Mediterranean and National Strategies for Sustainable Development
Priority Field of Action 2: Energy and Climate Change

Energy Efficiency and Renewable Energy
Israel - National study's summary

Dr. Amit Mor, Dr. Shimon Seroussi, Eco-Energy M.S. (2001) Ltd.
Financial & Strategic Consulting ECO ENERGY

Plan Bleu
Regional Activity Centre

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1. Challenges and energy sustainability

Israel's energy sector faces a number of challenges. It is both a developed, industrialized country with living standards similar to those of many Western European countries, and a rapidly developing, resource-poor, with significant geopolitical risks, dependency on imported fossil fuels, and vulnerability to climate change. Israel is also an "electrical island" isolated from neighboring countries' national transmission systems, thereby requiring significant reserve capacity to avoid electrical blackouts.

Israel's energy demand continues to rise, albeit not at the rates seen during the mid to late 1990s. By far the largest cause of Israel's energy demand growth has been population growth, which, at approximately 2% annually, significantly exceeds that of Western Europe. In fact, per-capita demand has been relatively constant since 2002. However, compared to the current and forecasted demand growth in much of Europe, both on an overall and a per-capita basis, Israel's demand growth is significantly higher, rising 44% since 1990 compared to 15% for the European Union member nations. Moreover, Europe's energy intensity has declined steadily during that period, while Israel's have remained constant or declined slowly. Although energy demand growth has been mitigated somewhat by stricter government standards for energy efficiency and the growth of energy service companies, energy efficiency measures' influence on energy demand continues to remain marginal.

Israel's energy supply continues to be highly dependent on imported fossil fuels, particularly coal and oil, with imported natural gas likely becoming a major component of Israel's future fuel mix. Although Israel's dependence on foreign oil for electricity generation is expected to decline, the Ministry of National Infrastructures ("MNI") and the Israel Electric Corporation ("IEC") have expressed strong interest in expanding Israel's coal-fired generating capacity, which currently produces approximately 75% of the country's electricity in two major power plants. The other power plants are gradually shifting from oil to natural gas, which by 2010 would produce about 35% of the electricity and comprise some 60% of the installed capacity.

Public's awareness of the link between energy and climate change has increased recently, due to significant media exposure and increased environmental emphasis within Israel's educational system. Such awareness is critical for Israel to develop a sustainable energy future.

2. Indicators

Renewables constitute less than one-tenth of one percent of Israel's primary energy supply. Although Israel continues to be among the world leaders in the use of solar water heating, producing the equivalent of over 4% of Israel's electricity consumption, it has not kept pace with other developed countries in integrating solar resources into its energy mix, let alone other renewables. Currently, Israel's electricity generation mix is comprised of coal (75%) and natural gas (11%), with the remainder consisting of heavy fuel oil and gasoil. In 2003, the Government of Israel set rather modest goals for renewables' share of electricity generation over time: 2 percent (200 MW) in 2007, increasing to 5 percent (approximately 750 MW) by 2016. Although the 2007 goal is clearly unattainable, the 2016 target may be achievable if the planned central-station solar thermal facilities and the current renewable license holders enter the market. Nevertheless, Israel's renewables potential significantly exceeds these targets, since potential solar generation capacity alone (solar thermal and photovoltaic) may exceed 2,500 MW by 2025.

Energy efficiency has been an insignificant part of Israel's overall energy planning. The Israel Energy Master Plan and subsequent work indicate that energy conservation could comprise up to 20% of current consumption. Subsequent work by the Ministry of National Infrastructures suggests potential energy savings of 35%. Lately the MNI has begun licensing energy service companies (ESCOs) to develop this potential. Moreover, the decision by the Public Utilities Authority (PUA) requiring time-of-use tariffs for all customers with annual electricity consumption exceeding 60 thousand kWh has reduced peak-hour consumption, especially by industrial customers. Although the MNI and PUA have attempted to quantify the effects of ESCOs and time-of-use rate implementation on energy efficiency, there are no consensus studies of the overall impact of all energy efficiency initiatives on the energy sector.

3. The currently established policies in terms of RE and RUE

As mentioned above, the Government of Israel set a target of at least 2% of all electricity to be supplied by renewable energy by 2007, rising to 5% by 2016. To implement this policy, the MNI published a set of policies and procedures to promote renewables development in 2004, and the PUA has since developed renewables tariffs, licensing procedures, and codes of conduct for renewable electricity generators. The renewables tariff is calculated as a premium above IEC's normative production costs; the premium is based on the prices of the emissions avoided by substituting renewables for fossil units. IEC, as the single purchaser of this generation, pays this tariff for energy produced by these renewable generators. To date, renewable developers' response to these government initiatives has been slow, and less than 100 MW of renewable generators have received conditional licenses.

There is no Government policy for RUE similar to that for RE. Nevertheless, the Government has been setting standards for energy efficiency since 1989 when the Energy Resources Law was passed by the Knesset (Israel's Parliament). These standards include energy labeling for domestic products and inspections for larger commercial and industrial facilities. These standards have not produced measurable energy efficiencies, however, because of lax enforcement attributable largely to a lack of resources. The economic incentives for RUE have consisted mainly of Time-of-Use tariffs and the newly established, limited scope ESCOs' performance contract mechanisms, which reduce the effective cost of implementing energy efficiency.

4. Difficulties, possible solutions, needed reforms

There are a number of difficulties that have impeded the growth of RE and RUE. These include: (a) inaction and lack of policy coordination by Government authorities; (b) IEC's lack of cooperation; (c) weak economic incentives for RE and RUE; and (d) lack of public awareness of the links between climate change and energy consumption.

Some recommendations for accelerating RE and RUE in Israel include:

- Improved tariffs for renewables and mechanisms for net metering.
- Enforceable emissions performance standards as a condition for receiving and keeping electricity generation licenses.
- Non-bypassable public benefits charges on electricity and gas tariffs to support RE and RUE development.

- Improved energy efficiency labeling and information for consumers.
- Adaptation and enforcement of "Green Building" standards.
- Mandatory demand-side management programs for all fuels, with cost-effectiveness determined on a total societal net benefit basis.

5. Success story

Israel is among the recognized leaders in developing solar thermal and integrated solar/desalination technologies. It is also becoming recognized for innovative biomass technologies. These capabilities are direct results of Israel's energy resource mix; it has abundant sunshine, limited freshwater resources, and a history of innovative agricultural resource utilization. Solar and desalination technologies have benefited greatly from world-renowned university research facilities and some private investment by Israeli companies such as Solel and IDE. Eco Energy's estimates of the annual net benefits from solar-generated electricity alone range from $1.4 billion to $2.7 billion through 2025, assuming 2,000 MW of solar thermal and 500 MW of photovoltaics are phased in through that period. The benefits include avoided environmental costs, employment, avoided transmission and distribution infrastructure (for photovoltaics) and balance of payment improvements.

Although Israel has not become a major player for RUE development, the benefits from importing energy efficiency technologies are significant as well. Consensus estimates of the potential energy consumption savings through improved insulation, more efficient heating and air-conditioning systems, and passive solar energy could reduce electricity bills by $1.0 to $1.6 billion annually. These energy savings would provide secondary benefits as well, by freeing up funds for customers' investment, and enabling IEC to avoid or defer capital expenditures, thereby improving its financial condition in advance of its restructuring and privatization.