

DEPARTMENT OF ENERGY
STATEMENT OF JONATHAN H. ELKIND
ASSISTANT SECRETARY FOR INTERNATIONAL AFFAIRS
BEFORE THE
COMMITTEE ON FOREIGN AFFAIRS, SUBCOMMITTEE ON MIDDLE
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Chairman Ros-Lehtinen, Chairman Weber, Ranking Member Deutch, Ranking Member Grayson, distinguished Members of the Subcommittees - thank you for the opportunity to address you today.

My name is Jonathan Elkind, and I am the Assistant Secretary for International Affairs at the U.S. Department of Energy (DOE). My office applies knowledge of energy technologies, markets, and policies to advance U.S. objectives in international energy security, clean energy deployment, and national security. In this effort, our office works in tandem with the Department of State and other federal agencies to engage international allies and partners.

Our most robust relationship in the eastern Mediterranean region is with Israel and its Ministry of National Infrastructure, Energy, and Water Resources (MIEW), an important friend and ally to the United States. In my remarks today, I will provide context from global and regional energy markets and then focus on our collaborations with Israel in a variety of important energy areas.

Eastern Mediterranean Natural Gas Markets and the Broader Context

This is a time of significant change in global natural gas markets. Abundant natural gas resources and rapid advances in productive capacities, particularly in North America, have created significant regional and global opportunities for U.S. producers. The U.S. is experiencing an energy revolution, as we benefit from technical advances that have allowed us to unlock unconventional oil and gas resources. The U.S. is now the number one producer of natural gas in the world, and U.S. exports of liquefied natural gas (LNG) are contributing to increased competitiveness and liquidity in global natural gas markets. The Energy Information Administration's 2016 International Energy Outlook projects that global LNG trade will exceed pipeline natural gas trade by 2020, with LNG trade

of 16.5 trillion cubic feet (Tcf) projected in 2020 as compared to pipeline natural gas trade of 13.4 Tcf in 2020.

The share of LNG traded through shorter-term contracts, an indicator of a more competitive and liquid gas market, increased from 16% in 2008 to 28% in 2015. Also contributing to shifts in global natural gas market dynamics, oil-linked natural gas prices in Asia fell significantly in 2015 and some LNG importers were able to successfully renegotiate their contracts with sellers—adding more flexibility to the market. This transition away from oil-indexed pricing and longer-term contracts is being driven to a significant extent by the flexibility of destination clauses in U.S. LNG export contracts and their pricing terms being linked to Henry Hub, the U.S. natural gas benchmark.

Significant investment in LNG facilities in Australia and the United States is also re-shaping the traditionally regional nature of gas markets. The International Energy Agency forecasts that between 2015 and 2021, global liquefaction capacity will increase by 45%, mostly from the United States and Australia. By 2020, the United States is projected to account for one-fifth of global liquefaction capacity and will have the third-largest LNG export capacity in the world (after Qatar and Australia). This fundamental shift in the diversity of LNG supply sources along with increased liquidity in global LNG markets will place significant competitive pressures on other new sources of LNG. As a result, over the mid-term, the economics of LNG exports from the Eastern Mediterranean region will be challenged by the emergence of hub-pricing in global LNG trade which will reflect the impact of lower cost supply sources.

The International Energy Agency's 2016 Medium-Term Gas Market Report predicts that lower natural gas prices globally will fuel global natural gas demand – although at lower levels than previously forecast (largely due to the competitiveness of renewables). Market fundamentals analysis presented by the U.S. Energy Information Administration in the 2016 International Energy Outlook indicate an oversupply in the global natural gas market over the medium term which will likely maintain downward pressure on global spot prices for LNG.

While Europe is a particularly attractive market for new LNG supplies due to the flexibility of its gas system and well-developed spot markets, continued flat to soft European demand for natural gas suggests intense competition will develop among producers to retain or gain access to European customers.

In the Eastern Mediterranean region, there are competing proposals to develop pipeline and LNG infrastructure to support regional natural gas demand -- each with a unique set of challenges and each confronted by an increasingly competitive global supply for LNG. At present, the focus appears to be on developing regional gas pipelines.

Historically, Israel has been an importer of natural gas, with a substantial portion of its natural gas needs supplied from Egypt and a small amount from liquefied natural gas, or LNG, imports. Discoveries starting in 1999 of significant natural gas resources offshore have provided the potential to meeting Israel's domestic needs for decades to come while also presenting the possibility, and likely the need, for exports as well. In 2015, Israel consumed 297 billion cubic feet (Bcf) of natural gas; nearly all met by domestic production. According to the U.S. Energy Information Administration, Israel in 2016 has 7 Tcf of proved reserves and 33 Tcf of estimated reserves.

As Israel considers plans to become an energy exporter, multiple export agreements have been proposed with various countries. Noble Energy and its partners are working on arrangements to export Israeli gas to Jordan and Egypt for domestic consumption, and to world markets via LNG facilities in Egypt. Other countries that have proposed agreements with Israel include Turkey, Greece, and Cyprus.

Noble Energy signed a natural gas sales agreement with two Jordanian companies to provide supplies from the Tamar field in early 2014, and has letters of intent with at least three Egyptian firms for transport of natural gas via subsea pipeline to existing LNG facilities for export, as well as Egyptian domestic power generation. In August 2015 Italy's Eni discovered the Zohr gas field off Egypt's Mediterranean coast, which is estimated to hold 70 Tcf of technically recoverable natural gas resources. The discovery may make it more challenging for Israel to sell natural gas to Egypt and to use Egyptian LNG facilities.

The Israeli government is also considering the idea of transporting Israeli and Cypriot gas through a new subsea pipeline that would run to mainland Greece, which would be a very long and expensive route, and presumably therefore challenging to construct given current market conditions. A consortium led by Nobel Energy has discovered natural gas in the Aphrodite field offshore of Cyprus estimated to hold 5 trillion cubic feet of potential reserves. Israeli and Turkish officials have also indicated the time may be right to explore exporting gas to Turkey via pipeline.

To realize the potential presented by Israel's natural gas resources, commercial drivers and institutional frameworks must give investors confidence to make the long-term, multi-billion dollar commitments. These decisions by investors must be taken in context of a global competition for capital and global opportunities for natural gas resource development, so the importance of creating attractive legal and regulatory structures cannot be overstated.

U.S.-Israel Energy Dialogue

The centerpiece of our cooperation with Israel is the annual U.S.-Israel Energy Dialogue, a comprehensive inter-agency forum that includes policy and technical discussions at the level of senior officials, program managers, and researchers. Most recently, the 2015 Dialogue focused on the areas of oil and gas development, oil and gas research, the so-called energy-water nexus, energy sector cybersecurity, post-doctoral research exchanges, clean energy development, and other topics.

In any country, the energy sector is one of the foundational underpinnings of economic well-being and national security. Israel and the United States face very different energy challenges, but we also face some common opportunities. The Energy Dialogue provides a forum in which we share analysis and interpretations of energy sector trends, exchange ideas, learn about each other's research and policy priorities, and engage in collaborative problem-solving. The Dialogue is led by me and a counterpart from the Israeli energy ministry – typically the Director General. The Dialogue also provides a strong foundation for Cabinet-level engagement between the Department of Energy and Israeli counterparts. For example, in April of this year, Secretary Moniz traveled to Israel for an intensive round of meetings with Prime Minister Netanyahu, Energy Minister Steinitz, and other Israeli officials and researchers.

Let me now highlight a few specific areas of collaboration that have been important elements of our Energy Dialogue:

Oil and Natural Gas

Development and use of oil and natural gas have been an important area of focus in our Energy Dialogue. In 2011, with Israel suffering after repeated disruptions in pipeline gas supplies from Egypt, Israel solicited our assistance in trying to consider options to improve its energy security. We engaged experts from both DOE headquarters and Sandia National Lab to conduct a hazard assessment and risk analysis for a proposed floating LNG regasification terminal. Our team

conducted site visits to Israel and completed a comprehensive analysis focusing on the hazards and risks associated with the proposed floating regasification project. The regas terminal became operational in January 2013.

In March 2014, we sponsored a U.S.-Israel Offshore Oil and Gas Exploration, Development, and Production Workshop, which included experts in offshore resource development licensing from the U.S. Department of the Interior's Bureau of Ocean Energy Management. Together with inter-agency partners, we held additional workshops in Israel in September 2015, focused on detailed examination of methodologies for estimating the size of offshore reserves, and classifying those reserves, as well as workshops on CNG vehicles. Our cooperation in the area of oil and gas development continued during the October 2015 Energy Dialogue, with a breakout session dedicated to U.S. experiences in LNG development and exports, offshore leasing and evaluation, and environmental programs.

Energy-Water Nexus

One of the most promising topics under the Energy Dialogue is the so-called energy–water nexus. As Members of the Committees will know, production of water requires significant amounts of energy for extraction, purification, distribution, and treatment. Energy production likewise requires significant quantities of water, whether for thermal cooling at power plants, manufacturing processes for solar panels, drilling fluids for hydrocarbon production, or aspects of other energy production.

Israel and certain areas of the United States face an imperative to manage more effectively scarce water resources to meet the needs of our growing economies, and this imperative is core to ensuring our energy security as well. Israel has developed world-leading expertise on water management. Several of our national laboratories have been conducting research in this area as well. The expertise gained by our Israeli colleagues can have real benefit for certain areas of the United States.

At the October 2015 Energy Dialogue, Secretary Moniz and Minister Steinitz agreed to launch the U.S.-Israel Desalination Design Challenge, which was later formally announced during Secretary Moniz' visit to Israel this past April. The Design Challenge is a joint competition led by DOE and MIEW that encourages

leading engineers and researchers in the U.S. and Israel to design novel integrated energy and desalination systems. A bilateral panel will select leading designs, which will then be eligible for U.S. and Israeli funding.

Post-Doctoral Exchange Program

Israel is an important leader in scientific research, including in clean energy technologies, and this provides the basis for another important area of energy collaborations that we are focusing on through our Energy Dialogue. At the October 2015 Energy Dialogue, Secretary Moniz and Minister Steinitz agreed to enhance collaborative research – especially on clean energy topics. Earlier this year, our two agencies announced the U.S.-Israel Post-Doctoral Exchange Program, which will enhance scientist-to-scientist cooperation between DOE-funded research programs and Israeli scientists in energy-related topics of mutual interest. As a starting point, we are coordinating exchanges involving DOE Energy Frontier Research Centers (EFRCs), U.S. national laboratories, and Israeli universities and research centers. A call for research proposals has been published with the plan to start exchanges later this year.

BIRD Energy

The Binational Industrial Research & Development (BIRD) Foundation provides awards to Israeli and American companies partnering on research and development projects, with the goal of expanding cooperation between U.S. and Israeli private high tech industries. To date, \$295 million in grants have been awarded to over 800 partnerships since BIRD's inception in 1977, and those partnerships have generated over \$10 billion in product sales.

BIRD Energy, a subsidiary project focused exclusively on clean energy, has supported companies working to bring to market technology in areas such as photovoltaic design and manufacturing, biofuels production from non-food feedstocks, wind measurement, hydrogen fuel cells, magnesium batteries, industrial energy efficiency, and building energy efficiency.

BIRD Energy began in 2009 as a result of the Energy Independence and Security Act of 2007. BIRD Energy has approved 32 projects with a total investment of \$21.6 million combined from U.S. and Israeli governments, including the six selected projects announced in November 2015, which will leverage a private sector cost-share for a total project value of \$11.3 million. DOE and MIEW are

currently reviewing funding proposals under the annual competitive solicitation to be awarded at the end of 2016.

Energy Cybersecurity

Through difficult experience, Israel and the United States have learned that energy sector cybersecurity is a top national security priority for each of us. The strengthening of defenses against cyberattacks on energy companies, infrastructure, and federal agencies is a critical shared goal.

To this end, DOE and MIEW added cybersecurity as a featured topic of the October 2015 U.S.-Israel Energy Dialogue. Building on the exchanges made at the Dialogue, Secretary Moniz's April 2016 trip to Israel included discussions on energy sector cyber defense with Prime Minister Netanyahu, Minister Steinitz, and Israel's cyber coordinator. Through several recent executive level meetings and visits to recent Israeli cyber security events, our agencies are currently working together to identify specific areas of research and cooperation to improve cyber defenses in each of our countries.

U.S.-Israel Energy Center

The U.S.–Israel Strategic Partnership Act of 2014 called for the establishment of a joint energy research center. Our Department is preparing to establish in FY 2017 a virtual center that will facilitate joint research in energy and related areas, subject to appropriations. In the coming weeks and months, we will begin consultations with Israel on the focus of that center, but we expect that the center could resemble similar technology collaborations that involve contributions from both partner countries, as well as a private sector matching requirement from within each country to maximize the center's impact.

The center will build on the extensive engagement that already exists between our two countries through the U.S.–Israel Energy Dialogue, as well as programs such as the BIRD Energy program, the upcoming energy-water desalination challenge, and others. We are confident that a potential new center would help benefit U.S.–Israel energy cooperation.

U.S.-Israel Oil Agreement, Implementing Arrangements

The U.S. Department of State and Israel's Ministry of National Infrastructure, Energy, and Water Resources recently renewed the U.S.-Israel Oil Agreement for a

period of ten years, through April 2025. Under the existing agreement, the United States would make oil available to Israel in case of a major crisis, a responsibility that is taken very seriously. The Department of Energy is responsible for updating the implementing arrangements under the agreement. We are working closely with State and MIEW to ensure that the arrangements reflect current market realities and can facilitate effective support to Israel in the event of a crisis.

Conclusion

The eastern Mediterranean region is a dynamic part of the global energy landscape, and within that region, Israel is an important partner and ally to the United States. The energy sectors of our two countries are vastly different in scale, resource endowment, and a number of other attributes. Nonetheless, our Energy Dialogue has provided an important platform for collaborations on natural gas development, the energy-water nexus, clean energy research and development, energy sector cybersecurity, and other topics. By working together in this arena, we enhance our energy security and provide benefits for both our countries.

Thank you for the opportunity to appear before your committees today. I look forward to responding to your questions.