



OECD Environmental Performance Reviews

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OECD Environmental Performance Reviews: Israel 2023

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Note by the Republic of Türkiye

The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Türkiye recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Türkiye shall preserve its position concerning the “Cyprus issue”.

Note by all the European Union Member States of the OECD and the European Union

The Republic of Cyprus is recognised by all members of the United Nations with the exception of Türkiye. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

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Foreword

The principal aim of the OECD Environmental Performance Review (EPR) programme is to help member and selected partner countries improve their individual and collective performance in environmental management by:

- helping countries assess progress in achieving their environmental goals
- promoting continuous policy dialogue and peer learning
- stimulating greater accountability from governments towards each other and public opinion.

This is the second EPR of Israel. It examines the country's environmental performance since the first review of 2011. Progress in achieving domestic objectives and international commitments provides the basis for assessing Israel's environmental performance. Such objectives and commitments may be broad aims, qualitative goals or quantitative targets. A distinction is made between intentions, actions and results. Assessment of environmental performance is also placed within the context of Israel's historical environmental record, present state of the environment, physical endowment in natural resources, economic conditions and demographic trends.

The OECD is grateful to Israel's Ministry of Environmental Protection for providing information and comments, organising the review mission (3-8 April 2022) and virtual policy mission (14 September 2022), as well as for facilitating contacts inside and outside government institutions. Thanks are also due to all government ministries and agencies, as well as non-governmental organisations, that participated in the missions and provided information or comments.

The participation in the review of the representatives of the two examining countries, Thalia Statha (Greece) and Helge Wendenburg (Germany), is also gratefully acknowledged.

The authors of this report are Eugene Mazur and Sho Yamasaki of the OECD Environment Directorate and Oriana Romano and Juliette Lassman of the OECD Centre for Entrepreneurship, SMEs, Regions and Cities. Nathalie Girouard provided oversight. Carla Bertuzzi provided statistical support, while Lydia Servant provided administrative support. Mark Foss copy-edited the report. Natasha Cline-Thomas supported communications activities. Preparation of this report also benefited from inputs and comments from Kathleen Dominique, Guillaume Gruère, Soo-Jin Kim, Sarah Miet, Oliver Roehn, Kurt Van Dender and Julia Wanjiru of the OECD Secretariat.

The OECD Working Party on Environmental Performance discussed the draft Environmental Performance Review of Israel at its meeting on 5 December 2022 and approved the Assessment and Recommendations.

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Reader's guide

Signs

The following signs are used in figures and tables:

– : nil or negligible

. : decimal point

Country aggregates

OECD Europe: This zone includes all European member countries of the OECD, i.e. Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

OECD: This zone includes all member countries of the OECD, i.e. the countries of OECD Europe plus Australia, Canada, Chile, Colombia, Costa Rica, Israel*, Japan, Korea, Mexico, New Zealand and the United States.

Country aggregates may include Secretariat estimates.

Currency

Monetary unit: Israeli Shekel (ILS)

In 2021, USD 1 = ILS 3.23; EUR 1 = ILS 3.82

In 2020, USD 1 = ILS 3.44; EUR 1 = ILS 3.93

Cut-off date

This report is based on information and data available up to 15 August 2022.

Indicators

Internationally-comparable indicators presented in the [OECD Environment at a Glance](#) online platform support the analysis. They should be read in conjunction with this report.

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Basic statistics of Israel

2021 or latest available year (OECD values in parentheses)^a

PEOPLE AND SOCIETY				
Population (million)	9		Population density per km ²	425 (37)
Share of population by type of region:			Population compound annual growth rate, latest 5 years	1.9 (0.6)
Predominantly urban (%)	68	(68)	Income inequality (Gini coefficient)	0.34 (0.32)
Intermediate (%)	32	..	Poverty rate (% of pop. with less than 50% median income)	17 (12)
Rural (%)	..	(32)	Life expectancy	83 (81)
ECONOMY AND EXTERNAL ACCOUNTS				
Total GDP (National currency, billion)	1 558		Imports of goods and services (% of GDP)	28 (29)
Total GDP (USD billion, current prices and PPP)	411		Main exports (% of total merchandise exports)	
GDP compound annual real growth rate, latest 5 years	3.6	(1.5)	Machinery and transport equipment	32
GDP per capita (1 000 USD, current PPP)	44	(49)	Chemicals and related products	26
Value added shares (%)			Manufactured goods	17
Agriculture	1	(2)	Main imports (% of total merchandise imports)	
Industry including construction	20	(24)	Machinery and transport equipment	36
Services	78	(74)	Manufactured goods	17
Exports of goods and services (% of GDP)	29	(29)	Chemicals and related products	14
GENERAL GOVERNMENT				
Percentage of GDP				
Expenditure	46	(48)	Education expenditure	7 (5)
Revenue	35	(38)	Health expenditure	5 (8)
Gross financial debt	88	(125)	Environment protection expenditure	0.6 (0.5)
Fiscal balance	-9	-(7)	Environmental taxes: (% of GDP)	2.3 (1.4)
			(% of total tax revenue)	7.7 (4.6)
LABOUR MARKET, SKILLS AND INNOVATION				
Unemployment rate (% of civilian labour force)	5	(6)	Patent applications in environment-related technologies (% of all technologies, average of latest 3 years ^b)	7 (11)
Tertiary educational attainment of 25-64-year-olds (%)	50	(40)	Environmental management	2 (3)
Gross expenditure on R&D, % of GDP	5.4	(2.7)	Climate change mitigation technologies	5 (10)
			Climate change adaptation technologies	2 (1)
ENVIRONMENT				
Energy intensity: TES per capita (toe/cap.)	2.3	(3.8)	Road vehicle stock (vehicles/100 inhabitants)	40 (67)
TES per GDP (toe/1 000 USD, 2015 PPP)	0.06	(0.09)	Water stress (abstraction as % of available resources)	45 (7)
Renewables (% of TES)	5	(12)	Water abstraction per capita (m ³ /cap./year)	138 (691)
Carbon intensity (energy-related CO ₂):			Municipal waste per capita (kg/capita)	691 (534)
Emissions per capita (t/cap.)	6.2	(7.9)	Material productivity (USD, 2015 PPP/DMC, kg)	1.8 (2.5)
Emissions per GDP (t/1 000 USD, 2015 PPP)	0.16	(0.18)	Land area (1 000 km ²)	22
GHG intensity: ^c			% of arable land and permanent crops	22 (11)
Emissions per capita (t/cap.)	8.8	(10.5)	% of permanent meadows and pastures	7 (23)
Emissions per GDP (t/1 000 USD, 2015 PPP)	0.23	(0.26)	% of forest area	6 (33)
Mean population exposure to air pollution (PM _{2.5}), µg/m ³	19	(14)	% of other land (built-up and other land)	64 (32)

a) Values earlier than 2015 are not taken into consideration. OECD value: where the OECD aggregate is not provided in the source database, a simple OECD average of the latest available data is calculated where data exist for a significant number of countries.

b) Higher-value inventions that have sought protection in at least two jurisdictions.

c) Excluding emissions/removals from land use, land-use change and forestry.

Source: Calculations based on data extracted from databases of the OECD, IEA/OECD, EUROSTAT and the World Bank.

Executive summary

Attainment of the climate goals requires robust sectoral measures

Israel has raised its climate ambitions in recent years. It has set an 85% greenhouse gas (GHG) reduction target for 2050, as well as sectoral targets for GHG emissions from electricity generation, solid waste, transport and industry. It has also declared the overall ambition of carbon neutrality by the same year. However, Israel is not on track to reaching these targets with existing measures and will need to introduce additional ones across all sectors. Adopting the government-approved draft Climate Law with its binding targets would be an important step in this direction.

The country's share of renewables in the energy mix is the second smallest in the OECD. Israel needs to promote, and remove administrative barriers for, solar power installations and accelerate integration of renewable sources into the electric grid. To address its high car dependency, Israel should develop a coherent interagency strategy for a low-carbon transition in the transport sector and prioritise investment in public transport. It should also strengthen links between transport and land-use planning while enhancing the role of local governments. The rapidly expanding residential sector and its growing energy intensity call for accelerated implementation of the mandatory Sustainable Building Standard for all new buildings and establishing energy efficiency standards for existing buildings.

Biodiversity protection should go beyond protected areas and be mainstreamed across sectoral policies

The increasing demand for new housing and infrastructure is causing more pressure on open natural landscapes and adding to land scarcity and habitat fragmentation. The significant increase in development of settlements and infrastructure is affecting biodiversity more than ever. Israel is making progress in expanding protected areas: it has protected about a quarter of its land area but only 4% of its territorial waters. However, most vulnerable ecosystems are under significant stress outside protected areas. Invasive alien plant and animal species have a significant negative effect on biodiversity and ecosystems, which requires regulatory action.

Israel intends to adopt a new national biodiversity strategy and set measurable biodiversity targets. It should pursue better mainstreaming of biodiversity protection into sectoral, particularly agricultural, policies and further integrate ecological corridors into spatial plans. The country should also intensify efforts to protect terrestrial ecosystems outside national parks and nature reserves by minimising urban sprawl. In addition, it should expand the size of marine protected areas.

Despite water management successes, water pollution remains a problem

Israel is one of the most water-stressed countries in the world, with agriculture accounting for over half of water consumption. To address water scarcity, it has invested massively in large-scale reuse of wastewater and desalination of seawater. Israel is the largest user of recycled effluent water for agriculture across OECD member countries; desalination secures the country's supply of potable water. Israel has also made significant progress in improving water allocation among sectors and to nature by developing and implementing river plans and providing incentives to farmers to minimise upstream water abstraction. However, both surface water and groundwater remain polluted. Israel needs to continue to reduce freshwater consumption in agriculture through better water allocation planning and price signals, reduce nutrient loading from agriculture and complete upgrades of its wastewater treatment infrastructure.

Adoption of good regulatory practices is slow

Israel's environmental regulatory framework is fragmented and partly outdated. Environmental assessment does not yet cover all projects, policies, plans and programmes with a potentially significant environmental impact. The country's environmental permitting system is governed by several disparate issue-specific laws. Adopting the draft Environmental Licensing Law approved by the government in 2022 would be an important step towards substantive integration of environmental permit conditions across environmental media on the basis of best available techniques.

The country's environmental compliance monitoring and enforcement capacity has increased over the last decade but remains insufficient. Inspections are mostly prompted by incidents or complaints. Compliance data are patchy and inconsistent. Israel should strengthen risk-based targeting of compliance monitoring and engage in more active compliance promotion with a particular focus on small and medium-sized enterprises. It also needs to improve compliance-related reporting and data management.

Fossil fuel taxes and subsidies do not facilitate a low-carbon transition

Israel's excise taxes on motor fuels are among the highest among OECD countries. However, other fossil fuels have so far been taxed at very low rates. Israel is planning to gradually increase excise taxes on other fossil fuels so that carbon pricing would cover about 80% of its GHG emissions. In doing so, it needs to ensure the increased tax rates are commensurate with the fuels' carbon content.

Israel's fossil fuel subsidies increased over the past decade. They include consumer subsidies through excise tax rebates on diesel fuel for buses, taxis and several other vehicle categories, as well as support for natural gas producers. These subsidies should be phased out. At the same time, Israel should consider and address the impact of the energy tax and subsidy reforms on low-income households.

Investment in solar energy and electric vehicles needs scaling up

Most of the government's environmental expenditure consists of subsidies to local authorities for waste collection, transport and treatment. Subsidies for, and investments in, wastewater treatment and recycling constitute the bulk of public wastewater-related expenditure. Israel has made significant investments in solar power generation, including in the residential sector. It has also had some success in increasing the use of public transportation, including railways, light rail and buses.

The low-carbon transition requires the country to ramp up investments in renewable energy and clean transport. Israel should develop and implement a medium-term investment plan for the production, storage

and transmission infrastructure for solar-based electricity. It should also accelerate public and private investment in electric vehicle-charging infrastructure.

Waste generation and landfilling continue to grow

Israel aspires to “zero waste” by 2050. However, Israel’s sustained economic and population growth over the past decade and the absence of robust waste management policies have contributed to growing municipal solid waste (MSW) levels, while the shares of both landfilling (80%) and recovery (20%) have remained stable. The Sustainable Waste Economy Strategy (2021-2030) aims to reduce the share of total MSW landfilled to 20% and increase MSW recycling to 54%, while reducing GHG emissions from the waste sector by 47% compared to 2015 levels. However, Israel does not yet have a clear legislative framework for waste management.

Israel has taken a number of key steps to advance its zero waste and circular economy agenda. These include establishing a tax on certain single-use items, broadening the deposit-refund scheme, adopting a Packaging Law, and setting up a Cleanliness Fund to bridge the waste treatment infrastructure gap. The government has made progress in fighting illegal waste dumping. However, illegal open burning of waste persists in certain areas of the country.

Israel’s policies lack a life-cycle perspective. The country should start to develop higher-value material loops whereby materials are recovered, reclaimed, recycled or biodegraded through natural or technological processes. It should also foster eco-design, repair and reuse.

Local governments should play a larger part in transition to a circular economy

Strengthening the role of municipalities will be key to achieving recycling targets and applying circular economy principles in areas such as built environment. Municipalities are legally obliged to collect packaging and electrical waste separately but have discretion on sorting other types of waste. Separate waste collection is not widely practised, largely due to insufficient economic incentives and a lack of recycling infrastructure. The role of local authorities in transitioning from a linear to a circular economy must be enhanced. The central government should provide them with regulatory and technical support to strengthen regional waste management schemes and build their capacity to reduce waste generation and increase resource efficiency. Other tools, such as pilot programmes for circularity in the food system and built environment, as well as exchange of good practices among municipalities, should also be employed.

An economy-wide approach is needed to shift to circularity

Israel should leverage the full potential of a circular economy across all sectors, from preventing waste generation to keeping materials in use as long as possible, to transforming waste into resources. The government has launched several circular economy initiatives, including a 2019 National Programme for a Circular Economy in Industry, guidelines for designing sustainable industrial zones and a centre for resource efficiency. Israel’s climate mitigation policy considers the circular economy key to reducing GHG emissions from industry. However, there is no consolidated national circular economy plan. The current focus on industry misses opportunities to move towards a producer- and consumer-driven circular economy across sectors.

A roadmap towards a circular economy with clear objectives and targets could introduce a life-cycle perspective to policies and projects and foster eco-design and reuse. Bridging the data gap on material flows, resource efficiency, material exports and imports would help identify most resource-intensive sectors and take targeted actions to promote circularity.

Full potential of waste management tools has yet to be leveraged

Existing economic instruments for waste management do not provide sufficient incentives for behavioural change. The total cost of landfilling in Israel, which includes the landfill levy, is lower than that of more sustainable treatment methods such as incineration with energy recovery and organic waste treatment. Israel has not yet implemented the pay-as-you-throw mechanism foreseen by the Sustainable Waste Economy Strategy (2021-2030). Such a mechanism would increase the costs of waste disposal and make waste prevention and recycling more attractive. Israel should introduce deposit-refund schemes and separate waste collection fees from municipal taxes to incentivise waste reduction and separation of recyclables by households.

The government has progressively introduced environment-related criteria into its procurement tenders and recently set a target of 20% of government spending for green public procurement. However, the voluntary nature of these criteria combined with conservative habits, lack of dialogue between suppliers and buyers, and poor knowledge of purchasing practices limit the introduction of green public procurement. Although Israel is a fertile territory for innovation, start-ups in environmental technology (“cleantech”) face challenges in responding to green tenders. Israel should implement circularity criteria in green public procurement, incorporate different business models in tenders and build capacity in contract management and tender definition.

Stakeholder engagement is a must in a circular economy transition

Education and awareness initiatives such as the AMCHAM Circular Economy Forum and those led by the Manufacturers Association of Israel have largely been voluntary and targeted at the private sector. However, the transition to a circular economy requires engaging stakeholders beyond the private sector, such as civil society, community-based organisations and knowledge institutions. Israel should promote a bottom-up approach to a circular economy by establishing a formal stakeholder engagement mechanism, such as an advisory group. This could inform circular economy policies and create incentives to reward cities and businesses that achieve pre-defined zero waste targets.

Assessment and recommendations

The Assessment and Recommendations present the main findings of the OECD Environmental Performance Review of Israel. They identify 24 recommendations to help the country make further progress towards its environmental objectives and international commitments. The OECD Working Party on Environmental Performance discussed and approved the Assessment and Recommendations at its meeting on 5 December 2022.

1. Towards sustainable development

Israel's fast economic and population growth along with a high degree of urbanisation in a land- and water-scarce context continue to exert significant pressure on the environment. Israel's carbon footprint was increasing steadily over 2014-20 but started to decline in recent years. Both total and per capita greenhouse gas (GHG) emissions and air emissions of key pollutants have decoupled slowly from gross domestic product (GDP), mostly due to the rapid replacement of coal by natural gas in the energy mix. However, the country's biodiversity continues to suffer from habitat fragmentation, invasive alien species, over-exploitation of water resources and pollution. The average temperature in Israel is projected to rise by 4.4°C by the end of the century. This will put additional pressure on quality of human life and ecosystems.

The government launched a multi-sectoral process "Israel 2050 – a thriving economy in a sustainable environment" in 2019. The resulting strategy on the "Transition to a Low-Carbon Economy" includes national and sectoral GHG emissions reduction targets and sector-specific implementation plans. The strategy also aims to optimise the way the country uses energy and other resources, shift from fossil fuels to renewables in the power sector, make transport and industry run on electricity and end waste landfilling. The central government dominates most aspects of environmental policy implementation, leaving little space for local initiatives beyond providing waste management services.

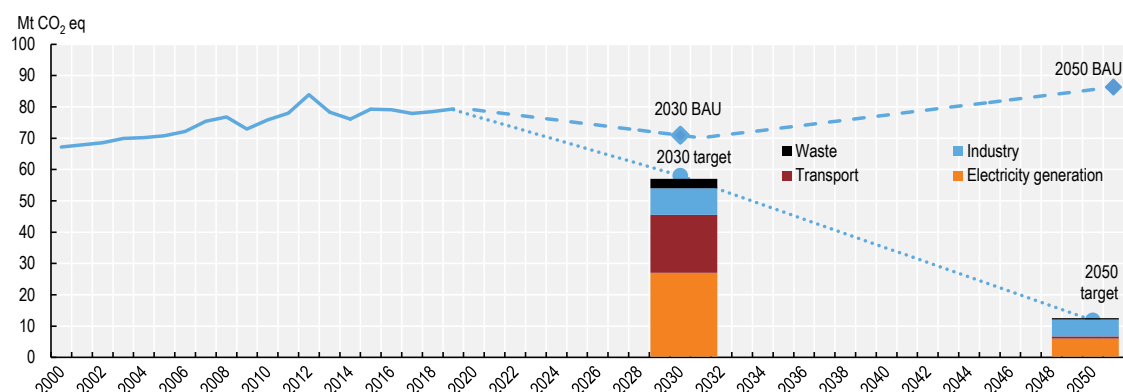
Addressing key environmental challenges

Climate ambition has grown but is not supported enough by sectoral policy measures

Israel has raised its climate ambitions in recent years. In 2021, it updated the national GHG emission reduction target for 2030 from one based on per capita reductions to an absolute target of a 27% reduction compared to 2015. It also set an 85% reduction target for 2050, as well as sectoral targets for GHG emissions from electricity generation, solid waste, transport and industry, before declaring the overall ambition of carbon neutrality by 2050. Israel is not on track to reaching these targets with existing measures (Figure 1) and will need to introduce additional ones across all sectors. The draft Climate Law approved by the government in May 2022 is an important step in this direction.

Figure 1. Meeting the 2030 and 2050 climate targets will require substantial new measures

GHG emissions: Trends, projections and targets



Note: GHG emissions exclude land use, land-use change and forestry. Dashed lines refer to emission projections according to the business-as-usual (BAU) scenario. Dotted lines refer to trajectories towards 2030 and 2050 GHG reduction targets with abatement measures according to Government Decision 171/2021.

Sources: Country submission; Government of Israel (2021), Updated Nationally Determined Contribution under the Paris Agreement; OECD (2022), "Air and climate: GHG emissions by source", *OECD Environment Statistics* (database); UNFCCC (2022), *Israel National GHG Inventory 2021*.

StatLink <https://stat.link/0hxzgr>

Electricity production is the largest source of GHG emissions in Israel, accounting for 49% in 2019. The share of natural gas in electricity generation rose from 37% in 2010 to 69% in 2021, driven chiefly by the discovery of off-shore natural gas reserves. All coal-fired power plants are scheduled to be shut down by 2026.

Despite a vast climate potential for solar power generation, renewable sources accounted for a meagre 8% in electricity production and 5% in the total energy supply in 2021. The country's share of renewables in the energy mix is the second smallest in the OECD. The solar generation capacity has been expanding in recent years. However, it is facing barriers of limited land availability, transmission grid constraints and onerous permit procedures. Israel aims at increasing the share of renewable (predominantly solar) energy in electricity generation to 30% by 2030. In May 2022, the Ministry of Energy published a roadmap for achieving this target.

Transport is the second largest contributor to emissions after electricity (24% of Israel's emissions in 2019). Car dependency is high because of the limited public transport available and the rapidly expanding residential sector. The central government regulates public transport in Israel whereas local governments would be better placed to address their communities' transport needs (OECD, 2020a). In 2020, electric vehicles in Israel accounted for only 0.1% of the total, partly due to the poor charging infrastructure (Liebes et al., 2018).

GHG emissions from the buildings sector have also been on the rise. While there has been a real energy efficiency improvement in the commercial-public sector, the energy intensity of the residential sector has increased. The Israeli Sustainable Building Standard was mandated for most new buildings in 2022, but there are no energy efficiency targets for existing buildings.

Climate change adaptation efforts are at an early stage

In 2018, the government created a Climate Change Adaptation Administration (CCAA) under the Ministry of Environmental Protection (MoEP) to elaborate strategies and action plans to increase Israel's resilience to climate change and develop respective adaptation tools. However, the CCAA lacks authority and financial resources to implement adaptation actions (State Comptroller, 2021). Climate change has recently been integrated into the aggregate national threat assessment. However, climate change adaptation measures tend to focus on technological rather than nature-based solutions to prevent flooding, drought or other climate change-induced natural disasters. Few municipalities are proactive in adaptation efforts.

Air pollution remains a problem in several areas

Emissions of all key air pollutants have been steadily declining over the last decade due to reduced combustion of coal and implementation of the 2011 Clean Air Law. However, the exposure to particulate matter pollution – PM_{2.5} and PM₁₀ – is one of the highest in OECD countries, partly because of Israel's proximity to the Sahara and the Arabian deserts. In 2021, transport was responsible for 31% of PM₁₀ emissions, while industry and waste burning accounted for 18% and 21%, respectively. Waste burning is particularly problematic in rural areas due to lack of appropriate waste management infrastructure and enforcement. There are also hotspots of nitrogen oxides, ground-level ozone and benzene.

The 2022 national programme for the reduction of air pollution sets new emission reduction targets for 2030. It envisages further conversion of coal-fired power plants to natural gas, prevention of waste burning in open areas and a range of actions in the transport sector. Low-emission zones (LEZs) for some categories of polluting vehicles have already been implemented in Jerusalem and Haifa. However, there are no immediate plans to introduce taxes on air pollutants.

Biodiversity is under pressure from housing and infrastructure development

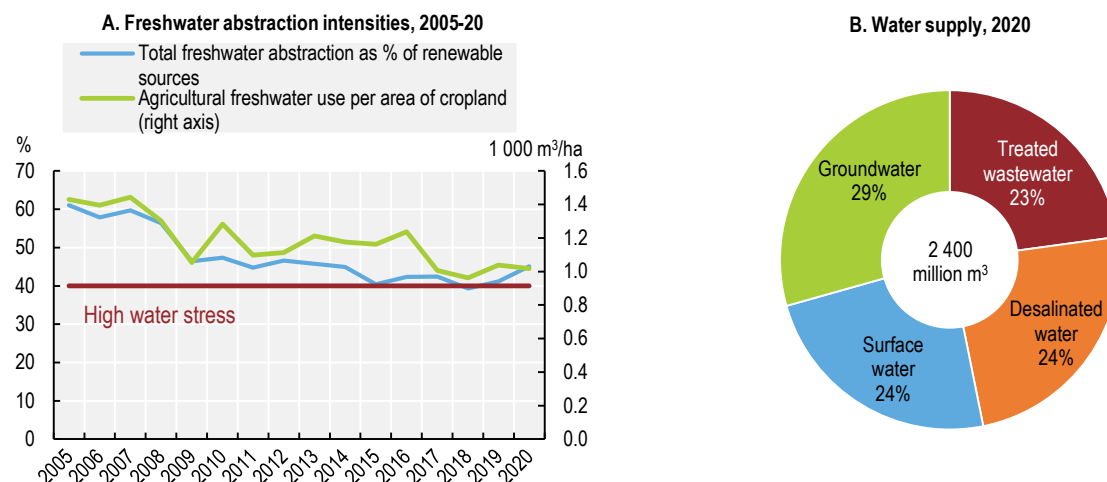
The increasing demand for new housing and infrastructure is causing more pressure on open natural landscapes and adding to land scarcity and habitat fragmentation. The significant increase in development of settlements and infrastructure is affecting biodiversity more than ever. Outside protected areas, most vulnerable ecosystems are under significant stress. More mammal species are threatened (as a share of total indigenous mammals) in Israel than in any other OECD member country. Invasive alien plant and animal species cause a significant negative impact on biodiversity and ecosystems. It is expected that climate change will put further pressure on biodiversity.

Israel completed its first national ecosystem services assessment in 2021 and published its latest State of Nature Report in 2022. It intends to adopt a new National Biodiversity Strategy and Action Plan by the end of 2022 and set measurable biodiversity targets compatible with the Convention on Biodiversity's Post-2020 Global Biodiversity Framework. Some ecological corridors have been integrated into spatial plans. Israel has made substantial progress over the last decade, expanding terrestrial protected areas and establishing marine ones. About 25% of Israel's land area was protected as of mid-2022, but only 4% of its territorial waters. Importantly, the country does not have a whole-of-government approach to mainstreaming biodiversity considerations into sectoral policies. The legislation relevant to biodiversity protection spans different laws and provides partial prevention and protection measures.

Pressure on freshwater resources is easing, but water quality needs improvement

Israel is one of the most water-stressed countries in the world, with agriculture accounting for over half of water consumption. To address water scarcity, it has invested massively in large-scale reuse of wastewater and desalination of seawater, which together account for almost half of the total water supply (Figure 2). Israel is the largest user of recycled effluent water for agriculture across OECD member countries.

Figure 2. Wastewater reuse and seawater desalination are reducing freshwater scarcity



Note: Panel A – Water stress = total freshwater abstraction as percentage of total renewable water resources. A water stress higher than 40% indicates serious water scarcity and shows unsustainable water use.

Source: CBS (2021), "Water and sewage", *Statistical Abstract of Israel 2021 – No 72*; OECD (2022), *OECD Environment Statistics* (database).

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Israel has made significant progress in improving water allocation among sectors and to nature by developing and implementing river plans and providing incentives to farmers to minimise upstream water abstraction. Efforts to rehabilitate surface water bodies need to continue. Reduced wastewater discharges have improved water quality in rivers and in Lake Kinneret. However, Israel has not met its target to have tertiary treatment at all its wastewater treatment plants. Nitrate pollution of groundwater caused by extensive fertiliser use in agriculture remains a problem.

Environmental governance and management

Israel's environmental governance system is centralised: the MoEP employs about 60% of all environmental personnel in the country. The MoEP manages a wide portfolio of environmental issues, but its co-ordination with other ministries with environment-related responsibilities is at times ad hoc and mostly informal. Many local authorities pool resources to deliver waste management services. A quarter of local authorities do not have an environmental unit.

The environmental regulatory framework is fragmented and in part outdated. Political instability in recent years has impeded efforts to upgrade the legislation, creating regulatory uncertainty for businesses. The adoption of good practices for implementing environmental law has been slow, mostly due to a lack of resources.

Coverage of environmental assessment is partial

The field of application of environmental impact assessment remains significantly narrower than in the European Union: it is not required for several categories of installations or for facilities in industrial zones. Spatial plans undergo environmental assessment. However, there is no system of strategic environmental assessment of policies, plans and programmes.

The environmental permitting reform is incomplete

The country's environmental permitting system is governed by several disparate laws and is not integrated across environmental media. The Environmental Licensing Bill approved by the government in March 2022 would make operators subject to one permitting procedure and consolidate several disparate environmental permits into one that would include most environmental conditions (except for wastewater discharges into water bodies). The law would be an important step towards cross-media substantive integration of environmental permit conditions on the basis of best available techniques. However, the law's adoption in the Knesset is uncertain. At the same time, Israel is streamlining environmental requirements for lower-risk facilities by adopting general binding rules for a growing range of activity sectors.

Compliance assurance is improving but remains mostly reactive

The MoEP's compliance monitoring and enforcement capacity has increased over the last decade but remains insufficient. Compliance monitoring is dominated by reactive site visits prompted by incidents or complaints. Many offences are not documented or reported at all. A new electronic system for inspection reporting was piloted in 2022. It is expected to improve inspection co-ordination across the ministry's district offices and provide access to comparable compliance data.

The duplication and inconsistent entry of compliance data impair the MoEP's ability to take appropriate enforcement actions. In over half of reported non-compliance cases, no administrative or criminal sanctions are applied (State Comptroller, 2019). The collection of most administrative fines has improved, but monetary penalties are fixed in law and do not allow for recovery of economic benefits of non-compliance. The MoEP is only starting to engage in compliance promotion, mostly by informing the public about enterprises' environmental performance.

Remediation of contaminated sites is hindered by a regulatory gap

Israel has made progress in creating a methodological and institutional framework for remediation of contaminated sites. The MoEP has determined threshold values for various contaminants and published a national map of contaminated soils throughout the country. However, draft legislation on preventing and remediating land contamination has been stalled for many years due to opposition inside the government. The issue of securing funds for remediation of the contaminated environment remains unresolved. The state pays for clean-up of priority sites contaminated by state-owned entities. However, remediating sites where the responsible party is either unknown or insolvent is a challenge in the absence of appropriate legislation.

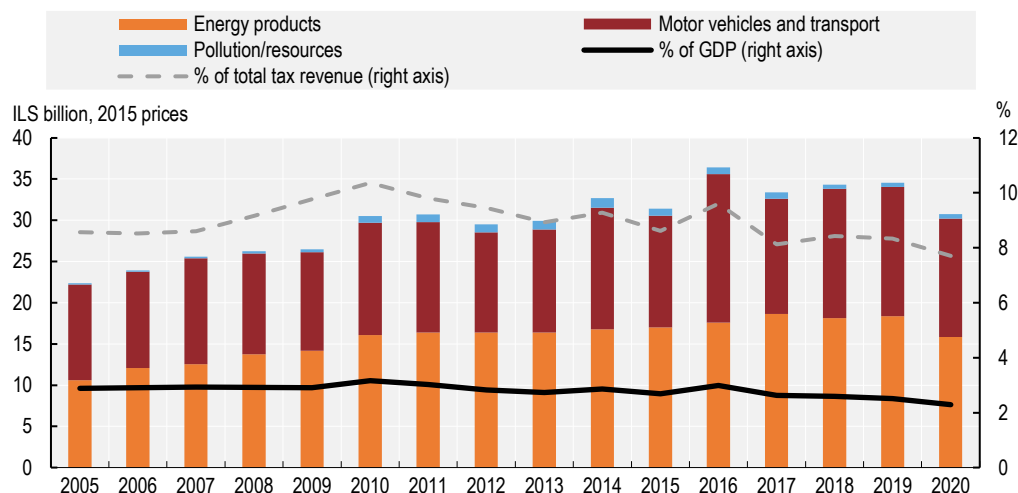
Economic instruments and investment for green growth

Taxes and charges increasingly account for environmental externalities

Environmentally related tax revenue represented 2.3% of GDP and 7.7% of total government revenue from taxes and social contributions in 2020 (Figure 3). This is relatively high compared to the OECD average. However, Israel has the second lowest share (after New Zealand) of energy taxes in environmentally related taxes among OECD member countries – the OECD average share is 70% – due to both relatively low energy taxes and high vehicle taxes.

Figure 3. Environmentally related tax revenues are growing slower than GDP and total tax revenue

Environmentally related tax revenue by tax base, 2005-20



Note: Includes preliminary data and partial data for 2019-20.

Sources: Country submission; OECD (2022), "Environmental policy instruments", *OECD Environment Statistics* (database).

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Excise taxes on motor fuels are among the highest among OECD member countries, for both gasoline and diesel. However, other fossil fuels have so far been taxed at very low rates. In an effort to introduce carbon pricing for all fossil fuels, Israel is planning to create a "carbon tax". This would take the form of an increase in excise taxes on coal, fuel oil, natural gas, liquefied petroleum gas and petcoke over five years. As a result of this reform, taxes on polluting fossil fuels are expected to cover about 80% of Israel's GHG emissions. However, the tax rates per tonne of carbon dioxide (CO₂) emissions would differ greatly between fuel types. The rate for natural gas, for example, would only be USD 20 per tonne, far too low relative to externalities (IMF, 2022). Furthermore, the 2022 energy price increases and general elections have delayed implementation of these measures.

Israel has the second-highest car purchase tax rate in the world. In 2020, the tax rate stood at 10% of the purchase price for full electric cars, 25% for plug-in hybrid cars, 45% for standard hybrid cars and 83% for conventional internal combustion engine vehicles. There is a plan to gradually increase the tax rates for hybrid vehicles so they eventually align with that for conventional vehicles at 83%. At the same time, the rate for full electric vehicles would rise to 35% in 2024. This would reduce the incentives to upgrade the car fleet. Car owners also pay an annual registration fee in conjunction with the vehicle's inspection. Congestion charges are expected to be introduced in Tel Aviv in 2025.

Israel has also made some progress in applying charges to pollution. In 2011, a charge was imposed on permit holders who discharge wastewater or waste into the sea. Since November 2021, the country has also been applying a charge on single-use plastic utensils that doubles the average consumer price of these items. The charge aims to change behaviour of citizens, and to significantly curb Israel's high use of these items, with early positive results. However, the landfill levy is not high enough to support the goal of reducing municipal solid waste landfilling as a percentage of total volume from 80% in 2021 to 20% by 2030.

Water tariffs ensure recovery of costs of service provision

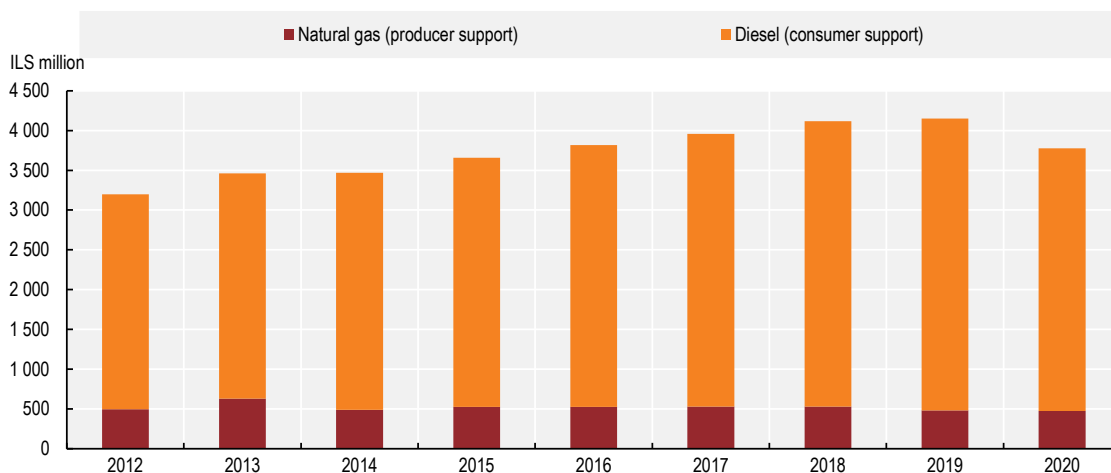
The Israeli water sector has almost achieved financial autonomy. The 2017 amendments to the Water Law removed tariff differentiation between sources where the water is abstracted and its uses. They also required tariffs for water production and supply to be based on cost recovery. However, there are still cross-subsidies between users. Water tariffs for the industrial sector were gradually increased over 2010-15, but water prices for agriculture remain subsidised. Treated wastewater for irrigation is significantly subsidised to encourage farmers to use it instead of freshwater, contributing to the decrease in average price of water for agriculture. In 2021, the Water Authority published draft recommendations to gradually raise the price of water for agriculture by 2028 by phasing out the subsidy and implementing the cost recovery approach to pricing.

Environmentally harmful subsidies and incentives remain despite the phase-out efforts

Israel's fossil fuel subsidies increased over the past decade, with a slight decline in 2020. They include consumer subsidies through an excise tax exemption (rebates) on diesel fuel for buses, taxis, fishing boats and specialised vehicles (87% of the total) and support for natural gas producers (Figure 4). In 2018, the government started an eight-year gradual phase-out of diesel rebates. As of 2021, the subsidy reduction has been limited, highlighting the need for further efforts.

Figure 4. Support for diesel fuel consumption increased considerably over the last decade

Total tax rebates and support for fossil fuels, 2012-20



Note: The OECD estimates government support for fossil fuels as all direct budgetary transfers and tax expenditures (tax reductions, preferential treatment for cost recovery) that provide a benefit or preference for fossil fuel production or consumption. The measures included in the OECD inventory are obtained from official government sources. No attempt is made to assess the justification of these measures, their environmental or economic effect, or need for reform.

Source: OECD (2022), *OECD Inventory of Fossil Fuel Support Measures* (database).

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Environmental investments have been substantial, but gaps remain

Israeli government spending on environmental protection was roughly equal to the OECD average (0.6% of GDP) in 2020. It has been growing in absolute terms over the last decade but slower than GDP. The main domains of Israel's environmental protection expenditure are waste and wastewater management

and biodiversity protection. Most of the government's environmental expenditure consists of subsidies to local authorities for waste collection, transport and treatment (Section 2).

Massive state investment has driven expanded desalination of seawater and reuse of treated wastewater. The implementation of public-private partnerships has improved the operational performance of water services, raised private funding for investment and ensured the sustainability of water infrastructure. The Water Authority's subsidies for, and investments in, wastewater treatment and recycling constitute the bulk of public wastewater-related expenditure.

Israel has made significant investments in solar power generation, including in the residential sector, as well as in its transmission and distribution. In 2021, the government set up a task force to remove barriers for infrastructure investments into a low-carbon economy. However, to reach its targets of 30% electricity generation from renewables and 18% energy efficiency improvement by 2030, Israel will need to ramp up these investments. Developing an advanced storage system for solar electricity should be a priority. In 2021, the Israeli Electricity Authority started issuing tenders for solar and storage facilities. Israel is also implementing the 2020 National Plan for Energy Efficiency in the residential, industrial and transportation sectors.

Israel has had some success in increasing the use of public transportation, including railways, light rail and buses. It has built a high-speed rail link between Jerusalem and Tel Aviv and expanded the electrification of the rail network. Light rail is being expanded in Jerusalem and being developed in Tel Aviv. Israel has also begun planning an underground rail system in the Tel Aviv metropolitan area. The government has been promoting public transport through cheaper fares. It also supports a transition from a bus fleet composed almost entirely of diesel-powered vehicles to electric buses, as well as a transition to hybrid, and eventually electric, taxis.

To address the slow and limited uptake of electric vehicles (EVs), Israel is investing in a network of a few thousand public charging stations. However, about 150 000 private chargers and 13 000 public charging stations will be required to support a 5% EV share in the vehicle fleet (Liebes et al., 2018). This highlights the need for further public and private investment.

Environmental risks started to be incorporated into the financial system

The adaptation of Israel's financial regulations to environmental risks is at an early stage. Companies are now required to include environmental risks in their stock exchange prospectus. Public companies have been rated since 2014 through an Environmental Impact Index based on their impact on the environment, compliance with environmental laws and regulations, and environmental management and reporting. A Fossil Fuel Free Climate Index introduced environmental transparency at the Tel Aviv Stock Exchange in 2020.

In 2021, the country's financial regulator required institutional investment firms to incorporate environment, social and governance criteria into their investment policies, with a potential positive impact on the entire business sector. Disclosure of non-financial information, including environmental sustainability, has also been promoted. However, Israel has not yet implemented sustainable financing tools, such as green bonds and loans that would facilitate the transition to a low-carbon economy.

Just transition requires continuous measures to mitigate social inequalities

Israel is among the ten OECD member countries with most income inequality (OECD, 2020b). Poverty is widespread especially among Arab-Israeli and Jewish ultra-orthodox communities that are mostly concentrated in separate cities or neighbourhoods, exacerbating inequality across municipalities. Almost all environmental indicators are usually worse in lower-income areas. Social disparities often lead to environmental hazards from waste dumping and burning in open areas, and unequal access to public transportation and green public spaces.

The consequences of carbon pricing are heterogeneous across households that adhere to different lifestyles and consumption patterns. Without further policy measures, carbon pricing in Israel will have regressive distributional outcomes (Stekel and Missbach, 2021). To avoid unintended distributional consequences, the carbon pricing scheme needs to be designed in a transparent and inclusive manner. Revenues generated from carbon pricing can be used to lower existing taxes or provide targeted subsidies, for instance for electricity tariffs.

A 2021-26 whole-of-government Arab Society Programme will invest ILS 30 billion in education, transportation, infrastructure and social welfare in Arab communities. As part of this programme, about ILS 550 million will be allocated to improve waste management and promote climate change adaptation measures and resilience. Other projects have already financed waste management infrastructure in those communities and provided technical assistance to local authorities, including law enforcement and other relevant training. An inter-ministerial government team is set to begin working to design policy and programmes to promote a just transition towards a circular and low-carbon economy.

Recommendations on sustainable development

Climate and air quality policies

- Adopt a law on climate with legally binding GHG reduction and renewable energy production targets; promote, and remove administrative barriers for, solar power installations, mindful of the need to preserve open spaces and biodiversity; accelerate integration of renewable sources into the electric grid.
- Develop a coherent interagency strategy for a low-carbon transition in the transport sector, enhancing the role of local governments; strengthen links between transport and land-use planning; prioritise investment in public transport, walking and cycling; expand implementation of LEZs in urban areas.
- Accelerate implementation of the mandatory Sustainable Building Standard for all new buildings; establish energy efficiency standards for existing buildings.
- Conduct a national assessment of medium- and long-term impact of climate change on the economy; promote nature-based solutions in building climate resilience; continue to encourage and support climate change adaptation efforts by local authorities.

Natural resource management

- Adopt and implement a national biodiversity strategy and action plan with measurable targets; pursue better mainstreaming of biodiversity protection into sectoral, particularly agricultural, policies, including regulatory measures to stem the introduction and spreading of invasive alien species.
- Protect terrestrial ecosystems outside national parks and nature reserves by minimising urban sprawl and integrating ecological corridors into spatial planning; continue rehabilitation of surface water bodies; expand the size of marine protected areas.
- Continue to reduce freshwater consumption in agriculture through better water allocation planning and price signals; reduce nutrient loading from agriculture through stricter requirements for fertiliser application, taxes on fertilisers, awareness raising and training for farmers; complete upgrades of the wastewater treatment infrastructure to reduce the impact on water quality.

Regulation and compliance assurance

- Establish a comprehensive system of environmental assessment of all projects, policies, plans and programmes with a potentially significant environmental impact, including climate change mitigation and adaptation effects that would provide for consideration of alternatives and broad public participation.
- Adopt the Environmental Licensing Law to consolidate environmental permits and pursue further cross-media integration of permit conditions on the basis of best available techniques.
- Require local authorities to create environmental units and empower them to engage in compliance assurance activities.
- Strengthen risk-based targeting of compliance monitoring and engage in more active compliance promotion with a particular focus on small and medium-sized enterprises; consider introducing variable monetary penalties to increase deterrence and recover economic benefits of non-compliance; improve compliance-related reporting and data management.
- Develop and adopt legislation to impose liability for land contamination on operators of activities with high environmental risk and create a mechanism for financing remediation of contaminated sites.

Economic instruments and investment for green growth

- Implement the carbon pricing framework, making sure the increased excise tax rates are commensurate with the fuels' carbon content; phase out excise tax rebates for diesel and eliminate subsidies for natural gas producers.
- Increase the landfill levy to provide a greater incentive for waste reduction and recycling; gradually raise water tariffs for agriculture while preserving and strengthening incentives for farmers to use recycled wastewater for irrigation.
- Develop and implement a medium-term investment plan for the production, storage and transmission infrastructure for solar-based electricity; accelerate public and private investment in EV-charging infrastructure, in collaboration with local authorities, to support EV uptake targets.
- Consider introducing sustainable financing tools such as green bonds and loans; pursue further measures to make conditions of access to financing dependent on firms' environmental performance.
- Ensure that environment-related economic instruments (fuel and vehicle taxation, water tariffs) consider impact on low-income households and ensure targeted measures to address affordability issues where they arise; promote the sustainability of waste management and climate change adaptation measures in Arab and other low-income communities through empowerment of local authorities and capacity building.

2. Waste management and circular economy

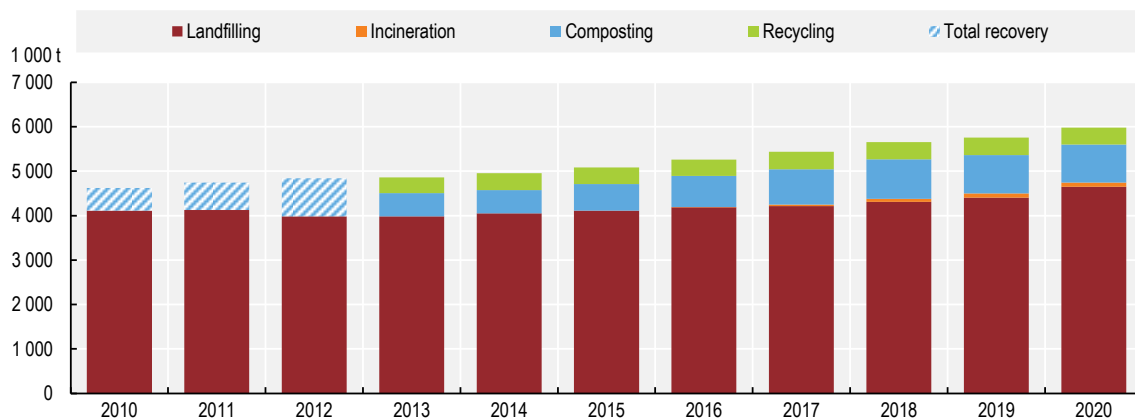
Main trends and policies

Limited progress on waste management as waste generation and landfilling continue to grow

Israel's sustained economic and population growth over the past decade in the absence of robust waste management policies have contributed to high levels of municipal solid waste (MSW) generation, while the share of both landfilling (80%) and recovery (20%) have remained stable (Figure 5). In 2020, Israel generated 6 million tonnes of MSW for a population of more than 9.2 million, making it one of the countries with the highest level of MSW generation per capita among OECD members (691 kg per capita in 2020, above the OECD average of 534). Households account for 80% of MSW, while the remaining 20% comes from the commercial-institutional sector. Collection of separate waste streams is advanced in the commercial-institutional sector, but is low for household waste. Food waste is a significant issue: food residues constituted 43% of MSW in 2020. In 2020, recycling accounted for 6.4% of total MSW collected. The MoEP is developing standards for composting organic waste for use in agriculture and a ban to landfill untreated organic waste.

Figure 5. Growing municipal solid waste generation and stagnating landfilling rate increase total volume of landfilled waste

Municipal waste collected by treatment type, 2010-20



Note: Municipal waste includes household waste and similar waste collected by or on behalf of municipalities. It includes bulky waste and excludes construction waste and sewage waste. Breakdown data for recycling and composting are available from 2013.

Sources: CBS (2022), *Waste and Recycling* (database); OECD (2022), "Waste: Municipal waste", *OECD Environment Statistics* (database).

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Growing waste generation, high landfilling rates and poor separation of bio-waste all contribute to making the waste sector a significant emitter of greenhouse gas (GHG) emissions. MSW in Israel accounts for approximately 8% of GHG emissions, with around 6% of total GHG emissions due to food waste alone (Leket Israel, 2021). In comparison, in OECD member countries, waste contributes on average to about 3% of total GHG emissions. GHG emissions from MSW increased on average by 0.9% per year between 2011 and 2019 (UNFCCC, 2021). Most direct GHG emissions from waste in Israel stem from methane emitted by the decomposition of bio-waste in landfills. Preventing food waste, collecting it separately and

reusing it for energy or compost have significant potential to address multiple challenges, namely GHG emissions, waste generation and food security.

Since the 2011 EPR, Israel has made limited progress on waste management laws and regulations. It has adopted a law regulating plastic bags and levying a tax on their use. It has also broadened the extended producer responsibility schemes to packaging and waste electrical and electronic equipment and expanded the deposit-refund mechanism to large plastic bottles. The government has amended the Free Export and Import Ordinances to ensure effective oversight of cross-border movements of waste based on licences granted according to the Basel Convention. Inspection and surveillance against illegal disposal of construction and demolition waste in dumping sites and open spaces have been strengthened, but illegal dumping remains a problem. In addition, standards on the use of recycled aggregates in infrastructure projects have been developed, although the share in use remains very low. More regulations are set to enter into force in the coming years (e.g. banning the landfilling of bio-waste without pre-treatment). Nevertheless, Israel still lacks a comprehensive legislative framework for waste management. The “patchwork” laws and regulations, combined with the absence of harmonised definitions, hinder efficient and effective waste management, policy making and implementation.

A clear vision for a circular economy is lacking

The MoEP decided in 2020 to prioritise waste management and a circular economy. It aimed to engage municipalities, raise awareness across stakeholders to reduce single-use plastics, fight illegal dumping and burning of waste, and set up economic, regulatory and governance tools towards a modern waste management approach. The MoEP set up a Sustainable Waste Economy Strategy (2021-2030) to transform Israel's economy by 2050 from a linear to a circular economy that aspires to zero waste. It aims to reduce the share of waste treatment by landfilling from 80% to 20% in 2030, decrease pressure on natural resources and cut GHG emissions. The strategy foresees consolidation of the main policies and regulations of the waste sector under a single framework law, which would allow more market certainty and potentially unlock investment potential.

The government has launched several circular economy initiatives but there is no consolidated national circular economy plan. The Industries Administration in the Ministry of Economy and Industry (MoEI), along with public and private sector partners, set up a National Programme for a Circular Economy in Industry in 2019. Transition to a circular economy is one of MoEI's priorities. A circular economy is considered a pillar for reducing GHG emissions from industry within Israel's climate mitigation policy. Other circular economy initiatives (e.g. guidelines for the design of sustainable industrial zones and a centre for resource efficiency) have also been implemented. However, their focus on industry misses opportunities to move towards a producer- and consumer-driven circular economy across sectors.

Israel needs to leverage the full potential of a circular economy across all economic sectors, from preventing waste generation to keeping materials in use for as long as possible, to transforming waste into resources. A roadmap with clear objectives and targets could introduce a life-cycle perspective in policies and projects and stimulate the uptake of eco-design and reuse. Moreover, there is a need to bridge the data gap on material flows, resource efficiency, material exports and imports. This would help identify most resource-intensive sectors and take action to prevent waste and keep resources in use for as long as possible.

Local governments are not sufficiently engaged in the circular transition and waste management

Responsibilities for waste management are shared between the central and local governments. By law, municipalities are obliged to separately collect packaging and electrical waste, while they can decide on sorting other types of waste. Nevertheless, due to a lack of economic incentives and recycling infrastructure, separate waste collection is not widely implemented, leading to inconsistency in collection

methods across the country. The national government aims to use socio-economic clusters (*eshkolot*) as functional areas for locating waste treatment facilities. This can create economies of scale by reducing the number of tenders for municipal waste collection and help manage waste more efficiently.

Strengthening the role of municipalities will be key to achieving recycling targets and applying circular economy principles in areas such as food value chain and the built environment. Beyond bridging the infrastructure gap across municipalities, capacity building programmes will be needed for more sustainable waste management. The government could establish guidelines and offer more flexibility through decentralised decision making. Cities could implement pilots in various sectors to test the impacts of circular-related practices.

Policy tools for transition to a circular economy

The full potential of policy tools to tackle waste has not yet been leveraged

Economic instruments need to be better designed to create incentives for behavioural change. The landfill levy is a key economic instrument for internalising the externalities of landfilling. However, the total cost of landfilling, including the landfill levy, handling fees at the landfill site and transport costs, is one of the lowest among OECD member countries. The cost of landfilling is insufficient to discourage this practice: it is lower than that of incineration with energy recovery and of organic waste treatment, making landfilling the cheapest option.

Property owners in Israel pay for waste collection and treatment, along with other municipal services, as part of the property tax. This gives households limited economic incentive to reduce waste or separate waste streams. Israel has not made progress in separating the revenue raised from waste management activities (e.g. through fees and levies) from the local property tax as recommended in the 2011 EPR, which would make waste management fees more visible for households. Israel has not yet implemented a “pay as you throw” mechanism (foreseen by the Sustainable Waste Economy Strategy), which would increase the costs of waste disposal and make alternatives (recycling) more attractive.

Environment-related criteria have progressively been introduced in government procurement tenders, but there is no obligation to use them. In recent years, the MoEP and the Ministry of Finance set a target of 20% of government spending for green public procurement. These criteria concern energy efficiency, resource efficiency, reduced waste and phase-out of hazardous materials. However, conservative habits, lack of dialogue between suppliers and buyers, and poor knowledge of purchasing practices lead to delays in, and exemptions from, tenders. In addition, although the country is a fertile territory for innovation, start-ups in environmental technology (“cleantech”) face challenges in responding to green tenders. While hundreds of companies operate in this sector in Israel, 75% are specialised in energy and water, while waste and resource management and industrial efficiency are poorly represented.

Stakeholder engagement in the circular economy transition has focused on the private sector

Education and awareness raising will play an important role in making citizens and businesses part of the circular economy transition. However, initiatives to date have largely been voluntary and targeted at the private sector. For example, to foster adoption of circular practices by companies, the Israel-America Chamber of Commerce, in partnership with the MoEP and the MoEI, launched the AMCHAM Circular Economy Forum in 2020. The Forum aims to identify needs and opportunities for member companies to implement circular principles in their activities and to pilot different types of circular solutions. In addition, the Manufacturers’ Association of Israel is involved in capacity building and information sharing: it has set up a database to collect information on wastes that can be reused and/or recycled to promote industrial symbiosis among its members. However, ensuring sustainable waste management and a transition towards a circular economy requires engaging stakeholders beyond the private sector, such as civil

society, community-based organisations and knowledge institutions. They need timely information and opportunities to be involved in decision making.

Recommendations on waste management and circular economy

- Implement the Sustainable Waste Economy Strategy for 2030; create comprehensive and coherent framework legislation aligned with the strategy's quantitative targets to ensure common statutory definitions and market certainty, set targets and provide regulatory tools.
- Establish a roadmap towards a circular economy to define clear objectives and actions across sectors and government departments, anchored in framework legislation; ensure that adequate human and financial resources are in place for implementation of the roadmap, that information is shared across stakeholders in a timely manner and data on waste streams, material flows and resource efficiency are collected and up to date.
- Move from waste to resource management by starting to develop higher-value material loops, whereby materials are recovered, reclaimed, recycled or biodegraded through natural or technological processes, and fostering eco-design, repair and reuse; mainstream resource efficiency goals into governmental policy related to climate change, innovation, education, etc.; consider strengthening legislation to promote sustainable production and consumption.
- Recognise the role of local authorities as key players in transitioning from a linear to a circular economy; provide regulatory and technical support to strengthen regional waste management schemes; develop agreements across levels of government to build capacity for reducing waste generation and enhancing resource efficiency; develop pilot programmes for circularity in the food system (from production to consumption) and the built environment (e.g. circular neighbourhoods) and foster the exchange of good practices among municipalities.
- Set up incentives for separate collection of waste streams and recycling, such as deposit-refund schemes and weight-based disposal fees differentiated by collection bin; gradually introduce pay-as-you-throw schemes for waste handling to separate waste collection fees from municipal taxes as a way to incentivise waste reduction and separation of recyclables at the level of households; introduce a regulatory framework for the management of construction and demolition waste, including taxes on raw materials for construction aggregates to foster sustainability in the construction sector.
- Implement circular criteria in green public procurement, incorporate different business models in tenders (e.g. rental, product-as-a-service models) and build capacity in contract management and tender definition.
- Engage stakeholders and promote a bottom-up approach to a circular economy by establishing a formal stakeholder engagement mechanism, such as an advisory group, to inform circular economy policies and create incentives to reward cities and businesses that achieve pre-defined zero waste targets.

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Annex 1. Actions taken to implement selected recommendations from the 2011 OECD Environmental Performance Review of Israel

Recommendations	Actions taken
Chapter 1. Towards sustainable development	
Addressing key environmental challenges	
Consider expressing the target for reducing greenhouse gas (GHG) emissions by 2020 in absolute terms and making it legally binding; fully integrate climate, environmental and health considerations into the government's long-term energy and transport policies.	The 2030 GHG reduction target was for the first time expressed in absolute terms. In 2021, the government passed a decision on "Transition to a Low-Carbon Economy" and adopted as its part the National Action Plan on Climate Change 2022-2026. The draft Climate Law includes 2030 targets.
Set up a system to monitor the implementation of GHG emissions reduction measures; provide an annual assessment to the Knesset on progress in achieving targets, preferably by an independent body, and periodically propose recommendations to adjust policy measures.	Israel has established a national system for measurement, reporting and verification. An inter-ministerial committee reports annually to the government on the implementation of GHG reduction measures.
Introduce mandatory minimum energy performance standards for buildings, and ensure that information on building energy performance is available to consumers.	In 2020, the National Planning and Building Board approved regulations that require most types of new buildings to be constructed according to the Sustainable Building Standard. A new energy efficiency rating system was introduced by the Ministry of Energy in 2020 to inform apartment buyers. Since December 2022, a new regulation approved by the Ministry of Housing requires contractors of new apartment buildings to inform buyers about their apartment's energy rating.
Consider how local ecological conditions and minimum river flows could be better reflected in decisions on water allocation among sectors and to nature.	A Master Plan for the Supply of Water to Nature was issued jointly by the Nature and Parks Authority, Ministry of Environmental Protection (MoEP) and Water Authority in 2013. An inter-ministerial team has approved river plans for several major rivers. In some places, they set aside a minimum quota of water for ecosystems.
Define water quality objectives for all stretches of rivers, and issue discharge and abstraction permits accordingly.	The river plans determine the flow regime, water quality and actions necessary to protect the existing ecosystems. The Centre for Aquatic Ecology, established in 2015, determines biological standards used to assess the ecological status of the country's streams.
Undertake a comprehensive national assessment of Israel's ecosystems and biodiversity, including their economic value; analyse how the main pressures on biodiversity are likely to evolve and how they could be mitigated by alternative policies.	An ecosystem assessment was conducted in 2013-21 as part of the National Ecosystem Assessment Programme and included the work of over 200 scientists. The study describes services provided by each of the country's ecosystems, the biodiversity underpinning these services, the threats to each ecosystem and the drivers of change affecting the services.
Establish measurable biodiversity targets; consolidate the national biodiversity monitoring system to measure progress in achieving these targets and to support future policy development.	Nineteen national targets were formulated in 2015 in accordance with Aichi Targets but never approved by the government. Israel is developing a National Biodiversity Action Plan which will include biodiversity targets in alignment with the CBD's post-2020 Global Biodiversity Framework.
Strengthen and broaden biodiversity conservation in and around nature reserves, e.g. by establishing buffer zones, ecological corridors and biosphere reserves.	About 25% of Israel's land area is protected as part of declared nature reserves and national parks. However, only 4% of the territorial waters are protected. Outside protected areas most vulnerable ecosystems are under significant stress. The National Planning Administration envisages integrating ecological corridors into spatial planning.
Identify specific measures to reduce the introduction of invasive alien species from all sources.	In 2017, Israel carried out a comprehensive analysis of introduction pathways of invasive alien species. The institutional and regulatory fragmentation on this issue has hampered the adoption of comprehensive biosafety and biosecurity legislation to address invasive species.
Sustainable development and green growth policy framework	
Develop a whole-of-government approach to sustainable development and green growth; fully integrate environmental and green growth considerations into the government's development strategies; establish clear performance monitoring and follow-up mechanisms.	A 2019 government decision required Sustainable Development Goals to be integrated into government programmes. A 2019-21 multi-sectoral process "Israel 2050 – a thriving economy in a sustainable environment" produced a vision and a strategy towards a low-carbon economy. An analysis of progress in achieving SDGs was published in 2022.

Institutional framework for environmental governance	
Strengthen environmental policy implementation at the local level by making government subsidies to municipalities contingent on the establishment of viable environmental units (including units involving co-operation among local authorities), and by implementing compulsory training for such units.	Forming an environmental unit is voluntary but subject to tender conditions and funding from the MoEP. The MoEP does not want to run a risk of local governments refusing the much-needed funding if such funding becomes contingent on having a unit. Trainings for local environmental units have been organised.
Introduce a system of performance indicators to monitor the effectiveness and efficiency of environmental policy implementation in the framework of result-oriented planning and budgeting.	The MoEP has four multi-year targets that serve as a basis for concrete, measurable and realistic goals. Goals are linked to expenditure and have timeframes.
Regulatory framework for environmental management	
Implement integrated (cross-media) environmental permitting for facilities with high environmental risk; issue such permits based on advanced, process-related technological and management solutions, and using procedures that are open to public participation.	In March 2022, the government approved a draft Environmental Licensing Law that includes amendments to the Clean Air Law and the Hazardous Materials Law. If the draft law is adopted by the Knesset, the operator will be subject to one permitting procedure and will receive one permit that includes most environmental conditions (wastewater discharges to water bodies would still not be covered).
Building on the voluntary emissions reporting scheme, establish a mandatory Pollutant Release and Transfer Register (PRTR) that includes GHG emissions; strengthen data quality control across the various ambient air quality monitoring networks.	A 2012 law established a PRTR and required some 500 facilities with significant environmental impact to report on the annual quantity of emissions of pollutants (including GHG emissions) and waste transfers to the environment. The information is accessible on the PRTR webpage.
Compliance assurance	
Strengthen the system of self-monitoring by requiring all facilities subject to such requirements to report regularly to the environmental authorities; enhance the capacity of environmental inspectors to undertake multi-media compliance monitoring and verification.	Operators report to the PRTR. The MoEP's compliance monitoring and enforcement capacity has increased. The ministry has established Drone Squadron 11 as part of its Green Police to enhance its compliance monitoring functions.
Reinforce environmental liability for damage to natural resources by: expanding the use of administrative clean-up orders; strengthening legislative provisions (including those in the Prevention of Land Contamination and the Remediation of Contaminated Lands bill) for the recovery of remediation costs from responsible parties; and applying such provisions more vigorously.	The Prevention of Land Contamination and Remediation of Contaminated Lands bill has not been adopted due to strong opposition inside the government. A Risk-Based Corrective Action Technical Guidance was published in 2014 to provide a consistent decision-making framework for remediation of contaminated sites. In 2022, the MoEP published a national map of contaminated soils.
Greening the system of taxes and charges	
Consider introducing an economy-wide carbon tax, or adjusted excise duties on fossil fuels, to reflect an appropriate carbon price.	In 2021, a government resolution required the Minister of Finance to introduce a carbon tax per tonne on fuel. The "carbon tax" is expected to come in the form of an increase in excise taxes on coal, fuel oil, natural gas, liquefied petroleum gas and petcoke to be introduced in 2023 and rolled out in phases through 2028.
Follow up on plans to introduce environmentally related taxes and economic instruments (notably the proposed air emission levy, coastal and marine protection charges, and the marine pollution levy), and gradually remove tax concessions that are potentially harmful to the environment (including concessions on the water extraction levy for farmers and on the diesel excise duty for commercial use).	In 2011, Regulations on the Prevention of Sea Pollution from Land-Based Sources imposed a charge on permit holders who discharge wastewater or waste into the sea. In 2021, the Water Authority published draft recommendations to gradually raise the price of water for agriculture by 2028, phasing out the subsidy while implementing the cost recovery approach to pricing. In 2018, the government started an eight-year gradual phase-out of diesel rebates for trucks, taxis and buses. A tax on single-use plastic was introduced in 2021.
Using the legal basis provided by the Clean Air Law, introduce an air emissions levy targeting priority pollutants emitted by large and medium stationary sources.	Air emission charges have not been introduced because the government is reluctant to impose a charge on only a few polluters permitted under the Clean Air Law and responsible for less than half of air emissions.
Review the tax treatment of company cars, with a view to eliminating the perverse incentives that result in increased car use and environmental impacts; replace the current car allowance for some services and public employees with other forms of compensation that are not linked to car ownership.	The tax treatment of company cars has not changed over the review period. All the costs of company cars remain fully deductible from corporate taxes, and there is no cap on fuel expenses.
Extend the use of road tolls on congested motorway stretches and consider introducing congestion or pollution charges in major metropolitan areas.	A first congestion charge will be introduced in the Tel Aviv metropolitan area in 2025. There is a high-occupancy toll lane on the inter-urban freeway connecting Jerusalem to Tel Aviv.
Gradually increase the agricultural and industrial sectors' share in financing the full costs of water infrastructure, taking account of the positive externalities associated with water supply; establish targets for domestic water consumption in line with best practices in western European countries.	As of 2017, the Israeli water sector achieved almost full financial autonomy, with the exception of wastewater reuse still relying on investment subsidies. Water tariffs for the industrial sector were gradually increased over 2010-15. However, water prices for agriculture remain heavily subsidised.

Consider broadening the use of economic instruments for water management, including: expanding the scope of the proposed marine pollution tax to effluent discharges in freshwater and aquifers; ensuring that extraction tax rates reflect water scarcity; introducing a pesticide tax with rates reflecting pesticide toxicity; and trading water quotas among different agricultural producers and, in the medium term, with other water users.	The 2017 amendments to the Water Law removed tariff differentiation between sources where the water is abstracted and its uses. According to this reform, tariffs for water production and supply would be based on cost recovery, thereby creating a water market.
Investing in environmental and low-carbon infrastructure	
Rationalise the financial incentives for renewable energy projects, taking account of the full range of costs and benefits of renewables; provide consistent guidelines on the types of land used for, and the conditions that apply to, such projects; streamline the associated planning and permitting processes.	A state-guaranteed loan fund of ILS 500 million offers incentives for local solar energy projects. Other promotional measures include auctions for commercial rooftop projects and improved permitting and tax treatment for residential systems, and the requirement for new buildings to be equipped with solar panels for water heating or photovoltaic panels.
Better integrate transport and land use planning; further develop public transport networks; improve the integration of public transport services and networks.	Israel has invested significantly in electrifying the rail network and expanding light rail (tramway). A Jerusalem-Tel Aviv high-speed electric rail has been operational since 2019. The first line of the Tel Aviv light rail is expected to be operational by early 2023.
Chapter 2. Waste management and circular economy	
Review current arrangements for the management of waste, including hazardous waste, and consolidate them in a comprehensive and coherent new policy, possibly a new law, and an action plan.	The Sustainable Waste Economy Strategy (2021-2030) builds on a long-term vision of transforming Israel's linear economy to a circular one. There is no national legislative framework for waste management. Waste-related requirements are spread across laws/regulations concerning health, hazard prevention, business, cleanliness, recycling and air pollution. The Free Export and Import Ordinances were amended in 2021 to ensure effective oversight of cross-border movements of hazardous waste.
Strengthen national and local efforts to address remaining problems with unregulated waste disposal [...]; strengthen responsibilities of the construction sector for treatment and safe disposal of construction and demolition waste.	Inspection and surveillance against illegal disposal of construction and demolition (C&D) waste in dumping sites and open spaces has been strengthened. Still, about 25% of Israel's C&D waste is illegally discarded.
Increase the level of the waste collection component of the municipal property tax to reflect the real costs of the service; gradually introduce volume- or weight-based waste disposal fees for mixed waste; identify and exchange good practice approaches for waste management among municipalities.	No progress has been made. Fees for the collection and treatment of municipal solid waste, paid by property owners, cover only 10% of the costs.
Building on pilot projects, roll out the programme for separate collection of dry and organic waste to all municipalities; develop the related treatment infrastructure, including a wider use of waste-to-energy solutions, and engage the private sector in this effort.	In 2011, the MoEP started a separation of waste at source programme, but the programme ended in 2016. The MoEP has allocated funding for the establishment or upgrading of treatment facilities for biodegradable waste, but they remain to be completed.
Broaden Extended Producer Responsibility systems to other priority waste streams, including batteries, waste electric and electronic equipment, and vehicles; strengthen the collection and safe disposal of used oils and car oil filters; ensure that their design and implementation is effective and efficient.	Israel has introduced extended producer responsibility schemes for packaging (2011) and waste electrical and electronic equipment (2012), expanded the deposit-refund scheme for beverage containers (2021) and adopted a law on plastic bags (2016).

Source: OECD Secretariat based on country submission.

Chapter 1. Towards sustainable development

This chapter provides a brief overview of key environmental trends in Israel and progress towards climate change and biodiversity targets. It assesses the environmental effectiveness and economic efficiency of the environmental policy mix, including regulatory and voluntary instruments; fiscal and economic instruments; and public and private investment in environment-related infrastructure. It examines the interaction between the environment and other policy areas with a view to highlighting opportunities and barriers to environmentally friendly and socially inclusive growth.

1.1. Addressing key environmental challenges

Israel is a small, open economy with the fastest growth among OECD member countries over the last decade. Israel managed the COVID-19 pandemic well. After a relatively mild contraction (-2%) in the economy during 2020, gross domestic product (GDP) expanded rapidly in 2021 (around 8%). The resilience of the Israeli economy is mostly attributable to the strength of its high-tech sector. Exports of high-tech services continued to grow strongly during the pandemic. Meanwhile, employment in the sector well exceeds pre-pandemic levels, performing much better than the country's labour market overall (OECD, 2020a).

The population is increasing by around 2% each year, which is faster than the OECD average. This poses challenges for the availability and affordability of housing. To alleviate the pressure, the government wants to build 1.5 million homes by 2040. High urbanisation, population density and land scarcity continue to exert significant pressure on the environment.

1.1.1. Progress towards climate targets

In absolute terms, Israel's greenhouse gas (GHG) emissions have risen by about 5% since 2010, driven primarily by economic and population growth. However, they started to decline in 2020.¹ The GHG emission rise has been moderated by the replacement of coal by natural gas in Israel's energy mix, as well as by less transportation use during the pandemic. Israel's per capita GHG emissions have declined compared to 2010. However, they remain higher than in countries with comparable climate conditions, such as Greece and Spain. At the same time, both total and per capita GHG emissions have decoupled slowly from GDP.

The country's carbon dioxide (CO₂) productivity (GDP generated per unit of CO₂ emitted) has increased substantially over the years. It surpassed the OECD average from 2013 onwards due to the growing share of low energy-intensity/high-GDP activities (e.g. in the high-tech sector).

Objectives

Over the review period, Israel has set several, increasingly ambitious sets of climate change mitigation objectives. In 2016, the government adopted a national plan that set Israel's first-ever goals for reducing GHG emissions (general and sectoral) for 2020 and 2030, albeit in per capita terms.² These goals were less ambitious than the conservative recommendation issued by the interagency steering committee at the time (State Comptroller, 2021). The overall target was a 26% reduction in anticipated GHG emissions in 2030 relative to the 2005 per capita level. The plan also envisaged a 17% reduction of electricity consumption and a 20% reduction of private kilometres travelled by 2030 compared to a business-as-usual (BAU) scenario. Israel was planning to generate at least 13% of electricity from renewable sources in 2025, and at least 17% in 2030.

For many years, poor inter-ministerial collaboration prevented more ambitious climate change targets and hampered implementation efforts. Government ministries (except for the Ministry of Environmental Protection, MoEP) tended to prioritise the goals central to their ministerial responsibility over GHG emission reduction targets. As a result, Israel did not achieve any of the interim sectoral targets for 2020. The private mileage travelled grew by a quarter instead of being reduced by 20%. The target to increase energy efficiency by 20% was met only half-way, with 60% of the funds allocated for energy efficiency investments remaining unused (State Comptroller, 2021).

Since 2019, Israel has raised its climate ambitions and developed a low-carbon economy strategy – Israel 2050 – through an inter-ministerial and cross-sectoral process (Section 1.3). In July 2021, the government passed a landmark decision on "Transition to a Low-Carbon Economy" and adopted under its umbrella the

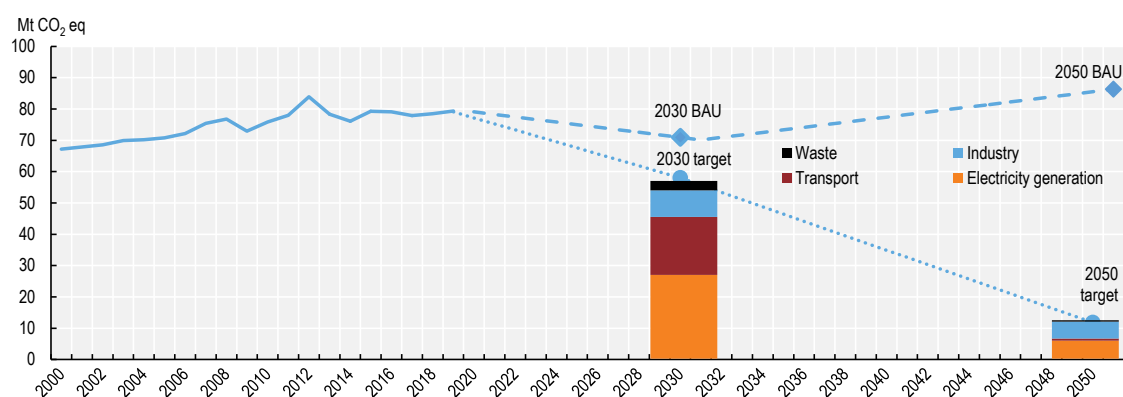
National Action Plan on Climate Change 2022-2026. The plan updated the national GHG emission reduction target for 2030 to an absolute target for the first time: a 27% reduction compared to 2015 and an 85% reduction target for 2050. It also set sectoral per capita targets for GHG emissions for 2030 and 2050 compared to 2015: electricity generation (30% and 85%, respectively), transport (3.3% and 96%), waste (47% and 92%) and industry (30% and 56%). The 2020 National Energy Efficiency Plan by the Ministry of Energy called for 1.3% year-over-year reduction in energy intensity of Israel's economy.

These targets lag in ambition behind most OECD member countries. Moreover, agriculture (responsible for 2.7% of the country's GHG emissions in 2019) is not featured in Israel's Nationally Determined Contribution or its national mitigation plan (OECD, 2022a).

Shortly before COP26, Prime Minister Bennett declared that Israel would become climate-neutral by 2050, raising Israel's climate ambition. However, Israel is not on track to reaching these targets with existing measures (Figure 1.1). It will need to introduce additional measures across all sectors.

Figure 1.1. Israel is not on track to reach its climate change targets

GHG emissions: Trends, projections and targets



Note: GHG emissions exclude land use, land-use change and forestry. Dashed lines refer to emission projections according to the business-as-usual (BAU) scenario. Dotted lines refer to trajectories towards 2030 and 2050 GHG reduction targets with abatement measures according to Government Decision 171/2021.

Sources: Country submission; Government of Israel (2021), Updated Nationally Determined Contribution (NDC) under the Paris Agreement; OECD (2022), "Air and climate: GHG emissions by source", *OECD Environment Statistics* (database); UNFCCC (2022), Israel National GHG Inventory 2021.

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In May 2022, the government approved a draft Climate Law that enshrines 2030 overall climate change mitigation targets (but not sectoral targets or those for renewable energy use) and formulates a long-term framework for action to reach the 2050 carbon neutrality goal. It would also establish a Ministerial Committee on Climate Affairs headed by the Prime Minister. In addition, an Advisory Committee on Climate Change would bring together representatives of government stakeholders, industry and non-governmental organisations (NGOs). Meanwhile, an independent interdisciplinary committee of academic experts would provide scientific support for government action. However, the prospects for the adoption of the law by the Knesset are uncertain.

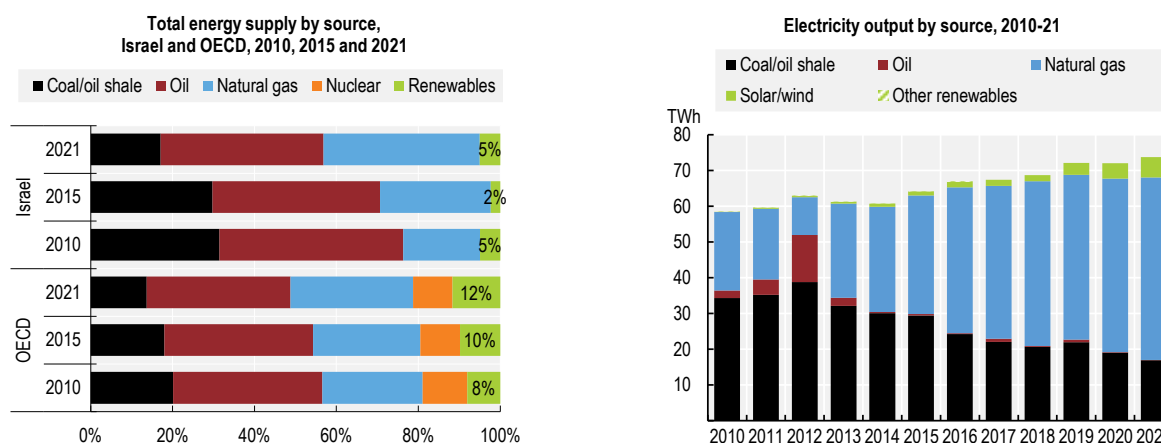
Energy mix

The energy intensity of Israel's economy declined by 38% over 2010-21 and is significantly lower than the OECD average. The overall carbon intensity of the economy (CO₂ emissions per unit of GDP) decreased even more over the same period, by almost 40%, and is now slightly below the OECD average. This ratio declined largely due to the fast growth of Israel's GDP over that period: 51% compared to the average of 21% in the OECD area.

The share of natural gas in electricity generation rose from 37% in 2010 to 69% in 2021 (Figure 1.2), driven chiefly by the discovery of offshore natural gas reserves. This has strengthened the country's energy security and contributed to most of the reduction of GHG emissions and air pollution over that period (OECD, 2020b). In parallel, the share of coal in electricity generation decreased considerably from 59% in 2010 to 23% in 2021. Several generation units at the Hadera coal power plant are scheduled to be shut down in 2023; plans to construct another coal plant in Ashkelon have been cancelled. All coal plants are scheduled to be closed by June 2026.

Despite a vast potential for solar power, renewable sources accounted for a meagre 8% in electricity generation and 5% in the total energy supply in 2021. The country's share of renewables in the energy mix is the second smallest in the OECD. It is dominated by solar energy. One of the main objections against developing wind energy in Israel is that the country is on a major migration path of many bird species that would be harmed by wind turbines.

Figure 1.2. Israel's energy mix relies heavily on fossil fuels



Note: Left panel: Data exclude trade in electricity and heat and small quantities of non-renewable waste. Right panel: Other renewables includes hydro, biofuels and waste.

Source: IEA (2022), *IEA World Energy Statistics and Balances* (database).

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Trends and mitigation policies in key sectors

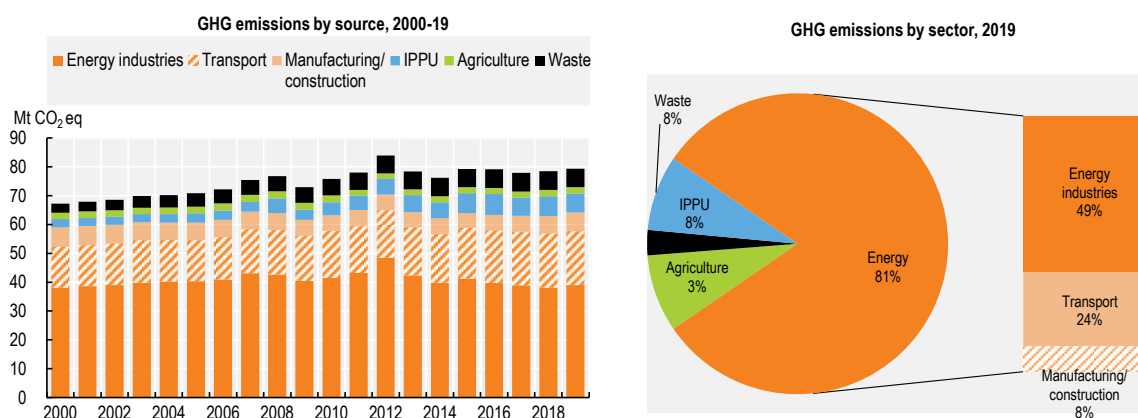
Power generation

Electricity production is the largest source of GHG emissions in Israel, accounting for 49% of emissions in 2019 (Figure 1.3). Israel's electricity-related carbon intensity is one of the highest among OECD countries. The massive growth of the share of natural gas (Figure 1.2) has compensated for the impact of increased power generation on GHG emissions. In 2018, the Ministry of Energy set a 2030 goal to use 80% natural gas and 20% renewables in electricity production. In 2020, the government increased the renewables

target for 2030 to 30% of electricity production (28% from solar energy, with only a small fraction from wind and biomass). In May 2022, the Ministry of Energy published an operational plan for achieving this goal. The plan listed regulatory measures to accelerate planning and approval of solar and wind projects, actions to improve the electricity grid and ways to optimise spatial planning for renewable energy. Also in 2022, the MoEP called for a 40% target in the same timeframe. However, a longer-term strategy is needed to support planning, development and investment towards a low-carbon economy.

Solar generation capacity has been expanding in recent years, facilitated by policy measures supporting solar energy. These include auctions for commercial rooftop projects and improved permitting and tax treatment for residential systems. New residential buildings must also be equipped with photovoltaic or water heating solar panels. However, these positive drivers have been tempered by several factors. There is limited land availability next to major consumption centres, for example, as well as transmission grid constraints. Concerns about protecting open spaces and natural habitats create a conflict between climate change and biodiversity conservation goals. In addition, complex permit procedures are holding back large-scale projects. To address the land availability issue, Israel has come up with such innovative solutions as covering water reservoirs with solar panels and installing agrovoltaic panels on agricultural facilities or over fields. In November 2021, Israel signed a declaration of intent with Jordan and United Arab Emirates whereby Israel would provide Jordan with desalinated water in exchange for electricity generated by solar panels to be built in the Jordanian desert. This agreement was reiterated and strengthened in November 2022.

Figure 1.3. Energy industries and transports generate almost three-quarters of total GHG emissions



Note: Energy industries include small quantities of other energy categories (about 1% in 2019). IPPU=Industrial processes and products use.
Source: UNFCCC (2022), *Israel National Greenhouse Gas Inventory 2021*.

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Transport

Transport is the second largest contributor to GHG emissions after electricity (24% in 2019); emissions have risen by 15% since 2010 (Figure 1.3). Car dependency is high because of the limited public transport available. Inadequate spatial planning does not provide for sufficient public transport infrastructure investment to match the rapidly expanding residential sector. In 2020, full electric vehicles (EVs) in Israel accounted for less than 1% of the total. EV uptake is impeded by the poor charging infrastructure for EVs and legal issues complicating the installation of charging points in apartment buildings (Section 1.7.3). In

2021, the Ministry of Energy postponed the target set in 2019 – to prohibit import of vehicles with fuel-burning engines starting from 2030 – by another five years.

The Ministry of Transport has not yet formulated a detailed plan for reducing GHG emissions from this sector. The central government regulates public transport, although local governments are better placed to address their communities' transport needs (OECD, 2020b). A strategic plan, "Development of Public Transportation", was published by the Ministry of Transport and the Ministry of Finance in 2012 but has not been fully implemented (State Comptroller, 2021). Since 2020, the MoEP has allocated significant subsidies (ILS 40 million in 2022) to buy electric buses for public and private transportation companies, including inter-city and regular city buses.

Buildings

GHG emissions from the buildings sector have also been on the rise. There has been a real energy efficiency improvement in the commercial-public sector. However, the energy intensity of the residential sector has increased. Residential buildings account for about 30% of total electricity consumption. Part of this trend can be explained by increased energy consumption that accompanies improvement in quality of life. The trend also reflects inadequate regulation of environmental aspects of expansive new construction in response to the housing shortage. This has led to greater sprawl, low-density development and poorly integrated infrastructure across municipalities, all of which increase emissions.

Promoting energy efficiency in buildings is another important policy area. Thousands of housing units, commercial centres and office spaces in Israel have been constructed in accordance with the Israeli Green Building Standard (IS 5281). However, compliance with the standard for energy rating of buildings (IS 5282) had been voluntary. In 2020, the National Planning and Building Board approved regulations that require most types of new construction to meet the Green Building Standard. This would follow the recommendation from the OECD 2011 Environmental Performance Review (EPR) to introduce minimum energy performance standards for buildings. The IS 5281 standard, which has five levels of requirements, covers energy, land, water, building materials, health and welfare of building users, waste, transportation, building site management and innovation.

This regulatory change is expected to lead to a significant reduction of GHG emissions from buildings. However, the Green Building Standard would apply only gradually from 2022 to about 80% of new residential buildings, schools and industrial buildings. To support implementation of the standard, the MoEP has increased the number of verification and labelling authorities for green buildings. The MoEP has also collaborated with the Israeli Green Building Council to offer two training courses for professionals in green building certification. The MoEP recognises the willingness of many local authorities to voluntarily adopt green building policies. Consequently, it will continue to expand their adoption by training local authority staff on green construction standards in 2022. There are no energy efficiency targets for existing buildings. However, a new rating system introduced by the Ministry of Energy in 2020 allows buyers of apartments to verify in advance if their new home is energy efficient. Ministry of Housing regulations require constructors to publish the energy rating of each new apartment starting in 2023.

Industry

The manufacturing sector is the only sector that has reduced its energy consumption in absolute terms over the last decade. The reduction in industrial energy intensity can be explained essentially by industrial plants switching to natural gas (often with improved process efficiency), as well as by technological improvements. An Energy Efficiency Assistance Programme launched in 2013 by the MoEP and the Ministry of Economy and Industry's Small and Medium Enterprises Agency provides subsidised professional advice to businesses. Since 2016, the MoEP, MoEI and the Ministry of Energy have been jointly managing a subsidy programme for emission reduction, energy efficiency and solar shading projects

in businesses and municipalities. In 2022, the subsidy cap was raised from 20% to 25% of capital investment.

Climate change adaptation

Israel is highly vulnerable to the impacts of climate change. In recent years, extreme weather events have been more frequent and lasted longer, including years that were either exceedingly wet or dry. Under a “high emissions scenario”, the mean annual temperature could rise by up to 4.4°C by the end of the century; 60% of days could be “hot days”. Meanwhile, total annual precipitation is predicted to decrease by 25%, with large year-to-year variability in drought conditions (WHO and UNFCCC, 2022). This, along with other impacts, is expected to reduce recharge of groundwater aquifers and have negative impacts on freshwater ecosystems; reduce water levels and increase salinity of Lake Kinneret; and cause more desertification of the southern part of Israel. Sea level in the Mediterranean is projected to rise by 0.5 metres in 2050 and by 1.0 metres by 2100 (OECD, 2013).

In 2018, the government decided to elaborate a strategy and action plan on Israel’s preparedness to adapt to climate change. Under the MoEP, it created a Climate Change Adaptation Administration (CCAA), which includes representatives of 35 governmental and non-governmental stakeholder organisations. The Climate Change Adaptation Report that the CCAA submitted to the Knesset for approval in 2021 includes recommendations for budgeting some 50 projects. However, the CCAA has not been granted sufficient authority, budget or human resources to implement adaptation actions (State Comptroller, 2021). At the same time, the Ministry of Energy has created a manual to support climate change adaptation efforts by local governments, only a few of which are proactive in this field. Over a dozen local adaptation action plans have been developed, covering about a third of the country’s population.

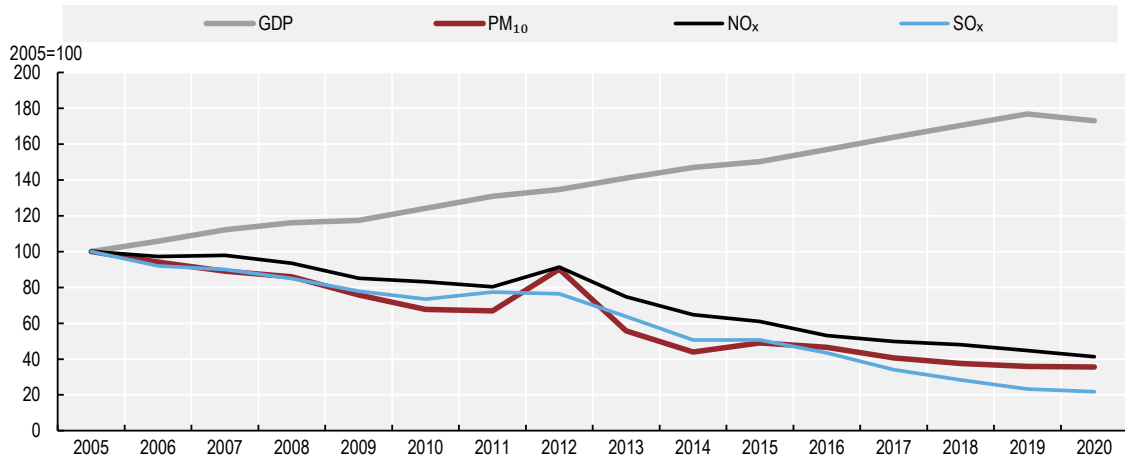
First steps on adaptation have been taken at the national level. The Ministry of Agriculture and Rural Development and the Water Authority each formulated a risk analysis methodology for climate change adaptation in these sectors, albeit without close co-ordination. Several ministries have adopted adaptation action plans, but these are not sufficiently co-ordinated either. In 2022, the National Emergency Management Authority included climate change in the national threat map, making it part of the aggregate national threat assessment. However, no government economic body or entity responsible for macroeconomic forecasts in Israel has yet assessed the long-term damage and effects of climate change on the Israeli economy. Climate change adaptation measures tend to focus on technological rather than nature-based solutions to prevent flooding, drought or other climate change-induced natural disasters – something the draft Climate Law has the ambition to change.

1.1.2. Atmospheric emissions and air quality

Air emissions of key pollutants have decoupled from Israel’s economic growth (Figure 1.4). This is mostly due to the reduced combustion of coal for electricity generation. However, the country’s population is exposed to levels of air pollution that significantly exceed the target values defined in Israel’s Clean Air Law. The exposure to fine particulate matter pollution (PM_{2.5}) is one of the highest in OECD countries (Figure 1.5), partly because of the country’s proximity to the Sahara and the Arabian deserts. It causes 2 500 premature deaths per year with annual indirect costs of almost USD 7 billion (OECD, 2019a). In its 2021 inventory of external costs of air emissions, the MoEP estimates that burning of fossil fuels accounts for over 70% of the costs inflicted by air pollution.

Figure 1.4. Air emissions have decoupled from economic growth

Decoupling trends in air pollutant emissions and GDP

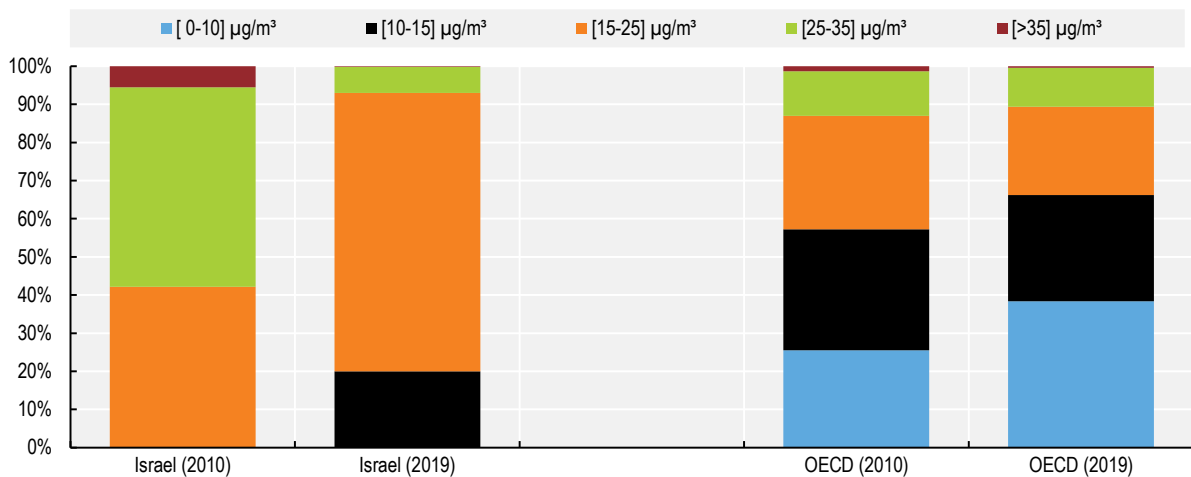


Note: Data for particulate matter exclude emissions from non-road mobile sources. GDP at constant prices.
Sources: Israel Central Bureau of Statistics (2022), "Air pollution and greenhouse gases", *Environment* (database); OECD (2022), "Air and climate: Air emissions by source", *OECD Environment Statistics* (database).

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Figure 1.5. Population's exposure to fine particulate matter is declining but exceeds OECD average

Percentage of population exposed to PM_{2.5}



Source: OECD (2022), "Air quality and health: Exposure to PM_{2.5} fine particles – countries and regions", *OECD Environment Statistics* (database).

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In 2021, transport was responsible for 31% of PM₁₀ emissions, while industry and waste burning accounted for 18% and 21%, respectively (MoEP, 2022). Road transportation is the main source of air pollution in population centres. Waste burning is especially problematic in rural areas due to lack of appropriate waste management infrastructure and enforcement (Chapter 2).

In addition, alarming nitrous oxide levels are found in the centre of the country, particularly in Tel Aviv and Rishon LeZion. The highest levels of ground-level ozone are observed in the Upper Galilee, as well as in the less populated Judean, Arava and Negev deserts. Total national annual emissions of non-methane volatile organic compounds (NMVOCs) dropped in 2021 by 43% compared to their peak in 2016 (MoEP, 2022). The implementation of the 2015 National Plan for Reducing Air Pollution and Environmental Risks in Haifa Bay has led to a 56% reduction in industrial emissions of NMVOCs in that area. This exceeds the programme's target of a 48% reduction by 2018 compared to 2014 levels (MoEP, 2021). Still, Haifa Bay remains a serious air pollution hotspot, especially for NMVOCs such as benzene due to the concentration of the petrochemical industry around the city. In March 2022, the government approved a plan to phase out Haifa Bay's oil refineries within a decade.

In early 2022, Israel adopted the World Health Organization's air quality guidelines for key pollutants as the country's "health standards" (target values). It also approved a new national programme for reduction of air pollution. The programme envisages a 70% reduction of sulphur dioxide (SO₂) emissions over 2018-30, a 38% reduction for nitrogen dioxide, 10% for PM_{2.5} and PM₁₀, and 3.5% for NMVOCs over the same period. The measures that would lead to such reductions include further conversion of coal-fired power plants to natural gas and prevention of waste burning in open areas. They also include a range of actions in the transport sector: low-emission zones in cities (Box 1.1), promotion of EVs, reduction of commuting through enhanced teleworking, etc. Industrial air emissions have been regulated under the 2011 Clean Air Law through permits based on best available techniques used in the European Union.

Box 1.1. Low-emission zones target air pollution in major Israeli cities

Haifa

The first stage of the low-emission zone (LEZ) initiative in Haifa began in February 2018. It prohibits diesel vehicles weighing more than 3.5 tonnes from entering Haifa's residential areas without an emissions-reducing particulate filter. As of January 2019, polluting light commercial vehicles are also prohibited from entering residential areas of Haifa. The LEZ will ultimately result in a 20% reduction of transport emissions in Haifa.

Jerusalem

In 2020, Jerusalem became the first city in the country to create a LEZ that bans old, polluting vehicles from its entire municipal jurisdiction. During the first phase of the project, which started in February 2020, a regulation prohibited old, heavy (3.5 tonnes or more), polluting diesel vehicles from entering downtown without a particulate filter installed on the vehicle. In September of the same year, the second phase expanded the weight limitation, prohibiting light diesel vehicles from entering Jerusalem's LEZ and implementing the LEZ across the entire municipality. In 2022, the MoEP allocated ILS 10 million for the next phase of the project, which will restrict access to heavy machinery, create bicycle paths and raise people's awareness.

Tel Aviv

In 2020, the Minister of Environmental Protection and the Mayor of Tel Aviv agreed to turn Tel Aviv into a "Clean Air City" by reducing vehicle-caused pollution. Among other things, the initiative would transform Tel Aviv into a LEZ. However, this initiative has stalled.

Source: MoEP (2021).

However, Israel has not introduced charges on air pollutants recommended by the 2011 EPR. If such taxes were introduced under the Clean Air Law, they would only apply to permitted installations regulated by this law. The difficulty the MoEP is grappling with is that permitted installations are responsible for just half of the country's air pollution load, making the potential charges inequitable (Section 1.6.3).

1.1.3. Progress towards biodiversity targets

Despite its relatively small size, Israel enjoys extensive biodiversity at a junction of migratory routes between Europe, Asia and Africa. Most of its land is publicly owned, which facilitates the designation of protected areas. However, the country's biodiversity continues to suffer from habitat fragmentation, invasive alien species, overexploitation of water resources and pollution.

Israel has not yet established official biodiversity targets as recommended by the 2011 EPR. Nineteen national targets were formulated in 2015 in accordance with Aichi Targets under the Convention on Biological Diversity but have not been approved by the government. There is no overarching governmental approach to mainstreaming biodiversity considerations into sectoral policies. The legislation relevant to biodiversity protection spans different laws and provides partial prevention and protection measures. A 2022 State Comptroller report said that Israel had made insufficient progress on 14 of the 19 targets and that biodiversity had declined in 89% of the country's ecosystems (Surkes, 2022).

The 2010 National Biodiversity Strategy was never implemented. A new biodiversity action plan was intended to be completed in 2017, but this did not happen due to the MoEP's budget constraints. In January 2020, the MoEP began to develop a new Israeli National Biodiversity Strategy and Action Plan (NBSAP). The plan is expected to be finalised by an inter-ministerial committee and adopted by a government decision by the end of 2022. The NBSAP would include several regulatory and budget recommendations. It will also set measurable biodiversity targets for 2030 in line with the Convention on Biodiversity's Post-2020 Global Biodiversity Framework. These will include, among others, protecting at least 30% of all terrestrial and marine ecosystems, reducing the number of endangered species by at least 10% and restoring at least 20% of degraded ecosystems.

An assessment of Israel's ecosystems was initiated in 2013 within the framework of the National Ecosystem Assessment Programme, in line with a 2011 EPR recommendation. Its comprehensive report, based on the work of over 200 scientists, was published in 2021. This study, the first of its kind in Israel, details services provided by each of the country's ecosystems, the biodiversity underpinning these services, the threats to each ecosystem and the drivers of change affecting the services. It attaches monetary value to some of the services, although this valuation is limited by methodological constraints.

Israel published State of Nature reports in 2013, 2016, 2018 and 2022. In addition, Israel's Central Bureau of Statistics (CBS) published a National Index for Biodiversity in 2019 as part of the Indices of Quality of Life, Sustainability and National Resilience. The biodiversity index is based on the State of Nature report data and is updated every two years. The index is intended to assess the state of the country's ecosystems. It represents an average of values characterising the remaining natural area and its state for each major ecosystem.

Habitat and species

The increasing demand for new housing and infrastructure is causing more pressure on open natural landscapes and adding to land scarcity. The significant increase in development of settlements and infrastructure causes habitat fragmentation and negative effects on the remaining adjacent natural areas. This is one of the constraints for the development of renewable energy sources in Israel: wind turbines interfere with bird habitats and migration routes, and solar panels should avoid occupying open spaces to prevent further biodiversity loss.

The 2040 Strategic National Housing Plan adopted by the National Planning Administration in 2017 includes some biodiversity considerations such as integrating ecological corridors into spatial planning to address habitat fragmentation. More statutory planning of ecological corridors is underway across the country.

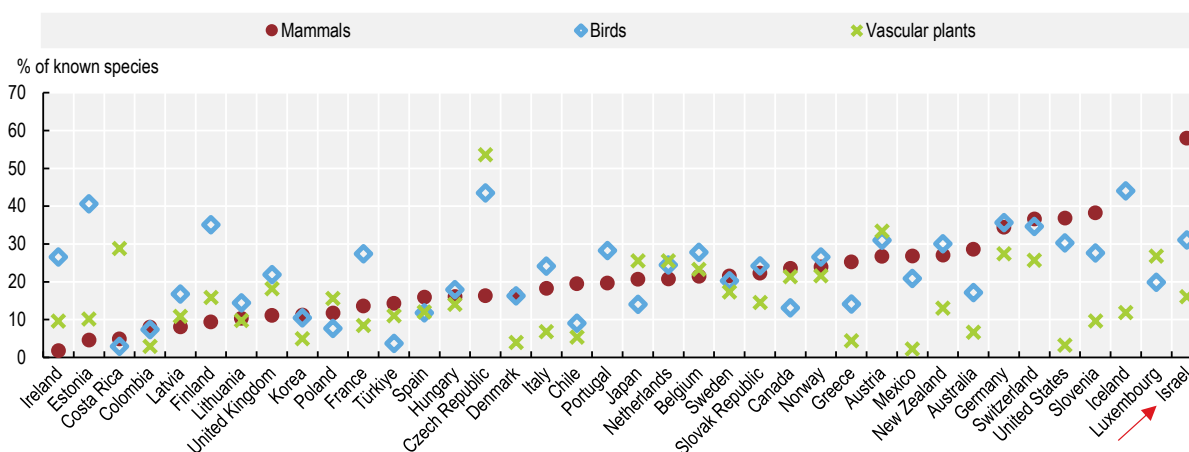
Outside protected areas, most vulnerable ecosystems are under significant stress. In the last decade, the MoEP encouraged local authorities to prepare urban nature surveys. The surveys are intended as a basis for municipal management tools for open landscapes and urban nature sites. To date, 70 local authorities have produced an urban nature survey. As of 2019, four municipalities prepared an urban nature policy document (Jerusalem, Be'er Sheva, Tel Aviv and Kiryat Gat). Jerusalem was the first municipality to incorporate urban nature sites and guidelines into the statutory District Outline Plan.

The Open Spaces Conservation Fund managed by the Israel Land Authority since 2012 serves as an offset fund for land development projects (mainly housing). This government fund is one of Israel's most prominent economic tools to promote biodiversity conservation. It plays an important role in mainstreaming biodiversity at the national and local levels. It aims at the rehabilitation, restoration and conservation of open spaces. This includes development of public recreational parks; removal of invasive species; restoration and rehabilitation of aquatic habitats and their surrounding areas; and collection and processing of spatial planning data, monitoring and research. Over 2012-19, the fund distributed about USD 180 million to more than 500 projects nationwide.

The status of indigenous species is concerning: more mammal species, as a share of total indigenous mammals, are threatened in Israel than in any other OECD member country (Figure 1.6).³ In 2019, the MoEP updated the protected species list for the first time in ten years, aligning it with the list of the Convention on International Trade in Endangered Species. Hundreds of species were added to the list, including 355 endangered plant species and 13 freshwater fish species.

Figure 1.6. Almost 60 percent of indigenous mammal species are threatened in Israel

Threatened species in OECD countries, late 2000s



Note: Data for Israel and New Zealand refer to threatened indigenous species. The reference year varies across OECD member countries as data are collected through sporadic national surveys; Israel data are from 2020.

Source: OECD (2022), "Biodiversity: Threatened species", *OECD Environment Statistics* (database).

StatLink <https://stat.link/8rhe5i>

Over the past decade, Israel has made considerable efforts to prevent invasive alien species from entering the country, as recommended by the 2011 EPR. In 2017, for the first time, introduction pathways of invasive alien species to Israel were comprehensively analysed. This was a joint initiative of the MoEP, the Israel

Nature and Parks Authority (INPA) and the Society for the Protection of Nature in Israel. However, invasive alien species (primarily plants, birds, fish and insects) continue to pose a major threat to the country's biodiversity (Surkes, 2022).

Israeli legislation on invasive alien species is largely focused on the agricultural sector and pest control. A draft law aims to prevent introduction of new invasive alien species that pose a threat to the environment and to control existing ones from a more holistic perspective. However, the institutional and regulatory fragmentation in the country's approach to this issue has so far hampered adoption of comprehensive biosafety and biosecurity legislation.

Protected areas

Israel has made substantial progress over the last decade, expanding terrestrial protected areas and establishing marine ones. In 2021, Israel joined the High Ambition Coalition and Global Ocean Alliance of over 100 countries committed to protecting at least 30% of global terrestrial land and marine areas. Over 2015-19, 40 terrestrial nature reserves (NRs) and 15 terrestrial national parks (NPs) were declared. This added about 6% to the total area of NRs and 13% to the total area of NPs under INPA management. About 25% of Israel's land area is protected as part of declared NRs and NPs.

The INPA published a marine spatial and strategic plan for Israel's territorial waters in the Mediterranean Sea in 2018. It included biodiversity guidelines for protected areas. In the Gulf of Eilat in the Red Sea, the Coral Reef Marine Nature Reserve (MNR) protects most of the coral reef ecosystem near the coast, covering 1.3 km of the Israeli territorial Red Sea waters. Israel's marine conservation strategy is to establish a small number of large marine reserves to enable sound functioning of ecosystems. Only 4% of the Israeli territorial waters were designated as MNRs as of mid-2022. However, a new large MNR was declared in the Palmachim Disturbance of the Mediterranean Sea in September 2022 (a first protected area in Israel's exclusive economic zone). This has more than doubled the size of Israel's offshore nature reserves.

1.1.4. Water management

Israel is a country with a high level of water stress (Figure 1.7). To provide its rapidly growing economy with sufficient and reliable water, it has combined institutional and regulatory reforms with massive infrastructure investment. The vast majority of Israeli citizens enjoy water supply through a direct connection to the national water system. However, the projected population growth and the diminishing supply of water from natural sources present a challenge for maintaining this access.

Water supply and consumption

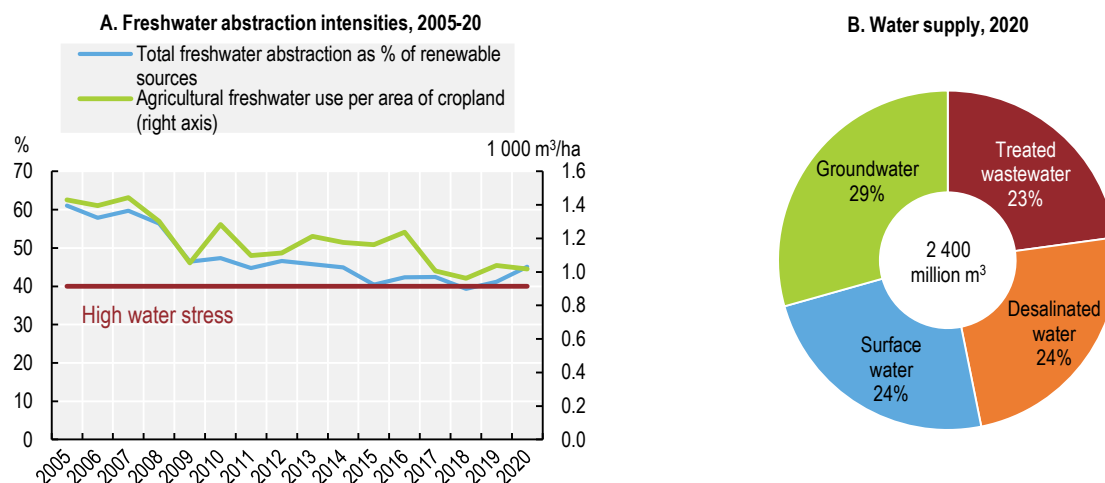
Large-scale reuse of wastewater and desalination of seawater (Figure 1.7) compensates for the lack of freshwater resources. Using advanced reverse osmosis technologies and improved process engineering, Israel's five desalination plants are among the most efficient in the world, supplying over 80% of the country's domestic urban water (i.e. water not used for irrigation). However, desalination has adverse environmental impacts. Apart from being highly energy intensive, the process produces brine. Discharges of brine into the sea can lead to increased salinity and temperature and accumulation of several potentially toxic substances in receiving waters. All Israeli desalination companies must monitor the coastal area of the Mediterranean around their plants for effects of brine disposal.

Agriculture accounted for more than half of total water consumption in 2020, while domestic use was responsible for about a third. Israel's gross freshwater abstraction per capita is among the lowest in OECD member countries. Israel is the largest user of recycled effluent water for agriculture across OECD member countries: more than 87% of wastewater effluent is reused for agriculture, representing approximately half of total water that farmers use nationwide (Marin et al., 2017). A national bulk water conveyance system allows for optimisation of water distribution from various sources depending on demand. Massive public

awareness campaigns have emphasised the value of water. Quasi-universal water metering allows for strict enforcement of water abstraction quotas.

Still, freshwater accounts for 36% of water use in agriculture, contributing to high levels of water stress. In 2018, entering the sixth year of the long drought, the Water Authority imposed permanent cuts in agricultural water quotas of up to 41% for irrigators accessing the national water system. Farmers could voluntarily waive part of the quota in exchange for support. Overall, between 2000 and 2018, agriculture's share of freshwater abstractions decreased by more than half to reach about a third of total water abstractions (OECD, 2019c).

Figure 1.7. Pressure on freshwater resources is easing but high water stress remains



Note: Panel A – Water stress = total freshwater abstraction as percentage of total renewable water resources. Water stress higher than 40% indicates serious water scarcity and unsustainable water use.

Sources: CBS (2021), "Water and sewage", *Statistical Abstract of Israel 2021 – No 72*; OECD (2022), *OECD Environment Statistics* (database).

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Water resource planning and allocation

In 2012, the Water Authority published a National Long-term Master Plan for the Water Sector through 2050. It covers protection of water resources, water supply and wastewater management. The master plan defines the vision, goals and objectives of the national water sector, as well as policies on major water issues. The plan aimed to integrate engineering considerations (ensuring the quality and quantity of water) with structural, economic, environmental, social and legal ones.

The 2012 master plan provided a medium- and long-term forecast for the balance of water resources in the country. It assumed a drop in the supply of natural water and an increase in non-conventional sources, including wastewater reclamation and desalination. In 2018, the government adopted a strategic plan for coping with periods of drought for 2018-30. Main measures include increasing supply of desalinated water, reducing demand and encouraging water conservation, and reinforcing protection of Lake Kinneret.

Israel has made significant progress in implementing a 2011 EPR recommendation to improve water allocation among sectors and to nature. In 2013, the INPA, MoEP and Water Authority jointly issued a Master Plan for the Supply of Water to Nature. An inter-ministerial team prepares and approves river plans to see how much water is needed for individual ecosystems. The plan determines how much water to discharge, what type and when. Approved plans exist for several major rivers. Water plans relate to

ecological, hydrological and regulatory aspects of the overall planning for a river. They determine the flow regime, water quality and actions necessary to protect the ecosystem or rehabilitate it, considering other uses and needs from upstream to downstream. In some places, they set aside a minimum quota of water for ecosystems. Such water plans align with the 2011 EPR recommendation to define water quality objectives for all stretches of rivers. A manual describes the bodies and institutional and regulatory framework involved in preparing water plans.

The Israel Centre for Aquatic Ecology, established in 2015, determines the biological standards used to assess the ecological status of the country's streams. A database with ecological and hydrological data for each of Israel's aquatic habitats (about 200 total) has been prepared. However, the methodology for water allocation for nature has been implemented at fewer than half of these sites due to lack of funding.

Water quality and wastewater treatment

Israel has fulfilled its voluntary commitment, made at the 2017 United Nations Oceans Conference, to reduce the direct discharge of wastewater into the sea by the end of 2017 by 80% compared to 2012 (MoEP, 2021). Water quality has improved in Lake Kinneret as a result of a significant reduction in pollutant loads. For example, chloride concentrations are down by 18% in January 2022 from their peak in 2018. About 94% of all wastewater is collected and treated, and 87% is reused, primarily for agriculture. However, nitrogen pollution of groundwater caused by extensive fertiliser use in agriculture remains a problem. Nitrogen balance in the soil was seven times the OECD average level in 2020 (OECD, 2022a). This problem is addressed by treating well water abstracted for human consumption. As drinking water comes increasingly from seawater desalination, the government considers such treatment more cost effective than reducing the nutrient input. High nutrient concentrations are not a problem in irrigation water.

Israel has not met its target for wastewater treatment levels. By 2020, the country planned to have tertiary treatment at all its wastewater treatment plants. Two years later, less than 55% of all wastewater receives tertiary treatment due to delays in upgrading large plants in Jerusalem and Haifa.

1.2. Institutional framework for environmental governance

Israel has a centralised system of governance influenced by the British colonial Municipal Ordinances of 1934 and 1941. There has been no major decentralisation reform: the central government retains most of the powers and strict oversight of local government activities and finances. Bylaws and ordinances adopted by councils, as well as their budgets, are subject to approval by the Ministry of the Interior.

1.2.1. Central government and horizontal co-ordination

The MoEP manages a wide portfolio of environmental issues (climate change, air pollution, waste and chemicals management, biodiversity conservation, environmental planning and education). It has both policy making and enforcement responsibilities and employs about 60% of all environmental personnel in the country. However, the MoEP's budget has remained one of the smallest in the government and has increased only slightly in absolute terms since 2015.

The Water Authority manages the water sector in accordance with the law and government policy. The Water Authority is governed by the Water Council which comprises representatives from the ministries of energy, environmental protection, finance, interior and agriculture.

The Ministry of Economy and Industry is responsible for resource efficiency as part of industrial policy. The Ministry of Energy is in charge of energy policy. Other important players in the environmental field are the Ministry of Agriculture and Rural Development and the Ministry of Transport. The co-ordination between these ministries on environmental issues is at times ad hoc and mostly informal. Besides the Water

Council, several inter-ministerial committees either implement specific legislation (e.g. the Law on Prevention of Sea Pollution from Land-Based Sources) or are formed to design specific draft policies or legislation.

Local government and vertical co-ordination

Israel's 257 local governments are divided into three categories: 77 municipalities, 124 local councils and 54 regional councils. There are also two local industrial councils, which only manage industrial zones and do not have residents. The status of municipalities is granted to cities with at least 20 000 inhabitants while that of local councils is reserved for towns between 2 000 and 20 000 inhabitants. Regional councils operate at the local level, bringing together settlements spread across rural areas to unite local communities and provide local services, including waste management. Local authorities, through independent water corporations, own municipal water and wastewater utilities that are regulated under licences issued by the Water Authority. The Ministry of Interior oversees local governments. In co-ordination with the Ministry of Finance, it approves the budget of local governments and audits their accounts. Government fund transfers account for about 40% of local government revenues, the rest coming mainly from the property tax (OECD, 2020a).

In 2019, 59 local environmental units covered 75% of local authorities and 90% of the population. Forming an environmental unit is voluntary but is subject to tender conditions and funding from the MoEP. The 2011 EPR recommended making government subsidies to municipalities contingent on viable environmental units and compulsory training for such units. This recommendation has not been implemented because the MoEP does not want to risk local governments refusing the much-needed funding for environmental purposes.

In 2014, the MoEP conducted a series of trainings for local environmental units on business licensing, prevention of air pollution and noise nuisances, environmental planning and enforcement. It has also developed a mandatory academic training course for new directors of local environmental units. The MoEP has significant influence over the environmental units' performance. However, the units' staff are municipal employees and give precedence to municipal policies. Some municipalities have sustainability units with similar functions, but those have been created outside the MoEP framework. Achieving a degree of uniformity in the powers and structure of environmental units would help strengthen local environmental governance.

Since 2009, the Ministry of Interior has established 11 regional clusters (*eshkolot*) that are inter-municipal unions that pool resources for delivering common services, primarily waste management. These clusters bring together 147 of the country's 257 municipalities, covering about 30% of Israel's population. The MoEP has invested heavily in environmental capacity building in the new clusters. Since 2021, the Ministry of Energy has been funding energy advisers in the clusters who work on energy efficiency and renewable energy projects in municipalities.

There are also other types of inter-municipal associations. For example, ten Municipal Associations for Environmental Quality work on issues ranging from environmental planning to air quality and waste management and environmental education. Forum 15 is an association of Israel's largest municipalities that advocates decentralisation and runs several programmes on climate and air pollution. In 2011, Forum 15 pioneered the Green Building Standard that was later adopted at the national level (Section 1.1.1). A few local governments have climate change officers. Among them, Tel Aviv has both climate change mitigation targets and an adaptation plan.

1.3. Sustainable development and green growth policy framework

The 2011 EPR recommended that Israel develop a whole-of-government approach to sustainable development and green growth. Although an inter-ministerial committee formulated a national green growth plan in 2012, it was never budgeted or adopted. A 2019 government decision required Sustainable Development Goals (SDGs) to be integrated into strategic government programmes.

The CBS serves as the national focal point for reporting SDG indicators to custodian agencies. It also oversees the reporting process of all relevant data providers within the Israeli national statistical system. Israel submitted its first Voluntary National Report in 2019 reporting on all 17 goals. Currently, statistical data are available for 113 indicators. In March 2022, the CBS published an analysis of the distance from achieving the SDGs in Israel. It concluded that Israel has achieved or is close to achieving the targets of 31 of the 72 indices included in the distance analysis (43%). The best performing indices are health-related ones. The indices below 50% of the target related to poverty eradication, economic inequality, work-related injuries and renewable energy, as well as conservation of marine and terrestrial ecosystems.

In 2019, the MoEP launched a multi-sectoral process, "Israel 2050 – a thriving economy in a sustainable environment". It sought to optimise how the country uses energy and other resources, shift from fossil fuels to renewables in the power sector, make transport and industry run on electricity and end waste landfilling. It focused on transportation, energy, buildings and urban planning, industry and trade. The work, conducted during the COVID-19 pandemic, produced a report in February 2021. The report includes a vision and implementation strategy towards a low-carbon economy with an emphasis on streamlining resource use.

1.4. Regulatory framework for environmental management

Israel's environmental regulatory framework is fragmented. Some environmental laws (on biodiversity protection, water and waste) have been in place for decades. Regulatory uncertainty is a significant challenge for businesses. The uncertainty is caused by frequent government changes and resulting policy fluctuations, as well as the inability of recent caretaker governments to pass legislation.

1.4.1. Environmental assessment

There have been no substantial changes in the environmental impact assessment (EIA) process since 2010. The field of EIA application remains significantly narrower than in the European Union (EU). Several categories of installations (e.g. certain chemical facilities and large poultry plants), as well as installations located in industrial zones, are not subject to EIA. There is no inherent linkage between the EIA system and permitting processes. However, while issuing permits, the MoEP may use information submitted as part of the EIA process.

Spatial plans under the responsibility of the National Planning Administration undergo an environmental assessment that is similar in scope to the EU definition of strategic environmental assessment (SEA). There is no SEA system in Israel for policies and programmes. The draft Climate Law (Section 1.1.1) includes the concept of climate impact assessment but no implementation mechanism for it. The MoEP is trying to introduce environmental elements into the mandatory regulatory impact assessment of draft laws and regulations.

1.4.2. Permitting

Israel's environmental permitting system is governed by several disparate laws and is not integrated across media:

- Air emission permits are issued by the MoEP under the 2008 Clean Air Law to approximately 140 high-impact facilities.
- Hazardous materials (poisons) permits are issued by the MoEP under the 1993 Hazardous Substances Law to approximately 4 600 facilities that handle hazardous substances or wastes.
- Business licences are granted by local authorities under the 1968 Business Licensing Law, based on conditions set by several government regulators, including the ministries of agriculture, health, labour and environmental protection. The MoEP sets conditions for about 9 000 business licence holders, with local authorities regulating the environmental impact of smaller facilities.
- Marine discharge permits are issued by an inter-ministerial committee headed by the MoEP under the 1988 Prevention of Sea Pollution from Land-Based Sources Law to about 120 entities, more than half of which are industrial facilities.
- Wastewater discharges into terrestrial water bodies (very few installations are not connected to public sewerage systems) are regulated by the Water Authority.

Since joining the OECD in 2010, Israel has been trying to introduce integrated environmental permitting in line with the EU Industrial Emissions Directive and the OECD Recommendation on Integrated Pollution Prevention and Control (IPPC). Following a recommendation of the 2011 EPR, the government approved the MoEP's plan to consolidate environmental permits. The MoEP then prepared a draft law to consolidate separate environmental permits covering air and marine pollution, chemicals and hazardous waste into one integrated permit valid for seven years. This would create one unified and simplified approval procedure. However, the draft law faced opposition from industry fearful of increased regulatory burden. In addition, other government ministries disagreed on substantive issues and required resources to implement the law.

Following a government decision on IPPC in 2021, the MoEP produced a draft Environmental Licensing Law that includes amendments to the Clean Air Law and the Hazardous Materials Law. It would also override certain provisions of the Business Licensing Law, making environmental approval a stand-alone authorisation. As a result, the operator will be subject to one permitting procedure and will receive one permit that includes most environmental conditions (wastewater discharges to water bodies would still not be covered). An agreement was also reached on personnel and budget resources needed to implement the new law. However, this law would only be a first step to achieving cross-media substantive integration of environmental permit conditions on the basis of best available techniques, in line with the practice in many OECD member countries. The draft law was approved by the government and sent to the Knesset in March 2022, but its adoption there remains uncertain.

In 2018, the Business Licensing Law was amended to simplify and accelerate the procedure for low-impact facilities. Uniform specifications (essentially, general binding rules) are expected to be gradually adopted for a range of activity sectors as defined by the respective approving ministries. As of mid-2022, the MoEP had published binding rules for 14 sectors, including gas stations, slaughterhouses, hotels, dry cleaners and non-hazardous waste collection. Businesses that sign an affidavit that they comply with the rules would receive a licence expeditiously. In addition, the amendments reduced the processing time for licence applications and extended licence validity for several activity sectors. The MoEP has also streamlined requirements for lower-risk facilities by developing integrated environmental permitting guidelines and rules for small and medium-sized enterprises and incorporating them in their business licence conditions.

1.5. Compliance assurance

The multitude of environmental enforcement authorities in Israel reflects the fragmented regulatory framework. Routine inspections (for example, of industrial facilities regulated under the Clean Air Law) are carried out by the MoEP's district offices. However, these offices, particularly for the Southern District,

suffer from a chronic shortage of inspection staff (State Comptroller, 2019). The Green Police of the MoEP is responsible for criminal investigations. Local authorities may assume a limited compliance assurance role on issues within their jurisdiction but rarely do: 44% of local authorities did not have any qualified environmental inspectors in 2018 (State Comptroller, 2019).

The Green Police, Marine and Coastal inspectors, Water Authority inspectors, the INPA's enforcement unit and the Environmental Unit of the Israeli Police have mostly informal co-ordination. For example, the MoEP and the INPA do not co-ordinate their inspection activities and reporting. In the last five years, a round table on environmental compliance has been held regularly under the auspices of the Ministry of Justice.

The MoEP is developing a portal to bring together regulatory interactions into a one-stop shop for all inspected entities. It is also planning a unified information-sharing system for all government stakeholders involved in environmental protection to manage permits, licences, monitoring, inspection and emergency events.

1.5.1. Compliance promotion

The MoEP is only starting to engage in compliance promotion activities, mostly by informing the public about companies' environmental performance. In line with a 2011 EPR recommendation, a 2012 law established a Pollution Release and Transfer Register (PRTR). It required some 500 facilities with significant environmental impact to report on the annual quantity of emissions of pollutants (including GHG emissions) and waste transfers to the environment. The information is publicly accessible on the PRTR webpage, making it possible to compare data across years and to enable international comparisons. The database, in Hebrew, may be searched by factory, sector or area. The online system includes annual reports, a dynamic map of factories, pollutant emissions inventory, a search engine for reports by factory and an advanced data analysis system (added in 2019).

The MoEP publishes an annual Environmental Impact Index of about 40 companies, 100 industrial factories and some 800 gas stations. Released annually since 2014, this index integrates several parameters: pollutant emissions and waste transfers as reflected in the PRTR, risks of using or storing hazardous materials, environmental sensitivity of the site, compliance level with regulatory and permit requirements, and voluntary actions such as environmental management systems and corporate reporting. The index equation is based on the United Kingdom's Operational Risk Appraisal scheme, through which the government assesses environmental risk and determines how to allocate its regulatory resources. As one of its main objectives, the index presents the public, investors and the companies themselves with a reliable measure of the environmental impact of each company.

1.5.2. Compliance monitoring

The MoEP's compliance monitoring and enforcement capacity has increased over the last decade. The ministry has established Drone Squadron 11 as part of its Green Police to enhance its compliance monitoring functions. Drones are used to gather intelligence and identify illegal operations and other environmental hazards. Enhanced interagency co-ordination has allowed joint enforcement against economic and environmental crimes.

Inspection planning is performed in the MoEP's six district offices using risk level-based minimum inspection frequencies set in guidelines. However, compliance monitoring is dominated by reactive site visits prompted by incidents or complaints. The district offices do not usually manage to conduct more than 75-80% of planned inspections. About 5 000 citizen volunteers ("cleanliness trustees") complement compliance monitoring by the MoEP and the Green Police. These volunteers send thousands of non-compliance reports on waste-related offences to a specially designated contractor. The contractor then filters and forwards them to the MoEP for possible enforcement action.

There are considerable gaps between the districts in the number and severity of environmental violations reported. Many offences are not documented or reported at all (State Comptroller, 2019). Compliance data management has been partial and fragmented across MoEP district offices. Different, often incompatible, database formats have been used. The duplication and inconsistent entry of compliance data impair the MoEP's ability to take appropriate enforcement actions. The Central district office, which has the best reporting and data management arrangements, reported 534 violations detected in 769 inspections in 2021, demonstrating a high level of non-compliance.

A new electronic system for site inspection reporting was piloted in July 2022. It is expected to cover environmental inspections of every type of activity, improve inspection co-ordination across the district offices and allow the ministry's inspection and enforcement directorate to access comparable compliance data, including compliance monitoring history of individual operators.

1.5.3. Enforcement

Israel has only fixed administrative fines for environmental offences. These fines, with amounts set in respective statutes, can be imposed by MoEP inspectors. The Green Police are authorised to issue fines under the Criminal Procedure Law in a variety of matters (in these cases, the offender can choose to pay the fine or go to court). The government has decided not to develop a system of variable administrative fines for environmental offences because it expects their justification to be difficult to defend in court. Instead, it has raised fixed fines per violation under different laws. For example, the maximum fine under the Hazardous Substances Law is ILS 2.5 million. The introduction of an ILS 6 000 fine for illegal burning of waste is awaiting parliamentary approval.

However, the MoEP's enforcement procedures do not include criteria for selecting an appropriate non-compliance response. In over half of reported non-compliance cases, no administrative or criminal sanctions are applied. In 2014-18, the Green Police filed criminal indictments in only 1.7% of significant non-compliance cases. About three-quarters of the investigation files in the same period were closed without an indictment (State Comptroller, 2019).

The collection of most administrative fines (with revenue going to the MoEP's extra-budgetary funds) has improved over the last ten years. The exception is small fines for waste-related offences, where the collection rates are low, at about 20%.

The MoEP has not followed through on its decade-old plans to systematically recover economic benefits of non-compliance. Israeli criminal law allows for this possibility. However, the few attempts to justify a methodology for calculating such benefits have failed in the courts.

1.5.4. Liability for environmental damage

The 2011 EPR noted that state ownership of most industries in the past and the predominant state ownership of land complicated the determination of liability of current land owners and lease holders and remediation of historically contaminated soils. The Prevention of Land Contamination and Remediation of Contaminated Lands bill, first developed in 2008, was endorsed by the 2011 EPR. However, it has still not been adopted due to strong opposition inside the government. The main controversial issues are potential implications for the value of state-owned land and the responsibility of the state as a polluter. The MoEP is revising the bill while also looking to integrate land rehabilitation provisions into conditions of future integrated environmental licences (Section 1.4.2).

A Risk-Based Corrective Action Technical Guidance, published in 2014, provides a consistent decision-making framework for remediation of contaminated sites. The MoEP's 2015 policy prioritises remediation of sites where environmental and economic benefits clearly outweigh the costs. The state pays for clean-up of such priority sites if they have been contaminated by state-owned entities. The MoEP has also determined threshold values for various contaminants. When thresholds are exceeded at a contaminated

site, remediation must not be postponed beyond seven years. The Environmental Services Company, a government company under the auspices of the MoEP, remediates land left behind by Israel Defence Forces and military industry to make it suitable for construction of some 70 000 housing units. In 2022, the MoEP published a national map of contaminated soils throughout the country, which includes more than 2 200 sites.

A 2019 amendment to the Prevention of Environmental Nuisances Law introduced civil liability for damage to natural resources and biodiversity. The amendment allowed citizens and NGOs to file lawsuits for damages against polluters. However, the issue of securing funds for remediation of the contaminated environment remains unresolved. The MoEP is trying to require remediation of current environmental damage through permit conditions. Remediating the sites where the responsible party is either unknown or insolvent is the biggest challenge in the absence of an appropriate legal framework. Some budget funds have been used for joint remediation projects with the Land Authority, but these efforts have not been systematic.

1.6. Greening the system of taxes and charges

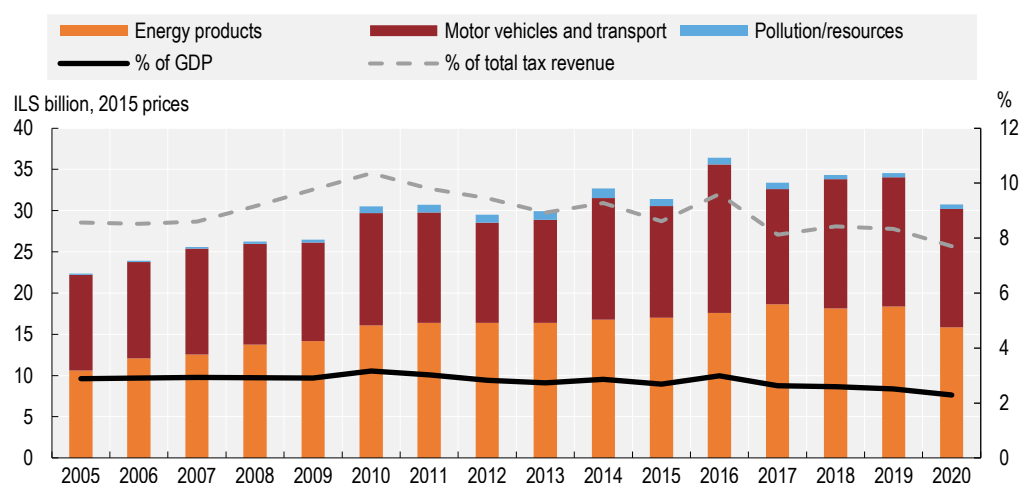
In 2020, the government collected ILS 30.7 billion worth of environmental tax revenue, representing 2.3% of GDP and 7.7% of total government revenue from taxes and social contributions (Figure 1.8).

This is relatively high compared to the OECD average (1.4% of GDP and 4.6% of total tax revenue). However, both shares have been decreasing over the last decade because the rate of increase of environmentally related taxes (1.4% per year on average over 2010-19) has been lower than the growth of GDP and tax revenue. In 2020, this decrease was accentuated by the COVID-19 pandemic that led to a reduction of both the fuel use and vehicle purchases.

As in other OECD member countries, energy-related taxes, including taxes on motor fuels, make up the bulk of environment-related taxes (52%), followed by transport taxes (47%); pollution-related taxes play only a minor role. Israel has the second lowest share (after New Zealand) of energy taxes in environmentally related taxes in the OECD – the OECD average share is 70% – due to both relatively low energy taxes and high vehicle taxes.

Figure 1.8. Environmentally related tax revenues are growing slower than GDP and total tax revenue

Environmentally related tax revenue by tax base, 2005-20



Note: Includes preliminary data and partial data for 2019-20.

Sources: Country submission; OECD (2022), "Environmental policy instruments", *OECD Environment Statistics* (database).

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1.6.1. Taxes on energy use and carbon pricing

Over the last decade, Israel has advanced reforms to deregulate its oil sector, particularly the petrol industry. It eliminated some price controls for end users of petroleum products and privatised the country's two oil refineries. Excise taxes on motor fuels are among the highest among OECD member countries, for both gasoline and diesel.

The 2011 EPR recommended that Israel consider an economy-wide carbon tax to reflect an appropriate carbon price. In 2021, a government resolution required the Minister of Finance to introduce a carbon tax per tonne on fuel. It also proposed amendments to the Excise Tax Directive on Fuel of 2004 and the Directive for Tax Fees and Exemptions and Purchase Tax on Goods of 2017 (State Comptroller, 2021).

The "carbon tax" is expected to take the form of higher excise taxes on coal, fuel oil, diesel, natural gas, liquefied petroleum gas and petcoke phased in over five years. As a result, carbon pricing would cover about 80% of Israel's GHG emissions. The excise tax on petrol will not increase since it is already among the highest across the OECD. The tax on natural gas would grow almost six-fold from ILS 29 per tonne in 2023 to ILS 170 per tonne. This will happen gradually to limit the increase of electricity prices to 5% per year. However, the resulting implicit carbon tax rate for natural gas would only be about USD 20 per tonne of CO₂, much lower than the externalities and rates for other fuels (IMF, 2022). Furthermore, the 2022 energy price increases have delayed implementation of these measures.

The impact of this increased carbon pricing on the industry is expected to be moderate due to the relatively low energy intensity of Israeli industry. Social equity concerns have gained prominence in the public debate. To address them, the Ministry of Energy is considering the mechanism to compensate the economic burden of carbon pricing on low socio-economic segments to avoid unintended distributional consequences (Section 1.8.2).

In 2011, the Petroleum Profits Taxation Law (also known as the Sheshinski Law) imposed a tax on Israel's natural gas resources. However, its payment was delayed until 2020 (notably for the Tamar gas reserve) to allow faster return on investment (Surkes, 2021a). In 2015, Sheshinski Law 2 extended this tax to all energy resources. Revenues from the Sheshinsky tax are transferred to the Sovereign Wealth Fund (see Section 1.7.4).

1.6.2. Transport-related taxes and charges

Vehicle taxes

Vehicle taxation – including taxes on registration, ownership and usage of company cars – is a key policy instrument for encouraging the purchase of low-emission vehicles. This, in turn, helps reduce GHG emissions in the transport sector.

The car purchase tax in Israel has been historically the highest of any country, except for Denmark. This was one of the reasons for the lowest rate of motorisation among OECD countries, and the higher number of older cars on the roads. This, in turn, meant that vehicles were both less safe and emitted more pollution. The tax was differentiated in 2009 in line with 15 pollution grades, which consider the harmful impact of the vehicle's emissions. In 2020, the tax rate stood at 10% of the purchase price for full electric cars, 25% for plug-in hybrid cars, 45% for standard hybrid cars and 83% for conventional internal combustion engine vehicles (Ministry of Energy, 2022). There is a plan to gradually increase tax rates for hybrid vehicles to eventually align them with that for conventional vehicles at 83%. At the same time, the rate for full EVs would rise to 35% in 2024 (Table 1.1). This would reduce incentives to upgrade the car fleet, especially since the import ban on combustion engine vehicles has been postponed until 2035 (Section 1.1.1).

Table 1.1. The purchase tax creates an incentive to buy electric vehicles

Purchase tax rate of vehicles by vehicle type

	2019	2020	2021	2022	2023	2024
Full electric vehicles	10%	10%	10%	10%	20%	35%
Plug-in hybrid electric vehicles	20%	25%	30%	40%	55%	83%
Standard hybrid electric vehicles	30%	45%	50%	83%	83%	83%
Other conventional vehicles	83%	83%	83%	83%	83%	83%

Source: Ministry of Energy (2022), "Electric vehicle in Israel".

In Israel, car owners must pay an annual registration fee in conjunction with the vehicle's inspection. The average registration fee is about ILS 1 500, resulting in a total annual revenue of ILS 4.7 billion.

The tax treatment of company cars has not changed over the review period. All the costs of company cars remain fully deductible from corporate taxes with no cap on fuel expenses. The 2011 EPR recommendation to eliminate the perverse incentives that result in increased car use has not been implemented: company car holders have no financial incentive to drive less.

Congestion charges and differentiated road tolls

About 60% of Israel's road congestion occurs in the metropolitan area of Tel Aviv, making it the fourth most congested city across OECD member countries (Tom Tom, 2021). A well-designed charging system can relieve congestion by steering users towards more balanced and efficient urban mobility choices. This would also generate revenue to facilitate additional investment. The 2011 EPR recommended that Israel

extend the use of road tolls on congested motorway stretches and consider introducing congestion or pollution charges in major metropolitan areas.

Israel has not yet introduced congestion charging, mainly due to the expected public opposition given already high taxes on vehicles and fuels (OECD, 2019b). According to a recently approved law, the first congestion charge will be introduced in the Tel Aviv metropolitan area in 2025. Three virtual rings have been defined, with the innermost ring covering the central business district of Tel Aviv. Vehicles passing through the rings during congestion hours will be charged. The charge amount will vary by ring, direction and time of day. The total daily maximum charge will be ILS 37.5 (USD 10.9). This is lower than the comparable congestion charge in London (USD 18.3) but higher than in Milan (USD 5.2 for non-residents). Israel needs to enhance acceptance of this measure by engaging with the public and the business community on the cost of congestion. To that end, it needs to provide information on the rationale and benefits of the proposed scheme. Congestion tolling is another option that has been tried in Israel (Box 1.2).

A complementary approach to congestion charges is to improve public transportation and parking policies. Parking fees in Israeli cities are low for many car users (OECD, 2020a). International experience shows that free or under-priced parking increases the costs of parking supply and land use. This implies that funds possibly available to improve the public transport system are used for parking (Russo et al., 2019). Therefore, congestion charges need to be combined with increased parking charges in central areas.

Box 1.2. High-occupancy tolls decongest traffic entering Tel Aviv

High-occupancy toll (HOT) lanes are a variant of the more common high-occupancy vehicle (HOV) lanes. HOV lanes allow public transportation vehicles, as well as private vehicles with a sufficient number of persons on board (2+, 3+, 4+, etc.), to use the lane. HOT lanes also allow vehicles that do not meet the relevant HOV threshold to use the lane if they pay a toll.

In theory, HOT lanes are less efficient than pricing congestion on all lanes. However, the choice offered by HOT lanes – between congested general lanes and reserved lanes with tolls – is generally more acceptable to the public. This is due both to the better use of road space and the fee being optional.

Israel is the only country outside the United States operating HOT lanes. The country's only 13 km-wide HOT lane is located along the inter-urban freeway connecting Jerusalem to Tel Aviv. It has been operating since 2011 in one direction, towards the entrance to Tel Aviv, starting near the Ben-Gurion International Airport.

As a result of the project, overall traffic volume on the freeway did not increase and may have declined slightly. Two mechanisms mitigated congestion in the general purpose lanes. One is a park-and-ride service. It doubles capacity of parking spaces near the interchange and offers a free shuttle service to the central business district. The second is the requirement of a minimum traffic volume and speed to activate the toll. The HOT project's successful implementation is inspiring other similar projects in Tel Aviv.

Source: Cohen-Blankshtain et al., 2020.

1.6.3. Other environmental charges

Charges on pollution

The landfill levy is the most important pollution-related economic instrument in Israel. The levy, introduced in 2009 by an amendment to the Maintenance of Cleanliness Law, requires landfill site operators to pay a charge for every tonne of waste entering it. The average levy was ILS 114 (EUR 33) per tonne for mixed waste in 2020. This is lower than average across the 23 EU member states with such a tax (it ranges from EUR 10 per tonne in Lithuania to EUR 120 per tonne in Wallonia, Belgium). To reach the policy goal that no more than 20% of municipal solid waste be landfilled by 2030, compared to the current landfilling rate of about 80%, the levy needs to be set higher to enhance its incentive impact (Section 2.5.2). Revenue from the landfill levy goes to the Maintenance of Cleanliness Fund (Section 1.7.4). Israel also applies a charge on single-use plastic utensils, which is expected to lead to a 40% reduction in their consumption (Section 2.5.2).

In 2011, Regulations on the Prevention of Sea Pollution from Land-Based Sources imposed a charge on permit holders who discharge wastewater or waste into the sea. The charge is based on the types and quantities of pollutants discharged, as well as the circumstances and location of discharge. The funds are channelled into the Marine Pollution Prevention Fund (Section 1.7.4).

The 2011 EPR recommended Israel to introduce air emission charges targeting priority pollutants emitted by large and medium-size stationary sources. These charges could use the legal basis provided by the Clear Air Law, but this has not happened. The government is reluctant to impose a charge on only a few polluters permitted under this law who are responsible for less than half of air emissions.

Water tariffs

The Israeli water sector has moved closer to financial autonomy. Water tariffs set by the Water Authority have contributed to cost recovery in the sector without posing significant affordability issues for the population (Avgar, 2018). However, there are cross-subsidies between users. Water tariffs for the industrial sector were gradually increased over 2010-15. This move partly implemented the 2011 EPR's recommendation to gradually increase the agricultural and industrial sectors' share in financing the full costs of water infrastructure. Wastewater reuse also still relies on investment subsidies.

The 2017 amendments to the Water Law removed tariff differentiation between sources where the water is abstracted and its uses. According to this reform, tariffs for water production and supply would be based on cost recovery. The production and transmission tariffs would not be derived from water use objectives. Rather, they would be based only on the cost of water production and transmission.

The 2017 reform aims at convergence of freshwater prices for farmers using the national water system and for those accessing water from other sources. In line with this reform, water prices for private producers have been raised. Meanwhile, water prices for consumers of the national water supply company Mekorot have declined (OECD, 2019c).

However, water prices for agriculture remain subsidised. Water tariffs for farmers are below those paid by domestic and industrial consumers and below the opportunity cost of producing freshwater, as is the case in most OECD member countries. Furthermore, they pay a lower freshwater extraction levy than industrial and domestic users, representing an implicit subsidy (OECD, 2019c). The price of treated wastewater for irrigation is significantly subsidised to encourage farmers to use it instead of freshwater, contributing to the decrease in average price of water for agriculture. This lower price for recycled wastewater is possible thanks to large investment subsidies for wastewater treatment and storage.

In February 2021, the Water Authority published draft recommendations to gradually raise the price of water for agriculture by 2028. Draft tariff regulations based on these recommendations were posted for

public consultation in November 2022. The measures would phase out the subsidy while implementing the cost recovery approach to pricing. Discussions have begun on compensating farmers for the planned price increase, but no agreement has been reached. In parallel, the Water Authority is exploring ways to reduce cross-subsidies in the agricultural sector between regions and water supply sources.

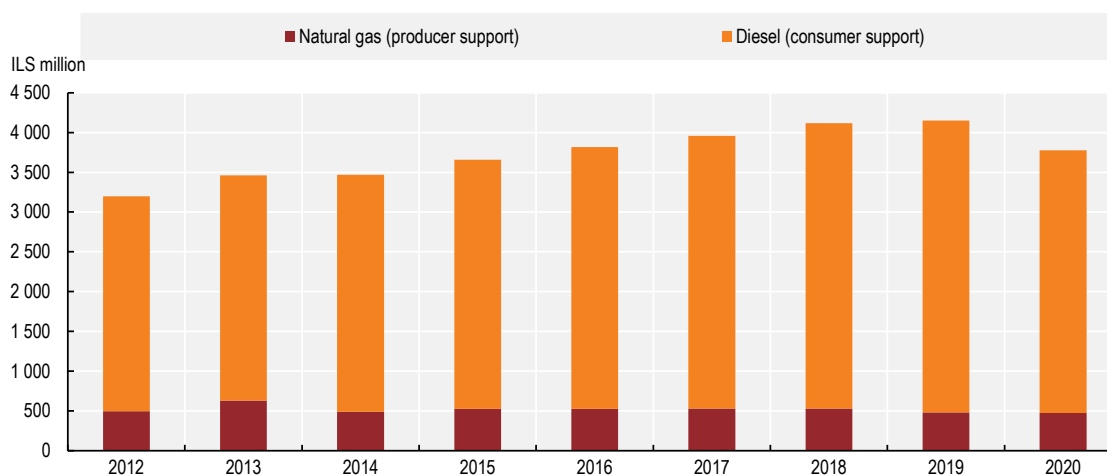
1.6.4. Removing potentially perverse incentives

For more than a decade, many OECD countries have prioritised phasing out inefficient fossil fuel support. The Glasgow Agreement at the COP26 in 2021 called upon parties to accelerate efforts towards a phase-out of inefficient fossil fuel subsidies. However, there is still a gap between official declarations and actual, sometimes hidden, support. It is difficult to measure and compare progress among countries without an internationally agreed definition of environmentally harmful subsidies, including fossil fuel subsidies.

Israel's fossil fuel subsidies have increased over the past decade, with a slight decline in 2020 (Figure 1.9). Israel is estimated to have provided ILS 38.2 billion worth of fossil fuel support over 2010-20, including forgone tax revenue. Government support to fossil fuels in Israel was estimated at ILS 3.8 billion in 2020, which represented 0.8% of the tax revenue (OECD, 2022b).

Figure 1.9. Support for diesel fuel consumption increased considerably over the last decade

Total tax rebates and support for fossil fuels in Israel, 2012-20



Note: The OECD estimates government support for fossil fuels as all direct budgetary transfers and tax expenditures (tax reductions, preferential treatment for cost recovery) that provide a benefit or preference for fossil fuel production or consumption. The measures included in the OECD inventory are obtained from official government sources. No attempt is made to assess the justification of these measures, their environmental or economic effect, or need for reform.

Source: OECD (2022), *OECD Inventory of Fossil Fuel Support Measures* (database).

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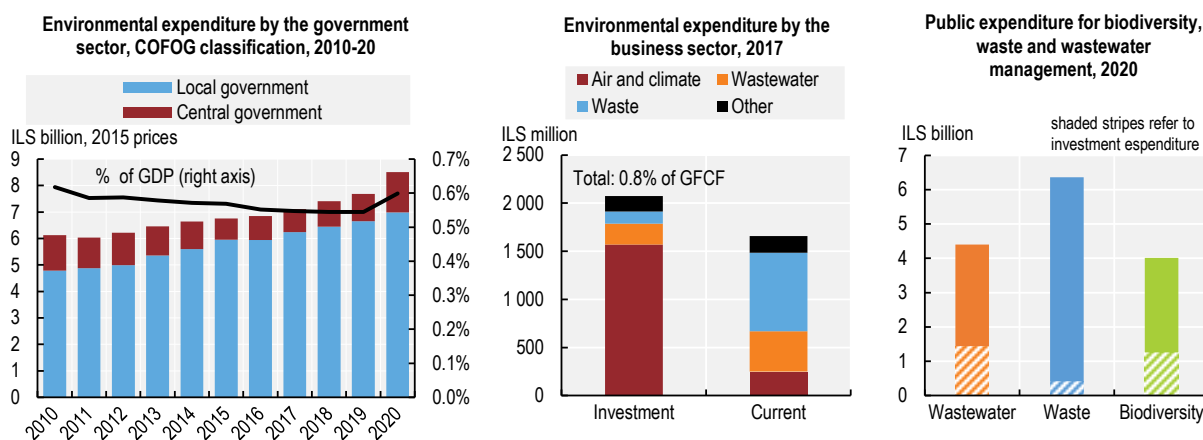
Israel's fossil fuel support comprises consumer subsidies through an excise tax exemption on diesel fuel (87% of the total in 2020) and natural gas producer subsidies. The latter arrangement falls under the agreement between the Israel Electricity Company and the Tamar Gas Field (11% of the total).⁴ The excise tax exemption on diesel fuel, introduced in 2005, consists of tax rebates on diesel used in buses, taxis, fishing boats and specialised vehicles such as tractors. The number of applicants claiming reimbursement under the diesel tax exemption increased significantly over 2011-19, while the excise tax rate for diesel also gradually increased. As a result, the related revenue forgone rose from ILS 2.4 billion in 2011 to

ILS 3.7 billion in 2019. The state support for fossil fuels increased by 3% over 2015-20 (OECD, 2022b). In 2018, the government started to phase out diesel rebates for trucks, taxis and buses over eight years. So far, the subsidy reduction has been limited: in 2021, the excise tax exemption still amounted to ILS 3.2 billion.

1.7. Investing in environmental and low-carbon infrastructure

Government civilian spending⁵ is lower than in most OECD countries, just above 30% of GDP (OECD, 2020a). Average public investment over 2015-19 was 2.3% of GDP, which is lower than the OECD average (OECD, 2020a). Israeli government spending on environmental protection was roughly equal to the OECD average (0.6% of GDP) in 2020 (Figure 1.10).⁶

Figure 1.10. Growing public expenditure is focused on waste, while private investment targets energy



Note: Other includes expenditure for protection of soil and groundwater, noise and other not separately reported. The right panel presents expenditure of government and public institutions and corporations providing environmental protection services; the left panel refers to expenditure by the government only (mostly on waste management). GFCF=gross fixed capital formation.

Sources: CBS (2022), *Expenditure for Environmental Protection* (database); OECD (2022), *OECD Environmental Statistics* (database).

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Since 2020, the MoEP has been working on a “green deal” plan for investments in clean technologies, renewable energy, energy and resource efficiency, pollution reduction and a circular economy. Specific proposals on investments in energy include incentives to get solar panels into or onto all types of built environment, with the creation of 5 500 to 10 500 jobs; electrification of production lines in industry to cut reliance on fossil fuels, along with incentives to reach better energy efficiency; subsidies to enable construction of public buildings such as schools in line with green building codes; and help with municipal plans to prepare for impacts of climate change (Surkes, 2020).

1.7.1. Environmental protection

The main domains of Israel’s environmental protection expenditure are waste management, wastewater and biodiversity protection (Figure 1.10). Most of the government’s environmental expenditure consists of subsidies to local authorities for waste collection, transport and treatment (Chapter 2). Public agencies fund directly, and transfer money to local authorities for, the maintenance of natural protected areas,

preservation of forests and afforestation, upkeep of beaches and preservation of the Dead Sea. The Water Authority's subsidies for, and investments in, wastewater treatment and recycling constitute the bulk of public wastewater-related expenditure.

Approximately ILS 1.6-2.0 billion of water tariff revenues per year is spent on desalination facilities. Israel invests ILS 1-2 billion a year in new desalinated water transmission infrastructure, in addition to its investments in the operation of existing networks. The seawater desalination programme has been implemented through public-private partnerships. In these cases, private concessionaires finance most investments and are responsible for operation and maintenance for 25 years.

The country's private sector also invests heavily in environmental technologies. Hundreds of Israeli tech companies operate in various related domains: water resources management, renewable energy, energy efficiency, recycling and waste management, efficient use of industrial materials, and smart and sustainable transportation. Approximately 75% of these companies engage in water and energy technologies (MoEP, 2021).

The government provides significant support for environment-related research and development through the Israel Innovation Authority – more than USD 280 million over 2018-20. However, the private sector is reluctant to invest aggressively in environmental technologies due to the difficulty of progressing from research to commercialisation. Yet equity investment in this domain is expected to yield significant returns. To address this issue, the Manufacturers Association of Israel has established a mutual fund. It supports members with up to 60% guarantees for environmental equipment and preferred loan conditions for investments in environmental technologies. Discussions on the challenges of investment in environmental technologies have also been held in recent years. These took place as part of the ongoing dialogue between the MoEP, other governmental agencies and the business sector.

1.7.2. Renewable energy and energy efficiency

Israel has made significant investments in solar power generation, including about ILS 6.5 billion as grants and low- and no-interest loans. One instrument is a state-guaranteed loan fund of ILS 500 million to offer incentives for local solar energy projects. Among other investments to promote solar power in residential areas, Israel offers a subsidy of 90-95% of installation costs of solar water heaters for tenants in public housing and the Good Neighbourhood project (Box 1.3). The government has also published tenders for solar power transmission and distribution projects. The Israeli Electricity Authority has recently allowed producers to sell their electricity to the network going through a tender process. These measures are in line with the 2011 EPR's recommendation to streamline financial incentives for renewable energy projects.

Box 1.3. The Good Neighbourhood project promotes low-carbon public housing

The Good Neighbourhood project interlinks several environmental and distributive concerns. It promotes renewable energy use and improved energy efficiency, helps reduce air pollution and lessen inequalities, and creates more sustainable and inclusive communities.

The project renovated 150 low-income public housing buildings in cities across Israel's northern and southern periphery. It provided better roof insulation and installed photovoltaic panels and thermo-solar rooftop heating systems for over 1 200 households. It also financed stairwell lighting and creation of green spaces around the buildings.

The ILS 40 million project was executed and financed by the ministries of housing and construction, and environmental protection, as well as the Jewish National Fund. Revenues from the electricity generated by photovoltaic systems are expected to cover all required operating expenses. The project will lead to an annual reduction of more than 2.3 million kWh in residential electricity consumption. It will also generate ILS 1.2 million in annual savings on their electricity bills. In addition, it should finance maintenance of each building for 20 to 25 years.

Source: Country submission; Israel National Review (2019), "Implementation of the Sustainable Development Goals".

In October 2021, the government adopted a series of resolutions related to energy. It set up an inter-ministerial team to monitor implementation of the National Energy Efficiency Plan. It also established a task force to remove barriers for infrastructure investments into a low-carbon economy. Israel aims to improve energy efficiency by 18% (compared to 2015) and to reduce electricity consumption by 17% (compared to the BAU baseline) by 2030. To that end, it has invested ILS 300 million as an interest-free loan into an action plan for an energy-efficient urban space in cities and adoption of smart technologies for energy-efficient homes. The government has also announced an ILS 350 million, multi-year plan to support energy efficiency improvements in the industrial and commercial sectors.

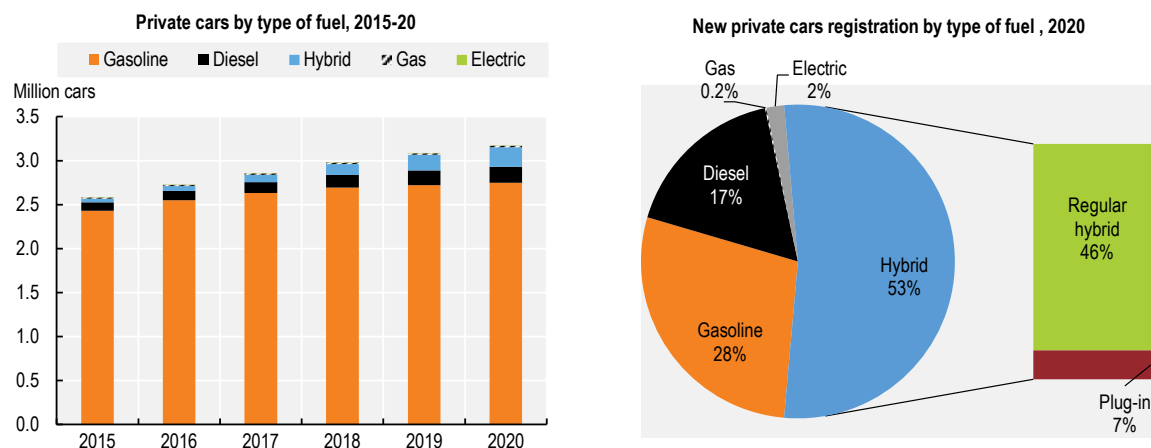
To reach the target of 30% electricity generation from renewables by 2030, Israel will need to develop an advanced storage system. It should be able to accumulate enough energy for periods when the sun does not shine. According to the Electric Authority, without such storage technology reaching the 30% target would require other types of infrastructure. Specifically, Israel would need 6 new switching stations and almost 100 substations (for conversion from high to lower voltage), as well as 1 600 km of transmission cables. This may take decades to complete, given the time needed for planning and obtaining permits (Surkes, 2021b).

1.7.3. Low-carbon transport

Support for electric vehicles

Israel has significant advantages in the adoption of EVs due to its low electricity prices (compared with fossil fuel prices) and short travel distances in a relatively small country. Despite these advantages, and unlike the experience of many other developed countries, the introduction of EVs in Israel has been slow and limited. Among total vehicles registered in Israel in 2020, only 0.1% were EVs and 6% were hybrid vehicles. In 2020, the number of EVs increased by 73%, while the number of electric private cars grew by 133%. New registrations of hybrid vehicles in 2020 accounted for more than half of the total (Figure 1.11).

Figure 1.11. EV adoption is improving but is still considerably behind hybrid cars



Note: Number of new car registrations in 2020 is calculated as the increase of total car registration over 2019.

Sources: CBS (2021; 2020), Motor Vehicles 2020 and 2019.

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Aside from the global supply chain challenges for EVs, the main barrier, as perceived by consumers, is the lack of public charging stations in the country. The Ministry of Energy is financing the establishment of several thousand fast- and slow-charging stations in the public space for ILS 54 million. However, one study estimates that almost 150 000 private chargers and almost 13 000 public charging stations will be needed to support the expected 5% EV share in the vehicle fleet by 2025 (Liebes et al., 2018). Countries with high EV uptake owe this success not only to generous subsidies for vehicles but also to public investment in a dense network of charging stations and related services. For instance, Norway had the largest share of EVs worldwide in 2020 – 12% of the total fleet. It also had more than 13 000 charging points the same year, including nearly 1 600 fast charging points, built with public subsidies (OECD, 2022c).

The MoEP strives to promote a transition from a bus fleet composed almost entirely of diesel-powered vehicles to electric buses. In 2020, it announced ILS 47 million worth of subsidies for public transportation companies to purchase 200 electric buses, including minibuses. Co-operation with local authorities is necessary to install battery charging infrastructure in bus parking lots. In February 2022, the MoEP published an order requiring all public transportation bus companies to switch to 100% electric buses by 2026 (the interim targets are 30% in 2024 and 50% in 2025). According to a government resolution, every new city bus should be electric by 2026. This would be a major transition that will result in significant reduction of air pollution in population centres.

In 2016, the government launched a hybrid taxi programme, offering taxi drivers discounts to buy hybrid vehicles. At that time, 98% of Israeli taxis were diesel-powered. The aim was to put 1 500 hybrid taxis (6% of all taxis) on the road, thus reducing air pollution in urban centres. When the programme ended in early 2020, 11% of taxis sold were hybrids. The ultimate goal is to transition to electric taxis. A 2015 government decision halves taxi permit fees for up to 500 electric taxis but has not been fully exploited. As of 2023, in keeping with a 2021 government resolution, new public taxi permits will only be granted to EVs.

Investment in alternatives to car use

In 2010-15, there was a 20% increase in passenger trips on public transportation (buses and light rail) and a 47% increase in passenger trips using Israel Railroad. Over the same period, there was a 36% increase

in the number of public buses, a 26% increase in the number of service kilometres travelled and a 26% increase in the number of bus travels.

Israel has invested significantly in improving transport infrastructure, including electrifying the rail network and expanding light rail (tramway). A Jerusalem-Tel Aviv high-speed electric rail has been operational since 2019. Additional light rail lines in both metropolitan areas are in different planning stages, with some delays due to the pandemic. The first line of the Tel Aviv light rail is expected to be operational by early 2023. There are also plans to create a light rail link between Haifa and Nazareth.

Plans for an underground rail system in central Israel (Tel Aviv metropolitan area) are moving forward. This metro project is Israel's most ambitious public transportation initiative (with a budget estimated to exceed ILS 200 billion), aiming to connect Tel Aviv's commuter zones across 23 municipalities. The new system will have three lines totalling 150 km, serving 109 stations. However, passengers are not expected to start using it before 2032.

At the beginning of 2016, public transport fares were significantly reduced and combined discount-tickets were introduced according to a revised zoning of metropolitan areas. Since April 2021, public transport users have been able to buy tickets and benefit from discounts through mobile apps. In April 2022, the government unveiled another fare reform plan, making public transport free for seniors and offering bigger discounts for children and people with disabilities.

In 2020, the MoEP completed a programme that allocated more than ILS 20 million to 19 local authorities for 28 projects to reduce private car usage. The projects have created 8 000 bicycle parking areas in 10 municipalities, 27 bike-rental stands in 4 municipalities, charging docks for electric bicycles in Kiryat Yam and shuttle bus services to 8 employment centres.

1.7.4. Statutory environmental funds

Israel has set up multiple statutory environmental funds to ensure revenue from environmental taxes and charges is used for environmental purposes. The oldest fund, the Maintenance of Cleanliness Fund, has existed since the 1980s. It holds funds collected from the landfill levy and other environment-related fees and fines that are earmarked for environmental protection. This includes prevention of illegal waste disposal, waste treatment, source separation and recycling, prevention of waste-related hazards and asbestos treatment. The fund's annual income has been approximately ILS 500 million. The fund's managers include representatives of the MoEP, the Ministry of Finance and local authorities. However, local authorities often complain about the fund's spending on municipal waste management, claiming that the centralisation of this expenditure is inefficient.

The much smaller Marine Pollution Prevention Fund concentrates financial resources for preventing marine and coastal pollution, including from land sources, as well as assisting in cleaning and monitoring coasts. Its resources are spent to build facilities and purchase clean-up equipment, run emergency plans for major pollution incidents, file lawsuits against polluters and conduct studies and education initiatives on marine and coastal pollution. The fund's total income (principally from charges on wastewater dumped into the sea) was approximately ILS 210 million over 2010-19. Its board is chaired by the MoEP director general, and operations are managed by the MoEP's Marine Environmental Protection Unit.

The revenues from the tax on oil and gas profits per the Sheshinski Law are transferred to a special Sovereign Wealth Fund. The fund's money is earmarked for social, economic and educational objectives, as well as for emergency response. The fund was initially due to begin operating in 2018, but the slower than expected stream of revenue has caused delays. The fund started to operate in June 2022, once its resources reached ILS 1 billion.

1.7.5. Integration of environmental risks in the financial sector

The adaptation of Israel's government and financial regulators to environmental risks is at an early stage. In 2012, the Israel Securities Authority published regulations requiring companies to include environmental risks in the prospectus they publish for the stock exchange. In 2014, the MoEP started to publish annually an Environmental Impact Index. It ranks public companies by their impact on the environment, compliance with environmental law, and environmental management and reporting. The index enables investors to receive a simple and direct indication of the level of their financial risk based on the companies' environmental performance.

In November 2020, the Bank of Israel joined the Network of Central Banks and Supervisors for Greening the Financial System, which was established in 2017. In November 2020, the Tel Aviv Stock Exchange (TASE) announced the launch of a TA-125 Fossil Fuel Free Climate Index, which excludes corporations involved in the production chain of fossil fuels. The list of "fossil fuel corporations" is determined by the Clean Money Forum of Life and Environment – an umbrella organisation of Israel's environmental NGOs. The TASE joined the UN Sustainable Stock Exchanges Initiative in early 2021. The TASE has also created a TA-Cleantech Index comprised of shares of cleantech companies.

In 2021, the country's Capital Market, Insurance and Savings Authority published instructions on implementing Environment, Social and Governance (ESG) criteria by institutional investment firms. It requires the investment committee of an institutional investor to incorporate ESG aspects into its general investment policy. The same year, the Bank of Israel issued regulations on disclosure of ESG aspects in banks. However, Israel has not yet implemented sustainable financing tools, such as green bonds and loans that would facilitate the transition to a low-carbon economy. The Israel Securities Authority is also developing voluntary ESG disclosure standards for public companies. A draft Israeli Green Taxonomy – a classification system establishing a list of environmentally sustainable economic activities – was published for public consultation in October 2022. It is based on the EU taxonomy for sustainable activities.

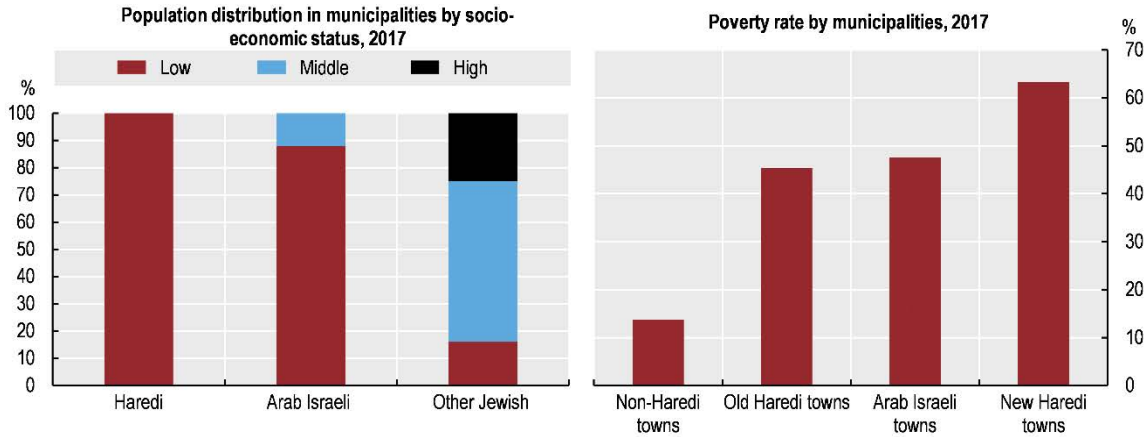
1.8. Social and distributional impacts of environmental policy

1.8.1. Socio-economic disparities

Israel is ranked among the top ten OECD member countries on the Gini coefficient of income inequality. Income inequality between municipalities is also among the highest in the OECD, despite Israel being one of the smallest OECD countries (OECD, 2020a). Poorer municipalities do not have enough resources to finance adequate public services for their residents, which further widens the gaps between municipalities.

Poverty rates vary significantly between different areas, as ethnic and religious groups with high unemployment are concentrated in separate cities or neighbourhoods. Poverty is widespread especially among Arab-Israeli and Jewish ultra-orthodox (Haredi) communities (Figure 1.12). This reflects a lack of skills needed to get high-productivity and well-paid jobs. For the Haredi, it also reflects an explicit choice to focus on non-material benefits and engage in life-long religious studies (OECD, 2020a).

Figure 1.12. Arab-Israelis and the Haredi are the poorest segments of the population



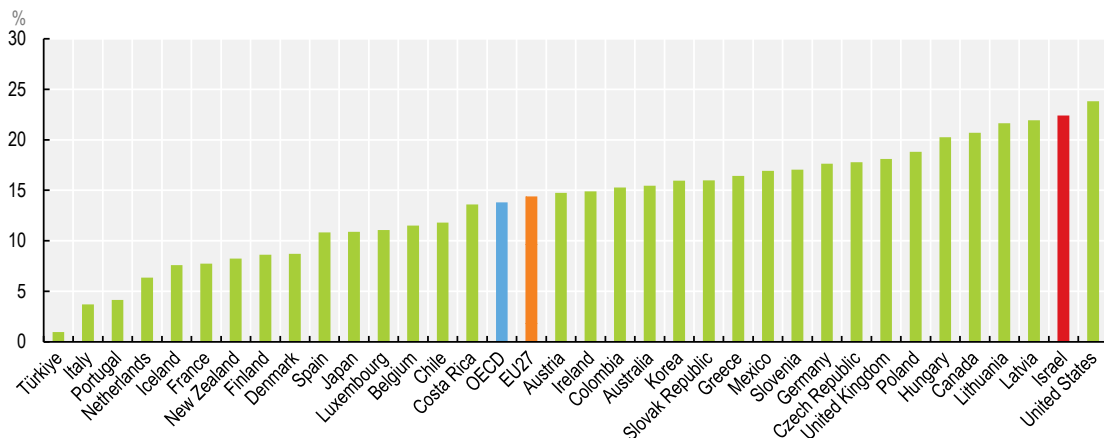
Source: OECD (2020), *OECD Economic Surveys: Israel 2020*.

StatLink <https://stat.link/achvgt>

Arab citizens represent around 20% of Israel's population and live largely separated from the majority. Only one-tenth of the Arab population lives in mixed Jewish-Arab cities. The rest live in distinctly Arab cities, mostly in the north of the country and in the Negev district in the south. In these towns, economic activity is generally weak and inward migration limited (Khamaisi, 2013). This contributes to the share of low-paid workers in Israel being among the highest in OECD member countries (Figure 1.13). Labour markets observed further widening of inequality as COVID-19 hit the vulnerable population much harder. Contact-intensive sectors suffered disproportionately large job losses during the pandemic. Meanwhile, the high-tech sector continued expanding, given its adaptability to remote working and greater demand for its products.

Figure 1.13. Share of low-paid workers is among the highest in OECD countries

Low-pay incidence, 2020 or latest available year



Note: The incidence of low pay refers to the percentage of workers earning less than two-thirds of gross median earnings of full-time employees (data for Israel refer to 2018).

Source: OECD (2022), "Earnings: Gross earnings: decile ratios", *OECD Employment and Labour Market Statistics* (database).

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Almost all environmental indicators are usually worse in lower-income areas. According to the definition of the National Insurance (Israel's social security institution), 20% of Israeli citizens live in poverty and are vulnerable to extreme weather events because of bad infrastructure conditions or because they cannot pay electricity costs. At least 2 million apartments built before the 1980s have low energy performance.

The main challenges in Arab communities are budget limitations (very little municipal tax is collected due to poverty and illegal construction), poor infrastructure and environmental services, little environmental awareness and lack of law enforcement. They often lead to environmental hazards from, for example, waste dumping and burning in open areas. Disparities also exist in access to public transportation and green public spaces. Inadequate environmental conditions impede economic growth and deepen these communities' alienation from the government. At the same time, they increasingly rely on the government to support provision of waste management and other services.

1.8.2. Social impacts of carbon pricing

The consequences of carbon pricing are heterogeneous across households that adhere to different lifestyles and consumption patterns. If no further policy measures are taken, carbon pricing in Israel will have regressive distributional outcomes. For instance, 25% of the poorest households spend more than 15% of their expenditures on energy, with 5% of households spending more than 30% on energy. Moreover, Arab households spend more on liquid fuels as a percentage of total household expenditures than other groups (Stekel and Missbach, 2021). The same is true for rural households that must own and use a car.

To avoid unintended distributional consequences, the carbon pricing scheme needs to be transparent and inclusive. If the pricing is not progressive, some redistribution mechanisms should be introduced. Revenues generated from carbon pricing can be used to lower existing taxes or provide targeted subsidies, such as for electricity tariffs. This could in turn increase public acceptance of carbon pricing. As the Israeli government is contemplating carbon pricing as an essential tool in achieving its GHG emission reduction targets, the Ministry of Energy is co-ordinating a task force to design compensation mechanisms for low-income populations.

1.8.3. Environmental initiatives for social and environmental justice

In a whole-of-government initiative, the Arab Society Programme will invest ILS 30 billion in education, transportation, infrastructure and social welfare in Arab communities over five years by 2026. As part of this programme, the MoEP will contribute ILS 300 million to improve waste management and ILS 250 million to promote climate change adaptation measures and resilience in those communities.

The Sviva Shava (Equal Environment) project, valued at ILS 308 million, was implemented over 2014-20 in 75 municipalities, focusing primarily on waste management. The project procured waste collection containers for almost a million residents, created municipal solid waste landfills and conducted environmental rehabilitation projects in 63 municipalities. It also improved the quality of waste management data and provided technical assistance to local authorities, including law enforcement and other relevant training. Another nine local authorities were part of targeted projects for Bedouin communities (ILS 81 million). Yet another programme was directed towards improving environmental conditions in Jerusalem's eastern neighbourhoods, with a budget of ILS 107 million. Despite how these projects empowered local authorities and engaged local residents, it will take more work to ensure the sustainability of waste management infrastructure they helped create.

Israel amended the Maintenance of Cleanliness Law to increase the amount of funds from the Maintenance of Cleanliness Fund that can be allocated towards basic waste treatment in low-income communities without the need for local matching funds. In April-May 2022, the government approved ILS 185 million from the Maintenance of Cleanliness Fund to support the operational management of bulky waste in Arab

municipalities. In addition, the MoEP allocated ILS 12 million to establish and upgrade recycling centres, ILS 6 million to conduct urban nature surveys and ILS 5 million for climate education in those communities for 2022-23.

The MoEP is forming a working team with the ministries of economy and finance, the Council for Higher Education and trade unions. Together, they will be designing policy and programmes to promote a just transition towards a circular and low-carbon economy. This initiative will analyse direct and indirect employment impacts of environmental policies and specific policy measures and examine the need for alternative policies and measures, including occupational training support, to mitigate adverse impacts on employment.

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Notes

¹ Israel established a national system for measurement, reporting and verification of GHG emissions in the last five years. The 2022 annual PRTR report (MoEP, 2022) indicated a 3% decline in GHG emissions from the 575 largest stationary sources in 2021 over 2020.

² The only other countries to have set per capita emission targets include Albania, Armenia, Malawi and Zimbabwe; most OECD countries set absolute emission reduction targets for 2030, typically, compared to 1990 or 2005 levels of GHG emissions.

³ Israel's extensive knowledge of the state of its species partly explains the high numbers of threatened indigenous mammals.

⁴ Reduce royalty payments for natural gas produced under the Tethys concession account for about 1% of the total fossil fuel subsidies.

⁵ Total government spending minus defence spending and interest payments.

⁶ Some infrastructure investment is executed by state-owned enterprises, which is not included in public investment, but instead recorded as government capital transfers in National Accounts.

Chapter 2. Waste management and circular economy

This chapter examines waste management and Israel's shift towards a circular economy. It looks first at its record of achieving recycling and resource productivity targets, including municipal waste generation, treatment and disposal, and material flow and resource productivity. After reviewing the division of responsibilities and the role of local authorities at the institutional level, the chapter analyses the legislative framework and regulations for waste handling and treatment. It ends with a review of Israel's planning, pricing and other policies towards a circular economy. This covers economic instruments to reduce waste production and landfilling; circular economy as a pillar of climate mitigation policy; the move towards circular procurement; and the need to engage stakeholders and increase transparency.

2.1. Introduction

Israel is a small, densely populated and highly urbanised country. It has seen economic and population growth since 2000, which has intensified pressures on the environment, increased demand for goods and services, and produced high levels of waste. Within the last ten years, municipal solid waste (MSW) levels have continued growing, while the share of MSW destined for landfill (around 80%) has remained stable. This situation prompted the Ministry of Environmental Protection (MoEP) to prioritise waste management and a circular economy with the aspiration of “zero waste” by 2050. As part of the shift from a linear economy, the MoEP aimed to engage municipalities, raise awareness across stakeholders to reduce single-use plastics, fight illegal dumping and burning of waste, and set up economic, regulatory and governance tools for modern waste management.

The MoEP has taken a number of key steps to advance this agenda. These include developing a Sustainable Waste Economy Strategy as a basis for a circular economy strategy; establishing a tax on certain single-use items; broadening the deposit refund scheme (DRS); adopting a Packaging Law; and setting up a Cleanliness Fund to bridge the waste treatment infrastructure gap. However, a clear legislative framework for waste management and an agenda for a circular economy have yet to be set.

To date, the government has focused on improving waste management, while “circular economy” remains an incipient concept. There is room to broaden Israel’s policy vision to leverage the full potential of a circular economy. This could range from preventing waste generation and keeping materials in use for as long as possible to transforming waste into resources. Strengthening the role of municipalities will be key to achieving recycling targets and applying circular economy principles to areas such as food systems and the built environment. Fiscal policy tools, such as taxes and landfill levies and a tax on virgin construction aggregates, will be needed to set incentives and change behaviours. Education and awareness raising will also play an important role in prompting behavioural changes in citizens and businesses.

2.2. Achieving recycling and resource productivity targets

2.2.1. Municipal waste generation, treatment and disposal

Israel has one of the highest levels of municipal waste generation per capita among OECD member countries. Households produce 80% of waste with the rest generated by the commercial institutional sector.¹ This level has been consistently growing for the past 20 years. In 2020, Israel generated 6 million tonnes (Mt) of MSW, approximately 0.3 Mt more than in 2018. MSW per capita amounted to 691 kg per capita in 2020, well above the OECD average of 534. Between 2010 and 2020, MSW grew at a rate of 2.6% per year, of which 1.9% can be attributed to population growth and 0.7% to increased waste production per person. In a business-as-usual scenario, MSW generation is expected to continue growing at a rate of 2.4% per year, reaching 6.6 Mt in 2025 and almost 7.5 Mt in 2030.

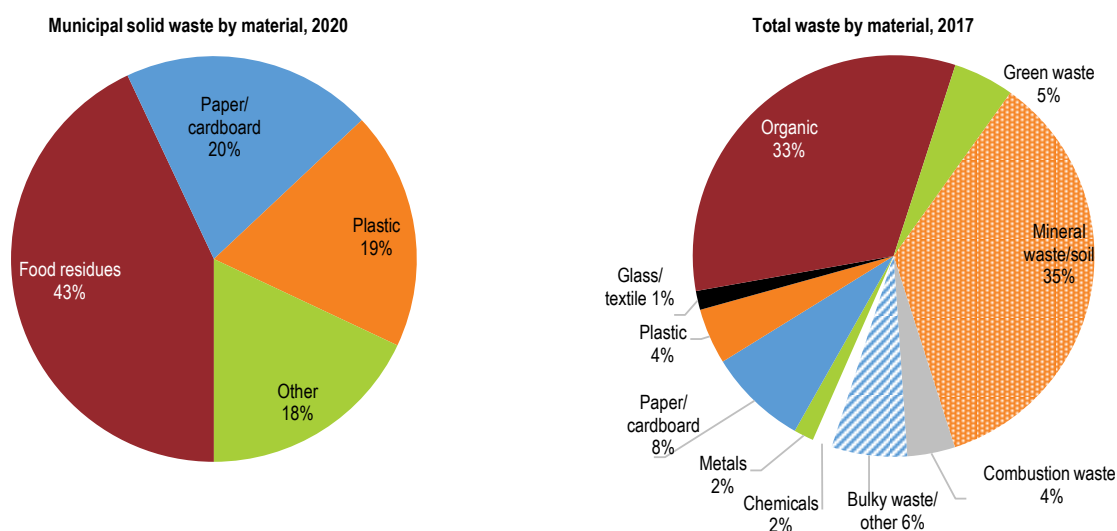
Construction and demolition (C&D) waste was by far the largest contributor (63%) to total waste of the five sectors with available data in 2020 (mining and quarrying; manufacturing industries; energy production; water supply, sewerage, waste management; and construction). More than one-third (68%) of total treated C&D waste was recycled in 2020, its volume more than doubling from 1 711 Mt in 2010 to 3 789 Mt in 2020. Manufacturing industries are the second largest contributor to total waste (2 522 Mt). Non-metallic mineral products are the main contributor to this waste stream (875 Mt), much of which is attributable to the manufacturing of construction materials.

Biodegradable waste (bio-waste), in particular food waste and loss, accounts for a significant share of both MSW and total waste in Israel (Figure 2.1). An average Israeli family throws away ILS 3 600 worth of food per year. This is equivalent to 13% of average household food expenditure and 1.5 months of food

consumption. Overbuying (i.e. buying more food than needed) in turn generates excessive food preparation, which is a key source of household food waste.

In 2020, Israel generated 2.5 Mt of food waste (by consumers) and loss (between harvest and retail), worth ILS 20.3 billion. The volume of food waste corresponded to about 35% of overall domestic food production (Leket Israel, 2021). This is in line with the global estimate of one-third of the food produced in the world for human consumption being lost or wasted (FAO, 2013). The total environmental cost of food waste in the country is estimated at ILS 3.4 billion. This amount breaks down further into ILS 1.4 billion from the impact on natural resources (water and land); ILS 1.27 billion from damage from emissions of greenhouse gases (GHGs) and air pollutants; and ILS 0.8 billion from waste treatment (Leket Israel, 2021). Food waste alone is responsible for 6% of the country's GHG emissions.

Figure 2.1. Bio-waste is the largest contributor to total and municipal waste in Israel



Note: Total waste: data calculated in accordance with the System of Environmental Economic Accounts.

Sources: CBS (2020), *Satellite Waste Accounts 2017* (database); country submission.

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The separation of waste streams and their collection by households remain low, although Israel has undertaken some initiatives in response to the 2011 EPR recommendation to implement separate collection of dry and organic waste in all municipalities and develop related treatment infrastructure. In 2011, the MoEP started a separation of waste at source programme, backed by financial support to 50 local authorities to establish sorting plants for dry and organic waste. However, the programme ended in 2016.

Also in 2011, the MoEP issued two calls for proposals to local authorities and private developers for the establishment or upgrading of facilities for biodegradable waste. While ILS 350 million was allocated for 29 facilities, including sorting transfer stations and composting and anaerobic digestion facilities, this infrastructure remains incomplete. A MoEP analysis in 2018 highlighted the need to build five waste-to-energy facilities in the country, including three by 2030. The Sustainable Waste Economy Strategy (2021-2030) foresees economic incentives for waste separation and reduction at source, notably through weight-based charging for households, as well as energy recovery from residual waste.

Landfilling has remained the primary form of waste treatment in Israel (MoEP, 2020b) despite the limited availability of land. In 2020, 77% of MSW was landfilled, one of the highest rates in the OECD. Each year, around 3 Mt of unsorted (mixed) waste (especially from municipalities close to a landfill and those that do not have a sorting facility nearby) and 4.5 Mt in total are sent to one of Israel's 11 landfills. Some landfills are planned for expansion, but there are no plans for additional landfills. It is estimated that the available capacity for landfilling will drop from the current 45 Mt to 16 Mt in 2030. Waste-to-energy processes are starting to be implemented (2% in 2020), and recycling accounted in 2020 for 6.4% of collected municipal waste (excluding composting). Adding composting would bring the share of material recovery to 20.7%.

As part of the shift to a circular economy, a significant increase in recycling would help address resource scarcity and reduce the number of landfills required. As an illustration of good practice in this area, Box 2.1 explains how Lithuania has transitioned from previously landfilling almost all its waste to recycling and composting most of it in less than a decade. The experience of Lithuania, which also has the ambition to shift to a circular economy by 2050, can serve as an inspiration for Israel.

Box 2.1. Leapfrogging from landfilling to recycling and composting: The case of Lithuania

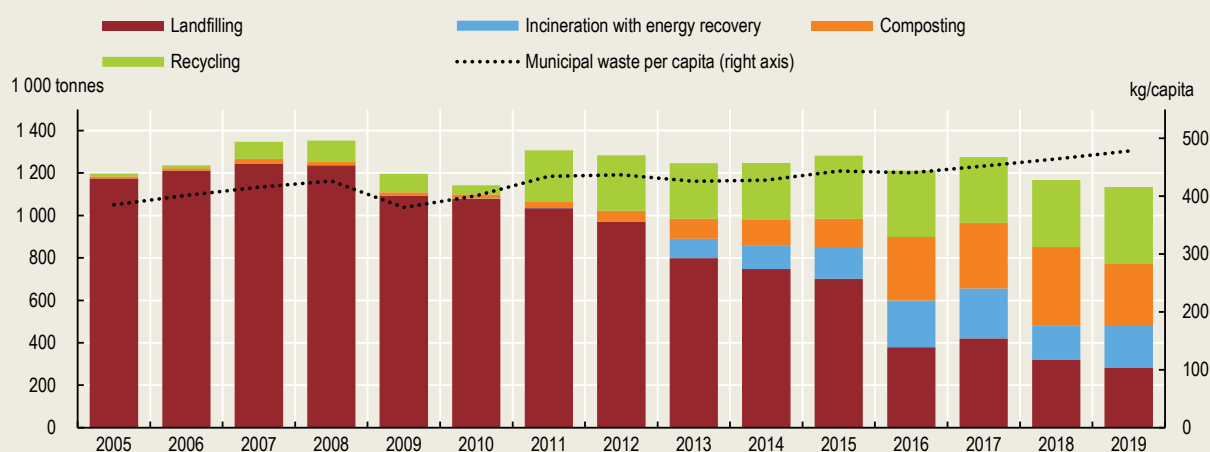
Lithuania has moved from landfilling almost all its waste to recycling and composting most of it in less than a decade. This has allowed the country to narrowly meet the targets for recycling half of household waste (paper, metal, plastic and glass) and 70% of construction waste by 2020 set by the EU Waste Framework Directive. The transformation is the result of waste management improvements, including near-total coverage of the population by municipal waste management services, separate waste collection, construction of sorting facilities, improved labelling requirements, education and awareness campaigns, and expansion of deposit refund schemes (DRSs) for beverage containers made of different materials.

The pricing of municipal waste management follows the principle of full cost recovery. Charges for waste management services include a fixed component for administrative and infrastructure costs and a variable component that can be set according to the number and size of mixed municipal waste containers used; the frequency of emptying them; or the weight of mixed municipal waste generated. The charges promote waste separation at source and reduction of waste going to landfills. Municipalities set the charges within limits defined by the central government.

Reducing biodegradable waste (bio-waste) has been and continues to be a national waste policy priority. Public awareness campaigns promote behaviour change, and the government plans to install food waste sorting and collection infrastructure for household waste. The new National Waste Management Plan (2021-2027) requires municipalities to sort bio-waste (green and food waste) and to collect it separately, in line with the EU requirement to do so from 2024. While most municipalities are still working to implement this requirement, those in the Alytus region have already started separate food waste collection (including from apartment buildings), reportedly without additional costs for municipalities.

In 2016, Lithuania introduced a DRS for primary packaging on glass, plastic or metal beverage containers. In 2019, 92% of relevant packaging was collected through the DRS. Individuals buying the covered beverage containers (marked with the deposit symbol) pay the deposit (EUR 0.10) at the point of sale. After delivering the used package to a collection point (e.g. a store or a reverse vending machine), consumers receive a refund on their deposit.

Treatment of municipal waste and municipal waste per capita in Lithuania, 2005-19



Note: Excluding marginal quantities of waste incinerated without energy recovery. Data include breaks in time series.

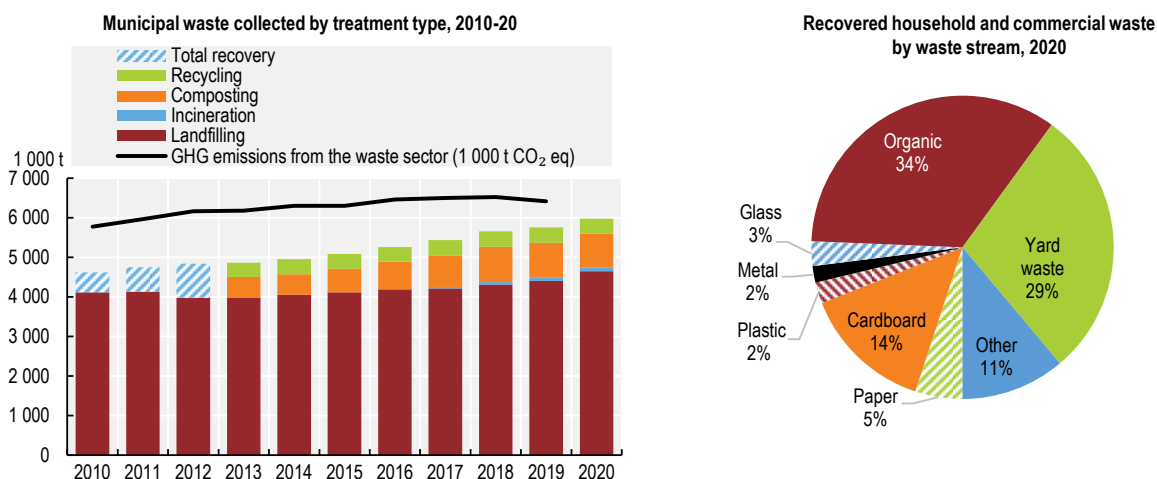
Source: OECD (2021a).

Bio-waste, composed of yard and food waste, accounted for almost two-thirds of the household and commercial waste recovered in 2020. However, the quality of the waste recovered is relatively poor, given most of it was recovered post-collection rather than separated at source. Meanwhile, packaging-related materials, including paper, cardboard, plastic, metal and glass, made up 26% of recovered waste (Figure 2.2). Paper and cardboard waste is separated at source in designated facilities and collected at prices set by local authorities. Approximately 260 Mt of paper and cardboard packaging is collected annually, most of which is recycled in Hadera paper mills for raw material for Israel's paper industry. Around 12% of this waste sent for recycling is landfilled as a by-product.

The country generates an estimated 1 Mt of plastic waste annually, of which only about 7% is recycled and 11% goes to energy recovery. The Sustainable Waste Economy Strategy (2021-2030) establishes weight-based recycling targets for plastic packaging waste (55%) and glass containers (75%) (MoEP, 2020b). However, these targets are not anchored in legislation. The total collection rate of glass container waste was 50% in 2016, significantly lower than in many European countries. The collected glass is transferred to three processing plants for treatment and processing. An estimated 40% of the collected glass is handled in the local market at the only glass recycling site in Israel. The factory is not operating at capacity, due to issues with separation by colour. Much of the remaining glass is exported. More broadly, the National Plan for MSW Treatment aims for higher recycling rates and waste-to-energy conversion as a crucial means to reduce the amount of waste going to landfill.

Growing waste generation levels, poor segregation of organic waste and high landfilling rates make the waste sector an important contributor to Israeli GHG emissions. The waste sector is responsible for approximately 8% of GHG emissions, excluding land use, land-use change and forestry (UNFCCC, 2021). In contrast, the waste sector contributes to about 3% of total GHG emissions on average in OECD countries. In Israel, most of the direct GHG emissions from waste stem from methane emitted from biological decomposition of waste in landfills. The geographical mismatch between the regions producing most of the country's waste in the centre and the location of landfills in the northern and southern parts of the country adds transport-related GHG emissions. GHG emissions from MSW in Israel grew on average by 0.9% per year between 2011 and 2019 (UNFCCC, 2021).

Figure 2.2. Landfilling contributes significantly to GHG emissions; bio-waste accounts for most recovered waste



Note: Municipal waste includes household waste and similar waste collected by or on behalf of municipalities. It includes bulky waste and excludes construction waste and sewage waste. Breakdown data for recycling and composting are available from 2013.

Sources: CBS (2022), *Waste and Recycling* (database); OECD (2022), "Waste: Municipal waste", *OECD Environment Statistics* (database); UNFCCC (2022), *Israel National GHG Inventory 2021*.

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Although reduction of MSW per capita is one of three overarching aims of Israel's Sustainable Waste Economy Strategy (2021-2030), it does not have a measurable target. The “best case scenario” forecast by the strategy, where all policy measures are applied to reduce MSW at the source, projects an 11.5% reduction of MSW generation. The measurable targets of the 2030 strategy relate to reducing the share of waste being landfilled (maximum 20% of MSW), the uptake of recycling for MSW (54% of which should be recycled) and packaging waste (70%), separation at source (no landfilling of untreated waste) and GHG emissions (-47% compared to 2015 levels).

These targets are aligned with those of the National Action Plan on Climate Change 2022-2026 (NAPCC),² which aims for climate neutrality by 2050. However, the NAPCC expresses the target for landfilling MSW differently from the Sustainable Waste Economy Strategy (2021-2030). The strategy states that no more than 20% of MSW should be landfilled by 2030, while the NAPCC aims for a 71% reduction of the amount of MSW landfilled annually by 2030. The NAPCC also includes a target for the reduction of MSW at source by 2030 (-12%) that is absent from the strategy (MoEP, 2021a).

Current monitoring gaps might undermine achievement of these targets. The strategy points to discrepancies in data collection between the MoEP and local authorities. In addition, waste data are too sparse for an accurate picture of primary waste: data exist for certain categories, depending on the year, but the total level of primary waste is not computable.

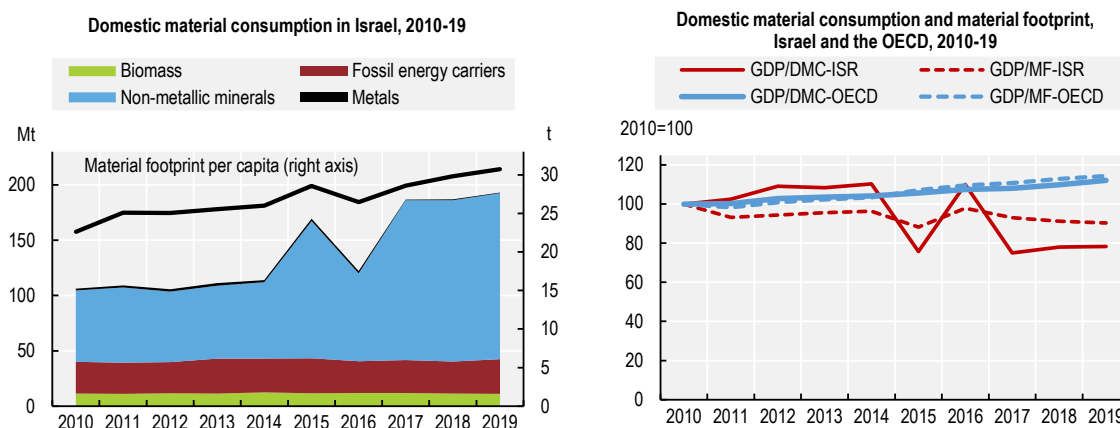
2.2.2. Material flow and resource productivity

Israel's economy is relatively resource-intensive, as the country's domestic material consumption (DMC) and material footprint per capita are above the OECD average. In 2019, Israel had a DMC per capita of 22.7 tonnes, above the OECD average of 17.5 tonnes per capita. With the inclusion of materials extracted abroad and embodied in imported goods, Israel's material footprint amounts to 30.8 tonnes per capita. This rate is similar to the one in the United States, while the OECD average is 21.5 tonnes per capita.

Israel's material productivity³ declined between 2010 and 2019, contrary to the average trend observed across OECD countries (Figure 2.3). Israel's trend was partly driven by rising domestic fossil fuels extraction (OECD, 2019a) and a strong increase in consumption of non-metallic minerals in the construction sector. On the other hand, most OECD member countries have experienced improvements in material productivity since 2000. These improvements have occurred due to more efficient production processes; changes in the materials mix; and substitution of domestic production by imports (OECD, 2022a).

Additionally, Israel's DMC profile is different from the OECD average in terms of materials consumed. The country's DMC is dominated by non-metallic minerals, which accounted for 78% of DMC in 2019, the highest share among OECD member countries (OECD, 2022a). The sharp increase in non-metallic minerals in 2014 and 2016 and the sustained increase since then are attributable to increased construction activity. Fossil energy materials account for 16.2%, while biomass represents 5.8% and metallic minerals 0.4% (one of the lowest among OECD countries). The OECD material mix is also dominated by non-metallic minerals (mostly for construction) but to a lesser extent than in Israel, at 39%. Biomass and fossil energy materials/carriers both account for 23.8% each, while metals make up less than 14% of the total on average.

Figure 2.3. DMC and material footprint per capita have grown, making material productivity decline



Note: Domestic material consumption (DMC) refers to the amount of materials directly used in an economy. Material Footprint (MF) refers to the global allocation of used raw material extracted to meet the final demand of an economy. GDP/DMC-ISR refers to the productivity of DMC in Israel; GDP/DMC-OECD refers to the average productivity of DMC in OECD countries; GDP/MF-ISR refers to the productivity of Israel's MF; and GDP/MF-OECD refers to the average productivity of MF in OECD countries.

Source: OECD (2022), "Material resources", *OECD Environment Statistics* (database).

StatLink <https://stat.link/iclq2x>

2.3. Institutional arrangements

2.3.1. Division of responsibilities

Both central and local governments have responsibilities for waste management (Table 2.1). The Ministry of Interior (MoI) regulates intra-municipal waste systems consisting of storage, collection and transport. The national government also operates national hazardous waste facilities. Municipal waste collection is mostly carried out by municipal sanitation departments: local authorities determine the deployment and configuration of collection bins based on land uses, waste streams, evacuation methods, composition of waste and quantity, and frequency of waste removal. However, private sector collection is becoming increasingly common with the rise of competitive tendering. Once collected, municipal waste is transferred to a sorting facility, then to a recycling or a landfill site. Commercial and industrial waste producers manage their own waste. Meanwhile, waste streams covered by an extended producer responsibility scheme are managed by producer responsibility organisations or local authorities (OECD, 2019a).

The MoEP is in charge of compliance assurance: its inspectors impose fines for illegal dumping or burning of waste, while the Green Police investigate criminal offences (Section 1.5). The MoEP also collects data from waste sites under its supervision (landfills, transit stations and some recycling sites) for the Waste Information System, created in 2017. According to the Sustainable Waste Economy Strategy (2021-2030), the MoEP should be authorised to determine thresholds and standards for storing, transporting, recycling, composting, incinerating and landfilling waste. The ministry should also be able to set targets to limit waste disposal and exports, as well as establish criteria for end-of-waste⁴ decisions.

Table 2.1. Waste management responsibilities are spread across levels of government and stakeholders

Waste type	Responsible body
Intra-municipal	Ministry of Interior
Hazardous	Ministry of Environmental Protection
Municipal	Local authority or regional association
Commercial and industrial	Waste producer
Extended producer responsibility streams	Producer responsibility organisation or local authority

Source: MoEP (2020b).

There is some cross-ministerial collaboration on energy efficiency and waste management but less relating to development of a circular economy. Initial dialogues are taking place between the ministries of interior; construction and housing; economy; environmental protection; and energy, as well as the anti-trust, innovation, planning and land authorities, to define how to promote circular economy principles in the built environment. Horizontal collaboration could promote circular economy principles in housing and infrastructure. In so doing, it would strengthen the Strategic Development Plan towards 2040 developed by the Israel Planning Administration under the Ministry of Interior. In addition, the ministries of agriculture, education and finance, as well as specialised government agencies, play a role in transitioning from a waste to a resource management approach, co-ordinating actions and enhancing policy coherence.

As argued by OECD (2021b), governments should mainstream the goal of resource efficiency into cross-cutting policies such as on innovation, investment and education. This would reduce pressures from major resource-consuming sectors. The shift towards a circular economy should be shared across ministries rather than a sole responsibility of environmental ministries and agencies. Sharing responsibility would permit taking advantage of economic opportunities across economic sectors. For example, Ireland's circular economy policy, led by the Department of the Environment, Climate and Communications, was born out of the country's waste policy, which led to an initial focus on waste management (OECD, 2022b). In a positive move, the new Whole of Government Circular Economy Strategy includes setting up an inter-departmental Circular Economy Working Group with relevant ministers, government departments, state agencies and local governments.

Beyond environmental and economic ministries, the government can involve other departments in developing circular economy policies. One good practice example is the Spanish Inter-ministerial Commission for the country's circular economy strategy (Box 2.2). In other countries, ministries of environment share the responsibility for circular economy policy with the Ministry of Industry (Colombia and Denmark), the Ministry of the Economy and Finance (Italy), or the Federal Ministry of Jobs, Economy and Consumers (Belgium). In the Netherlands, the Ministry of Infrastructure and Water Management and the Ministry of Economic Affairs are the main responsible authorities (OECD, 2020b). In Italy, an Observatory on the circular economy will be the implementing body of the recently approved National Strategy on the Circular Economy (June 2022).

Box 2.2. In Spain, ministries co-ordinate to implement its circular economy strategy

The Spanish Circular Economy Strategy (España Circular 2030) was jointly promoted in 2018 by the Ministry of Agriculture and Fisheries, Food and the Environment and the Ministry of Economy, Industry and Competitiveness. An inter-ministerial commission formed by 14 ministries and the Economic Office of the President contributes to it, together with the autonomous communities and the Spanish Federation of Municipalities and Provinces.

The commission meets at least once a year to evaluate and monitor implementation of the national strategy. Additionally, the commission has created a working group for autonomous regions responsible for forming other working groups to further implement the strategy. As of June 2022, the government of Spain has approved a first triennial Action Plan for the Circular Economy announced as part of the strategy and adopted a new law on waste and contaminated land for a circular economy. The law aims to reduce waste by 15% compared to 2010 by 2030 and to increase the share of waste reused rather than recycled (10% of total by 2030), among other objectives.

Sources: Government of Spain (2020); OECD (2020b).

2.3.2. Role of local authorities

The government aims to use clusters (*eshkolot*) as functional bodies for locating and operating waste treatment facilities that can benefit from economies of scale and reduced number of tenders. Established under the Arrangements Act in December 2016 and added to the Cities Associations Act, these clusters are groups of local authorities with executive bodies (Section 1.2). The clustering started as a voluntary and bottom-up process with the establishment of the Western Galilee Cluster in 2009 (OECD, 2019b). In 2012, the Mol, the Ministry of Finance and several civil society organisations created a pilot programme to establish voluntary regional clusters. They reached legal status in 2016. By 2022, their number had increased from 5 to 11 while the number of associated local authorities had increased from 59 to 147.⁵ Clusters, based on agreements across municipalities, are managed by a committee of municipality representatives and professional experts.

Further consideration should be given to the role of local governments in waste management, beyond operational aspects. Local governments' responsibilities include delegated and own functions, such as waste collection (Section 1.2). By law, municipalities must collect packaging and electrical waste separately but can decide on sorting other types of waste. Nevertheless, due to a lack of economic incentives and recycling infrastructure, separate waste collection is not widely implemented, generating inconsistency in collection methods across the country.

Most European OECD countries favour separate, kerb-side collection of recyclable municipal waste, which can enhance waste separation and recycling levels (OECD, 2019a). Some countries (e.g. the Czech Republic) rely on voluntary deposits at containers and civic amenity sites where households can dispose of and recycle waste. Other countries (e.g. France and Ireland) rely on a mix of both (OECD, 2022b). Israel should develop a modern approach to waste management and promote separate collection and recycling to reduce landfilling, while starting to implement a materials cycle. It should also ensure that materials incorporated in products sustain a high value by fostering ecodesign, repair and reuse.

Beyond bridging the infrastructure gap across municipalities, broader capacity building programmes will be needed for more sustainable waste management. The Sviva Shava (Equal Environment) project implemented over 2014-20 recognised significant gaps in waste management practices between the minority sector local authorities and other municipalities (Section 1.8.3). The project highlighted the need

to raise awareness and build capacities and knowledge across local communities to enhance separate collection and limit illegal treatment. In this context, developing platforms for city-to-city dialogues could help local authorities learn from others on project design and management, funding, sustainable management practices and circular economy principles. In addition, the national government should support local capacity building to promote the transition to a circular economy. Finally, cities could implement pilots and experiments in various sectors to test the impacts of circular-related practices. For example, it could pilot circular neighbourhoods, analysing construction techniques and resource efficiency for potential scaling up.

To build capacities, the government could establish guidelines and provide flexibility through decentralised decision making. In some OECD member countries, this happens through contracts between levels of governments, frequently used in the framework of regional development. According to the maturity of decentralisation processes and the capacity of national and subnational governments, the OECD identifies three main types of contracts between central and subnational governments: empowerment, delegation and policy sharing. Empowerment contracts can transfer responsibilities to subnational governments while gradually building capacities for policy implementation. They do this by valorising the role of local decision makers in targeting initiatives and using untapped potential. Central governments can include specific incentives as conditions of their signature, such as partnering with private actors, involving neighbour local governments, adopting specific regulations, etc. Delegation assumes that regional and local actors are better positioned to implement national policies at the local level, with more efficiency in public spending. Policy-sharing contracts allow common decision making, dialogue and sharing of financial and political risks across levels of government (Charbit and Romano, 2017).

2.4. Legislative framework and regulations for waste handling and treatment

2.4.1. Recent regulatory developments

The 2011 EPR recommended that Israel consolidate arrangements for management of waste in a comprehensive and coherent new policy or law. However, to date the country still has no national legislative framework for waste management. Waste-related requirements are scattered across different laws and regulations concerning health, hazard prevention, business, cleanliness, recycling and air pollution (MoEP, 2020b). The Sustainable Waste Economy Strategy (2021-2030) foresees the consolidation of main policies and regulations of the waste sector in a single framework law. This law would formulate basic guiding principles of waste management (waste management hierarchy, internalisation of negative externalities and the “polluter pays” principle), provide for a licensing and registration system, set targets and better define roles and responsibilities (including for compliance assurance) (MoEP, 2020b).

Extended producer responsibility is regulated by laws on the deposit of beverage containers, tyres, packaging, electronic waste and disposable carry-on bags. The quantity of potentially recyclable waste covered by these laws represents 22% of total household and commercial waste. In line with a 2011 EPR recommendation, these developments include extended producer responsibility schemes for tyres, packaging, and waste electrical and electronic equipment (WEEE), a DRS for beverage containers and a plastic bag law (Table 2.2).

In 2016, Israel passed the Law for Reduction of Use of Disposable Plastic Carrier Bags to ban the distribution of “very thin” (width of less than 20 microns) plastic bags in supermarkets and mandate a levy of at least ILS 0.10 for bags between 20 and 50 microns. The law does not apply to other businesses such as pharmacies and toy stores. Following the law’s entry into force in 2017, the number of plastic bags dispensed by retailers dropped from 2.8 billion (325 bags per Israeli) to 1.5 billion (171 bags per capita) in 2017. The Packaging Law provided for a ban on landfilling of packaging waste by 2020. Nevertheless, due to a lack of a dedicated infrastructure or a market for secondary material, this provision of the law has not

yet been enforced. As of July 2021, the WEEE Law, which holds manufacturers and importers responsible for their products at end-of-life, also covers electric bicycles and scooters. Similarly, in December 2021, the 1999 Deposit Law was extended to large beverage containers.

Table 2.2. Waste prevention legislation has developed in the last two decades

Date	Sector	Law
1999	Plastic, glass and aluminium	Beverage Container Deposit Law on bottles of up to 1.5 litres
2007	Tyres	Tyre Disposal and Recycling Law
2011	Packaging	Packaging Law
2012	Electronics	Waste Electrical and Electronic Equipment (WEEE) Law
2016	Plastic	Plastic Bag Law
2021	Plastic, glass and aluminium	Deposit Law was extended to beverage containers of 1.5-5 litres

Source: Country submission.

A number of laws related to waste handling and treatment are under discussion and are likely to enter into force in the coming years. In line with a 2011 EPR recommendation, progress has been made in hazardous waste regulation. The Free Export and Import Ordinances were amended in 2021 to ensure effective oversight of cross-border movements of waste, based on licences granted according to Basel Convention. The Ministry of Economy and Industry (MoEI) is drafting an internal procedure that would provide a classification of hazardous wastes, as well as definitions of end-of-waste criteria and of a by-product. The absence of a standard for compost means that composted food waste does not always meet the quality requirements for use in agriculture. Consequently, another regulation will ban the landfilling of bio-waste without pre-treatment and set requirements for the share of stabilisation and treatment of bio-waste coming from sorting facilities. The government will propose amendments to legislation (e.g. on packaging and expanding extended producer responsibility schemes) based on EU laws.

Israel's waste management legislation must be updated, consolidated and streamlined to modernise the recycling industry and promote behavioural changes conducive to a circular economy. The patchwork waste-related regulations and the absence of harmonised definitions and procedures mean that the private sector is unable to make long-term plans and operate changes to "business as usual" with certainty.

Following a circular economy approach that extends beyond waste management, Israel should consider the perspectives of both producers and consumers (e.g. ecodesign and reuse). As part of its Sustainable Products Initiative, the European Commission (EC) intends to propose new "right to repair" legislation in the third quarter of 2022. This would strengthen consumer rights to repair products at fair prices, with the objective of extending products' useful life (Box 2.3). Preventing waste across the entire life cycle of products could allow Israel to aim for a higher target than the 12% reduction in MSW generation levels at source by 2030.

Box 2.3. EU circular economy measures aim at closing loops and changing behaviours

In December 2015, the European Commission adopted a Circular Economy Package to support the EU transition to a circular economy. The package sets out 54 actions targeting the entire life cycle of products across 6 priority areas (plastics, food value chain, critical raw materials, construction and demolition, biomass and bio-based products, and innovation). The package also includes four legislative proposals amending the Waste Framework Directive, the Landfill Directive, the Packaging Waste Directive and directives on end-of-life vehicles, batteries and accumulators, and WEEE. It sets the following targets:

- 55% of municipal waste recycled by 2025, 60% by 2030 and 65% by 2035
- reduction of landfilling to 10% of municipal waste generated in 2035
- mandatory separate collection for hazardous waste (2022), organic waste (2023) and textiles (2025).

It also foresees a reform of extended producer responsibility schemes, broadening their scope and governance and setting new objectives for preventing waste, especially marine and food waste.

In January 2018, several new measures were adopted, including the EU Strategy for Plastics in a Circular Economy, to transform the way plastic products are designed, produced, used and recycled. By 2030, all plastic packaging should be recyclable in the European Union.

The new Circular Economy Action Plan, adopted in March 2020, is one of the building blocks of the Green Deal. It sets out 35 actions and initiatives aiming to:

- make sustainable products the norm in the European Union
- empower consumers and public buyers
- focus on sectors that use the most resources and where the potential for circularity is high
- ensure less waste
- make sure circularity works for people, regions and cities
- lead global efforts on the circular economy.

Under the Circular Economy Action Plan, the European Commission has several initiatives to improve the reparability and extend the useful life of products. The Sustainable Products Initiative, for example, revises the Ecodesign Directive and proposes additional legislative measures to make products more durable, reusable, repairable, recyclable and energy efficient. The initiative was adopted in March 2022, alongside a proposal for a directive on Empowering Consumers for the Green Transition. This directive would ensure that consumers have access to information on a product's durability and reparability before they buy it.

Source: EC (2020, 2018), European Parliament (2022); OECD (2020b); Šajin (2022).

2.4.2. Implementing the packaging law

Clear communication and stakeholder engagement are key to fulfilling the obligations and targets foreseen by the Packaging Law. The law requires every producer to engage in a compliance scheme recognised by the MoEP. TAMIR, established in 2011 by major Israeli manufacturers and importers, is the only recognised packaging recovery organisation. TAMIR funds the separation and collection of packaging waste as well as ensures compliance with recycling targets set by the Packaging Law. Manufacturers and importers must pay fees to TAMIR according to the weight of the material and the type of packages they

put on the market. Beyond manufacturers and importers, TAMIR foresees signing contracts with local authorities to enhance separate collection and removal of packaging waste, which represents about 74% of household waste.

As of 2021, TAMIR entered into agreements with about 1 700 Israeli producers. They reported approximately 455 000 tonnes of packaging, which represented 57% of the packaging waste marketed in Israel in 2020. This implies that many producers do not comply with their obligation to enter a recognised compliance scheme. This free riding increases the financial burden on the producers who comply with their obligations and generates an unfair competitive advantage for non-compliant producers. Israel may benefit from the experience of Spain and Italy where a similar system helps foster sustainable management of packaging (Box 2.4).

Box 2.4. Intermediary companies promote packaging recycling in Spain and Italy

In Spain, the non-profit environmental organisation Ecoembes promotes and manages the system for recycling household packaging waste across the country. The organisation gathers more than 12 000 companies that are requested by law (Law 11/1997 on Packaging and Packaging Waste) to finance a system of selective collection and recycling of household packaging. Ecoembes is financed through the “Green Point”, a fee paid by packagers and distributors placing packaging on the market for consumption. This fee ensures that packaging is recycled at the end of its useful life.

In Italy, producers and users of packaging rely on CONAI, a private not-for-profit consortium, to guarantee achievement of the objectives of recycling and recovery of packaging waste stipulated by law. Indeed, Legislative Decree No. 22/97 assigned to the consortium the task of achieving the overall target and implementing targeted management policies, including prevention through eco-innovation. The CONAI system aims to guarantee compliance through extended producer responsibility. Producers and users joining CONAI must pay the CONAI Environmental Contribution, which varies depending on the type of packaging put on the market. Municipalities cover additional charges resulting from separate collection of packaging.

Source: OECD (2020b); CONAI (2022).

2.4.3. Fighting illegal dumping

The government has made progress in fighting illegal waste dumping. These actions were in line with the 2011 EPR recommendation to strengthen national and local efforts to address remaining problems with unregulated waste disposal and safely dispose C&D waste. Since 2011, Israel has strengthened inspection and surveillance against illegal disposal of C&D waste in dumping sites and open spaces. It has also developed standards on use of recycled aggregates in infrastructure projects, and set administrative and criminal enforcement procedures. In addition, the government has provided financial and technical support to local authorities to tackle illegal waste disposal (e.g. under the Sviva Shava project).

However, illegal open burning of waste persists in certain areas of the country. Construction waste managers lack the technological expertise to produce aggregates made with recycled content of sufficient quality for infrastructure projects. This represents a significant barrier for use of recycled building waste in Israel (22% marketed, compared to 89% in the European Union). In addition, infrastructure projects have long lead times (five years from planning to implementation). Consequently, recycling entities selling construction aggregates cannot commit with certainty to providing the quantities required by the project. This poses a risk to the infrastructure developer.

In 2012, the government decided to start collecting refrigerators and cooling devices for recycling. However, high-value waste streams such as WEEE and end-of-life vehicles are still a concern for illegal dumping. A draft regulation forbidding illegal burning of waste from agriculture faces opposition. In 2018, the MoEP established a dedicated unit for fire prevention, working in co-ordination with the Green Police and the Fire Department of the Ministry of Public Security. It monitors illegal transfers of waste for open burning in areas controlled by the Palestinian Authority. The unit is endowed with the power to issue clean-up orders and fines (ILS 600 for the illegal burning of waste by individuals and ILS 2 000 for companies). These fines are doubled if the order is not complied with by the deadline.

In addition to enforcement, the MoEP supports local authorities. For example, the Arab Society Programme (Section 1.8.3) foresees capacity building, pilots for separate collection within specific clusters with standards for waste collection and treatment, and the financing of bulky waste collection for five years.

2.5. Planning, pricing and other policies towards a circular economy

2.5.1. Planning for sustainable waste management

The Sustainable Waste Economy Strategy (2021-2030) is part of a long-term vision of transforming Israel's linear economy to a circular one, in line with a zero-waste aspiration for 2050. Its three main objectives are to reduce landfilling (from 80% to 20% in 2030), ease pressure on natural resources and reduce GHG emissions. The 2020 National Plan for MSW Treatment to 2040 also highlights the need to increase recycling and reduce landfilling through three key measures. These comprise supporting industry and research and development to increase recycling rates; prohibiting landfilling of unsorted waste; and increasing waste-to-energy for non-recyclable waste (MoEP, 2020a). By the end of 2023, six additional sorting facilities are planned for construction and operation. The sorting facilities would separate waste for the following treatment streams: fertilisation and biological stabilisation of bio-waste; anaerobic digestive facilities for bio-waste; and recycling facilities for paper and cardboard, plastic and glass waste.

As food waste represents one-third of Israel's household waste, the strategy foresees specific actions for this waste stream. First, similarly to EU legislation, it would mandate separation of bio-waste at source through legislation within the next five years. Second, it would establish an EU-like standard for compost. Finally, it would provide financial support for anaerobic digestion facilities and integrated mechanical and anaerobic digestive facilities. Beyond household food waste, significant efforts would be needed to address the food system as a whole, from production to consumption (Box 2.5). This approach should ensure that separated bio-waste feeds back into local food chains as animal feed, where appropriate. It could also be transformed into biogas, compost or fertiliser.

Box 2.5. Working across the value chain can reduce food waste in Israel

The Ministry of Agriculture and Rural Development (MoARD) works across the value chain to reduce food loss and waste, including by:

- Developing packaging to extend shelf life and reduce food loss along the supply chain. The solutions include smart packaging for fresh agricultural produce (e.g. packages that help regulate humidity levels) and various post-harvest treatments to reduce waste (e.g. covering potatoes with menthol oil to prevent sprouting).
- Operating an educational programme with the Ministry of Education to encourage smart consumption of fruits and vegetables in schools.
- Formulating marketing strategies encouraging the sale and buying of “ugly” fruits and vegetables.
- Publishing fruit and vegetable conservation guidelines to consumers, wholesalers and retailers.

The MoEP developed Israel’s Food Donation Act in 2018 to protect those in the food donation chain from liability. Everyone from food donors to non-profit organisation employees and volunteers must meet food safety standards. The Act protects them from liability for damages that might be caused by their food donations. MoEP-led initiatives on food waste target households, students and businesses include the following:

- In 2011, the MoEP launched a household campaign (“Let’s Think Green”) to change public perceptions and behaviour regarding the environment, including responsible food shopping and over-consumption; since 2019, it has also led workshops nationwide on reducing food waste in households.
- Since 2016, a new topic dealing with food waste reduction has been added to the co-operative sustainability education programme. This programme, which reaches about 100 000 students a year, is run by the MoEP and the Ministry of Education.
- To address food waste in businesses, the standard for labelling food packages was re-examined, and several options were planned for improving it. Additionally, in 2016, the MoEP, the city of Tel Aviv-Jaffa and the Israel Standards Institute launched a “Green Label” for cafes and restaurants. One of the requirements for getting the badge includes efforts at reducing food waste.

The MoEP, the MoARD and other ministries have also been collaborating with TNS Israel on reducing food waste. In March 2017, the MoARD, TNS and the Manna Center Program for Food Safety & Security at Tel Aviv University held a “hackathon” on reducing food loss and waste, following which two projects received support for further development.

Source: Country submission; MoEP (2020b).

Given the country’s high level of wastewater treatment, nutrients recovered from wastewater can also become part of the solution to enrich soils and make agriculture more resilient to climate change. This can be done by strengthening urban-rural partnerships. Israel could also consider adopting a regulation similar to one in France that bans disposal of food waste from outlets such as supermarkets and large catering services (Box 2.6).

Box 2.6. The fight against food waste in France starts with legislation here

Two recent laws made France the first country in the world to ban supermarkets from throwing away or destroying unsold products. The 2015 Energy Transition for Green Growth Law covers “the fight against waste and the promotion of the circular economy from product design to recycling”. A year later, France adopted the Law on Combating Food Waste. These are the two main instruments to reduce food waste in the country.

The 2020 anti-waste law for a circular economy strengthens the fight against food waste by setting ambitious targets. For instance, by 2025, the food distribution and catering sectors (supermarkets, canteens, etc.) will have to cut food waste in half compared to 2015 levels. Moreover, retailers are obliged to donate their unsold food products to charities, and the law prohibits the disposal or spoiling of unsold food. The new law reinforces penalties for the destruction of unsold but edible food. It also introduces a national anti-food waste label that promotes initiatives to reduce food waste and guide consumer choices.

Source: ADEME (2019), Ministry of Ecological Transition (2020).

The Sustainable Waste Economy Strategy is a first step in the direction of a circular economy as it recognises the need to implement sustainable waste management and improve resource efficiency. However, a detailed and ambitious roadmap that would identify key sectors, actors and actions is still missing. Defining such a roadmap would enable a clear vision of the steps to achieve defined targets. It could also bolster support from businesses and other actors for its implementation (Box 2.7).

Box 2.7. Circular economy strategies go beyond waste management

In the European Union, more than 60 strategic circular economy frameworks and roadmaps have been developed at the national and subnational levels. They tend to be built around eight key blocks:

- a vision of the desired future state
- qualitative goals the transition aims to achieve
- links to other policies and strategies
- an indication of interest groups involved
- a selection of priority areas
- quantitative targets
- implementation measures and monitoring
- evaluation and communication plans.

There is a great diversity of approaches for developing these strategic frameworks. These largely depend on local context, challenges and potential benefits, as well as underlying drivers and stakeholder involvement. The following are some examples of national and subnational circular economy strategies in OECD countries:

- The Circular Economy in the Netherlands by 2050 strategy is based on five priorities: biomass and food; plastics; manufacturing industry; construction sector; and consumer goods.
- Colombia has six lines of action in its 2019 National Strategy for the Circular Economy: flow of industrial materials and mass consumption products; flow of packaging materials; flow of biomass; energy sources and flows; flow of water; and flow of construction materials.
- For the city of Paris (France), the first roadmap adopted in 2017 included 15 actions for planning and construction; reduction, reuse, repair; support for actors; public procurement and responsible consumption. The second roadmap, adopted in 2018, defined 15 actions organised in five new themes: exemplary administration; culture; events; sustainable consumption; and education.

Source: OECD (2021c; 2020a).

More broadly, Israel's policies lack a life-cycle perspective. In particular, the uptake of policies and standards towards ecodesign and reuse is very low. Additionally, although standards exist in the form of green labels, they are voluntary and thus rarely used. Israel should start to develop higher-value material loops, whereby materials are recovered, reclaimed, recycled or biodegraded through natural or technological processes. It should also foster ecodesign, repair and reuse.

There is a need to bridge the data gaps in terms of total waste, material flows, resource efficiency, and material exports and imports (Section 2.2). The lack of information and data on waste streams is a barrier for new players in the market, preventing them from estimating the market for secondary material. Moreover, this information would help identify the most resource-intensive sectors and enable key actors to prevent waste and keep resources in use for as long as possible. To build knowledge and evidence on resource inputs and outputs, Israel's Central Bureau of Statistics (CBS) and the MoEP are developing material flow accounts (MFAs). As part of developing the strategy for green growth indicators, the CBS, the MoEP and the MoEI are establishing an infrastructure of environmental accounting that will include waste, expenditure and MFAs. Selected input and outcome indicators could be used to evaluate the status and progress of the strategy's roadmap (Table 2.3).

Table 2.3. Measuring results of circular economy strategies helps improve policies

Phase	Type of indicator	Indicators for the circular economy strategy: Inputs, process and outputs
Setting the strategy	Process	Number of public administrations/departments involved
	Process	Number of stakeholders involved
	Input/process	Number of actions identified to achieve the objectives
	Input/process	Number of projects to implement the actions
	Process	Number of projects financed by the government/Total number of projects
	Process	Number of projects financed by the private sector/Total number of projects
	Process	Number of staff employed for the circular economy initiative and implementation within the administration
Implementing the strategy	Environmental output	Waste diverted from landfill (t/inhabitant/year or %)
	Environmental output	By-product or waste reused as material (t/inhabitant/year or %)
	Environmental output	CO ₂ emissions saved (t CO ₂ /capita or %)
	Environmental output	Virgin material use avoided (t/inhabitant/year or %)
	Environmental output	Use of recovered material (t/inhabitant/year or %)
	Environmental output	Energy savings (Kgoe/inhabitant/year or %)
	Environmental output	Water savings (million litres/inhabitant/year or %)
	Socio-economic output	Number of new circular business
	Socio-economic output	Number of businesses adopting circular economy principles
	Socio-economic output	Economic benefits (e.g. additional revenue and costs saving) (EUR/year)
	Socio-economic output	Number of employees in new circular businesses
	Socio-economic output	Number of jobs created in the circular economy
	Governance output	Number of procurement contracts, including circular criteria (no. of contracts per year/expenditure per year (%))
	Governance output	Number of companies or employees trained to adopt circular economy principles
	Governance output	Number of contracts awarded that include a circular economy criterion/Total number of contracts
	Governance output	Share of public investment dedicated to the circular economy policy in total public investment (%)

Source: OECD (2020a).

2.5.2. Economic instruments to reduce waste production and landfilling

Property owners in Israel pay for waste collection and treatment services along with other municipal services as part of the Israeli property tax. This gives households a limited economic incentive to reduce waste or separate waste streams. No real progress has been made in relation to the 2011 EPR recommendations to increase the level of the waste collection component of the municipal property tax to reflect the real costs of the service, and to introduce volume- or weight-based waste disposal fees for mixed waste payable by households. Waste collection and treatment fees are included in municipal property taxes and set according to the size of a household or business (OECD, 2019a). In 2016, the ministries of finance and environmental protection began supervising the prices of MSW collection and treatment to prevent increases due to lack of competition. This, in turn, was intended to reduce the cost of living.

A charge on disposable plastic utensils below a designated thickness threshold (making their reuse unlikely) has been levied since November 2021. Figures from the MoEP show that over the past decade

the consumption of disposable plastic in Israel has been steadily rising. It reached an estimated 13 billion items per year (MoEP, 2020b). At ILS 11 per kg, the charge doubles the price of single-use plastic utensils for the consumer. The charge aims to significantly curb Israel's high use of these items (7.5 kg per person per year compared to the EU average of 1.5 kg per person per year). Data from November 2021 showed a 65% decline in sales compared to the previous month (MoEP, 2021b). The charge is accompanied by an extensive bilingual communication campaign. The campaign, targeting several population segments, is supported by university studies in behavioural economics. In addition to this charge, the DRS for beverage containers was recently expanded to large-volume (1.5-5 litres) aluminium, glass and PET beverage containers.

The Sustainable Waste Economy Strategy (2021-2030) recommends incentivised charging with save-as-you-throw or pay-as-you-throw mechanisms, where consumers pay for waste disposal based on weight and waste stream. The MoEP supports pilot projects to implement economic incentives via “recycle and save” mechanisms in households to examine various methods of implementation and their impacts (MoEP, 2020b). Separating waste management income and expenses from local property taxes would allow local authorities to improve monitoring of the efficiency and effectiveness of waste collection and treatment services. Moreover, it would make waste management costs visible to households, incentivising them to reduce waste generation at source. In implementing the strategy, Israel can draw on the experience of European countries with a number of price-based tools of waste management (Box 2.8).

Box 2.8. European countries use a range of different price-based tools for waste management

A few countries have introduced **volume-based pricing (pay-as-you-throw)**. For example, almost all municipalities in the Netherlands impose a municipal solid waste (MSW) fee on households. The fee can be variable based on the volume of waste (40% of municipalities), fixed according to the size of the household (53% of municipalities) or a flat rate (7% of municipalities). The volume-based approach was shown to be more efficient and environmentally effective. Indeed, separate collection was much higher in areas with volume-based approaches (60%) compared to other fee-setting approaches (as low as 7%). Municipalities in the Czech Republic have three options for setting fees: pay-as-you-throw, an annual fee based on household size or a contractual fee. Around 15% of municipalities use the pay-as-you-throw option.

With **deposit refund schemes**, the customer makes an initial payment (deposit) at the point of purchase and gets refunded if the product or packaging is returned to the collection scheme. This approach is used for beverage containers in several European countries and North American states or provinces. Such policies specify the product category (e.g. beverage containers) and detail exemptions for particular types of this product category.

Ensuring an effective policy mix is a key determinant in the success of waste management policies. Public awareness and support are crucial for changing behaviour and generating acceptance of new measures (e.g. for pay-as-you-throw charging). In Ireland, the Circular Economy Programme led by the Environmental Protection Agency has been instrumental in raising awareness and improving household knowledge on waste prevention and separation through engagement with a wide range of stakeholders.

Source: OECD (forthcoming, 2022b, 2019a).

The landfill levy, in place since 2007, continues to be the main economic instrument for internalising the cost of landfilling in Israel (Table 2.4). The rate of the landfill levy depends on the type of waste. Rates are lower for sorted or pre-treated waste than for unsorted MSW. They are very low for construction waste to discourage its illegal disposal. In addition to the landfill levy, landfill sites charge handling fees (estimated at an average of ILS 70 per tonne). Transport costs per landfill are estimated at ILS 42 per tonne

(calculated at ILS 0.7 per tonne per km, assuming 60 km on average) (MoEP, 2020b). The total direct cost of landfilling, i.e. the sum of the landfill levy and gate fees, is around ILS 240 per tonne (EUR 67). This is relatively low in comparison to many EU countries (e.g. EUR 107 in Denmark and EUR 132 in the Netherlands) and insufficient to discourage this practice. The cost of landfilling is lower than that of incineration with energy recovery (estimated at ILS 300 per tonne) and of organic waste treatment (ILS 250-300 per tonne). This makes landfilling the cheapest and thus most incentivised option.

Table 2.4. Landfill levy rates have remained stable since 2018

Landfill levy rates in Israel, 2018-22 (ILS/tonne)

	2018	2019	2020	2021	2022
MSW, organic waste, dry household waste in MSW landfill, waste sorting residues	107.76	109.05	109.38	108.73	111.34
Dry household waste in dry waste landfill	71.84	72.70	72.49	72.49	74.23
Sludge in MSW landfill	143.38	145.40	145.84	144.97	148.45
Stabilised industrial sludge	47.89	48.47	48.61	48.32	49.48
Construction waste	4.79	4.85	4.86	4.83	4.95

Source: Country submission.

In the OECD area, most countries use landfill or incineration taxes, which have been key to promote recycling of MSW. For example, in Estonia, the waste disposal tax made other treatment options more competitive and resulted in a significant decline in landfilling (OECD, 2019a). Incineration taxes for MSW are less common and tend to be lower than landfill taxes. The Netherlands has the highest incineration tax at EUR 13 per tonne (OECD, 2021d). In Denmark, the incineration tax is based on energy and CO₂ content. This aims to incentivise recycling the most energy-intensive waste, such as plastics. However, incineration taxes can lead to emission leakage. For example, Norway's incineration tax led to increased exports of waste to Sweden, which did not have such a tax. Norway's tax, introduced in 1999, was abolished in 2010.

Taxes on raw materials, particularly for construction aggregates, could limit resource extraction and prevent waste upstream while fostering reuse and uptake of recycled aggregates downstream. Construction aggregates accounted for 78% of Israel's DMC of non-metallic minerals in 2019. Taxes on virgin materials incentivise efficient resource use by increasing the cost of extracting and using natural resources and raw materials (OECD, 2021b). One of the few examples of such taxes in OECD member countries is Denmark's virgin material taxes on sand, gravel, stones, peat, clay and limestone. They were introduced in 1990 and, in combination with waste taxes, increased the demand for recycled substitutes. Between 1985 and 2004, demand for recycled substitutes grew from only 12% of C&D waste being recycled to 94% (Söderholm, 2011). Although aggregate taxes have reduced natural resource use and promoted substitute materials to some extent, greater incentives for recycling are needed along with other waste management instruments (e.g. waste sorting).

2.5.3. Circular economy as a pillar of the climate mitigation policy

Within Israeli climate mitigation policy, a circular economy is seen as a pillar for reducing GHG emissions from industry. The NAPCC aims to improve resource efficiency of industry by 5% in 2030 and by 16% in 2050 relative to 2020. It presents a series of actions clustered in four main steps, one of which relates to a circular economy (Table 2.5).

Table 2.5. Circular economy is part of Israel's climate change mitigation action plan

Key actions	Beginning of implementation
Support for energy efficiency, GHG emissions reduction and transition to clean energy sources	2022
Support for integration of new technologies based on zero-emission energy, such as hydrogen	2022
Support for industrial symbiosis projects	2021
Support for the Israel Resource Efficiency Center, which advises on improving efficiency in the use of resources and raw materials	2020
Establish a community to advance circular economy through marketing, relevant expertise and managing platforms	2022
Adopt standards to allow use of recycled raw materials in products	2023
Support for the recycling industry to upgrade infrastructure and increase demand	2022
Support for pilot projects and integration of technologies for reduction at source and circular economy	2022

Source: MoEP (2021a).

The National Programme for a Circular Economy in Industry aims to decouple growth and raw material consumption and prevent environmental damage from mining virgin raw materials, as well as emissions from landfilling. The programme, started in 2019, is an initiative by the Industries Administration in the MoEI. Other partners comprise the MoEP, the Manufacturers Association, the Israeli Green Building Council, the Heschel Center for Sustainability and the Innovation Authority. In 2020, the MoEP and the MoEI funded the Israel Resource Efficiency Center, which helps manufacturers increase their economic and environmental efficiency. It provides free consulting services to selected manufacturing businesses, professional guides, newsletters and training, as well as sectoral case studies offering solutions (e.g. on identifying and handling excessive energy consumption).

With support from the SwitchMed programme, the MoEP and the MoEI have defined Specifications for the Design of Sustainable Industrial Zones as guidelines for planning and developing new industrial zones in Israel. They contain measures on energy (e.g. efficiency and renewables), water and wastewater (e.g. use of constructed wetlands), transport (e.g. infrastructure for joint travel), biodiversity conservation and sustainable management. The specifications manual contains both non-binding suggestions and binding measures for planning or developing a new industrial zone.

The industrial symbiosis programme promotes productivity and reduction of waste through ecodesign. The MoEI supports the use of secondary materials in industry. It has identified a need to build 130 recycling plants to produce such materials. The ministry helps companies improve their facilities, access the international market and export their products.

A number of funding options are available for companies of all sizes that apply circular business models. The 2018 National Resource Efficiency and Environmental Innovation Programme supported companies by investing EUR 143 million in circular economy projects out of a total annual investment of EUR 756 million for environmental projects (Flanders Investment & Trade, 2019). In July 2022, the government allocated ILS 400 million for recycling and collaboration across the supply chain to help plan, design and manufacture recycled products.

The MoEP and the Israel Innovation Authority support technology start-ups at an advanced stage by offering financial and regulatory support for pilot projects, some of which are circular. Of 120 applications, 40 projects were approved (over six rounds) for a total of ILS 37 million, representing half of the project cost on average. The seventh round is now open for 2022; the start-ups will receive ILS 5.3 million. One project example relates to materials for wall coverage made of agricultural and municipal yard waste.

Finally, the MoEP is planning a fund to invest in circular economy projects, modelled on other funds that support small and medium-sized enterprises (SMEs). Such funds include government-backed loan funds and Jewish Agency funds. This support is based on the recognition that the circular transition can be particularly slow for SMEs, many of which are family businesses with relatively conservative attitudes and

limited resources. However, the size of SMEs can also be an advantage, as they can adapt more easily and integrate changes faster than larger corporations.

2.5.4. Towards a circular procurement process

Environment-related criteria have been progressively introduced into government procurement tenders, but there is no obligation to use them. In recent years, the MoEP set a target of 20% of government spending for green public procurement (GPP). To that end, it co-operates with the Purchasing Administration, Housing and Construction Administration, and Vehicles Administration under the auspices of the Ministry of Finance. In addition, the Government Procurement Administration has developed a life-cycle costing tool. Dedicated training courses and a green procurement process forum have been set up to support public officials in the use of GPP. The government recognises a need for dialogue between suppliers and buyers, as well as with local authorities.

Procurement of single-use plastics in government offices was banned from November 2022. The MoEP identified furniture as one of the priority sectors for applying criteria related to a circular economy. However, conservative habits and poor knowledge of purchasing practices have delayed tenders and led to purchasing through exemption from tenders. Additionally, despite being a fertile territory for innovation, start-ups in environmental technology (“cleantech”) face challenges in scaling up and thus in responding to green tenders in Israel (MoEP, 2020b). While hundreds of companies operate in this sector in Israel, 75% are specialised in energy and water, not waste resources management and industrial efficiency.

Circular criteria should become an integral part of GPP in Israel. This can also support the scaling up of circular start-ups. For example, purchasing entities can consider circular business models (e.g. product as a service) rather than systematically opting for ownership (e.g. leasing vehicle fleets for public transport) (OECD, 2020b). Further efforts should also be deployed to train purchasing entities and to provide guidance to businesses participating in tenders, especially start-ups. International examples are provided in Box 2.9. OECD (2021e) identifies the following actions for the effective implementation of GPP with circular economy criteria:

- Establish targets with regard to the circular economy, e.g. second-hand furniture.
- Co-ordinate across departments to analyse the potential of the circular economy, e.g. education, spatial planning, etc.
- Incorporate different business models (e.g. rental, product-as-a-service models) into tenders.
- Create demand in the market based on the need of the administration and allow market development: a circular solution can be developed during the duration of the contract. In other words, the company may not offer a certain service at the beginning of the contract but could work with the supplier to achieve a target (e.g. refurbish/remanufacture furniture).
- Build capacity in contract management, not only in tender definition.
- Develop metrics and environmental data to analyse the results.
- Expand the existing public procurement regulation to assess the full life cycle of products, from design to end-of-life.

Making public procurement accessible to new entrants and SMEs carrying out circular economy activities is also important. Per the OECD Recommendation on Public Procurement (OECD, 2015), this requires providing “clear guidance to inform buyers’ expectations (including specifications and contract as well as payment terms) and binding information about evaluation and award criteria and their weights (whether they are focused specifically on price, include elements of price/quality ratio or support secondary policy objectives)”.

Box 2.9. Green public procurement can accelerate the circular economy transition

Almost all OECD countries have developed strategies or policies to support green public procurement (GPP). In the European Union, the impact of public procurement on the transition to a circular economy is worth around EUR 2 trillion, representing around 14% of gross domestic product. Some examples of GPP include circular criteria:

- In its 2018 circular economy strategy, Denmark aims to develop a partnership for GPP and a forum on sustainable procurement. A task force on green procurement is planned to focus on a circular economy. It will be expanded to aim – in addition to public institutions – at private enterprises, with the additional creation of an online portal called “The responsible procurer”.
- Portugal’s circular economy action plan recognises the need to implement a support structure for collaborative development of solutions that adopt circularity principles, especially in priority sectors such as construction. This support structure would entail an analysis of the integration of criteria promoting resource circularity in the list of priority goods and services established by the working groups of the National Strategy for Green Public Procurement.
- Flanders, Belgium, implemented the Green Deal Circular Procurement (GDGP) between 2017 and 2019. The deal was signed by 162 companies and organisations. In total, 108 purchasing organisations, local authorities, companies, financial institutions and 54 facilitators have been involved. Throughout the initiative, GDGP signatories conducted more than 100 pilot projects on circular procurement.
- In the United Kingdom, the Scottish government promoted sustainable procurement tools for life-cycle impact mapping. They considered criteria such as impacts of raw materials extraction and the reuse, recycling and remanufacture of materials.

Source: OECD (2022c, 2020b).

2.5.5. Engaging stakeholders and increasing transparency

Ensuring sustainable waste management and a transition towards a circular economy requires engaging stakeholders. To that end, stakeholders need timely information and opportunities to be involved in decision making. One example of an initiative aimed at creating a fertile environment for circular companies is the AMCHAM Circular Economy Forum launched in 2020 by the Israel-America Chamber of Commerce, Circular Economy IL and the Afeka Institute of Circular Engineering and Economy, in partnership with the MoEP and MoEI. The Forum aims to identify needs and opportunities for members to implement circular principles in their activities. It will also create and promote pilots for different types of circular solutions.

The Manufacturers Association of Israel is involved in capacity building, consulting services and information sharing. It builds capacity through circular economy workshops and training. It provides services to businesses and also directs them to relevant government initiatives. Finally, to promote industrial symbiosis among members, it shares information through a database on wastes that can be reused and/or recycled. The association has also proposed circular practices in sectors such as vehicle scrapping and helped formulate requirements and criteria for sustainable industrial zones. Beyond industry and the private sector, civil society, community-based organisations and knowledge institutions should be further engaged in decision-making processes. The combination of top-down and bottom-up approaches can foster the circular transition. The government could map relevant stakeholders groups (e.g. civil society, social enterprises, community-based organisations, knowledge institutions, local authorities, architects and designers). Armed with this list, it could establish a formal engagement mechanism, such as an advisory group, to inform circular economy policy.

Israeli consumers do not tend to attach a positive value to green products. For example, Israeli consumers are 50-60% less likely than the global average to say they would pay more for sustainable products. Regarding products as a service, Israeli consumers are also 50-60% less likely than the global average to say they would rather sign up for a membership to a product or service than pay extra to own it (Kavanagh, 2019). This indicates a need to raise awareness on the environmental consequences of consumption. The government can take inspiration from MyWaste.ie, Ireland's information-sharing platform for waste management and circular economy for households. The platform consists of a website, a mobile phone application and social media pages. It aims to advise citizens and businesses on options for reusing, recovering and disposing of a wide range of materials. It also shares information about initiatives by local authorities and waste management stakeholders, as well as news and updates on the circular economy, resource efficiency and waste management topics.

Episodes of fraud and a lack of clarity in the use of the Cleanliness Fund have resulted in a lack of public trust in waste management policy. Notably, despite waste streams being collected separately for several years, most of them eventually reached landfill as unsorted waste. This was experienced as a fraud by the public and harmed the willingness to separate waste at source for recycling. Since then, the government has set up a new system of bins for separate collection. It changed the system from two bins (one for general waste, another for biodegradable waste) to three bins for recyclable, residual waste and bio-waste. It also promoted a campaign to reduce single-use plastics.

The Cleanliness Fund, whose revenues come from the landfill levy, needs to solve the issue of lack of waste treatment facilities. The government is still evaluating how to use the fund effectively for recycling facilities. However, the Israeli circular economy stakeholder group issued a petition representing the municipalities on use of the fund. More transparency in Cleanliness Fund reports is needed to increase trust and make the sustainable waste management more effective. Local authorities could play a key role in promoting a circular economy culture, while increasing trust in the government. The national government could create “circular city contests” to reward cities reaching pre-defined circular economy targets.

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Notes

¹ The major sectors included in this segment are food manufacturing/sorting plants, industry, kitchens of large companies and organisations, hospitals, hotels, restaurants, food stores and big supermarkets, and other relatively small sub-sectors.

² The National Action Plan for Climate Change is part of the Strategy Israel 2050 – Transition to a Low Carbon Economy.

³ Material productivity is the amount of economic output generated (in terms of GDP) per unit of materials consumed.

⁴ End-of-waste criteria specify when certain waste ceases to be waste and becomes a product or a secondary raw material.

⁵ There are 257 local authorities in Israel.

OECD Environmental Performance Reviews

ISRAEL

Israel's rapid economic and population growth along with a high degree of urbanisation continue to exert significant pressure on the environment. Israel has raised its climate ambitions in recent years, though is not on track to reach greenhouse gas reduction targets. Enhancing biodiversity protection, addressing water pollution and adapting to the impacts of climate change require further action. Israel has taken a number of key steps to advance its zero waste and circular economy agenda. However, further efforts are required to improve waste management and introduce an economy-wide shift to a circular economy. The review provides 24 recommendations to help Israel improve its environmental performance, with a special focus on waste management and circular economy.

This is the second Environmental Performance Review of Israel. It provides an independent, evidence-based evaluation of the country's environmental performance over the past decade.

