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# ISRAEL AND CLIMATE CHANGE

*Nadine Mensel*

Compared to other policy sectors, environmental policy in Israel has a tough job. The security situation in the region, the unresolved conflict with the Palestinians, the tensions within society and the socioeconomic challenges overshadow seemingly softer policy areas. This assumption is confirmed when one looks at public expenditure. In the two-year budget for 2011/2012, the Ministry of Environmental Protection was allocated close to six billion Israeli shekels in total. This amount corresponds to just a fraction of the funds of the Ministry of Defence, which had access to nearly one hundred billion shekels over the same period. The proportion of total government spending that the Environment Ministry had at its disposal was 0.84 per cent, while that of the Ministry of Defence was close to 14 per cent.[1]

However, this reference to the financial resources should not lead to the conclusion that protection of the environment and nature is totally marginalised in Israel. Upon closer examination it is apparent that politicians and civil society have been steadily increasing their activities in this area over recent years. A change of attitude has been taking place in Israeli society for quite some time. Not only has the posture towards general environmental issues become more attentive, there has also been a noticeable sensitisation regarding the dangers of global warming. The understanding that a global phenomenon such as climate

1 | Cf. author's own calculations based on figures from the Israel Ministry of Finance, "State Budget. Proposal for Fiscal Years 2011-2012. Major Provisions of the Budget and Multi-Year Budget Plan", 2010, http://financeisrael.mof.gov.il/Finance Israel/Docs/En/publications/BudgetProposal2011-2012.pdf (accessed 18 Jan 2013). The budget for the financial year 2013 has not yet been passed, which was one of the reasons for the early elections in Israel that took place on 22 January 2013.

change entails massive consequences for the regional or local ecosystem is becoming widespread. One of the catalysts of this development was no doubt the tragic event that occurred in December 2010, when a devastating forest fire swept across Mount Carmel. That catastrophe, which had been caused by arson, claimed 44 lives and destroyed a third of the forest cover on Mount Carmel.[2]

**The part that a small country such as Israel plays in global climate change is minimal. But the entire Middle East region will be severely affected by the consequences of global warming.**

Israeli environment policy and the resulting activities focus mainly on climate protection. Obviously, the part that a small country such as Israel plays in global climate change, i.e. the anthropogenic impact on the greenhouse effect, is minimal. But focusing on this issue is appropriate because the entire Middle East region will be severely affected by the consequences of global warming. One particularly interesting question is which measures Israel should take to adapt to climate change on the one hand and to help mitigate further global warming on the other. Deliberations on environmental issues and climate policy are also influenced by security policy considerations. This illustrates that the boundaries between hard and soft policy areas are becoming increasingly blurred, which helps advocates of a coherent environment policy to make their case.

## CLIMATE CHANGE IMPACT

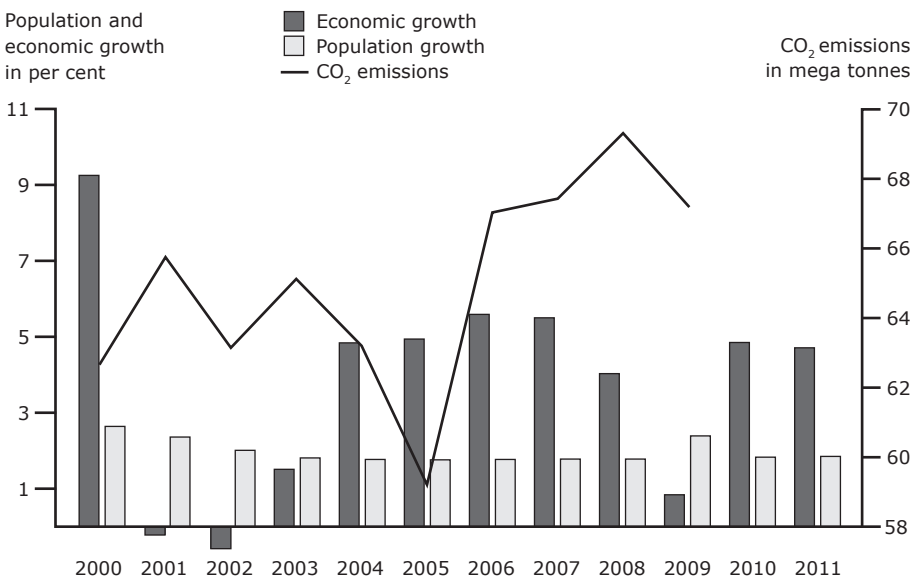
### Specific Environmental Factors

In terms of geography, Israel is characterised primarily by arid and semi-arid climatic zones. The average annual temperature is 21.4 degrees Celsius, with temperatures fluctuating according to the time of year and location. In Jerusalem, the average temperature is 17.8 degrees Celsius, while it is seven degrees higher in Eilat. During the summer months from June to August, the figures rise to an average of 27.6 degrees Celsius overall, while dropping to

2 | Cf. Daniel E. Orenstein, Alon Tal and Char Miller, "Introduction", in: *Between Ruin and Restoration: An Environmental History of Israel*, Daniel E. Orenstein, Alon Tal and Char Miller (eds.), Pittsburgh, University of Pittsburgh Press, 2013, xi; Ehud Zion Waldoks and Abraham Rabinovich, "Carmel, and its people, prepare to rise from the ashes", *Jerusalem Post*, 10 Dec 2010, http://www.jpost.com/Features/InThespotlight/Article.aspx?id=198830 (accessed 5 Mar 2013).

an average of 14.2 degrees Celsius in the winter between December and February. The latter are also the months that generally encompass the rainy season. Precipitation varies greatly throughout the country. In the south, annual rainfall might only amount to 100 millimetres. In the north, it can be up to 1,100 millimetres. Water thus represents one of the scarce resources in Israel, 45 per cent of whose landmass consists of desert. Since the early 1970s, there has been a noticeable change in temperature in the region, forecast to lead to an increase in average temperature of 1.5 degrees Celsius by 2020.[3] Conservative scenarios described by the Intergovernmental Panel on Climate Change (IPCC) assume that there will be an increase in average temperature of 5 degrees Celsius in Israel by the end of this century compared to the period between 1960 and 1990.[4]

Fig. 1
**Economic growth, population dynamics and carbon dioxide emissions in Israel, 2000 to 2011**




Source: World Bank, n. 5.

3 | Cf. Israel Ministry of Environmental Protection, "Coping with Climate Change. Special Issue. UN Copenhagen Climate Change Conference", 2009, http://old.sviva.gov.il/Enviroment/Static/Binaries/ModulKvatzim/P0525_1.pdf (accessed 5 Mar 2013), 6; Lucy Michaels and Pinhas Alpert, "Anthropogenic Climate Change in Israel", in: Orenstein et al., n. 2, 312.

4 | Cf. Israel Ministry of Environmental Protection, n. 3, 6.

Demographic development and economic dynamics have a significant impact on environmental conditions. In Israel, both show an upward trend, i.e. there is growth in both the population and the economy (see Fig. 1). The per capita GDP was around 19,000 U.S. dollars (at current prices) in 2011, while it amounted to over 31,000 U.S. dollars ten years later.[5] This does, however, entail greater pressures on the environment, affecting particularly the availability of usable water as well as the emission of climate-damaging gases, land use and energy demand. These lead to interactions with regard to climate change, which need to be examined more closely.

**Causes for the Rise in Emissions**

Reliable figures for the emission of greenhouse gases in Israel are available up to 2008. According to these, emissions have increased by five per cent since the turn of the millennium, rising to 78 million tonnes of carbon dioxide equivalent[6] ($MtCO_2e$).[7] There has been no sign of the trend reversing so far. On the contrary, the volume of emitted gases is expected to double by 2030, taking the 2000 figures as the basis of comparison (72.4 $MtCO_2e$). According to calculations based on a business-as-usual scenario (BAU scenario), emissions would rise to 142 $MtCO_2e$ within the next two decades.[8] At 85 per cent, carbon dioxide represents the greatest proportion of climate-damaging

5 | Cf. World Bank, "World Development Indicators", http://databank.worldbank.org/data/views/reports/tableview.aspx (accessed 9 Mar 2013).

6 | The unit "carbon dioxide equivalent" (CO2e) was devised in an attempt to put a figure on the greenhouse potential of climate-damaging emissions. The calculated value indicates the proportion by which a climate-damaging gas contributes to the greenhouse effect, using the potential of carbon dioxide as reference. The objective is the determination of the average warming potential over a defined period of time, usually 100 years.

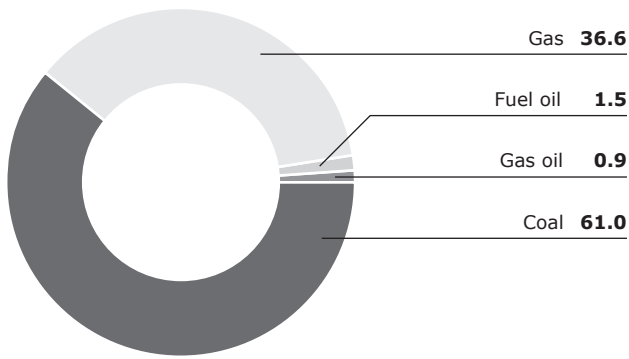
7 | Cf. Organisation for Economic Co-operation and Development (OECD), *OECD Environmental Performance Reviews: Israel, Paris*, OECD Publishing, 2011, 150 and 153.

8 | Cf. Israel Ministry of Environmental Protection, "A Carbon Cost Curve for Israel", Jerusalem, Israel Ministry of Environmental Protection, 2009, 1; Israel Ministry of Environmental Protection, *Israel's Second National Communication on Climate Change – Submitted under the United Nations Framework Convention*, Moshe Yanai Axelrod and Shoshana Gabbay (eds.), 2010, 20, http://www.environment.gov.il/Enviroment/Static/Binaries/index_pirsumim/p0578-english_1.pdf (accessed 18 Jan 2013).

gases, amounting to a total of 67.2 million tonnes (2009 status). Israel thus reaches just under 9.2 per cent of the carbon dioxide emissions for which the Federal Republic of Germany is responsible. But in a per capita comparison, the two countries are virtually identical at 8.97 compared to 8.98 tonnes.[9] The main emitters are the energy and transport sectors (power generation and fuel combustion respectively). In Israel, electricity is produced almost exclusively from fossil fuels (Fig. 2).

What makes matters worse is that the entire energy and electricity production must take place within the country's borders because there are no cross-border power trunk lines, not even to states with which peace agreements exist (Egypt and Jordan). Israel's isolated position, which is partly due to security policy issues, thus has consequences for climate policy.

Fig. 2
**Annual electricity production by national electricity provider Israel Electric Corporation (IEC) according to fuel type, 2010 (in per cent)**




Source: IEC, n. 10, 4.

As average temperatures are due to rise due to climate change, the energy supply situation will become even more precarious. During the hot summer months of July and August, power consumption is currently already 1.04 to 2.12 billion kilowatt hours higher than during the months of January and February.[10] Because of the expected rise

9 | Cf. n. 5.
10 | Cf. Israel Electric Corporation (IEC), "Statistical Report Year 2010", 2011, 26, http://iec.co.il/EN/IR/Documents/stat2010.pdf (accessed 9 Mar 2013).

in demand for cooling equipment and air conditioning, for instance, expansion of the energy generation capacities is unavoidable. This will put pressure on the providers[11] to guarantee the supply of electricity to private households and businesses without any shortages. Between 2000 and 2010, electricity consumption in Israel increased by 3.2 per cent year on year. Total consumption was close to 52 billion kilowatt hours in 2010, with total production amounting to just over 56 billion kilowatt hours.[12] At peak times, the IEC's capacities are utilised at over 92 per cent, which means there is a relatively high risk of supply shortages that may lead to power cuts.

**Consequences for the Water Balance**

**For Israel, a ten centimetre rise in sea level within a decade means a loss of between 0.4 and two square kilometres of land and a retreat of the coastline by two to ten metres.**

Rising temperatures are also leading to rising sea levels due to melting of the polar ice caps. For Israel, a ten centimetre rise in sea level within a decade, as has been predicted by scientists for the Mediterranean region,[13] means a loss of between 0.4 and two square kilometres of land and a retreat of the coastline by two to ten metres each decade.[14] Apart from these changes to the landscape, such a development will also affect the aquifers, which will be increasingly contaminated by salt water.

Furthermore, the expected reduction in rainfall will jeopardise water supplies. A ten per cent reduction in rainfall is expected by the end of this decade.[15] When considering that three quarters of the available fresh water reserves in Israel come from rainfall,[16] one realises that reduced precipitation (in combination with increased evaporation due

11 | The Israel Electric Corporation supplies not only the Israeli market, but also delivers electricity to the providers in the Palestinian Territories.
12 | Cf. n. 10, 4, 21 and 27.
13 | Cf. Fengjun Jin, Akio Kitoh and Pinhas Alpert, "Water Cycle Changes over the Mediterranean: a Comparison Study of as Super-high-resolution Global Model with CMIP3", in: *Philosophical Transactions of the Royal Society*, 368, 2010, 1-13.
14 | Cf. Israel Ministry of Environmental Protection, n. 3, 6 et seq.
15 | Cf. Michaels and Alpert, n. 3, 313.
16 | Cf. Israel Ministry of Environmental Protection, "Climate Change Adaptation in Israel", 2012, 4, http://old.sviva.gov.il/Enviroment/Static/Binaries/ModulKvatzim/Brochure-ClimateChangeAdaptationInIsrael-Nov2012_2.pdf (accessed 9 Mar 2013).

to higher temperatures) will put great stress on what is already a precarious water balance. One area under direct threat is the Sea of Galilee. Israel's only fresh water lake, it covers a quarter of the country's annual water consumption. If there is a reduction in precipitation in that area of the Upper Jordan River Basin and a simultaneous increase in evaporation – put at 20 per cent each in one scenario – this will translate into an annual loss of fresh water at 110 million cubic metres.[17]

Added to this is the fact that waters from the Sea of Galilee run through Jordan into the Dead Sea, whose mineral deposits are of considerable economic importance (particularly for the chemical industry and tourism). A circumstance that is equally significant in geopolitical terms is that the Jordan River forms a border. In the 1994 peace agreement with the Hashemite Kingdom of Jordan, the two contracting parties committed themselves to joint management of the waters of the Jordan and Yarmuk Rivers. Amongst other things, Jerusalem and Amman agreed that Israel would provide its neighbour with a specific volume of water each year.[18] One question that has so far remained unanswered is what will happen when both rivers carry substantially less water due to climatic conditions and the precisely quantified transfer can no longer be realised on the basis of the natural resources. Once again it becomes evident how the issues of climate change have an impact on areas of security policy.

Further impacts of climate change Israel will have to expect include the danger of flash floods and flooding. While the absolute quantity of precipitation may decrease, the probability of heavy rain will increase. Relatively large volumes of rain falling in a short space of time exceed the soil absorption capacity and the carrying capacity of rivers and wadis, which may cause flooding.[19] Furthermore, there will

17 | Cf. Israel Ministry of Environmental Protection, *Israel's Second National Communication on Climate Change*, n. 8, 75.

18 | Cf. Israel Ministry of Foreign Affairs, "Treaty of Peace between the State of Israel and the Hashemite Kingdom of Jordan. Annex II: Water and Related Matters", 1994, http://www.mfa.gov.il/MFA/Peace%20Process/Guide%20to%20the%20Peace%20Process/Israel-Jordan%20Peace%20Treaty%20Annex%20II (accessed 10 Mar 2013).

19 | In the winter of 2012/2013, this affected several villages and cities, including Tel Aviv, where the Ayalon River burst its ▸

be related effects on flora and fauna from the climatic changes, which will also affect cultivated land. Plants and animals being driven out of their habitats, for instance by desertification and forest fires, in conjunction with the advance of non-native species threatens to cause fundamental changes in biodiversity.[20] Where agriculture is concerned, increased use of pesticides is to be expected, which will result in contamination of soil and groundwater. In addition, yields of certain crops will be affected, for instance because of fluctuations in the growing seasons due to climatic conditions.

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## ENVIRONMENT AND CLIMATE POLICY IN PRACTICE

### Political Responsibilities

These worrying developments highlight the question as to what policy the government will apply in response. In Israel, environment and climate policy is not exclusively the responsibility of the Ministry of Environmental Protection. Besides this key department, the Ministries of Agriculture and Rural Development, of National Infrastructures, of Industry, Trade and Labor, of Construction and Housing and of Finance all have some decision-making powers in this policy area.

This fragmentation of responsibilities regarding environment policy has an impact on policy formation and means that there are conflicting goals involved. Added to this is the need to balance diverging interests within the government coalition. Given this convoluted mix of responsibilities, there is also a need for coordination between the above-mentioned departments and authorities. Four topic-specific and cross-departmental committees are performing this task. The Ministry of Environmental Protection has main responsibility for the key area of "Sustainable Development"; the area of "National Infrastructure" is controlled by the Ministry of the Interior in consultation with

banks and disrupted some road and rail traffic. Cf. Jonathan Lis, Ilan Lior and Zafrir Rinat, "Biggest Storm in Decade Wreaks Havoc in Israel, Shuts Down Ayalon Highway for 9 Hours", *Haaretz online*, 9 Jan 2013, http://haaretz.com/news/1.492773 (accessed 9 Mar 2013).

20 | Cf. n. 7, 127-133.

seven government departments, local government bodies and non-government organisations (NGOs); the Ministry of Finance has overall responsibility for "Green Taxation" and also oversees the committee on "Climate Change".[21]

**Legal Framework and Government Action**

**Israeli environmental activists complain that there is still neither consistent environmental legislation nor a coherent climate strategy in place.**

Central environment and climate-related legislation does not go very far back and has been created in a piecemeal fashion, as noted by the Organisation for Economic Co-operation and Development (OECD).[22] Israeli environmental activists share this assessment and add that it was only in the last few years that political decision-makers acquired an increasing awareness of the issues and showed a clearer willingness to take action. But they complain that there is still neither consistent environmental legislation nor a coherent climate strategy in place.[23] Pieces of legislation considered ground-breaking include the Protection of the Coastal Environment Law, in force since 2004, the Polluter Pays Law, 2008, further the Clean Air Law, which the Knesset approved in 2008 and which came into force in 2011, as well as the Packaging Law, 2011. Law enforcement tools complement these legal regulations. These include forty Environmental Inspectors, who pursue violations on behalf of the Ministry of Environmental Protection and prepare criminal prosecutions. The Ministry also funds a small environment unit of the regular Israeli police, which collaborates with the Environmental Inspectors.[24]

The Israeli government neglected climate protection for a long time and did not become active in this field until relatively recently. A first step was the establishment of an inter-departmental steering committee in 2006 headed by the Scientific Adviser in the Ministry of Environmental Protection. The aim was to form a clear picture of the challenges facing Israel in its efforts to adapt to climate change. Later on, not only did the climate debate gain in depth, activity at the political level increased as well. This

21 | Cf. ibid., 52.
22 | Cf. ibid., 160.
23 | Conversation between the author and Naor Yerushalmi and Maya Crabtree, Director and Vice-Director of the The Israeli Union of Environmental NGOs, Life & Environment, on 12 Feb 2013 in Jerusalem.
24 | Cf. n. 7, 51.

was probably due in large measure to the Copenhagen UN Climate Conference, the 15th conference of the contracting states of the UN Framework Convention on Climate Change (UNFCCC). "In the run-up to Copenhagen, Israel's leaders finally began to acknowledge the need to address climate change."[25] The first indication of this was a McKinsey study on the costs involved in reducing greenhouse gas emissions in Israel published in November 2009. The second one was the commitment by President Shimon Peres to reduce carbon dioxide emissions by 20 per cent by 2020 announced at the climate conference in December 2009.

Table 1
**Recommendations of the McKinsey study on the greenhouse gas abatement potential**

| | |
|---|---|
| 1. | High penetration of concentrated solar thermal power generation |
| 2. | High penetration of solar photovoltaic power generation |
| 3. | Improved fuel efficiency of internal combustion engine vehicles |
| 4. | Increased energy efficiency in new buildings as a result of improved planning and insulation |
| 5. | Use of efficient lighting and lighting control systems |
| 6. | Retrofit of residential buildings with improved insulation in order to improve heating and cooling efficiency |
| 7. | Industry fuel transition – fuel oil to gas |
| 8. | Use of landfill gas for electricity generation |
| 9. | Increased penetration of electric vehicles and plug-in hybrids (assuming low-carbon power fuel mix) |
| 10. | Use of wind turbines for power generation |

Source: McKinsey & Company, n. 26, 3 et seq.

The analysis by McKinsey & Company[26] determined the abatement potential regarding the emissions of climate-damaging gases compared to a BAU scenario, in which

25 | Michaels and Alpert, n. 3, 322.
26 | Cf. McKinsey & Company, "Greenhouse Gas Abatement Potential in Israel. Israel's GHG Abatement Cost Curve", Translated Executive Summary, 2009, http://mckinsey.com/~/media/McKinsey/dotcom/client_service/Sustainability/cost%20curve%20PDFs/israel_cost_curve_exec_summary_english.ashx (accessed 8 Mar 2013).

emissions forming Israel's carbon footprint would increase to 142 $MtCO_2e$ by 2030. If the study's recommendations (see Table 1) were followed, it should be possible to cut these emissions by 52 $MtCO_2e$ through technical means as well as measures to encourage behavioural change. The greatest impact could be achieved in the energy sector: firstly by converting to renewable energies for electricity generation and including a greater proportion of natural gas in the energy mix and secondly through improved the energy efficiency of buildings and technical equipment, for instance.

Politicians could derive concrete implementation strategies from these recommendations if they interpreted the president's statement in Copenhagen as a call for action. In this connection it is important to know that although Israel is one of the signatories of the Framework Convention on Climate Change and joined the Kyoto Protocol in 2004, it is not part of the group of Annex I states of the Protocol, which have entered into binding commitments to reduce their greenhouse gas emissions. At the time of the ratification, Israel was not listed as an industrialised country, which is why commitments to reduce greenhouse gases were voluntary and no verification was required as is the case for the Annex I states.[27] In spite of this, the former Environment Minister Gilad Erdan (Likud) advocated that Israel should consider itself an industrialised economy even before joining the OECD – and thereby the group of industrialised nations – and demonstrate responsibility for its own ecological footprint accordingly.[28]

**Measures for Climate Change Adaptation and Mitigation**

The efforts made by the Israeli government in matters of climate protection aim both at adapting to climate change and at mitigating the greenhouse effect. Concrete measures in both areas of action require more in-depth scientific research. For this purpose, the Ministry of Environmental Protection set up a register for greenhouse gas emissions in 2010. Parties to this initiative, be they public or private

27 | Cf. Ofira Ayalon et al., "Greenhouse Gas Emission Reductions Action Plan for the State of Israel", 2011, 1, http://events.awma.org/GHG2011/Abstracts/Session%207/Abstract%20%2316/Extended%20Abstract_16.pdf (accessed 18 Jan 2013).

28 | Cf. Michaels and Alpert, n. 3, 322.

institutions and organisations, are called upon to report their emissions annually on a voluntary basis.[29] Using the resulting database should make it easier in future to make more reliable statements about the development of greenhouse gas emissions. The success of this undertaking does, however, depend on the scope of the register. The more institutions become actively involved in the data collection, the more accurate the mapping of the emissions will be. The Environment Minister has further instructed the Israeli Climate Change Information Center (ICCIC), which opened at Haifa University in 2011, to disseminate the information and carry out the scientific analysis.[30]

**The Environment Minister has instructed the Israeli Climate Change Information Center to disseminate the information and carry out the scientific analysis.**

Two years previously, the Ministry had already been instructed via a government decision to devise a national programme for climate change adaptation.[31] Work on this programme is still ongoing, although initial suggestions from individual working groups are already available. The building sector, for one, is attributed a key role in this; it is considered equally in strategies for climate change adaptation and for the mitigation of the greenhouse effect. On the one hand, higher external temperatures demand intelligent architecture, for instance to facilitate the creation of acceptable living conditions in buildings as well as disruption-free working and production processes; on the other hand, modern construction methods contribute to lower energy consumption in the construction sector, which means lower emissions from power generation based on fossil fuels.

The general recommendation is that the principle of sustainability should be enforced more strongly for new buildings and that corresponding renovation measures should be encouraged for older buildings. The most important suggestions in this area envisage mandatory energy certificates for buildings, low-energy construction methods

29 | Cf. Ayalon et al., n. 27, 4; Israel Ministry of Environmental Protection, "Climate Change Mitigation in Israel", 2012, 5, http://old.sviva.gov.il/Enviroment/Static/Binaries/Modul Kvatzim/Brochure-ClimateChangeMitigationInIsrael-Nov2012 _3.pdf (accessed 9 Mar 2013).
30 | Cf. n. 16, 2.
31 | Cf. ibid.

as well as use of renewable materials in construction. This corresponds to the catalogue of measures from the McKinsey study, which attributes "green" construction great potential for mitigating the greenhouse effect and for adapting to it successfully. There has been a standard for sustainable construction in existence since 2005.[32] Although this was amended in July 2011, it is still assessed by critics as inadequate.[33] The responsible Ministry for Construction and Housing is therefore called upon to check the existing guidelines for effectiveness and to improve them as necessary.

Apart from the need to formulate and realise a coherent strategy for climate change adaptation, the simultaneous implementation of a national plan for reducing climate-damaging emissions is urgently required. Approved by the Israeli government in 2010, this mitigation plan envisages a 20 per cent reduction of greenhouse gas emissions by 2020, in line with President Peres' declaration of intent in Copenhagen. Over the course of the current decade, the state will be making available 2.2 billion shekels (around 450 million euros) to realise this ambitious target.[34] Due to the enormous potential for reducing emissions in the energy sector, the national plan concentrates on measures in this segment. These measures are building on existing government programmes. Firstly, support is to be provided for measures aimed at reducing electricity consumption, by 20 per cent by 2020 (government decision of September 2008). Secondly, the aim is to expand the proportion of renewable energies in electricity generation to ten per cent over the same period (government decision of January 2009).[35]

## SIGNIFICANCE OF THE ENERGY SECTOR FOR CLIMATE PROTECTION

To reduce electricity consumption to the stated extent and thus make a contribution to the mitigation of global warming – even with continuing population and economic

32 | Cf. OECD, "Policies to Support Eco-innovation in Israel", 2011, http://www.oecd.org/israel/48354947.pdf (accessed 5 Mar 2013), 20.
33 | N. 23.
34 | Cf. OECD, n. 32, 12.
35 | Cf. ibid., 12 et seq.

growth – will require fundamental changes in behaviour. To this end, state authorities as well as the national electricity provider are promoting a change in attitude through increased public relations activities. What is involved in practice is that power-hungry devices are swapped for more efficient products; private households, for instance, can expect financial support if they decide in favour of a refrigerator with a high efficiency rating. Further opportunities to reduce overall electricity consumption once again lie in the construction sector, namely through inducements to use more energy efficient construction methods. Close to 60 per cent of electricity consumption in Israel is attributable to this sector (divided more or less equally between housing and business premises).[36] In addition, financial tools may be introduced to encourage electricity saving, such as special levies for businesses with particularly high electricity consumption. But there has not been sufficient progress in terms of legal regulations as yet to allow for such an option.

Prof. David Faiman from Ben-Gurion University is a pioneer in solar energy and photovoltaics. | Source: Nadine Mensel, KAS.

When considering the expansion of renewable energies, which represents the second cornerstone of the strategy to mitigate the greenhouse effect, the government wishes above all to utilise Israel's natural advantages. Solar energy is therefore of central importance, complemented

36 | Cf. Israel Ministry of Environmental Protection, Israel's Second National Communication on Climate Change, n. 8, 136.

by wind energy and biomass to a lesser extent. The main technologies for generating energy to be considered in this context are photovoltaic installations and thermal solar power plants (solar thermal technology). Although the environmental conditions are favourable, utilisation has been lagging behind the opportunities, and the expansion of the infrastructure is proving to be more difficult than expected. One reason for this is the late introduction of feed-in tariffs. It was not until 2008 that the first regulatory framework for small-scale photovoltaic plants was set up. That actually had a considerable effect. Within one year, the production from this segment increased from one to 229 gigawatt hours. During the same year, electricity generation from alternative energy sources reached 0.4 per cent of total production. One should add that by this time two per cent of the available electricity were supposed to be covered by regenerative energies.[37]

If the government wants to adhere to its ten per cent target for 2020, further huge efforts will be required, both in terms of legislation and infrastructure. David Faiman, a solar energy expert from the "Jacob Blaustein Institute for Desert Research" at Ben-Gurion University of the Negev, has made the following calculation: "Israel would need to install approximately 0.8 B kWh of new generating capacity each year until that time. Taking photovoltaics as a convenient and tangible technology, […] this would mean the construction of approximately 450 MW per year."[38] Rather than taking this route, there seems to be a greater willingness to increase the proportion of natural gas in electricity generation. In fact, this share rose from just under a fifth to a third between 2006 and 2011.[39] Those advocating greater use of natural gas are being encouraged by the fact that there are not inconsiderable reserves of natural gas present in front of the Israeli Mediterranean coastline.[40] These circumstances

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37 | Cf. OECD, n. 7, 173.

38 | David Faiman, "Key Aspects of the BGU-KAS Energy Security Conference", in: *Energy Security in Europe and Israel*, Konrad-Adenauer-Stiftung Israel, Jerusalem, 2012, 3 et seq.

39 | Cf. n. 5.

40 | The explored fields "Tamar" and "Leviathan" hold up to 750 million cubic metres of natural gas, and one can work from the assumption that there are further fields with a total volume of up to 450 million cubic metres. Cf. Faiman, n. 38, 4.

are also advantageous in terms of energy security, because the reserves promise a reduction in the dependence on natural gas imports from Egypt, at least in the medium term. Be that as it may, the government should not relent in its efforts to continue investing in alternative energy production. State assistance in this sector includes support for practical research projects for instance, available since 2008, and financial support for start-ups in the area of environmental technologies ("clean technologies").[41]

## IS THE NEW GOVERNMENT LIKELY TO GO "GREEN"?

There is still a great deal to be done in terms of environmental and climate protection where Israeli politics is concerned. Nor can the new government under Prime Minister Benjamin Netanyahu any longer afford to ignore environmental aspects when defining Israel's security interests. There is no question that the classic security policy has to take priority in view of the unresolved Middle East conflict as well as the upheavals in the Arab World, which Israelis have been following with some concern.[42] But there should be increased promotion of a wider understanding of security that takes phenomena such as climate change into account. The main challenge is bringing the long-term consequences of global warming to people's attention now. A policy aimed at avoiding greenhouse gases and saving resources will entail continuously increasing costs for future measures to adapt to climate change. Amir Peretz, the new Environment Minister from the HaTnuah (the Movement) party, therefore has many tasks ahead of him.

**A policy aimed at avoiding greenhouse gases and saving resources will entail continuously increasing costs for future measures to adapt to climate change.**

It will take valiant efforts to ensure that thinking and acting to further sustainable development will achieve wider acceptance in politics and society. This is where the involvement of numerous environmental organisations and civil society initiatives is of great importance. The umbrella organisation Life & Environment, whose members include

41 | The financial support programmes are entitled "Tnufa", "Startergy" and "Magnet". Cf. n. 32, 11.

42 | Cf. Amichai Magen, *The Crisis of Governance in the Middle East: Implications for Democracy, Development and Security*, International Institute for Counterterrorism and Konrad-Adenauer-Stiftung Israel (eds.), Herzliya/Jerusalem, 2013.

over 130 NGOs from the environmental community, for instance organises an annual action day in the Knesset to enlist the support of Members of Parliament for legislation to benefit the environment and the climate. The largest environmental organisation, the Society for the Protection of Nature in Israel, is currently targeting local communities as local elections are due in autumn. Community action is crucial for effective environmental protection by not only implementing national policy but also demanding more far-reaching steps. These communities can also provide encouragement to the general public to engage in environmentally aware conduct. One example of this is the case of 15 self-governing cities coming together to form Forum 15 in 2008, which has attracted three further communities since then. These cities have put the implementation of climate protection targets as well as measures against air pollution on their agenda.[43]

Members of the environmental NGO Society for the Protection of Nature in Israel on a visit in the Galilee. | Source: Nadine Mensel, KAS.

In support of such initiatives – and particularly to convince the politicians of the feasibility of mitigating the impact of global warming – one should invoke the pioneering spirit that has accompanied the history of the modern state of Israel from the very beginning. In spite of adverse geophysical conditions, Israel has worked its way up to become

43 | Cf. Forum 15, The Israeli Forum of Self-Government Cities, http://forum15.org.il/en (accessed 13 Mar 2013).

a high-tech country and has produced various innovations in the area of alternative energy generation and resource saving irrigation. The potential to meet the challenges of climate change is there. What is needed now is to devise an environmental and climate policy that neither thinks in short-term categories nor neglects to give serious consideration to the above-mentioned trends.