construction of new buildings that will meet the Israeli green buildings standard, and consideration of more stringent minimum efficiency standards for electric appliances.
- **Fuel switch:** The government is working to further increase the share of natural gas and biofuels in the electricity fuel generation mix, thereby reducing the GHG intensity of power generation. Among the measures that have been proposed are increasing the tax on coal in order to fully incorporate externality pollution costs, issuing power plant-specific emission limits, and co-firing of biomass in existing coal-fired units.
- **Renewable energy:** The government is working to remove bureaucratic, planning and other barriers in order to promote the renewable energy market, including investment in renewable energy installations, as well as additional tenders and quotas.
- **Clean-tech industry:** The government is working to develop an action plan to assist Israeli companies that develop cutting-edge technologies in energy conservation and management, renewable energy and storage and other relevant areas, in the development and demonstration of their solutions at proto-type and commercial-scale facilities.
- **Reduction of private vehicle usage:** Further development of public transport systems, particularly in metropolitan areas.

02

Prior National Reduction Target and Mitigation Actions

In November 2010, the Government of Israel approved a target to reduce greenhouse gas emissions by 20% by 2020, relative to a business as usual (BAU) scenario. Formal adoption of the target occurred following the Copenhagen Accord in 2009, in which Israel's then-President Shimon Peres declared Israel's intention to reduce greenhouse gas emissions by 20% in 2020. Israel's BAU and mitigation scenarios for this reduction target were based on the Greenhouse Gas Abatement Potential in Israel Report, which was published by McKinsey in 2009. According to the report, in the BAU scenario, Israel's 2020 GHG emissions will reach 109 $MtCO_2e$. Reducing emissions by 20% translates into an emissions target of 87.2 $MtCO_2e$ in 2020. In addition, the government separately approved two key supporting targets, namely a 10% renewable energy target for electricity generation, and 20% energy efficiency target for electricity consumption, both to be reached by 2020.

As part of the GHG emission reduction target, the government established and approved the National GHG Emissions Reduction Program, which was budgeted at NIS 539 million (about $ 138 million) for the years 2011-2012. The majority of this budget was used to encourage energy efficiency measures, including the residential, commercial/public, and industrial sectors. Due to budget cuts, in May 2013 the program was suspended for two years, and in 2015 the program was replaced with Israel's updated GHG reduction targets.

Between 2010 and 2014, major actions were undertaken in Israel to reduce GHG emissions, both within the context of the National GHG Reduction Program as well as within the context of additional government decisions and initiatives. These actions can be categorized into the following fields:

- **Energy Efficiency** – Energy efficiency measures are a cornerstone of Israel's GHG emissions reduction policies. Israel has reduced electricity consumption by 6% relative to business-as-usual levels projected in 2010, through a combination of scrapping programs, government grants, and more stringent standards for electric appliances:
  - Scrapping programs: There have been a number of scrapping programs, with the goal of replacing inefficient household appliances. Between 2011 and 2014, these scrapping programs have yielded a combined energy savings of over 265,000 MWh/year, equivalent to GHG emission reductions of approximately 183,000 tCO_2e in 2014.
  - Government grants: An emission reduction grants mechanism was offered over 2011-2013 to commercial and industrial energy consumers to reduce emissions. Over the 3 years of the program, NIS 106 million (about $ 30 million) was distributed for emission reduction projects, yielding an estimated electricity reduction of 265,000 MWh in 2020, resulting in a reduction of 442,000 tons CO_2e in 2020. The majority of the 206 projects that received grants were energy efficiency projects.

    In addition, as part of ongoing activities for energy conservation in the private and municipal sectors between 2011 and 2014, approximately 270 projects

received a total of NIS 47 million in government grants, leveraging a further NIS 201 million in energy efficiency investments. These projects reduced electricity consumption by 140,000 MWh annually, resulting in an annual reduction of approximately 96,000 tCO_2e.

Large factories consuming over 2000 TOE of energy are required to submit an energy audit every five years. While smaller factories are not required to perform and submit energy audits, over the past years, the Ministry of Energy, and the MoEP along with the Ministry of Economy, have established programs which subsidize energy audits in smaller factories and for SMEs.

- Efficiency standards: Energy efficiency has also been achieved through updating minimum efficiency standards. Stricter standards for commercial chillers and for light bulbs are estimated to yield annual electricity savings of 93,000 MWh (approximately 64,000 tCO_2e) and 152,000 MWh (approximately 105,000 tCO_2e), respectively.

- **Renewable Energy –** In 2014, Israel generated about 1.8% of electricity from renewable sources. There are three primary delivery mechanisms for reaching the 10% target:
  - Fixed feed-in tariffs: The vast majority of renewable energy capacity by 2020 is to be achieved via feed-in tariffs, which are approved for specific technology types and scale, and which are valid for set time periods and capacity quotas.
  - Direct land tenders: Additional capacity will be constructed via a tendering process at pre-approved sites.
  - Net metering: Renewable energy plants (up to 5MW each) can also be established by energy consumers, with the monetary value of the generated electricity offsetting their electricity bill.
- **Natural Gas Fuel Switch –** There has been a significant switch to natural gas, instead of more carbon-intensive fuels, in both power generation and heavy industry; in 2013, this reduced emissions by 2.35 million tCO_2e. Smaller industrial factories as well as large commercial consumers are expected to switch to natural gas in the coming years, with the construction of the distribution network. The government has provided approximately NIS 20 million between 2009 and 2014 in grants for factories to switch to natural gas, while these factories have invested approximately NIS 100 million of private funds on the conversion.
- **Waste -** In recent years, Israel has undergone a Recycling Revolution, with the MoEP providing over NIS 1 billion (approx. $250 million) in grants to municipalities and private entities to build new infrastructure for separation at the source, including waste separation and treatment facilities. As of April 2014, approximately 450,000 households separated waste at the source, or close to 20% of households. Currently, 20% of solid waste is recycled, with a target in place to reach 50% recycling of solid waste by 2020. These measures decrease the percentage of total waste that reach landfills, leading to a reduction in the amount of methane released from waste.

In terms of recycling wastewater, Israel is a global leader, with approximately 75% of sewage treated to a level at which it can be safely reused, mainly in agriculture. Israel's target is to reuse 95% of treated wastewater by 2020.

- **Transportation –** A major accomplishment in recent years which has contributed to reduced emissions from transportation has been the introduction of green taxation, a differential purchase tax based on vehicle emissions that encourages the purchase of lower-polluting vehicles. Israel has also invested large sums into improving public transportation. In 2014, the Ministry of Transport budgeted NIS 1.7 billion (approx. $ 440 million) for mass transit projects in metropolitan areas. Finally, Israel is working towards promoting the use of petroleum alternatives through the Petroleum Alternatives Administration, which was established in 2013 with a target to reduce petroleum use in transport by 30% by 2020 and by 60% by 2025, relative to forecast demand (and subject to economic feasibility). The PAA has supported petroleum alternative pilot projects in public transportation (such as electric bus and CNG bus pilot projects), and encourages the development of new technologies.

The following table summarizes Israel's progress in meeting its key 2020 targets described above:

Table 21 › Israel's progress in meeting its 2020 key targets

National Target	Latest Reported Value and Year	Target Value (2020)
National GHG Emission Reduction Target	78.4 $MtCO_2e$ (2013) 80.2 $MtCO_2e$ (2014, estimated[21])	87.2 $MtCO_2e$
National Energy Efficiency Target	5.9% (2014)	20%
National Renewable Energy Target	1.8% (2014)	10%

Detailed information on Israel's mitigation actions is provided in the following table:

(21) This value is a Ministry of Environmental Protection estimated value developed as part of determining Israel's 2030 GHG emission target. This estimate was not developed by the CBS, charged with Israel's official GHG inventory, nor is it based fully on monitored activity data.

Table 22 › Mitigation actions

Name of Mitigation action	Nature and objectives of Mitigation action	Coverage	Progress of implementation (Start year-end year)	Steps taken/planned to achieve the action	Investment allocated to mitigation actions (government and private)	Quantitative goals.	Progress indicator and unit	Indicator value in the last reporting year	Estimated reductions (ton CO_2e)
General GHG reduction measures									
GHG Reduction Grant Mechanism	Grant monetary grants to projects, based on reduction potential and abatement cost	CO_2, CH_4, N_2O, SF_6, CFCs, PFCs	2011-2012	The MoEP along with the Ministry of Economy established and implemented a support mechanism that distributed NIS 106 million in GHG emissions reduction and energy efficiency projects in the commercial, industrial and municipal sectors. The program provided grants to 206 energy efficiency and GHG reducing projects and 11 projects which used locally-developed sustainable technologies. Projects reduced electricity consumption by 265 million kWh annually and will lead to a total annual emission reduction of approximately 442,000 tCO_2e by 2020.	Government investment - NIS 106 million Private investment - NIS 471 million		Emission reduction in 2020 as a result of the program	442,000 tons in 2020 (reported in 2012)	442,000 in 2020
Voluntary GHG Registry	Promote companies and corporations to annually submit voluntary greenhouse gas emissions reports to a national registry		2010-ongoing	There has been a steady increase in the number of companies reporting annually. 50 companies and corporations submitted voluntary reports in 2013, representing 60% of Israel's emissions inventory, up from 21 companies in 2010			# of companies that reported	50 (2013)	-

Name of Mitigation action	Nature and objectives of Mitigation action	Coverage	Progress of implementation (Start year-end year)	Steps taken/planned to achieve the action	Investment allocated to mitigation actions (government and private)	Quantitative goals.	Progress indicator and unit	Indicator value in the last reporting year	Estimated reductions (ton CO_2e)
Energy Efficiency									
Energy efficiency	Establishment of country-wide energy efficiency target to be reached through cross-sectoral electricity saving measures	CO_2, CH_4, N_2O	2010-ongoing	Encourage electricity reduction through a variety of energy efficiency measures, as described below, including but not limited to appliance scrapping programs in the residential and commercial sector, awareness campaigns, energy surveys		20% energy efficiency by 2020, as per Government Decision 4095. (Israel's new reduction target increases this to 17% by 2030)	Energy efficiency achieved, relative to BAU forecast from 2010	5.9% (2014)	2,647,380 tons CO_2e reduced in 2014, relative to BAU
Energy efficiency grants	Provide monetary grants to energy efficiency projects		2011-ongoing	As part of the ongoing program, grants have been distributed for energy efficiency projects in the private and municipal sector, including local authorities	Government investment – NIS 47 million Private investment – NIS 201 million		Annual electricity savings (MWh/ year)	140,000 (2014)	96,289 tons CO_2e in 2014
Household appliance energy efficiency - refrigerators	Incentives for citizens to replace and scrap inefficient refrigerators with newer, more efficient ones, through government assistance programs		2011-2012	As part of the program, approximately 126,000 refrigerators were replaced, which will save 132 million kWh / year	Government investment - NIS 152.4 million		Annual electricity savings (MWh/ year)	132,000 (2013)	90,787 tons CO_2e in 2014
Household appliance energy efficiency - Air conditioners	Incentives for citizens to replace and scrap inefficient air conditioner with newer, more efficient ones, through government assistance programs		2012-2014	As part of 3 scrapping programs, approximately 32,900 A/C units were replaced , which will save an estimated 49 million kWh / year	Government investment - NIS 44.7 million		Annual electricity savings (MWh/ year)	49,000 (2013)	33,701 tons CO_2e in 2014

Name of Mitigation action	Nature and objectives of Mitigation action	Coverage	Progress of implementation (Start year-end year)	Steps taken/planned to achieve the action	Investment allocated to mitigation actions (government and private)	Quantitative goals.	Progress indicator and unit	Indicator value in the last reporting year	Estimated reductions (ton CO_2e)
Household appliance energy efficiency - Light bulbs	Incentives for citizens to replace and scrap inefficient light bulbs with newer, more efficient ones, through government assistance programs	CO_2, CH_4, N_2O	2012	Through the implementation of the program, 675,000 incandescent light bulbs were replaced with 20W CFL bulbs. The CFL bulbs were offered at a reduced price. Annual electricity savings were estimated at 80 million kWh			Annual electricity savings (MWh/ year)	80,072 (2012)	55,072 tons CO_2e in 2014
Household appliance energy efficiency - Solar water heaters	Incentives for citizens to replace and scrap electrical water heaters with solar water heaters, through government assistance programs		2013	As part of the program 3,300 solar water heaters were replaced. Annual electricity savings were estimated at 4.4 million kWh			Annual electricity savings (MWh/ year)	4,400 (2013)	3,026 tons CO_2e in 2014
Energy surveys	Increase energy surveys in order to identify potential energy efficiency measures in the commercial and industrial sectors		2011-ongoing	By law, all corporations consuming over 2000 TOE of energy annually must conduct an energy audit every 5 years and submit it to the Ministry of Energy. In addition, those consuming over 300 TOE annually must appoint an energy officer and report their consumption annually. Subsidies were provided to 94 small factories that are not required by regulation to conduct surveys, to voluntarily conduct a survey to identify and quantify potential energy efficiency measures. The surveys identified potential savings estimated at 70.5 million kWh savings annually, which if implemented would be equivalent to 48,488 ton CO_2e in 2014.	Government investment - NIS 5 million		# of companies that have submitted surveys		

Name of Mitigation action	Nature and objectives of Mitigation action	Coverage	Progress of implementation (Start year-end year)	Steps taken/planned to achieve the action	Investment allocated to mitigation actions (government and private)	Quantitative goals.	Progress indicator and unit	Indicator value in the last reporting year	Estimated reductions (ton CO_2e)
Regulation and standards for commercial and household appliance energy efficiency	To improve regulations on commercial and household appliance efficiency, including minimum efficiency or maximum consumption	CO_2, CH_4, N_2O		With technological advances and more efficient appliances available to the public, regulations dictating minimum efficiency of appliances have been updated, and energy ratings have been developed for appliances. In addition, the law now requires visible energy ratings on all household appliances.			Annual electricity savings from improving regulations and standards of appliances		
Updated standards for light bulbs	To improve energy efficiency through stricter standards for light bulbs		2011-ongoing	In 2011, light bulb standards were updated whereas incandescent bulbs over 60 W can no longer be sold. These bulbs are being replaced by more energy efficient CFL bulbs.			Annual electricity savings (MWh/ year)	152,000 (2014)	104,542 tons CO_2e in 2014
Updated standards for commercial chillers	To improve energy efficiency through stricter standards for commercial chillers		2013-ongoing	In 2013, the standard which dictates the minimum efficiency of new chillers was updated, requiring a high level of efficiency. It is estimated that this update reduced energy consumption by approximately 93,333 MWh/year for new chillers.			Annual electricity savings (MWh/ year)	93,333 (2014)	64,193 tons CO_2e in 2014
Awareness campaign	Implement awareness campaigns to encourage citizens to reduce energy consumption		2010-2015	A 2-year campaign called 'Starting to Think Green' ran in 2011-2012 with the goal of increasing awareness of reducing GHG emissions through reducing mileage driven, green building, and electricity reduction. In addition, 13 other energy efficiency public awareness campaigns ran in 2011-2015. Energy efficiency was introduced into school curriculum for grades 1-9 during the 2010-2015 school years.	Government investment – Approximately NIS 33 million		Annual investment (NIS million)	Approx. NIS 5.6 million (on average, over the past 6 years)	

Name of Mitigation action	Nature and objectives of Mitigation action	Coverage	Progress of implementation (Start year-end year)	Steps taken/planned to achieve the action	Investment allocated to mitigation actions (government and private)	Quantitative goals.	Progress indicator and unit	Indicator value in the last reporting year	Estimated reductions (ton CO_2e)
Electricity Generation									
Fuel switch to natural gas in electricity generation	Natural gas fuel switch from other fossil fuels in electricity generation	CO_2, CH_4, N_2O	2004-ongoing	Israel has increased the percentage of electricity generation from natural gas annually since 2004 with the exception of 2011-2012 due to an unexpected natural gas shortage. Israel has increased the installed capacity of natural gas plants, with current capacity as of 2015 at 10,930 MW.			% of natural gas in the fuel mix	40.6% (2013). BAU scenario used to determine 2020 target assumed 35%	2,346,723 tons CO_2e reduced in 2013
Renewable electricity	Increase renewable installed capacity and electricity generation		2010 - ongoing	Feed-in-tariffs for renewable energy range from Nis 0.45-2.30 per kWh, depending on renewable energy source/technology. This acts as an incentive to the public to produce electricity from renewable sources. Renewable installed capacity at the end of 2014 was 3.7% of total installed capacity, and expected to reach 6.5% by the end of 2015.		10% renewable electricity generation by 2020 (of total consumption), 5% by 2014 (Israel's new reduction target increases this target to 17% by 2030)	% of electricity generation from renewables	1.8% (2014). Baseline year of 2010 had negligible renewables	758,284 tons CO_2e reduced in 2014
Smart grid	Smart grid pilot programs		2014-ongoing	A pilot project was recently launched with introduction of smart meters in 4600 households using different technologies to assess their viability. A further pilot is being considered which will install about 32,000 smart meters, in order to test user behavior and response to different tariff schemes.			Total # of smart meters installed	4600 (2014)	

Name of Mitigation action	Nature and objectives of Mitigation action	Coverage	Progress of implementation (Start year-end year)	Steps taken/planned to achieve the action	Investment allocated to mitigation actions (government and private)	Quantitative goals.	Progress indicator and unit	Indicator value in the last reporting year	Estimated reductions (ton CO_2e)
Time of Use Tariff (TOUT) Programs	Improve grid management by lowering peaks through increasing(TOUT) Programs	CO_2, CH_4, N_2O	Ongoing	All customers who consume over 40,000 kWh annually are required to use the TOUT Program. Anyone else who does not fall into this category may choose to join the Voluntary TOUT Program. At the end of 2014, 82,409 customers were part of the TOUT program, up from 56,114 customers in 2010			Percentage of total electricity consumption which is consumed through the obligatory and voluntary TOUT Program	57% (2014) In 2010, this stood at 59%	
Industry									
Natural gas fuel switch	Promote fuel switch in industry to natural gas, through subsidizing the cost of connecting to the distribution network and machinery conversion costs	CO_2, CH_4, N_2O	2012-ongoing	A comprehensive survey of was carried out on industrial and commercial sites with potential to switch to natural gas. Currently, 67 factories have received subsidies for converting factories to consume natural gas. Total subsidies given for these conversions total NIS 20 million, of which NIS 16.2 million was given in 2014	Government investments - NIS 20 million Private investments - NIS 100 million		Total number of factories that have switched to natural gas	67 (2014)	
Natural gas fuel switch	Increase with the expansion of the natural gas transmissions and distribution network		2009-ongoing	A National Master Plan for natural gas pipeline infrastructure was approved in 2001. There are currently 500 km of transmissions lines. The distribution network in Israel is split in 6 different districts, with one supplier in each district. All distribution networks, except for the Jerusalem District, are currently under construction, with some ready to come online in the near future. Jerusalem District is expected to begin construction in the near future	Government investment for distribution network - NIS 110 million Private investment for distribution network - Approximately NIS 780 million		# of districts with completed distribution networks	0/6 (2014)	

Name of Mitigation action	Nature and objectives of Mitigation action	Coverage	Progress of implementation (Start year-end year)	Steps taken/planned to achieve the action	Investment allocated to mitigation actions (government and private)	Quantitative goals.	Progress indicator and unit	Indicator value in the last reporting year	Estimated reductions (ton CO_2e)
Transportation									
Improved efficiency in vehicles, due to green taxation and updated standards	Improved efficiency in private vehicles can be achieved through updating vehicle standards and through the implementation of green tax framework, which offers tax breaks to private vehicles which pollute less, through approval of differential purchase tax rates, based on vehicles emissions	CO_2	2009-ongoing	The green tax was introduced in 2009, with 15 emission levels, based on a green score of 0-250+. A stricter tax rating (update #1) came in effect August 2013, and a 2nd update began as of January 2015. More efficient engines have reduced emissions by an estimated 163,937 tons CO_2e in 2014. All private vehicles imported must meet Euro 5 standards. in addition, all imported vehicles must have low resistance tires, and beginning in Feb. 2015, they must have automatic air pressure gauges	Government investment in 2014 due to lost taxes from green tax benefits - NIS 1.42 billion		Average carbon dioxide emission per km, of vehicles sold in current year (gram CO_2e per km)	140 (2014), relative to 178 (2009, at beginning of program)	163,937 tons CO_2e in 2014
Public transportation	Increase the use of public transport instead of private vehicles		Ongoing	There are 160 km of dedicated bus lanes, expected to increase to 240 km by the end of 2018. In 2011, a light rail began service in Jerusalem, and in 2014, construction on the Tel Aviv light rail began. Israel is increasing its heavy rail passenger services, including building a high speed rail between Jerusalem and Tel Aviv.	The budget allocated to mass transit projects in 2014 was over NIS 1.7 billion		Daily ridership on public transport	4,038,000 (2013)	
Electrification of rail	To increase the amount of electrified railroads, and in turn, introduce electric trains		2015-ongoing	The first electrified rail line in Israel, between Jerusalem and Tel Aviv, is currently under construction and expected to be completed in 2017.			% of total passenger train VKM traveled by electric trains	0%	

Name of Mitigation action	Nature and objectives of Mitigation action	Coverage	Progress of implementation (Start year-end year)	Steps taken/planned to achieve the action	Investment allocated to mitigation actions (government and private)	Quantitative goals.	Progress indicator and unit	Indicator value in the last reporting year	Estimated reductions (ton CO_2e)
Reducing private cars from entering city centers	To increase park and ride schemes into major cities and central business districts, and toll roads leading into major cities	CO_2	2011-ongoing	Establishment of major park and ride in the Tel Aviv Metropolitan area, with free parking and shuttle service into the city.			Total parking spaces at park and ride lots	4800 (2014)	
Old private vehicle scrapping program	To reduce the amount of old, heavy polluting vehicles by offering incentives to owners to scrap cars that are 20 years or older		2010-2013	The program ran over a period of 4 years, under the auspices of the MoEP and Ministry of Transport	Government investment - NIS 87 million		Total number of vehicles scrapped over lifetime of program	28,000	
Waste									
Decrease landfilling through recycling	Decrease amount and percentage of waste landfilled, through various recycling programs	CO_2, CH_4	2008-ongoing	Enforcement of the various laws pertaining to recycling waste, such as the Packaging Act, Beverage Container Deposit Law, all under the Extended Producer Responsibility system. Increase separation at the source, and increase recycling of household solid waste.	Over NIS 1 billion has been invested by the MoEP	Increase recycling rates for solid waste to 50% by 2020. Long-term aim is to reach 0% landfilling	Recycling rate of solid waste	20% (2014)	
Recycling of organic waste	To increase the amount of household organic waste separated and recycled, in order to reduce methane emissions		2008-ongoing	Provide grants for municipalities to create waste separation and treatment facilities, as well as Increase separating at the source. As of April 2015, approximately 445,000 households separate at the source	Total investment above includes investments for separating at the source and grants for building waste treatment stations, such as anaerobic digestion facilities	Total amount of organic matter separated in 2015 should reach 85,000 tons	Annual amount of organic matter separated (tons)	50,000 (2013)	

Name of Mitigation action	Nature and objectives of Mitigation action	Coverage	Progress of implementation (Start year-end year)	Steps taken/planned to achieve the action	Investment allocated to mitigation actions (government and private)	Quantitative goals.	Progress indicator and unit	Indicator value in the last reporting year	Estimated reductions (ton CO_2e)
LFG capture and utilization	Increase landfill gas collection rate, in order to produce electricity and decrease methane emissions	CO_2, CH_4	2001-ongoing	Landfills are required to measure methane levels and equipped to collect methane which can be utilized or flared. Some landfills either produce electricity from methane, or transfer captured LFG to nearby industrial plants.			Total methane captured and destroyed (ton CH_4/yr)	7,793 (2013)	163,657 tons CO_2e
Turn waste into resource	Utilize waste separation in order to produce RDF		Ongoing	Israel's sole cement producer currently replaces 10% of pet coke consumption with RDF at its largest cement production site. A waste separation and RDF production facility is currently being constructed and will produce approximately 500 tons RDF/day.			Amount of RDF used as a fuel alternative (ton/yr)	3,640 (2014)	
Turn waste into resource	To increase the percentage of recycled wastewater that is reused in agriculture		Ongoing	Increase treatment facility capacity to reach 600 mlm3 annually in 2020 which is fit to be used in agriculture. Israel currently recycles about 75% of sewage to the highest level, which is reused primarily in agriculture.		95% recycling rate by 2020	Percentage of wastewater recycled and reused	75% (2014)	
Green building									
Residential green building	Increase the uptake of residential new build which adheres to recognized green building standards	CO_2, CH_4, N_2O	2011-ongoing				Total amount of residential green buildings	152 (2014)	
Commercial/ public green building	Increase the uptake of commercial and public new build which adhere to recognized green building standards		2008-ongoing				Total amount of commercial green buildings	32 (2014)	

Name of Mitigation action	Nature and objectives of Mitigation action	Coverage	Progress of implementation (Start year-end year)	Steps taken/planned to achieve the action	Investment allocated to mitigation actions (government and private)	Quantitative goals.	Progress indicator and unit	Indicator value in the last reporting year	Estimated reductions (ton CO_2e)
Training of professionals	Increase the awareness of green building amongst contractors, planners, and other professionals in the field through increasing training programs	CO_2, CH_4, N_2O	2013 - ongoing	An increase in green building in the future requires an increase of qualified professionals in the field. This is being done through introducing green building in academia and offering training for professionals. 17 training workshops were offered with an average of 35 professionals attending each work. The majority of workshops were run by the Israel Green Building Council.			Number of qualified green building professionals	608 (2013)	
Update Green Building Standards	Update the Israeli Standards for Green Building, namely SI 5281: Sustainable buildings and SI 5282: Energy Ratings of Buildings		2005-ongoing	Both of Israel's main green building standards - SI 5281: Sustainable Buildings and SI 5282: Energy Ratings of Buildings - were revised in 2011. In 2013, SI 5281 began undergoing another revision. This draft revision has been published for remarks, and is expected to be completed in 2015			Most recent revision to Green Building Standards SI 5281 and SI 5282	2011 (as of 2014)	
Residential green building pilot project	Implementation of a pilot project which integrates green building into residential buildings		2012-ongoing	In 2012, a tender was published to choose 28 buildings which will receive grants in return for supplying the MoEP with data related to the building. Currently 17 buildings have joined the pilot project	Government investment – NIS 7.8 million		M2 of building involved in pilot project	70,749	

03

Measurement, Reporting and Verification

Israel is currently in the process of establishing a Measurement, Reporting and Verification (MRV) system, through which to measure the effectiveness of its policies and mitigation measures. This will help keep track of Israel's progress towards reaching its target, through accurate and transparent reporting at the national and international level. The MRV system is being established by the Ministry of Environmental Protection, with the assistance of a team of expert consultants from EcoTraders Ltd., in accordance with the GHG Protocol Policy and Action Standard developed by the World Resources Institute as well as international best practice.

Israel's MRV system will be constructed in order to facilitate, inter alia, the following:

- Assessment of implementation of government public policy related to GHG reduction measures and energy efficiency, including success rates based on various indicators.
- Assessment of governmental and private investments for these measures.
- Identification of barriers impeding progress.
- Formulation of recommendations for additional mitigation measures.

Previous GHG emission reduction targets were monitored by the MoEP, under government mandate, which submitted an annual report to government at the end of each year detailing the progress made towards meeting Israel's targets. In addition, as mentioned above, the CBS is responsible for compiling and publishing Israel's GHG Inventory and related information. As the CBS has a legal mandate to collect and publish data from all sectors, including both public and private, it is expected to continue to play a pivotal role the MRV system currently being established.

04

International Market Mechanisms

In 2004, Israel established a Designated National Authority for authorizing Clean Development Mechanism (CDM) projects. To date, 31 projects have been registered with the CDM Executive Board, accounting for a total potential reduction of more than 26 million tons of CO_2e. Projects span the areas of waste, agriculture, fuel switch, renewable energy and industrial energy efficiency. The CDM Executive Board has thus far issued more than 3 million Certified Emission Reductions (CERs) for projects in Israel, with the majority being issued to projects that reduce N_2O emissions from nitric acid production.[22]

Due to the collapse in international CER prices, coupled with high costs associated with verification of emission reductions and issuance of CERs, the vast majority of Israeli CDM projects are not currently requesting issuance of credits, and CERs issued to Israeli projects pertain almost exclusively to the 2008 – 2012 Kyoto Protocol 1 period.

(22) https://cdm.unfccc.int/Projects/projsearch.html

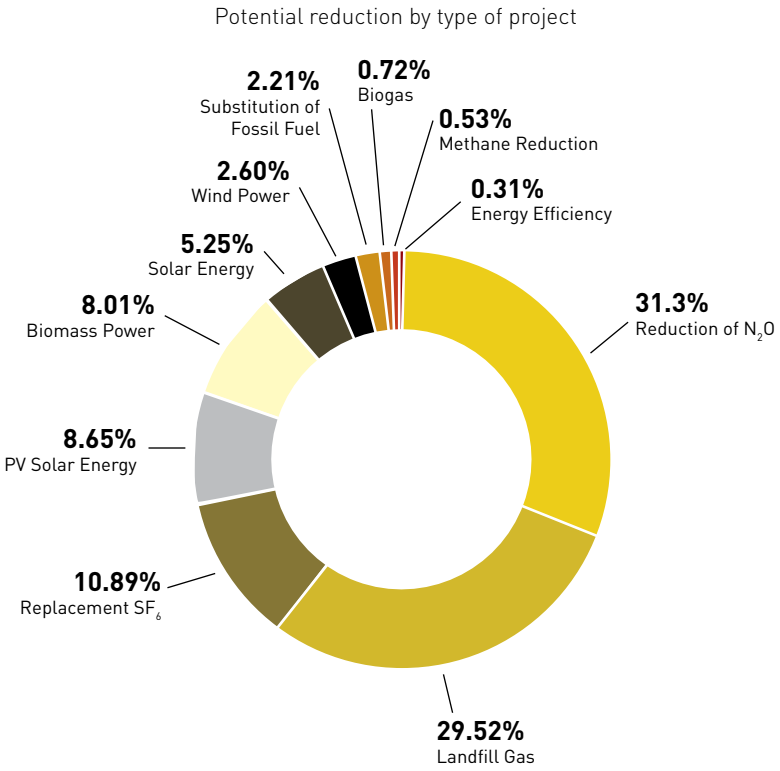
Table 23 › Description of CDM Projects

Name of CDM Project	Sector	Target Gases	Quantitative goals (Estimated tCO_2e reduction per annum)	Progress indicators (Total issuances in tons)
Hiriya Landfill Project	Landfill gas	CO_2, CH_4	85,463 (second crediting period) 93,452 (first crediting period)	273,416
Energy efficiency project in the Ramla Cement Plant in Israel through instalment of new grinding technology	Energy efficiency	CO_2	8,165	28,200
Small-Scale Grid Connected Wind Farm	Wind power	CO_2	39,042	0
Biomass Based Steam Generation at Galam factory	Biomass power	CO_2	26,956	0
Talia Landfill Gas Recovery Project and Electricity Production	Landfill gas	CO_2, CH_4	73,640	84,202
Project for the catalytic reduction of N_2O emissions with a secondary catalyst inside the ammonia reactor of the nitric acid plant at Fertilizers & Chemicals Ltd	Reduction of N_2O	N_2O	84,464	215,659
Project for the catalytic reduction of N_2O emissions with a secondary catalyst inside the ammonia reactor of the N3 nitric acid plant at Haifa Chemicals	Reduction of N_2O	N_2O	167,919	295,433
Project for the catalytic reduction of N_2O emissions with a secondary catalyst inside the ammonia reactor of the N1 & N2 nitric acid plants at Haifa Chemicals	Reduction of N_2O	N_2O	449,731	1,051,412
Project for the Catalytic Reduction of N_2O Emissions with a Secondary Catalyst Inside the Ammonia Reactor of the N4 Nitric Acid Plant at Haifa Chemicals	Reduction of N_2O	N_2O	116,320	137,193
Retamim Landfill Project	Landfill gas	CO_2, CH_4	53,715	0
Emek Hefer Biogas Project	Biogas	CO_2, CH_4	18,707	30,439
American Israel Paper Mill (AIPM) Natural Gas Fuel Switch	Substitution of fossil fuel	CO_2	48,410	131,701
Offis Textile Ltd. Fuel Switch, Israel	Substitution of fossil fuel	CO_2	9,243	18,878
SF_6 Switch at Ortal Die-casting 1993 Ltd	Replacement SF_6	SF_6	11,025	17,609
SF_6 Switch at Dead Sea Magnesium	Replacement SF_6	SF_6	2,736,160	794,961
Ganey Hadas Landfill Gas to Renewable Electricity project	Landfill gas	CO_2, CH_4	374,474	0
Methane Reduction at the Taibe'e Landfill using In-situ Aeration	Methane reduction	CO_2, CH_4, N_2O	19,805	0
Afcon E.B Wind Energy "Sirin" & "Gilboa" Grid Connected Wind Farms	Wind power	CO_2	40,648	0
Global Sun PV Solar Power Plants II	PV solar energy	CO_2	61,434	0
Global Sun PV Solar Power Plants I	PV solar energy	CO_2	64,684	0
Evlayim Landfill Project	Landfill gas	CO_2, CH_4	50,418	0
Shneur Solar Thermal Grid-Connected Power Plant in Ze'elim	Solar energy	CO_2	137,181	0

Name of CDM Project	Sector	Target Gases	Quantitative goals (Estimated tCO_2e reduction per annum)	Progress indicators (Total issuances in tons)
Blue Sky Energy PV Solar Power Plants	PV solar energy	CO_2	25,745	0
Global Sun Israel Solar PV Power Plant in Ketura	PV solar energy	CO_2	44,557	0
Israel Ports Landfill Project	Landfill gas	CO_2, CH_4	29,300	0
Shikun & Binui Renewable Energy PV Power Plants II	PV solar energy	CO_2	14,963	0
Shikun & Binui Renewable Energy PV Power Plants I	PV solar energy	CO_2	14,842	0
Animal manure anaerobic treatment facility – Ein Hahoresh	Biomass power	CH_4, N_2O	95,262	0
Eco Energy Beer Tuvya - Animal manure anaerobic treatment facility	Biomass power	CO_2, CH_4, N_2O	136,187	0
Green power Landfill Gas Project	Landfill gas	CO_2, CH_4	59,678	0
Efe'e Landfill Gas to renewable electricity Project	Landfill gas	CO_2, CH_4	155,646	0

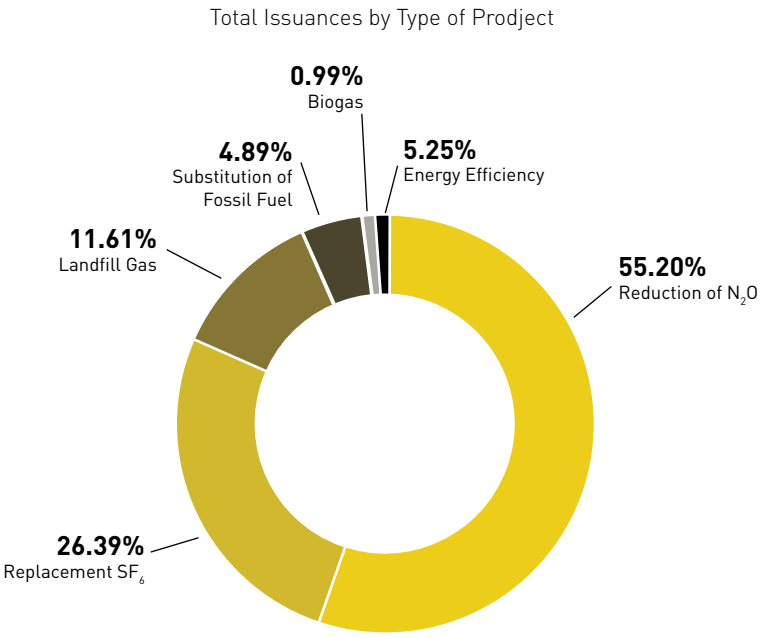
Reduction of N_2O projects represent the largest potential at 31% of total reduction potential, followed by landfill gas and replacement of SF_6 in magnesium production:

Figure 29 › CDM potential reduction by project type



Reduction of N_2O projects represent the largest proportion of issuances, at 55% of the total, followed by replacement of SF_6 projects with 26%

Figure 30 › CDM issuance by project type



CHAPTER 4:

FINANCIAL, TECHNOLOGY, AND CAPACITY BUILDING NEEDS AND SUPPORT RECEIVED

Despite its status as a non-Annex I country, Israel is an OECD member state, and receives little climate change related international aid. Israel provides aid to a number of countries and is actively involved in the international climate community. Israel participates in a number of international protocols and conventions; technology transfer and international development activities; bilateral climate cooperation activities; and international cooperation on climate change. Many countries have benefited from the State of Israel's technology transfers, in particular developing countries and countries in Africa.

01›

Support Received

Israel does not receive international support related to the preparation and submission of the BUR. The following is a list of projects related to climate change for which the MoEP receives international support:

- **Joint HFC project with Government of Bavaria –** Israel and Bavaria are currently underway with a 3 year project focused on replacing HFCs (which are currently being substituted for HCFCs that are controlled under the Montreal Protocol) with lower GWP substances. As part of this project, Israel receives two forms of capacity building assistance: first, visits by international experts to Israel to conduct professional workshops in the field of HFC replacement technologies; second, delegates from Israel will visit Germany to learn about relevant new technologies being implemented in the country. These delegates will return to Israel and provide training for additional local experts. The budget for the three year project is € 359,000 and is being paid by the Government of Bavaria.
- **EU ClimaSouth –** The ClimaSouth project supports climate change mitigation and adaptation in 9 South Mediterranean countries, including Israel. The project was initiated in February 2013 and will be implemented over 4 years with a total budget of € 5 million, provided by the European Neighborhood Policy (ENP). Its overall objective is to assist with the transition of partner countries towards low carbon economies and enhanced climate resilience. The project sponsors regional training and national projects. To date, Israel has received support for one national event, a workshop for government stakeholders and NGOs on the Long-range Energy Alternatives Planning model (LEAP), which is a widely-used software tool for energy policy analysis and climate change mitigation assessment developed at the Stockholm Environment Institute and which was used in developing Israel's national reduction target. The two-day workshop, which took place in March 2015 in Tel Aviv, provided 25 participants representing key government ministries, agencies and NGOs with a deeper understanding of the modeling approach to determine Israel's reduction target, with an aim to improve information sharing between and joint policy decisions between the various government bodies.

In addition, Israel has also participated in the following EU ClimaSouth regional workshops:

- In September 2014, two representatives traveled to Bonn to participate in a Climate Change Communication and Climate Change Finance Workshop.

- In October 2014, two representatives traveled to Brussels for a Climate Change Negotiation workshop.
- In November 2014, four representatives traveled to Italy for GHG modelling/ LEAP training.
- In April 2015, one representative traveled to Italy for a workshop on downscaling climate change modelling.
- In May 2015, two representatives traveled to Morocco to participate in climate change steering committee meetings

- **GHG Inventory Report Capacity Building –** Israel participated in a workshop on preparing the submission of greenhouse gas inventory reports, in accordance with the requirements of the UNFCCC. Three Israeli delegates spent five days with counterparts in the UK to learn how to properly develop the inventory report. The workshop was covered by TAIEX, an instrument of the European Commission.

02

International Protocols and Conventions

The MoEP is responsible for engaging Israel in international conventions and protocols related to climate and the environment. A number of other environmental multilateral agreements are the responsibility of other ministries. Many although not all of these conventions/protocols include components relating to climate change

The following is a list of protocols and conventions that Israel has ratified and of which the country is a member and to which it pays an annual contribution:

Table 24 › Protocols and conventions

Protocol/Convention	Topic
UNFCCC	Climate change
Kyoto Protocol to the UNFCCC	Emission reduction of GHGs
Vienna Convention for the Protection of the Ozone Layer	Protection of the ozone layer
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	Control of transboundary movements of hazardous wastes
Rotterdam Convention	Prior informed consent to International trade of hazardous chemicals
Montreal Protocol on Substances that Deplete the Ozone Layer	Phasing out production of substances responsible for ozone depletion (Annual membership payment)
Convention on Biological Diversity (CBD)	Sustaining the diversity of life on Earth
Convention on the Conservation of Migratory Species of Wild Animals (CMS)	Conservation of migratory species of wild animals

Protocol/Convention	Topic
Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)	Conservation of African-Eurasian migratory water birds
Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution	Protection of the marine environmental and coastal areas of the Mediterranean Sea
Convention on Wetlands of International Importance (Ramsar Convention)	Conservation of wetlands of international importance especially as waterfowl habitats
Mediterranean Wetlands Initiative (MedWet Initiative)	Protection of wetlands in the Mediterranean region
Kiev Protocol on Pollutant Release and Transfer Registers (PRTR)	Enhance public access to information through the establishment of PRTRs
Agreement on the Conservation of Populations of European Bats (EUROBATS)	Protection of 53 European bat species

The following is a table of additional payments and voluntary funding that MoEP has contributed to since 2010:

Table 25 › Additional payments

Additional payments	Type of payment
United Nations Environment Programme (UNEP)	Voluntary funding
Organisation for Economic Cooperation and Development (OECD)	Project on household behavior and environmental policy
OECD	Participation in OECD subsidiary bodies (environment)
OECD	Study on reform of energy taxation (case study of the Israeli "green taxation" on vehicles)
OECD	Measurement of Well-being and Progress: the OECD Better Life Initiative - Diagnosis and monitoring of Israel
OECD	Chemicals control program

03

International Development (MASHAV and KKL-JNF)

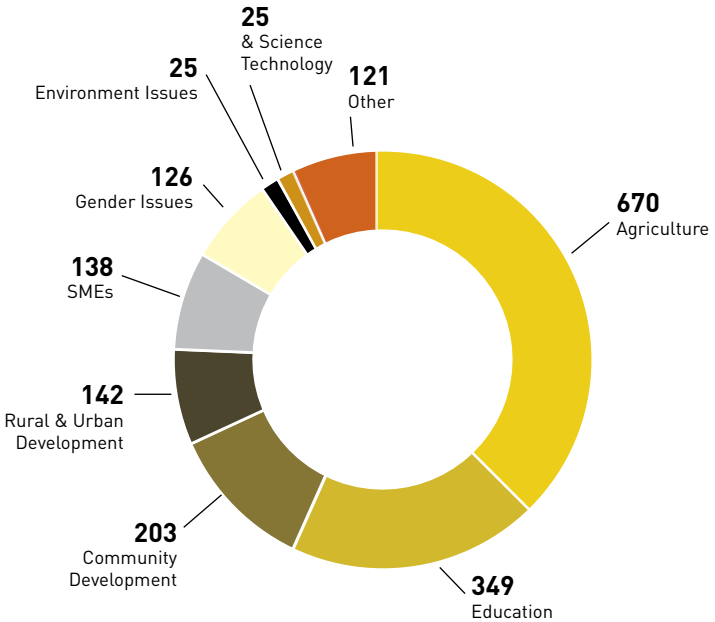
Israel has a long history of international cooperation with respect to technology, knowledge transfer, and capacity building. The main organizations in Israel engaged in these processes are MASHAV (Israel's Agency for International Development Cooperation, a division of the Ministry of Foreign Affairs) and the Keren Kayemeth LeIsrael – Jewish National Fund (KKL-JNF).

MASHAV is in charge of implementing the State of Israel's international development cooperation program and operates according to international agreed standards and principles. MASHAV focuses its efforts on capacity building and technology transfers, sharing relevant expertise accumulated during Israel's own development experience to contribute to the fight against poverty and to achieve sustainable development. MASHAV's activities include implementing projects abroad and professional training programs on a variety of topics, both in Israel and in situ. Participants in courses held in Israel typically stay between three weeks and five months. In situ courses are generally two to four weeks. In 2014, 1,774 professionals from 92 countries participated in 79 courses offered in Israel.[23]

In addition to courses, MASHAV staff members are deployed internationally as short- and long-term consultants. In 2014, staff participated in 67 short-term consultancy projects in 27 countries. There are also a handful of experts living and working abroad on longer-term projects. MASHAV is well known for its international development projects.[23]

Agricultural courses attracted the greatest number of participants in courses held in Israel, followed by education:

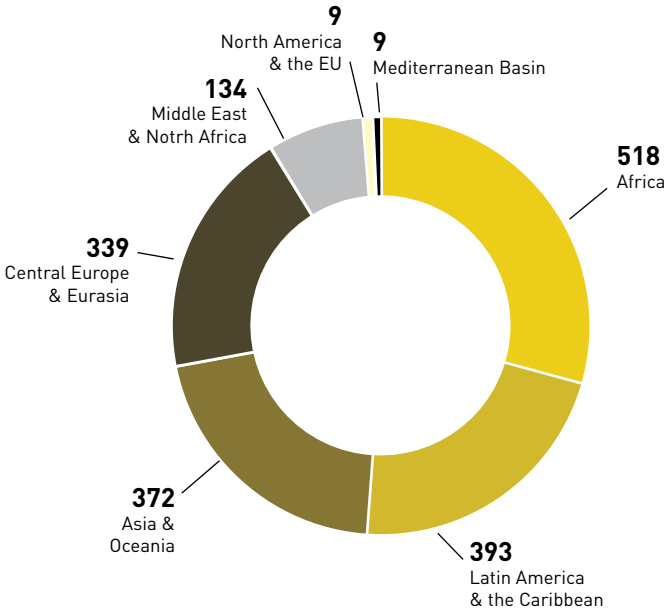
Figure 31 › Participants in MASHAV courses held in Israel by topic



(23) MASHAV's 2014 annual report - http://www.mashav.mfa.gov.il/MFA/mashav/Publications/Annual_Reports/Documents/AnnualReport2014.pdf

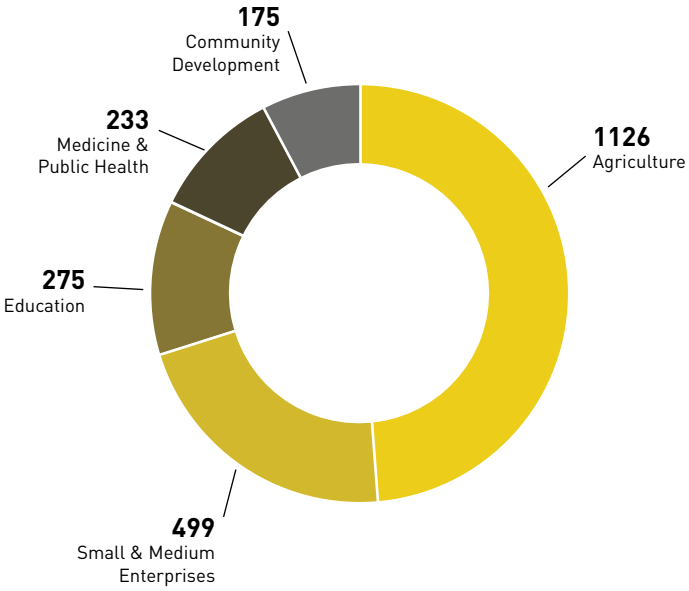
Over half of participants in projects held in Israel were from either Africa (518 participants) or Latin America & the Caribbean (393):

Figure 32 › Participants in MASHAV courses held in Israel by region



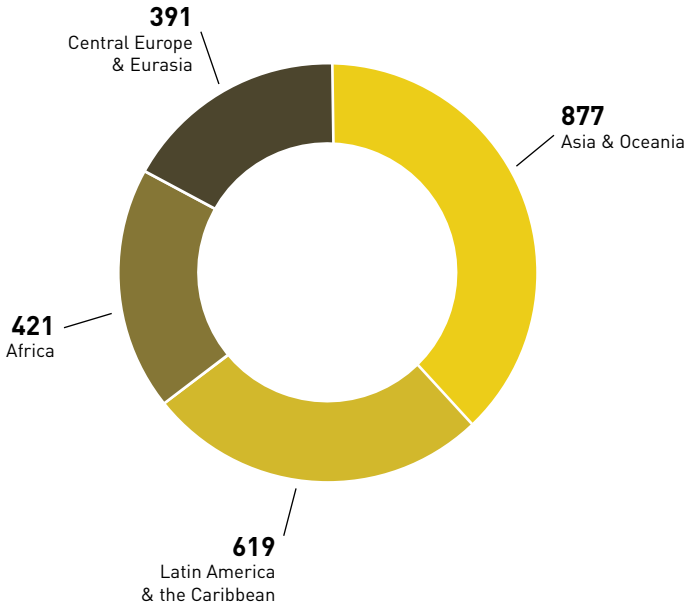
In 2014, 2,308 professionals took part in 44 in-situ courses offered in a total of 22 host countries. As with courses taking place in Israel, agricultural courses attracted the greatest number of participants in courses abroad:

Figure 33 › Participants in MASHAV abroad courses by topic



Asia and Oceania had the largest number of participants in courses abroad (877), followed by Latin America & the Caribbean (619):

Figure 34 › Participants in MASHAV abroad courses by region (2014)



While MASHAV works broadly on international development, the KKL-JNF, a non-profit, quasi-governmental organization focuses more specifically on environmental challenges in Israel and abroad. Water, forestry and environment, education, community development, tourism and recreation, research and development are the six areas of emphasis for the KKL-JNF. The KKL-JNF shares its knowledge and experience in these areas with countries worldwide through international aid projects, hosting delegations, presenting at conferences, and participating in membership organizations. The following is a non-exhaustive list of MASHAV's and KKL-JNF's international aid and development projects over the years 2010-2014:

Table 26 › MASHAV and KKL-JNF International Aid/Development Projects and Partnerships

Recipient Country/ Region	Implementing Agency	Name of Project/ Program	Sector(s)	Additional information/description
Ethiopia	MASHAV	Assistance to the development of Ethiopia's agriculture	Agriculture	The joint program (MASHAV, USAID, Ethiopian Ministry of Ag. & Rural Development) focuses on the development of horticultural plant propagation in Ethiopia through nursery cultivation and tissue culture propagation.
Ethiopia	MASHAV	Millennium Village Initiative Project in the Tigray region of Ethiopia	Agriculture, economic development	The program aims to bring about crop diversification, additional agricultural livelihoods, access to domestic and foreign markets and more efficient involvement of women in the development process through the creation of small entrepreneurships. MASHAV experts conducted a survey in the Tigray area to assess local needs.

Recipient Country/ Region	Implementing Agency	Name of Project/ Program	Sector(s)	Additional information/description
Ethiopia	MASHAV	Enhancing Irrigation Efficiency and Water Management as a Tool for Adaptation to Climate Change- Israel, Germany and Ethiopia	Agriculture, water	In June 2009, Ethiopia, Israel, and Germany launched a three-year tripartite agricultural development project, to enable Ethiopia to enhance small-scale irrigation development activities in different parts of the nation.
Kenya & Ghana	MASHAV	Economic development in Ghana and Kenya	Mitigation, water	MASHAV, the Millennium Cities Initiative, and UN-HABITAT in Kisumu, Kenya, work together to address environmental development issues, including the utilization of solar energy for water supply and irrigation, technology for waste management and greening the city.
Kenya	MASHAV	Education for Sustainable Development	Adaptation to climate change, sustainable consumption	MASHAV in cooperation with KEPSHA (Kenya's Organization of School Principals) and the Ministry of Education are implementing the project in a number of schools with the aim of introducing the subject as an integral element in the curricula of learning institutions.
Various	MASHAV	Techno-agricultural Innovation for Poverty Alleviation	Agriculture, technology, poverty alleviation	MASHAV helps to implement "Family Drip Irrigation Systems," which include a mix of annual and perennial crops and a special low pressure drip irrigation system, and has been proven to significantly enhance yields and lower the risk of subsistence farmers in arid and semi-arid zones.
India	MASHAV	Cooperation agreement between Israeli and Indian ministries of agriculture	Agriculture, technology	Agricultural Centers of Excellence were established as part of a three-year agricultural cooperation agreement. These Centers provide a suitable platform for a rapid transfer of technology to the farmers.
Kyrgyzstan	MASHAV	Consulting Center in Bishkek, Kyrgyzstan	Agriculture	The center assists farmers interested in planning, financing and implementing improved systems and support former MASHAV demonstration farms in the region.
Uzbekistan	MASHAV	Agreement between UNDP and MASHAV to strengthen local capacity for sustainable livestock development in Uzbekistan	Agriculture	An agreement was signed in 2007 between the UNDP and MASHAV to strengthen local capacity for sustainable livestock development in Uzbekistan. The agreement includes transfer of Israeli knowledge and technologies, professional training programs, and the provision of high quality genetic materials and equipment for artificial insemination.
China	MASHAV	The Xinjiang Sino-Israeli Demonstration Center for Arid Zone Agriculture	Agriculture	Established in 2003, the program promotes agricultural development in this water poor area by improving the efficiency of agricultural practices and engaging in commercial agricultural production. There are two demonstration farms.

Recipient Country/ Region	Implementing Agency	Name of Project/ Program	Sector(s)	Additional information/description
Philippines	MASHAV	Philippines-Israel Center for Agriculture Training (PICAT)	Agriculture, technology	Philippines-Israel Center for Agriculture Training (PICAT) was started in 2005-2006. It provides extension services to farmers, is jointly managed with the local agricultural university, and serves as a demonstration site for Israeli agricultural technologies.
Bilateral: Egypt, Jordan, Israel, & the Palestinian Authority	MASHAV	Regional Agricultural Program	Agriculture	The program comprises six subjects (animal health, small ruminants, dryland agriculture, saline and marginal water resources, post-harvest technology and marketing, and aquaculture) and is governed by a semi-annual steering committee with representatives from all partners. It is sponsored by the Danish International Development Agency.
Jordan	MASHAV	Beekeeping demonstration project near the city of Irbid, Jordan	Apiculture	MASHAV runs, in cooperation with Jordanian partners, a beekeeping demonstration project. The project involves upgrade of local bee stock, research and development, and training and demonstration activities geared at introducing improvements to the local beekeeping sector in the northern Jordan Valley.
Nepal	MASHAV	Memorandum of Cooperation with the United Nations Food Program (WFP) in the field of Water Management	Water	The agreement aims at providing a framework for collaborative efforts on international programs and activities by identifying areas of common interest and priorities based on Nepal's development strategies.
Kenya	MASHAV	Integrated Water Resources Management in Nairobi, Kenya	Water	MASHAV worked with the Gender and Water Alliance to organize a regional professional training program focused on capacity development for equitable water resources management.
China	MASHAV	Yongledian Dairy Cattle Demonstration Farm	Agriculture	Applying the latest Israeli designs, technologies and expertise, the farm has the highest milk production in China. The farm serves as a training center for thousands of dairy producers from China and from neighboring countries.
Sub-Saharan Africa	MASHAV	Sustainable Tourism as a Tool for Regional Development in Sub-Saharan Africa	Tourism	MASHAV's programs in this field are designed to deal with rural tourism as a tool for local and regional development. The program provides participants with practical tools to promote tourism planning and development in a comprehensive development context based on local assets.
Central Africa	MASHAV	Inter-State Pesticides Committee of Central Africa	Agriculture	The project aims to train lab personnel for the implementation of testing methods of pesticide residues in agricultural produce designated for export to the EU.

Recipient Country/ Region	Implementing Agency	Name of Project/ Program	Sector(s)	Additional information/description
Bosnia-Herzegovina	MASHAV	Bosnia-Herzegovina Technical Cooperation Project	Agriculture	MASHAV, USAID, and the Linking Agricultural Markets to Producers (LAMP) project worked to develop high-quality market-oriented vegetable production with special emphasis on quality control and plant protection regulations.
Vietnam	MASHAV	Dairy demonstration farm in Vietnam	Agriculture	State-of-the-art milking parlor in Ho Chi Minh City. Machinery, equipment, and computerized software are all Israeli made.
Central America	MASHAV	Central American Bank for Economic Integration and MASHAV	Agriculture, education	Cooperation between CABEI and MASHAV will concentrate mainly in the fields of agriculture, education, and development of small and medium enterprises including courses in Israel and on-site, in addition to short and long term consultancies carried out by Israeli experts
Ghana	MASHAV	MASHAV-MoFA-GIZ Cooperation in Ghana	Agriculture	Over 100 farmers and extension officers from across Ghana will benefit from an intensive training program on citrus production within the framework of the joint partnership between Ghana's Ministry of Food and Agriculture (MoFA), MASHAV and Germany's International Cooperation (GIZ).
Georgia	MASHAV	MASHAV-USAID In Georgia	Agriculture, migration	Irrigation kits and lettuce seedlings were distributed among internally displaced people families in the area of Gori in September 2013. The project, an initiative of the Israeli Embassy in Georgia, was conducted in cooperation with MASHAV, USAID and Netafim.
Jordan	MASHAV	Agricultural Cooperation in Jordan	Agriculture	The joint cooperation project between MASHAV and Japan's International Cooperation Agency started in 2008, and includes professional training in the areas of irrigation, fertilization, organic agriculture and post-harvest care.
Kenya	MASHAV	Israel-Kenya-Germany Trilateral Cooperation in Lake Victoria	Aquaculture	With the goal of increasing the income of fish farmers' households, eradicating poverty in the region and improving the Lake Victoria ecosystem, Kenya, Germany and Israel joined hands in a trilateral cooperation to improve the farmed tilapia value chain in Kenya.
Malawi	MASHAV	Agro-Technology Demonstration Project	Agriculture, technology	The project's objective is to achieve the reduction of poverty and hunger through sustainable agriculture by introducing and adapting modern techniques for the production of horticultural crops and efficient irrigation systems
Rwanda	MASHAV	Center of Excellence in Rwanda	Agriculture, technology	The Minister of Agriculture of Rwanda has asked MASHAV to establish a Center for Advanced Horticulture. The center will focus on knowledge transfer activities, capacity building and demonstrations, agro-inputs technologies and fresh produce. Implementation began in December 2013.

Recipient Country/ Region	Implementing Agency	Name of Project/ Program	Sector(s)	Additional information/description
Senegal	MASHAV	Trilateral Cooperation between Israel-Senegal-Italy	Agriculture	Small-scale horticultural packages are developed by Israeli and Italian experts, and include low-pressure drip-irrigation, a mix of annual and tree crops, and an "operating system" for irrigation.
Bilateral: China & Israel	MASHAV	Chinese-Israeli International Center for Research and Training in Agriculture	Research, agriculture	Since the establishment of CIICTA in 1993, Israel and China have been carrying out multi-level and comprehensive cooperation in the areas of arid zone agriculture and bio-agriculture, including application of advanced agricultural technologies.
Macedonia	MASHAV	Israel-Macedonia Joint Agricultural Project	Agriculture, economic development	The project is intended to improve agriculture practices in Macedonia, through the creation of a high-quality production chain including establishing seedling and seed production demonstration units. This project will create the basis for future production of high quality vegetables intended for the export to EU markets.
Colombia	MASHAV	Colombia Dairy Cattle Project	Agriculture	An on-going Dairy Cattle project is taking place in Colombia in cooperation with the Atlantic Department local government, in the northern part of the country. Different stakeholders are involved in the project including dairy-production activities such as nutrition, reproduction, milk quality, and more.
West Africa	MASHAV	MASHAV-ECOWAS	General environmental protection	A cooperation agreement was signed in 2009 between ECOWAS (The Economic Community of West African States) and MASHAV with emphasis on reducing poverty and preservation and protection of the environment.
Mexico	KKL-JNF	Restoration of Alameda Park Mexico	Conservation	KKL-JNF helped to restore a 600 year old park
South Africa	KKL-JNF	Agricultural School	Agricultural education	KKL-JNF partnered with the Catholic Church of South Africa and Food and Trees in Africa to establish an agricultural school in South Africa.
Nepal	KKL-JNF	Shivapuri Nagarjun National Park	Forestry, education	The Shivapuri Nagarjun National Park, KKL-JNF, the Shalom Club Nepal, and the Embassy of Israel launched the 'Shalom Trail Project', which is a walking trail in Nepal marked with signs identifying important indigenous plants.
Ethiopia	KKL-JNF	Seeds of Hope and Fair Planet	Agriculture	The project aims to provide small-holder farmers with resilient high-quality tomato seeds suitable to semi-arid lands.
Various	KKL-JNF	Pest infestation management	Agriculture	Israel distributes the plant galls with the parasitic wasps free to any country who requests them.

Recipient Country/ Region	Implementing Agency	Name of Project/ Program	Sector(s)	Additional information/description
Kenya	KKL-JNF	Furrows in the Desert	Agriculture	Organizations provide professional support and funding to Turkana, Kenya. Projects include solar pumps, a training farm, crop assistance, and establishing 132 farms.
Canada	KKL-JNF	Manitoba Israel Water Experts Symposium	Water	Although the scale of water-projects varies greatly between Manitoba in Canada and Israel, there are many elements in common. The only Israeli counterpart to the Canadian "wetlands" can be found in the Hula Lake. The Manitoba Water Stewardship department and KKL-JNF Canada hosted the first ever Manitoba-Israel Water Experts Symposium in 2008. Since then, there have been three other projects: (1) The Minister's scholarship for international water studies for students, (2) Joint Manitoba - Israel research projects, and (3) the 2010 Manitoba Israel Water Experts Symposium.
Canada	KKL-JNF	Oak Hammock Wetlands and Hula Valley	Conservation	A twin-site treaty for the promotion of the combined development of two major bird-conservation sites – Lake Hula in Israel and Oak Hammock Marsh in Manitoba – was signed in October 2010 between KKL-JNF and the government of the Canadian province of Manitoba.

KKL-JNF also provides knowledge transfer activities in Israel. The following table lists such activities since 2010:

Table 27 › KKL-JNF Knowledge Transfer Activities

Title	Sector(s)	Duration of Project	Description
Integrated pest control for fruit and forest trees workshop	Agriculture	2010	KKL-JNF with MASHAV, The Center for International Agricultural Development Cooperation within the Ministry of Agriculture (CINADCO), and the Volcani Institute - Agricultural Research Organization institute hosted a delegation of 25 representatives from more than 14 countries on the topic of integrated pest control for fruit and forest trees.
Research and agricultural development workshop	Agriculture	2011	KKL-JNF with MASHAV hosted a delegation of representatives from nine Latin America countries on the subject of research and agricultural development.
International Wood Fair	Forestry	30 Aug - 2 Sept 2012	KKL-JNF joined representatives of commercial companies from Europe at the International Wood Fair in Austria. The focus of the fair was on timber production and forest management. Staff members manned a KKL-JNF booth at the fair and presented on afforestation methods in arid and semi-arid regions, arid land forestry techniques, and Mediterranean forestry management.
Delegations from Kazakhstan	Forestry	10-15 Nov 2012, 25-28 Nov 2012	Hosted two official delegations of professional foresters and journalists from Kazakhstan
CINADCO Day Tour in Forestry	Forestry	11 Nov 2012	KKL-JNF hosted Russian & Spanish Speaking Courses (52 participants from 23 countries) in Israel on the topic of forestry

Title	Sector(s)	Duration of Project	Description
Urban Parks and Water Seminar (Chile)	Water, urban planning	14-17 Nov 2012	Organized by the Government of Chile and the Santiago Metropolitan Park Authority, KKL-JNF received a special invitation to lecture at the seminar.
Delegation from Kyrgyzstan	Ecotourism	19-26 Nov 2012	KKL-JNF hosted a delegation from Kyrgyzstan in Israel to discuss bike trails and ecotourism
Delegation from Indonesia	Agriculture	3-7 June 2013	Day tour of KKL-JNF as part of an agricultural delegation from Indonesia
Delegation from Italy	Water	22 Oct 2013	Hosted a group of Italian water experts
Delegation from Bosnia	Forestry, water, land management	24-29 Nov 2013	KKL-JNF shared expertise with three forest professionals from Republika Srpska in Bosnia & Herzegovina on the topics of forest, water, community projects, and the management of open areas. Guests toured projects and met with KKL-JNF officials.
Delegation from Chile	Agriculture	1-7 Dec 2013	Chilean foresters joined an INFOR delegation to Israel to study KKL-JNF's cultivation of the *Pinus pinea* in Israel on arid and semi-arid lands in order to cultivate the tree for pine nut harvesting in Chile.
KKL-JNF Environmental Scholarship Program	Environmental expertise	2007-present	This is an initiative of KKL-JNF Australia that promotes the exchange of environmental expertise between Israel & Australia. Since its launch in 2007, the program has facilitated 15 exchange visits between authorities in Australia and Israel.

נייר אקולוגי

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