US-ISRAEL
SCIENCE & TECHNOLOGY FOUNDATION

U.S.-Israel Joint Economic Development Group R&D Mapping Project

EXECUTIVE SUMMARY

I. Introduction

The U.S. and Israeli technology and innovation enterprises are deeply intertwined. Leading U.S. firms have significant R&D operations in Israel, and Israeli firms begin planning their U.S operation on the first day of business. Thousands of corporate executives, engineers, developers, scientists and physicians pass through each nation's borders every year bearing visas, dual nationality, or funding from government programs.

While the relationship is very strong, developing strategies to increase government R&D collaboration remains a priority in bi-lateral discussions of the Joint Economic Development Group (JEDG). In recent years, the JEDG has increasingly emphasized the unique innovative components of America's high-technology industrial base and linkages to Israel's technology driven economy that strengthen both nations' innovation ecosystems.

Three unique and complementary Bi-National Foundations have invested in, promoted, and developed breakthrough technologies and moved entire fields of research forward over the past several decades, creating an extraordinary track record of economic and societal benefit to both nations.

The three funding organizations—the Bi-National Industrial Research and Development Foundation (BIRD), Bi-National Agricultural Research and Development Foundation (BARD), and the Bi-National Science Foundation (BSF)—traditionally support company-to-company product development or university-to-university partnerships, while the direct government-to- government program relationship has been less well developed in recent years.

During the June 2014 JEDG meeting, both governments decided to initiate a review of existing industry-supporting R&D programs offered by each government that have the potential to support additional international cooperation. The U.S. Department of State and Israel's Ministry of Economy directed the US-Israel Science and Technology Foundation (USISTF) to survey a representative group of R&D program offices in each country to gather information, and present non-binding findings on strategies to promote collaboration within the existing programmatic and funding environment in both countries. The survey was intended to create a useful tool for government program managers and the private sector who desire a closer relationship between the two countries in priority technical fields.

II. Methodology

A steering committee was established, comprising representatives from the Israeli Ministry of Economy and U.S. Department of State. The Steering Committee elected to survey programs in three sectors: neurotechnology, energy and cyber-security. Using a standard set of questions designed and approved by the Steering Committee, USISTF interviewed R&D program managers in over 20 U.S. offices across seven departments and agencies (selected in coordination with the Steering Committee), and gathered information from over 50 program representatives. While comprehensive, it still did not exhaustively cover these technical sectors government-wide.

While R&D is distributed across many U.S. government departments and agencies, the majority of applied and commercially focused R&D programs within the Government of Israel (GOI) are centrally managed within the Office of the Chief Scientist (OCS) in the Ministry of Economy. International programs are managed through its Executive Agency, MATIMOP. Therefore, the review on the Israeli side focused on the OCS/MATIMOP, and was supplemented by the Prime Minister's Fuel Choices Initiative Office (FCI), the Ministry of Science, Technology & Space (MOST), and relevant governmentally supported non-government organizations.

During the interviews, USISTF collected key information on the management and nature of each program: legal authorities, budget and capacity, technological priorities, and opportunities for furthering international collaboration. USISTF and the Steering Committee conducted the interviews and held discussion around nine questions:

- *What are the R&D and technological priorities within your program?*
- *Is the R&D of commercial orientation or applicative R&D?*
- *What is the budget for your program?*
- *Do you currently work with international firms, and if so how? Or do you currently offer international bi-lateral R&D programs?*
- *Are there barriers to creating bi-lateral international R&D collaborations?*
- *What types of calls, solicitations, or engagement processes do you utilize to inform U.S. companies about opportunities?*
- *What resources do you have for outreach to U.S. companies?*
- *Do you see any synergies among your programs and OCS programs and capabilities?*
- *Are you interested in pursuing a collaborative process, and, if so, what would you recommend as next steps?*

Following each meeting with U.S. department and agency representatives, USISTF prepared meeting summaries for review and feedback. After approved by the U.S. office, they were presented to Israeli offices prior to conducting an in-person interview. It is noted here that just like not all of the U.S. government offices were surveyed, there were relevant GOI offices not yet interviewed. It also is important to note that if the interviews with the U.S. offices did not reveal any synergies, or if the U.S. program managers were not interested in collaboration, the offices were not presented to the Israeli side for consideration. Since the OCS has a specific organization, MATIMOP, tasked with creating international R&D programs with other countries, this office assisted in arranging meetings in Israel. In addition, the OCS has a flexible set of legal authorities and tools to support university-industry-laboratory collaboration, both domestically within Israel and internationally. For example, the MAGNET program funds consortia in Israel and international partners can be allowed to join in many circumstances.

In early May 2015, the State Department hosted an interim briefing on USISTF's preliminary findings which was attended by nine of the participating offices. The summary of the project distributed at the Oct. 13th meeting of the JEDG will be circulated to all participating offices.

III. The Findings

Overall, the review revealed that there were substantial opportunities for further collaboration with mechanisms already in place. Program managers surveyed in the U.S. and Israel offered many ideas and suggestions for joint activity. These ideas generally divided into seven main themes:

1. **Increase Direct Proposals to Existing Programs**
2. **Integrating Foreign Partners into Existing Consortia**
3. **Bi-lateral Solicitations**
4. **Creating Partnerships around SBIR Program**
5. **Expansion of Eligible Activity under GOI Programs**
6. **Facilitation of Joint Proposals with U.S. National Labs**
7. **Organizational Infrastructure**

IV. Discussion of the Findings:

Discussions with representatives of the two governments revealed there a need to increase awareness of all the government R&D program opportunities for collaboration on each side. Many individuals knew of an ongoing bilateral dialogue or a single collaborative activity, but were not fully aware of the range of opportunities to partner through existing U.S. program mechanisms or international programs of the OCS administered by MATIMOP or other GOI Ministries. The top recommendations are included later in this report, and several are discussed in detail below.

An impediment revealed from the interview process is that often U.S. and Israeli departments and agencies and their R&D program managers believe they must work exclusively with the sister agency. Or they believe their sister agency holds exclusive responsibility for comparable programs when in fact the two governments line-up of R&D is not symmetrical. While workshops, conferences and roundtable discussions that include private researchers and businesses from both countries take place on a regular basis, there are no sector or technical discipline-based multi-agency forums in which program managers from across government can participate. A regular forum in which several U.S. departments and agencies participate would enable their program managers to become better informed and offer more opportunities to create cooperative agenda with the GOI Ministries to expand government program bi-lateral R&D cooperation.

The routinely used and successful model of international cooperation used in Israel is a bi-national solicitation, which MATIMOP administers in partnership with more than 30 countries. Since U.S. R&D programs are not centralized as many are in Europe and other countries, this process is more difficult to replicate in the United States. Both the NIH Brain Initiative and the Department of Homeland Security Cyber Security Division (CSD) are developing joint programs with other countries and have expressed a willingness to explore greater collaboration with Israel. A similar approach was used successfully on a multi-department and agency basis during the 2013 Bioenergy Challenge. In that project, U.S. government departments and agencies identified research topics of interest, and then OCS and the FCI competitively selected Israeli researchers to visit the U.S.

Developing a partnering process with participants of the multi-department and agency Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) programs is another tremendous opportunity.

Thousands of small companies (those with fewer than 500 employees) are funded in the U.S. each year for a wide variety of innovative proof of concept projects.

International partners that bring their own research budgets could contribute their expertise and support testing and evaluation to create value for the U.S. program. Several departments and agencies, including the NIH, NIFA, DHS, NIST, and NSF have expressed a willingness to explore or have taken steps to realize this concept in conformance with office capabilities and requirements of the SBIR/STTR program.

Support of pilot projects, beta tests, and product evaluation is especially significant in meeting Israeli industry needs. Both the biomedical and cyber security fields represent a significant investment of the OCS, though young Israeli companies have limited access to infrastructure. Current OCS program managers were interested seeing further use of financial support to enable small Israeli firms to license U.S. NIH intellectual property and expand participation in clinical trials in the U.S. In the energy field, support of testing and evaluation projects in cooperation with the U.S. offices such as the U.S. Department of the Navy's Office of Operational Energy. And in cyber security, supporting Israeli company's beta and test projects with U.S. companies where the infrastructure and expertise are the much needed resources and serve as the in-kind match.

Another promising project model identified was the proposed U.S. Army Medical Research and Materiel Command's (MRMC) International Patent Consortium (IPC) in Israel. In this model, U.S. departments and agencies would share marketable intellectual property with the consortium, and consortium members would share the cost of foreign patent filings in exchange for exclusive marketing rights in a particular country or region. Due to the unique nature of some of the intellectual property MRMC produces for the war fighter, either there is no a U.S. market or there may be significant markets in other geographical regions. The proposed IPC model is a pilot project to increase international filing of patents for U.S. government funded intellectual property, while extending an economic advantage to Israel's biotech and medical device industry.

Finally, allowing OCS grants to financially support training sessions for Israeli industry to adopt and comply with U.S. standards was of interest to both governments.

1. Increase Direct Proposals to Existing Programs

"Bring me companies doing X."
"Can you publish our solicitation in Israel?"

Many U.S. R&D programs already welcome applications from foreign researchers and companies. The program managers interviewed offered suggestions on ways to share program information with their Israeli counterparts, and strategies for reaching a larger audience in Israel to increase the number of high quality competitive proposals from Israeli applicants. For example:

- The GOI could publish solicitations from U.S. agencies in Israel. The National Institutes of Health's (NIH) BRAIN initiative and the Defense Advanced Research Projects Agency (DARPA) are two programs actively seeking competitive applications from foreign researchers and firms.

- The GOI could organize industry days or proposer's workshops in Israel, similar to those regularly conducted by DARPA, the Intelligence Advanced Research Projects Activity (iARPA) and other agencies. The U.S. program managers would discuss scientific and technological mission needs, with the goal of generating increased competitive submissions to open solicitations and plans for future solicitations.

- The GOI and U.S agencies could develop a platform to share information on U.S. programs open to foreign researchers, and opportunities for U.S. researchers in Israel. For example, a centralized web site could be created to publish this grant information. The GOI also could designate a single point of contact that U.S. agencies could rely on for information on Israeli R&D programs and contacts.

2. Integrate Foreign Partners into Existing Consortia

"It is easier to link an international participant to an existing consortium than to create a new one or new program."

Numerous consortia programs exist in both the U.S. and Israel across many technical disciplines, and foreign participation can frequently be allowed by each government. Suggestions on ways to leverage existing consortia models for the benefit of both nations include:

- Partners in the Brain Stimulation and Monitoring Technology (BSMT)], an Israel-based consortium sponsored by the MAGNET program, could meet with the U.S. Army Medical Research Material Command (MRMC) on methods of collaboration on topics such as mild traumatic brain injuries, post traumatic stress disorder, electric-based therapeutics, operational stressors/predictors, along with other medical technologies with civilian applications.

- This could lead to U.S. partners joining the consortium, and the establishment of a consortium site in the U.S. If successful, this could serve as a precedent for the addition of U.S. partners to other OCS MAGNET-supported consortia.

- Israeli entities that are self- funded, or funded through GOI programs could join existing U.S.-based Industry-University Cooperative Research Centers (I/UCRC), funded jointly by industry and the National Science Foundation (NSF). A first step to foster collaboration could be convening center directors in Israel to present their ongoing research and ideas for collaboration to Israeli universities and companies. Once priorities for collaboration are identified, the GOI could support one or more Israeli University and companies to create an international site for an existing I/UCRC. If successful, this model could be expanded to other I/UCRCs.

- The above I/UCRC model for collaboration also could be applied to NSF's Engineering Research Centers.

3. Bi-lateral Solicitations

"We're discussing something with X country right now.
We can explore something similar in Israel. In fact, their experience might be helpful"

Some U.S. agencies already issue joint solicitations on projects of mutual interest. In this model, proposers can apply jointly, and if their project is selected, the U.S. partner is funded by the U.S. agency and the Israeli partner is funded by the GOI. Following are suggestions for expanding this successful practice to additional programs:

- The OCS, the Ministry of Science and Technology (MOST) and the NIH BRAIN program could discuss the Letter of Intent used by NIH with other countries to develop an appropriate cooperative R&D process between the agencies. The NIH provided a sample Letter of Intent as the first step in exploring bi-lateral solicitations.

- GOI and the Department of Homeland Security Cyber-security Division (CSD) could collaborate to develop a joint call for proposals after selecting a cyber-security topic that has a critical mass of companies to participate. This could be modeled on work that CSD has initiated with the Netherlands.

- The NSF is implementing joint solicitations with the Bi-National Science Foundation.

4. Creating Partnerships around the U.S. SBIR/STTR Program

"It's a great idea to link U.S. SBIR companies with Israeli partners. How do we make it end-user driven?"

Developing cooperation through the Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) is another tremendous opportunity. Thousands of small companies are funded in the U.S. each year for a wide variety of innovative proof of concept projects. International partners that bring their own budget can help contribute their expertise, support testing and evaluation, or help meet additional R&D objectives to create value for the U.S. program. Suggestions for exploring this opportunity include the following:

- The GOI could work with interested U.S. agencies to develop a pathway within the SBIR program to enable collaborative projects with Israeli researchers, with GOI funding the Israeli partner.

- In addition, GOI could create the capability to map U.S. SBIR awardees and use the information for matchmaking purposes.

- The GOI could participate in the National SBIR/STTR Conference by bringing Israeli companies and arranging partnering meetings.

- MATIMOP could coordinate with interested U.S. offices on incoming and outgoing delegations to match SBIR participants with potential Israeli partners. For example, supporting a delegation of NIH SBIR grantees to attend the BIOMED conference in Israel, and a delegation of Israeli

5. Expansion of Eligible U.S. Activity under GOI Programs

"It's the partnership with the U.S. partner that is most important, not how the bi-lateral process works. We need to support Israeli companies' pilots, tests and beta sites with U.S. partners"

Because the Government of Israel has a more centralized R&D system than exists in the U.S., it could consider expanding the range of activities receiving financial support from the GOI, such as:

- In consultation with National Institute of Standards and Technology at the Department of Commerce (NIST), MATIMOP could support a series of training sessions for Israeli industry to comply with U.S. FIPS and FISMA standards.

- Synberc, JBEI and other National Lab-Industry-University consortia operating in the U.S. would make excellent platforms for the development of R&D partnerships in energy with Israeli partners. The GOI could create a pilot program to support research budgets for participating Israeli companies for 24 months with the intent of developing cooperative R&D opportunities.

- Grants from the OCS could support an Israeli company's participation in a U.S. pilot project or beta test site. For example, current GOI program managers expressed strong interest in conducting demonstrations of energy efficient technologies in coordination with the U.S. Navy's Office of Operational Energy, as well sponsoring Israel firms to collaborate with U.S. companies on testing of cyber-security technologies.

- The MRMC has proposed the creation of an International Patent Consortium under which country or regional-specific groups of firms will collectively pay the expense for patent filing in the country or region for selected inventions in exchange for exclusive marketing rights. The GOI should explore working with MRMC to establish this model in Israel.

- GOI could provide grants to small Israeli firms to enable them to license technologies from NIH.

6. Facilitation of Joint Proposals with U.S. National Labs

"The current partnership for the ARPA-E application seems to have developed quite well and we would like to see this repeated"

Today, U.S government laboratories frequently compete for funding to support defined R&D programs, create shared infrastructure (or to support other projects at the laboratory. Where eligible, the addition of Israeli partners can complement and enhance the laboratory-based program. Some ideas for exploring this area of collaboration include:

- U.S. government laboratories could facilitate partnerships with Israeli entities by working with an intermediary organization to coordinate diverse research opportunities and manage the necessary infrastructure and agreements. This was performed successfully with Los Alamos for an ARPA-E application.

- The Berkeley Open Biofoundry, a vision of the Lawrence Berkeley National Laboratory and Synberc will house an advanced synthetic biology center and biological foundry, and is actively seeking collaborations with international partners willing to establish "sister institutes" within their borders. The GOI could explore collaboration with LBNL to determine whether a sister institute should be established in Israel, and to foster collaborative research projects.

- Synberc, JBEI and other National Lab-Industry-University consortia operating in the U.S. also would make excellent platforms for the development of R&D partnerships in energy with Israeli partners. GOI could create a pilot program to support research budgets for participating Israeli companies for 24 months with the intent of developing cooperative R&D opportunities with one or more of these consortia.

7. Organizational Infrastructure

"What do you know about Government of Israel R&D Budgets and Programs?"

One result of the survey was learning to what extent program managers in both the U.S. know about the full multi-office spectrum of GOI R&D opportunities. Both U.S. and Israel offices which participated expressed the desire to have better information about programs and funding opportunities, which could be created in several ways:

- The JEDG could request the designation of a lead agency in both countries responsible for ensuring each countries appropriate R&D offices and included in bi-lateral R&D initiatives.

- The GOI and U.S agencies could develop mechanisms to share information on U.S. programs open to foreign researchers, and opportunities for U.S. researchers in Israel. For example, a centralized web site could be created to publish this grant information.

- A joint Bi-lateral Agency Research Committee on U.S.-Israel Neurotechnology Cooperation could be established among the multiple U.S. government agencies participating in this area of research such as U.S. MRMC, NIH, iARPA, DARPA and NSF. And Israel's equivalent ministries including the Ministry of Economy, Ministry of Science and Technology, Ministry of Health, Ministry of Defense, to ensure all government offices know of opportunities.

- The joint Bi-lateral Agency Research Committee model also could be applied to all disciplines.

V. Conclusion

The interviews reveal additional opportunities for expanded R&D collaboration exist, and the programs and mechanisms are already in place. Under the framework of the JEDG, interested offices should determine goals and milestones to be implemented during by 2016. The USISTF remains available to serve as a supporting resource to move mutually agreed upon ideas to operational activities. In conclusion, and to maximize the value of the project, we have created a short-list of twelve activities that could begin today and quickly make an impact:

1. **Publication of Solicitations:** Publish NIH and all U.S. agency solicitations eligible for international submissions in Israel.

2. **Centralized Address for U.S. & Israel Opportunities:** Develop a central online address for both U.S. and Israel government agencies to post links or publish calls and solicitations. U.S. & GOI agencies can direct consortia to publicize international participation opportunities on the central address.

3. **Host I-UCRC Center Directors in Israel:** Host I-UCRC Directors in Israel to present their programs to Israeli Universities, MOST, and the OCS.

4. **"ARPA" Proposer Day:** Organize an industry day proposer's workshop in Israel for "APRA" programs which allow and encourage international participation.

5. **Support U.S. Standard Conformity:** Allow Israeli companies to use GOI R&D grants to become U.S. Standard compliant in the field of cyber-security.

6. **Joint Bidding:** Facilitate Israeli companies and researchers applying for GOI grants as part of a U.S. National Lab Consortium applying for U.S. Federal Funds. This model would be applicable to U.S. Universities as well.

7. **Test & Evaluation with U.S. Partners:** Allow Israeli companies to use government grants to support the costs of beta site and test and evaluation projects with U.S. partners without a requirement of matching financial support.

8. **Direct Engagement.** Multi-ministry development discussions with U.S. agencies that have expressed a willingness to enter into a joint solicitation.

9. **Advertisement on SBIR Resources Page:** Develop an information package that can be published on SBIR/STTR agency websites resources page informing U.S. companies how to find a partner in Israel, and notification of the potential match funding.

10. **National U.S. SBIR Conference:** The GOI should participate at the National U.S. SBIR/STTR Conference May 2016 with a delegation and host a partnering event.

11. **Trade & Innovation Missions for SBIR Participants:** Organize inbound and outbound Trade & Innovation Missions focused around partnering with US SBIR/STTR awardees. Inbound to BIO 2016, outbound to BIOMED 2016.

12 **U.S.-Israel S&T Agreement.** The S&T Agreement will allow U.S. companies and research institutes to directly engage with Israeli partners supported by OCS programs. Leveraged resources for all partners.

Thank You

USISTF