



The Israel–
Europe R&D
Directorate



HORIZON 2020

The European R&D Programme Takes Off



The contribution to Israel's economy

How to participate in European research Projects

Israeli success stories in the European R&D framework Programme



OCS-Office of the
Chief Scientist
MINISTRY OF ECONOMY

A Gateway to Europe



In a world where Industry is predominantly data-intensive and research-based, and where a large portion of Research is application driven, it is of essential importance to combine the two worlds together. The EU R&D Framework programmes (FPs) are the world's biggest platform for international collaboration between players from the commercial

and industrial realms and academic research groups. Israel's participation in the programme opens a gateway to Israeli entities for strategic integration into European research, development and marketing frameworks, owing to the relationships and partnerships that are created throughout the work process. These partnerships produce a business potential for expanding the Israeli industry's areas of operation, contributing to its positioning at the forefront of technology worldwide.

In FP7, which has ended in December 2013, Israeli industrial and academic entities benefitted from research grants estimated at a total of 840 million Euros. On top of this vital financial support, these entities were exposed to the intellectual property created in the process of the joint work, which became available to all of the participants. The value of this knowledge is immeasurably immense; the tools and financial support that are available to these entities, as part of the programme, as well as the opportunity to be exposed to knowledge and research that cannot be accessed in any other way, are key assets of paramount importance to Israel, globally positioned at the pinnacle of global R&D. Collaboration between the EU and Israel is more than 20 years old, and plays a significant role in every leap forward that is made by the Israeli industry and academia. We improve from one FP to the next. The new FP, HORIZON 2020, launched this year, will accompany us in the following years to come and is bound to implement many of the lessons that were learned in the previous FPs.

HORIZON 2020 places great emphasis on Israel's R&D community, and focuses on small and medium-sized enterprises (SMEs) that are so common in Israel, aiming to make the support channels accessible to as many players as possible, including government bodies and nonprofit organizations. The programme highlights innovation which well characterizes the State of Israel, a global leader in technological workforce, ranked fifth in patents per inhabitant. It is also worthwhile pointing out that in the framework of encouraging and promoting technological initiatives, the Office of the Chief Scientist operates many binational programmes, annually matching and supporting more than a hundred binational projects of strategic significance.

The Office of the Chief Scientist views the integration of Israel in the framework programmes as a direct extension of its binational activity, as part of the European research area, constituting one of the world's most progressive and principal research centers.

Sincerely,

Avi Hasson
Chief Scientist of the Israeli Ministry of Economy
and Chairman of ISERD's Steering Committee

A Win-Win Opportunity



The long-standing cooperation between Israel and the European Union on research and innovation is a key element of our broader relations. The attention devoted in Israel to the upcoming association agreement to

HORIZON 2020, the EU's new €80 billion, seven-year science funding programme, bears witness to this. This cooperation builds on the long-standing relationship in research and innovation, which is part of everyday reality for Israeli universities, research organisations, industrial laboratories and their partners across the Mediterranean and the broader European Union.

Israel's participation in our last research framework programme, FP7, has been a strong success and the results achieved impact in all spheres of the economy and society: from health to the environment, transport, energy and many others.

Since 2007, Israeli entities have signed 1,458 grant agreements involving more than 1,770 Israeli participants with EU funding of over 740 million euro. Israel attracted 223 European Research Council grants for cutting edge research, participated strongly in collaborative research, particularly in ICT, and the Israeli research community has been integrated across all elements of FP7.

I look forward to the association of Israel to HORIZON 2020 as a means to further strengthen our cooperation. This will bring tangible as well as intangible benefits. The direct financial investment will result in even larger economic spillovers. And equally important is the access to research facilities, the exchanges of good practices and the dialogue among researchers and other actors in society across different disciplines, languages, cultures that HORIZON 2020 will allow. Indeed, cross cultural cooperation in research and innovation is an important mechanism to reinforce mutual understanding and support regional stability.

Máire Geoghegan-Quinn,
European Commissioner for Research,
Innovation and Science

Leveraging Israeli Science



As the Minister of Science, Technology and Space, I see tremendous importance in Israel joining the EU R&D Framework Programme HORIZON 2020. The Ministry of Science, Technology and Space, which focuses on leading the area of applied research, bridging between basic and applied research, views the European framework

programme as crucially instrumental for attaining leverage, and as a vital infrastructure for strengthening these areas and fortifying Israel's science and technology in all fields.

The accomplishments of Israeli scientists in the 5th, 6th, and 7th framework programmes were extremely impressive, and Israel joining HORIZON 2020 was, in my opinion, inevitable – both from the perspective of the State of Israel and that of the European Union.

The European framework programme is an important factor in the national effort of advancing and promoting science in Israel. In the age of globalization, it is clear that the development of science and technology must be achieved by collaborating closely and across boundaries with leading global scientific, industrial and academic entities, while applying an interdisciplinary approach, a spirit of collaboration, information flow and feedback, as well as creating direct inter-personal relationships between researchers from different countries. All these are demonstrated in the European framework programme, and offer the State of Israel a possibility to maintain its high level of scientific research, while fostering a fortified network of international scientific relationships.

International scientific collaboration drives forward the relative advantages of Israel's science and research system, and streamlines access to cutting-edge research infrastructure and unique scientific equipment. The framework programme is an extremely meaningful platform that finances and advances academic research in Israel, leading to scientific and technological development. It is worthwhile pointing out that 4 of the 50 research universities which received the highest number of research grants from the framework programme are Israeli universities. Israel's success in this programme is an outstanding achievement, renowned for its positive impact on advancing science, on the industry's relationship with European countries, on technology transfer, and on Israel's position as a leading scientific-technological player in the global sphere and in Europe particularly.

The first round of calls for proposals for HORIZON 2020 is already underway, and I am absolutely certain that the Israeli scientists are already busy preparing their research proposals, together with their European colleagues. My wish to us all is that we will continue to positively benefit from the programme, leveraging the strength of Israeli science.

Sincerely,

MK Yaakov Peri

Israel's Minister of Science, Technology and Space

Reason Prevailed



It is a great pleasure to greet you as we undertake the first steps in joining HORIZON 2020, the next big venture in large scale collaborative research. We are by now seasoned veterans of previous European Framework Programmes, where we have proven that Israeli researchers

are second to none, having been awarded research grants that far exceed our membership fees. Moreover, we have witnessed the spectacular success of our young scientists in the ERC programme, which means that we are breeding new generations of researchers that are well positioned to lead over years to come in frontier research. Similarly, the many incoming faculty receiving support from Marie Curie have allowed our research universities to recruit more young faculty, and to provide them with the necessary means to conduct research at those initial crucial stages.

As much as we take pride in those achievements, we are grateful to the European Union for having fully opened its doors to us as full members in the framework programmes. We hope that our participation has not only fostered our own research, but has contributed in a significant way to advance the scientific enterprise in Europe, for the benefit of mankind.

It is not a secret that this time around serious difficulties arose as we negotiated our participation in HORIZON 2020. Finally reason prevailed on all sides, and the way was paved for joining once again this unique wide-scale research endeavour. In the name of the academic community in Israel, I want to express our deep gratitude to all those who worked hard to make it happen, among them the Israeli Foreign Ministry, the Prime Minister's Office, the Office of the Chief Scientist at the Ministry of Economy, ISERD, the Planning and Budgeting Committee of the Council of Higher Education, and of course our European counterparts. Special thanks to Marcel Shaton, who has headed ISERD since its creation, leading it to the great achievements that we now take pride in – best wishes to Marcel in his coming retirement.

We are looking forward with great excitement to the unfolding of HORIZON 2020, we are confident that we will continue to excel in it, and thus to strengthen the research ties with the expanding scientific family that HORIZON 2020 will soon span.

Sincerely,

Prof. Manuel Trajtenberg

Chairman of the Planning and Budgeting Committee of the Israeli Council for Higher Education



Leverage for Economic Growth

Israel's participation in the European Union's R&D Programmes has helped advance Israeli science to the next level through substantial grants, enhanced competitiveness in industrial sectors and facilitated collaboration between Israeli and European scientists. An interview with Marcel Shaton, General Manager of ISERD – The Israel–Europe R&D Directorate, who is certain that HORIZON 2020 will be even more innovative

A last-minute diplomatic effort ensured Israel's continued participation in HORIZON 2020, the European Union (EU) R&D Framework programme (FP). This effort expressed the mutual aspiration of both academia and industry in Israel, to be part of Europe's leading R&D programme, in which Israel has attained a respectable position over the years as one of its most prominent participants. In fact, this is one of the European programmes in which Israel enjoys an equal status, despite it not being an EU member.

For Israel, the importance of the EU FP is reflected in the data collected by ISERD – The Israel–Europe R&D Directorate, headed by Marcel Shaton and operated through the Office of the Chief Scientist at the Israeli Ministry of Economy. In the 7th FP (FP7), which ended in 2013, 2,110 Israeli scientists were awarded research grants of 840 million Euros. The total value of projects involving Israeli participation is 10 billion Euros.

The important contribution of the EU FP to both academic institutions and the development of innovative industrial products, has turned it into one of the major growth engines of the Israeli economy. No similar programme exists, granting access to a budget of 77 billion Euros in upcoming years and to European institutes.

Shaton believes that the programme constitutes a gateway for Israel to enter the European arena. Europe also

recognizes the growing importance of investing in R&D as a leverage for economic growth. Shaton points out that this outlook is based on studying the success of Israel and Ireland. The staff at the Directorate–General (DG) for Research and Innovation of the European Commission, is drawing conclusions from the implementation of previous programmes, and is making the adjustments necessary for adapting to the changing times of the 21st century economy. HORIZON 2020 will be even more innovative, and will deal with issues closer to the market, making it more suited for the Israeli R&D community than previous programmes.

What differentiates HORIZON 2020 from previous FPs?

Marcel Shaton: "By the end of every FP, each new commissioner at the DG for Research and Innovation of the European Commission finds himself confronted with building a new programme, different from the previous one. The financial model of HORIZON 2020 is new and different, based on 100% R&D costs refund, as well as 25% for overhead. In FP7, the financial model differed slightly, yet the financial result was ultimately the same. There, the refund was of 75% of the R&D costs, and 60% for overhead, so that eventually, SMEs and universities were reimbursed for 120% of their costs.

"The new programme relies more closely on the innovation chain – from the basic research stage until the

product reaches the market. The core of previous FPs was generic research. In HORIZON 2020, the budget for pure basic research (Blue Sky) was doubled on the one hand, while the programmes are to be closer to the market on the other. This approach encourages innovation in both basic research and technological development."

Israeli Success

Which areas are included in HORIZON 2020?

"Generally speaking, HORIZON 2020 covers all research areas: basic areas, such as ICT, nanotechnology, materials, manufacturing and space, as well as areas defined as societal challenges such as health, food, cleantech, transport, climate, homeland security and social sciences."

How is the new approach expressed towards small businesses?

"This time there is real improvement for small and medium-sized enterprises (SMEs). These businesses will now be able to contend independently, and apply for a grant without needing to join forces with a consortium. By EU definition, an SME is an autonomic company that employs up to 250 employees, with annual turnover not exceeding 50 million Euros, or with a unified balance of all of its activities not exceeding 43 million Euros. This is to ensure the business does not engage in any leveraged activities."



Good news for SMEs. Marcel Shaton

Did FP7, which ended in 2013, yield the desired results as far as Israel is concerned?

"FP7 was an Israeli success according to the concluding data. Israeli submissions reached 8,800 of which 2,110 were successful. Israeli industry had 464 wins, received grants in the total sum of 203 million Euros and participated in projects with a total value of 6.3 billion Euros. It is estimated that the value of the knowledge made available to Israeli companies is worth at least 2.1 billion Euros.

Israeli universities accumulated 1,330 wins with grants totalling 574 million Euros. Other sectors had 464 wins with grants totalling 63 million Euros. All Israeli entities won grants totalling 840 million Euros while Israel's participation fees were only 535 million Euros".

How did universities benefit from FP7?

"There is no doubt that FP7 contributed to the academic institutions in Israel. It enabled bringing Israeli scientists back to Israel, building labs and enhancing the exposure of the Israeli academia both in Europe and worldwide. A total of 574 million Euros in grants were awarded to 1,330 academic entities, from which 368 million Euros were awarded to 257 ERC grantees."

With which European countries did Israeli entities collaborate most

in FP7 projects?

"Germany, with 1,723 participations; UK, with 1,358 participations; Italy, with 1,206 participations; France, with 1,181 participations; and Spain, with 1,004 participations."

Which projects were led by Israeli companies?

"Two examples: The first is "ESS", a project led by the Israeli company Verint, which develops a decision making support system for on-the-field real time crisis management. The project won funding through the SECURITY programme in the 2007 call for proposals, and included 19 partners from Israel, Italy, Germany, the Czech Republic, Spain, France, UK, Greece and Sweden. The Israeli partners in this project were Verint, Aeraunautics and Magen David Adom (Israel Red Cross).

The second example is OptiBand, a project led by the Israeli company Corrigent Systems, which specializes in optimizing TV broadcasts over IP protocols. The project received funding through the 2009 call for proposals in the ICT programme, and included 11 partners from Israel, Belgium, Italy, France, Netherlands, Spain, Austria, Finland and Germany. The Israeli partners are Corrigent Systems and Optibase, and the major European partners include Telecom Italia, the Telecommunications Research Centre Vienna (FTW) in Austria, and Fraunhofer from Germany." ●

The Strategic Asset

The territorial clause almost pushed Israel out of HORIZON 2020, yet diplomatic intervention ultimately secured Israel's participation

The EU FPs constitute a strategic asset for the Israeli economy. Negotiations regarding Israel's association to HORIZON 2020 were conducted in two parallel channels: political, of territorial context, and technical, determining the manner for implementing the agreement.

According to the agreement, Israeli entities can participate in the programme if the R&D activity, for which the European grant is received, is conducted within the Green Line, even if the grant recipient is engaged in other activities beyond the Green Line.

RSFF loan eligibility is conditioned upon ensuring that the loans received will not finance R&D activity beyond the Green Line. Every application will be considered individually, to determine the most suitable solution.

A Worthy Investment

Israel's participation in FP7 had significant achievements, especially in the fields of ICT, ERC, homeland security, space, energy and transportation. Was the investment made in the programme worthwhile?

The Israeli return on investment is 60% - Israel invested 535 million Euros in FP7, while Israeli entities received 840 million Euros in research grants. This does not include the value derived from accessing the results of all the projects. These remarkable results shattered any concerns regarding the feasibility of participating in the FPs. In 1996, when Israel joined FP4, it paid 100 million Euros, and received only 50 million Euros - a disappointing result that raised questions in Israel about the programme. In FP5, Israel paid 154 million Euros and received 167 million Euros in grants, and in FP6 Israel paid 191 million Euros and received grants valued at 204 million Euros. The results of FP7 proved beyond any doubt that there is a significant return on investment, especially due to the ERC and the relative portion of funds that the Israeli industry received from the Cooperation programme. The participation rate of the Israeli Industry in the programme stands at 60%, compared with the European average of 25%, relatively positioning the Israeli industry in the first place. There is no doubt that the EU FP has opened the gates of Europe for the Israeli R&D community.





When Israel Met Europe, and Vice Versa

The combination of Israeli initiative, planning, research and creativity with those of its European counterparts has produced unique collaborations that yield impressive results. From a campaign encouraging bicycle use, to developing tools for bespoke chemotherapy treatment: 10 projects that are the fruits of the unique collaboration between Israel and the European Union's Framework Programme for research and innovation



SagivTech // Project: SceneNet

Enjoying a Depeche Mode concert five years ago, inspired Chen and Nitzan Sagiv to think: what do people in the audience do with all the clips they take during the concert using their smartphones, and could this information be used to create a quality 3D video, which is based on pictures collected at a multi-participant event? "The idea is to leverage on the wisdom of the crowd, and from a collection of low quality clips - depicting the scene from one single perspective - create an enhanced 3D video clip."

The Sagiv couple-team is the owner of Sagiv-Tech, a company specializing in image rendering solutions, from algorithm levels to realization in software, specifically on parallel platforms. The SceneNet project is conducted in collaboration with the Bremen University in Germany and the Swiss Institute of Technology. "This project is like a train-engine, hurling us forward," says Chen Sagiv. "To reach our goals and present an impressive and profound demo, we develop advanced algorithm and computerized technology." Now marking its fourth-year relationship with ISERD, the company, defined as an SME, was supported by ISERD services to better understand and streamline its operations with the EU. "For us, as a small company, such a research is considered a luxury," says Chen. "As Israelis who do not understand how to correctly handle our dealings with EU institutions, we have been, and continue to be, assisted by ISERD in asking questions and receiving answers."



Weizmann Institute of Science // Project: IMAGO

It has been four years since Prof. Michal Neeman, Dean of the Biology Faculty at the Weizmann Institute, started applying the IMAGO project for researching vascular development. She explores these in normal systems too, including fetal acceptance and development in early stages of pregnancy, and in pathological systems, such as cancerous tumors or post-transplant procedures.

For this project, Prof. Neeman is developing cutting-edge imagery methods that enable 3D kinetic observation and tracking of a wide variety of parameters, including shape, function and capacity of flow and carriage between the blood and tissue. "We study the factors that either expedite or block blood vessels, or the elements that determine the shape and function of blood vessels."

The project, which has received funding from the EU, is currently in its final stages, yet Prof. Neeman attests she will apply for continued support. "Many questions came up during the process," she says, "And these give us new directions for investigation."





Tel Aviv Municipality // Project: 2MOVE2

This past year, a mega-scale EU project was launched bringing together 180 cities from 30 countries looking to create alternative modes of transportation that are environmentally-friendly, sustainable and energy-efficient. Tel Aviv-Jaffa is the first city in Israel to take part in this project, titled 2MOVE2. Guided by the EU, Tel Aviv joined partner cities such as Stuttgart, Aachen, Brno and Malaga, committing to seven projects with a budget estimated at 1 billion Euros.

Dr. Benny Maor, head of the Construction and Infrastructure Administration at Tel Aviv Municipality and chair of the Steering Committee, elaborates on the projects

that are currently underway: developing traffic control technology with a preference for public transportation; sharing data from different sources, aimed at providing a complete information for route users; promoting electric vehicles –

substituting motorcycles used by the municipality with electric-run ones and on-street charging stations across the city; improving loading and unloading policy; providing transportation solutions for labor-intense areas, such as shuttles and car sharing; green routes. In one of the city's neighborhoods, a campaign is currently underway to encourage use of bicycles. Upon completion, the project's effectiveness will be measured, and lessons-learned will be implemented for the future. In addition, the municipality is reviewing a model for transportation division at the city center, to encourage bicycle riding and walking. "I already see the huge potential of this programme, and anticipate that it will change the city's landscape," says Dr. Maor. "I truly hope that other cities will join us."



Encouraging Cycling in the City, 2MOVE2



EWRE // Project: PANACEA

The Haifa-based energy company EWRE is responsible for three international projects – all dealing with the research and development of burying greenhouse gas emissions, and all at the forefront of global research. For this project, titled PANACEA, the company, headed by Dr. Jacob Bensabat, conducted two deep drills. Heavy monitoring and measuring equipment was inserted deep underground, through which CO2 Insertion experiments are run. The goal was to identify and quantify the factors responsible for long-term stability of stored CO2, and its interaction with the environment in which it is stored, while preventing damage to the environment and addressing public safety issues. The goal was to reach a state where CO2 emitted from factories and power station chimneys can be compressed and returned to the geological layers deep below the Earth's surface, reducing damage to the planet. "This is our sixth project with the EU," says Dr. Bensabat. "On the onset, as a young company, we did not know if we could bid for a large-scale project given our financial turnover. At ISERD we were given the reassurance that we could, and it succeeded."

EWRE
Environmental and Water Resources Engineering



Ben Gurion University // Project: SULTEG

It is often said that when you work on your research you know where you begin but you can never know where it may lead you. This is exactly what happened to Prof. Amir Aharoni from the Faculty of Natural Sciences at Ben Gurion University, Beer Sheva. Prof. Aharoni worked on a project in the field of protein engineering, in which he altered the characteristics of the protein by inserting an assortment of mutations. The goal was to understand the function of the protein from a biochemical point of view, both in the test tube (in vitro) and on the cell level (in vivo). Prof. Aharoni wanted to check how proteins react, how they interconnect, and how a change in their characteristics affects big processes, such as DNA replication. Yet, while working on the research, Prof. Aharoni realized that protein undergoes adaptive changes to maintain network uniformity, and hence he began to focus on directed evolution. The technology and methods devised specifically for this research, completed within the framework of ERC, are now employed by him in a new project aimed at developing drugs and treatments for curing autoimmune diseases.



The Road to Europe

10 tips for joining the European HORIZON 2020 projects



HORIZON 2020 Programme Structure

€ 77 Billion

(Amount indicated in current prices. Totalled € 70.2 billion in 2011 prices)

* Amounts are indicated in billions of Euros

Excellent Science – 24.4

Recruit, encourage, and promote prominent researchers through the following tools:

- European Research Council (ERC) – 13.1
- Future and Emerging Technologies (FET) – 2.7
- Marie Skłodowska-Curie Actions – 6.1
- Research Infrastructures – 2.5

Industrial Leadership – 17

Strategic investments in core technologies, encouraging investment in research and innovation, and supporting SMEs in the following Leadership in enabling and industrial technologies (LEIT):

- ICT
 - Nanotechnology
 - Materials
 - Manufacturing
 - Biotechnology
 - Space
- 13.5**
- Access to funding resources – 2.9
 - Innovation in SMEs – 0.6

Societal Challenges – 29.7

Encourage breakthrough via multidisciplinary scientific collaborations in the following fields:

- Health – 7.5
- Food – 3.9
- Energy – 6
- Transportation – 6.3
- Climate – 3
- Social Sciences – 1.3
- Security – 1.7

Spreading Excellence – 0.8

Science for Society – 0.5

Joint Research Centre (JRC) – 1.9

European Institute of Innovation & Technologies (EIT) – 2.7



Optimata // Project: APO-DECIDE

No doubt the future of healthcare lies in precision medicine. Owing to the latest scientific progress, new diagnostic technologies have been developed that are geared towards characterizing specific molecular structures of individual patients in order to match them the most effective treatment. Yet, lack of tools for translating the patient's molecular characteristics intended for practical treatment purposes, prevents effective use of these innovative technologies and causes medicine to still be more of an art form than a science, even today. Optimata was established early in the last decade, with a vision to develop computing tools that match existing treatment protocols to a specific cancer patient for optimal effectiveness and minimal drug induced harm. The company developed the Virtual Patient concept: a set of mathematical algorithms capable of emulating the inter-relationships between a drug and the patient's pathophysiological system. As a result of its work, Optimata was invited to take part in a focused interdisciplinary project, involving doctors, biomarker developers, system biologists and bio-mathematicians, for developing new tools that customize chemotherapy treatment for patients suffering from colorectal cancer. This project's research, conducted within FP7 and titled APO-Decide, strives to develop computational methods for predicting a patient's reaction to various oncological treatments, allowing for a personalized choice of drugs and treatments, in accordance with genetic and protein test results. In this research, Optimata contributes its expertise in the Virtual Patient realm and its knowhow, accumulated while building statistical and mathematical models of complex biological systems in medicine. Participation in the programme enabled the construction of a prototype for an inclusive clinical solution, responding to the need for personalized treatment of colorectal cancer patients. The project provided the company with access to high quality clinical information, drawn from different medical centers in Europe, and to unique molecular knowledge that would not have been attained without this research.



Hanita Coatings // Project: EXPERL

Perlite is formed when molten lava meets sea water, creating volcanic glass with a high capacity of water. When perlite is heated up at an accelerated rate and in high temperatures, its water content transforms to vapor. Pressure caused by the vaporized steam, inflates the perlite grains to 20 times their original size. "This inflation is similar to the process in which popcorn is made," says Dr. Yoash Carmi, physicist and Senior Scientist at Hanita Coatings, provider of engineered filmic products. "Much as the heating process causes the corn kernel to transform into fluffy material, same goes for perlite. After heating, the end-product is light, with advanced insulating and heat resistant traits."



Hanita Coatings

Together with the fact that perlite is a cheap material, these characteristics lend it the ability to be well suited for many uses, such as construction, agriculture and industry. Yet, in order to adapt it for more advanced uses and for applications of high added-value, a Greek quarrying company, which extracts the perlite on Mediterranean islands, initiated a multi-participant project involving leading European companies. Hanita Coatings also joined in. "Our part was to develop the protective film laminate that would enable using perlite as a cost-effective core for vacuum insulation panels in energy-efficient refrigerators," explains Dr. Carmi.

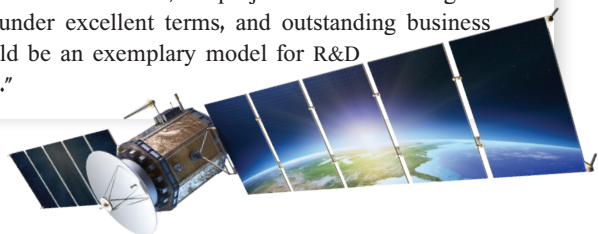
It is the company's fifth project with the EU, four of which were within FP7. "The network created by participating in the FPs provided an exceptional opportunity for collaboration in future European projects," says Dr Carmi.



Ramon Chips // Projects: MACSPACE, VHiSSI, and QI2S

Ramon Chips, dealing with planning, production and preparing of chips intended for outer space, was established a decade ago, and is already taking part in three large-scale international projects of the EU R&D programme. It participates in these projects together with leading European companies. "Our partners develop other elements or take part as future users," explains Prof. Ran Ginosar, one of the founders of the company that was named after the first Israeli astronaut, Ilan Ramon. "Actually," explains Prof. Ginosar, "these are R&D projects that offer economic leverage and allow us to be exposed to additional potential clients."

In the first project, VHiSSI, Ramon Chips develops microchips for rapid communication channels inside the satellite. In the second project, QI2S, they develop microchips for hyperspectral image processing, for which one of the applications is in agriculture. "From space, the system analyses wavelengths emitted by the plant," explains Prof. Ginosar. "This indicates phenomena to which the naked eye is blind. For example, the crop is exposed to diseases or receives too little water." As part of the third project, MACSPACE, Ramon Chips is building a computer to be installed within the satellite, enabling computing and analysis of signals that are more rapidly processed in space. "These researches enable us to forge collaborations with international giants, to which a small company such as ours would not have had access in any other way," he points out. "In addition, the project also includes a generous endorsement made under excellent terms, and outstanding business support. These should be an exemplary model for R&D funding also in Israel."





Application of multiple system data, Verint's projects.
Top: ESS
Bottom: TASS

Verint // Projects: ESS, TASS, HEMOLIA

“Saving time, saving lives” is the slogan of the project ESS, a support system enabling search and rescue forces to manage real time crises. In a multiple casualty and widespread damage event, when uncertainty levels prevail, decision makers must make vital decisions in real time. The system - developed by Verint, Aeronautics and Magen David Adom (Israel Red Cross) - is designed to synchronize between ground forces and headquarters, while receiving data from the field via sensors.

Verint, which specializes in actionable intelligence solutions and services for the defense and business sectors, is involved in three international projects as part of the EU R&D programme. The second project led by Verint is TASS (Total Airport Security System), focusing on airport security. “Our approach assumes the complete failure of all intelligence systems while the hostile is still within airport premises,” says Verint’s Gideon Hazani. “The question is how we detect it in real time, using multiple system data.”

The third project Verint leads is HEMOLIA, money laundering detection system that combines financial data analysis with information gathered from telecommunication networks, and actively shares this with international investigation agencies. “Our assumption is that money launderers do not operate in a vacuum,” says Hazani. “The combined financial-telecom analysis transforms the investigation to be two dimensional and swift.”

Verint worked with ISERD on submitting the three projects. “They are our gateway to the EU,” Says Hazani. “All the information flows through them. Relying on their expertise, they assist us in bidding for projects that are not trivial for us to approach.”



IBM // Projects: RESERVOIR, VISION CLOUD

“Participation in European projects grants us access to customers and business partners at the forefront of Europe’s industry and technology,” claims Dr. Yaron Wolfsthal, Senior R&D Manager who heads the Advanced Systems area at the IBM Research Lab in Haifa. “The projects enable us to attain profound insight regarding market needs, while at the same time to also properly expedite the development of customized solutions.”

The products of these projects often impact IBM’s global strategy, such as in the case of RESERVOIR, completed two years ago, a pioneer in cloud computerization research. IBM spearheaded the project and involved some of Europe’s leading computer and telecommunication companies. “We began this project in 2008, when the first signs of cloud technology began to sprout,” says Dr. Wolfsthal. “It gave us the opportunity to research a strategic area, backed by good partners and funding. Through this project, we attained leadership in the field and also propelled our product development capabilities in the datacenter networking area.”

Another cloud project, also led by IBM, is VISION CLOUD. In collaboration with several European media companies, IBM confronted the challenge of storing complex big data on the cloud. The outcome of this project is Object Storage technology, an innovative solution for storing music, clips and x-ray images, which received the IBC Award of Distinction at the International Broadcasters Conference.

Currently, the IBM Research Lab is working on another innovative cloud project, which promotes a powerful Open Source Cloud technology (OpenStack), as part of a large-scale European initiative on the Future Internet. As a leader in the area of advanced computing infrastructure, IBM is preparing for similar research proposals of this type in the future, including in the area of 5th Generation communication. “The people at ISERD are the new Zionists that assist the Israeli industry to advance forward in Europe,” Says Wolfsthal. “In many cases the team enables us to access information, resources, insights of needs and ways to connect to frameworks. I always say that had they not already existed, they would have had to be invented.”



Marching to the Horizon

The Israeli investment in HORIZON 2020 is significant, as are the challenges it faces. Upon launching HORIZON 2020, the new R&D Framework Programme (FP), several prominent Israeli figures gathered for a special panel to share their experiences and discuss the high returns obtained in FP7, the partnerships created between Israel and Europe, and the importance of integrating science and industry

“The European R&D Framework Programmes have granted Israel a position of excellence, which we would not have attained in any other way,” declares Prof. Ruth Arnon, President of the Israel Academy of Sciences and Humanities, and recipient of the Israel Prize.

“The consortia involved in the European R&D Programme offer great opportunity for collaboration, for both academia and industry,” she stresses. “It is a magnificent programme, which provides an opportunity for partnership and familiarity with people from universities and scientific institutions in Europe, making it highly important for Israel to continue participating in future programmes.”

Prof. Arnon said this at a panel discussion bringing together several prominent Israeli figures who are taking part in HORIZON 2020, the European Union’s 8th R&D FP. Some 70 billion Euros will be invested in the programme, which aims to establish Europe’s leading scientific and industrial position for the next decade.

The way to Israel’s participation in Europe’s prestigious programme was paved after a long and crisis-ridden negotiation. Israel, currently the only country outside Europe to take part in the FP, is now an associated member with equal-rights, owing to the significant contribution made by its

scientists and R&D community. “The Israeli investment in HORIZON 2020 is significant,” says Prof. Yoav Henis, VP for R&D at Tel Aviv University, and Chairman of the University VP Forum. “The return we received on our investment in FP7 was of the highest importance.” Both Prof. Henis and Prof. Arnon specifically stress the contribution of the European Research

Council (ERC) grants in the return of scientists to Israel.

A Leap in Israeli Investment

The preparation of Israeli companies for the launch of HORIZON 2020 began before FP7 was concluded. One such company is IBM’s Research Laboratory in Haifa. Dr. Yaron Wolfsthal, Senior R&D Manager who heads the Advanced Systems Area at the lab, says that IBM prepares extensively for its participation, with the full support of its management. He attests that the company invests many resources in this process, aiming to forge partnerships with large-scale companies in Europe and throughout the world.

Marcel Shaton, General Manager of ISERD, the Israeli R&D Directorate responsible for coordinating Israeli activity in the European FP, notes that in HORIZON 2020 Israeli investment will mark a substantial leap, exceeding 1 billion Euros. According to Marcel, this investment constitutes a significant challenge, and it is therefore crucial to extend the scope of Israeli participation – for both scientists and SMEs. “It is vital that the window of opportunities created here will be well exploited,” stresses Shaton, who expects hard work ahead for the ISERD team, and indicates that it is imperative that an adequate return on investment be attained for the R&D programmes.

SagivTech, a five years old company

More Industries, More Scientists

“Industries should lead the consortia in HORIZON 2020,” claims Prof. Ruth Arnon, President of the Israel Academy of Sciences and Humanities. Prof. Arnon explains that industries must create partnerships with scientists from the academia. “This combination is essential to Israel’s participation in the framework programme,” she emphasizes and explains that this partnership is the key to reaching additional achievements in the R&D programme. Marcel Shaton, General Manager of ISERD, elaborates on the need for an increased presence of scientists in the projects. “We must expand Israeli participation in the R&D programme,” he says, “and promote integration between academia and industry. This is an important challenge facing Israel in HORIZON 2020.”



"To expand Israeli participation in the EU R&D framework programmes." ISERD panel discussion, from right to left: Prof. Aric Orenstein, Prof. Yoav Henis, Dr. Chen Sagiv, Mr. Marcel Shaton, Dr. Vered Ariel-Nahari, Dr. Yaron Wolfsthal, Mr. David Lipkin, Dr. Rony Ohayon, Prof. Ruth Arnon, Mr. Ynon Porath

based in Ra'anana, is an example for integrating a small company in a European consortium. Dr. Chen Sagiv, the company's CEO, completed her post-doctoral programme at Bremen University, as part of FP6. Upon completion of the project, she received a grant from the EU, which led to collaboration with German universities. Currently, her company is involved in three R&D projects in Europe. The first is UNLOCK, a project in cooperation with Europe's leading mathematicians, which aims at developing a framework for constructing problem adapted, ultra-efficient algorithms for (de-) coding and analyzing signals or images. The second project, MAKDI, develops imaging technology based on medical information. SceneNet, the third project, deals with video documentation of events using multiple photographic sources. SceneNet consortium partners are Bremen University from Germany, EPFL from Switzerland, and the German companies SCILS and ERS. "We could not have arrived at these collaborations in any other way, except through the European FP," Dr. Sagiv confirms.

Prof. Aric Orenstein, Manager of The Advanced Technology Center (ATC) at Sheba Medical Centre in Tel Hashomer, recounts the hospital's successful experience with the FP. He says that

How Israel Was Accepted to CERN

"Accepting Israel into the CERN (the European Organization for Nuclear Research) is largely due to the R&D framework programme," claim both Prof. Ruth Arnon, President of the Israel Academy of Sciences and Humanities, and Prof. Yoav Henis, VP R&D at Tel Aviv University. For years Israel had participated in CERN as an observer but its scientific achievements changed its status, and in March 2013 Israel was accepted as a CERN member. "The relationship with CERN, which operates the world's biggest particle accelerator begun in the early 60's," notes Prof. Arnon, "but Israel's integration into the European framework programme aided to its acceptance to the organization."

when he first took on his current position, he found that the integration between the hospital and Tel Aviv University was lacking. In addition, he discovered that the prevailing approach at that time was that hospitals would only engage in patient treatment, and not in research. He describes that due to his intent to change this position, he was granted permission to establish a research institute employing 12 doctors and researchers. In order to forge relationships in Europe, he relocated to Europe for a period of six months, weaving a network of relationships that resulted in participation in consortia in the European FP. Today the Sheba Medical Center participates in ten consortia that also involve other Israeli organizations, including the Weizmann Institute, Tel Aviv University and Bar Ilan University. Shaton notes that other Israeli hospitals also took part in FP7,

including Hadassah, Ichilov, Kaplan, Meir and Schneider.

A Two Way Collaboration

IBM's Research Lab in Haifa was highly involved in FP7. Dr. Wolfsthal points out that the lab researchers have participated in the European Framework Programmes since FP5. The IBM lab in Haifa has led a significant number of projects in different areas, with an emphasis on ICT. The main approach taken by IBM's researchers in Haifa is to enter new areas early on, and therein strive to lead innovative European projects which are strategically aligned with the company's goals. "Participation in the European projects grants us access to customers and business partners at the forefront of Europe's industry and economy," adds Dr. Wolfsthal. "This approach enables the labs



to attain profound insights on the needs of customers and partners, and collaborate with the European ecosystem so as to significantly drive forward the development of technologies and innovative IT solutions both in Europe and worldwide". Often the results obtained from FP projects influence the global strategy of IBM. One example is the cloud storage field, where the entry of our Israeli research lab into the project has greatly advanced the entry of IBM Corporation to this field. Dr. Wolfsthal says IBM found that investment in initiating and leading FP projects is a worthwhile effort which greatly contributes to both the company and to all parties involved in Israel and Europe, including local partners, such as universities and industrial and service companies who have also joined these projects.

How does the Israeli market benefit from IBM's extensive involvement in the R&D programme?

Dr. Wolfsthal: "The benefits to the Israeli market are diverse. For example, additional local partners, such as the Technion - Israel Institute of Technology - and Maccabi Healthcare Services have participated in research proposals and projects in which we are involved, and this way knowledge is created and shared between Israeli partners, who also greatly benefit from the results of the FP research and from the relationship with this important market."

Demonstrating an Impressive Presence

Another Israeli company which was involved in several FP7 projects is Afcon Control & Automation. Ynon Porath, Director of Projects at Afcon, elaborates on the activities carried out by the company to benefit from the FP platform by gaining access to innovative knowledge and technologies and implementing them in their own products. Porath points out that European factories require advanced control systems to enable them to compete with Eastern

markets. Among other projects, Afcon is a partner in a consortium led by the University of Crete in Greece, aiming to create an effective control system capable of operating in complex circumstances.

Another graduate of the FP who also participated in the discussion is Dr. Rony Ohayon, VP of Technologies at Liveu. He completed his post-doctoral research in France, as part of FP5, and later participated as a researcher in FP6. "The programme allows small companies to think for the long-run," Ohayon clarifies. "Usually small companies mainly deal with the short-term, but now they have the opportunity to consider their future strategy in depth."

How can we prepare for HORIZON 2020 and increase Israeli presence?

Shaton: "The challenge Israel is facing is to demonstrate an impressive presence. While the programme's overall budget has grown by 40%, for Israel the cost of participation has risen by 100%, amounting to more than a billion Euros. This demands an increase in the number of participants from both academia and industry, and more particularly expanding the integration of Israeli companies in the programme. In the field of ICT, Israeli SMEs involvement was the highest, with most companies focusing on expanding their intellectual property."

In conclusion, Prof. Ruth Arnon calls to increase collaboration between industry and scientists, when competing for participation in European consortia. "Joint work should be encouraged, as both academia and industry will benefit from it," she says, and adds that there are academic

Visiting Israel Became a Delightful Bonus

"Israel became a desired destination among consortia participants," says Dr. Chen Sagiv, CEO of SagivTech. Dr. Sagiv notes that the Swiss, Austrians and Germans, with whom her company collaborates in the consortium, regard their trips to Israel as a real treat, and enjoy staying here and visiting Tel Aviv restaurants.

Shaton adds that, not very long ago, it was quite difficult to hold a meeting in Israel with all of the project's partners involved. He remembers a meeting planned in Israel during the Intifada, where all the European partners found a reason why "they could not attend" - an illness, refusal by the company or institution to approve the trip or even refusal by the insurance company to insure them. Due to this, the meeting was relocated to Madrid, but at the day of the meeting the city suffered a heavy terrorist attack in its train station.

partners in most hi-tech industries.

The Advanced Technology Center (ATC) at the Sheba Medical Center also plans to join European consortia while involving additional Israeli partners. Prof. Orenstein is already preparing to utilize the relationships formed in FP7 to promote new medical products. In order to increase the resources available for hospitals in Israel, ISERD intends to establish a forum for research managers in hospitals, to encourage them to use the "window of opportunities" of the European R&D FP. ●

The Programme's Value to Israel - in Numbers

Israel holds EU's first place in grants for researchers returning to their home country. The CIG funding tool offered by the FP, helps researchers who are training abroad to return to their countries of origin, and assimilate in academic or industrial research. As a member of the FP Israel has benefited from this funding tool. A four year adaptation grant is awarded, in the amount of 100,000 Euros. Owing to these grants, more than 350 Israeli researchers have returned to Israel and joined local research institutions and companies.





An Array of Funding Opportunities

In addition to the European Union's R&D Framework Programme, ISERD also promotes additional instruments offered by The Office of the Chief Scientist for companies seeking industrial R&D cooperation in Europe. All you need to know before partnering with Europe

In addition to the funding obtained through the European Union's R&D Framework Programme (EU FP), ISERD offers the Israeli R&D community additional funding opportunities through The Office of the Chief Scientist in the Israeli Ministry of Economy, for industrial R&D cooperation projects. These are binational (bilateral) projects which are operated under co-funding programmes.

These programmes are based on R&D cooperation agreements, signed between Israel and a European country, or between the funding agencies of the two countries. In most cases, for each programme, a call for proposals to submit binational projects is published annually.

Participants: two companies doing industrial R&D usually take part in these projects, one from each country. If the project involves academic entities, they can join as subcontractors. After a project has been examined and approved, the participating companies receive "parallel funding", where the Israeli company is funded through The Office of the Chief Scientist, and the foreign company receives funding from relevant agencies in its country of origin. The advantages for the Israeli company applying for a binational grant lie in its cooperation with the foreign company. Access to knowledge and to foreign markets transforms this funding tool into an especially attractive one.

Nonetheless, not all European countries have signed cooperation agreements with Israel. Therefore, when an Israeli company wants to apply for binational funding with such countries, the process would be slightly different. In

such cases, the request is done through EUREKA - a European programme aimed at advancing industrial R&D cooperation between countries through a "quality label" given to joint projects. The funding request submitted to EUREKA is registered at the organization's secretariat, and then transferred for examination by the funding agencies in the participating countries. The funding is received from the national agencies themselves.

The EUREKA secretariat also operates a programme called Eurostars, focusing specifically on small and medium-sized enterprises (SMEs) that are R&D intensive. This is the sector on which Europe has placed a special emphasis, as it is considered to be a sector that highly contributes to economic growth. Funding for the Eurostars programme is jointly provided by both national funding agencies and the EU FP.

When ISERD is approached by a company interested in learning more about funding opportunities, it presents to that company the variety of relevant options available. According to its goals and to the stage it is in, each company will be offered different options and programmes.

Target Audience: the binational programmes are better suited for companies in relatively advanced stages - companies that are more focused on development and less on research. Funding is faster in binational programmes, and there are higher chances of receiving it, in comparison to that of the EU FP. However the

latter offers higher funding than the bilateral programmes. Moreover, it is not required to return funding granted by the EU FP, while bilateral funding is subject to the regulations set forth by the Office of the Chief Scientist (National R&D Law) and must be returned in instalments if the project is successful and begins yielding revenues for the company.

How to Apply: submitting an application for the EU FP is more complex than for a binational project. To begin with, the calls for proposals for the EU FP are thematic, while the binational program calls for proposals are often open to any area. In addition, participation in the calls for proposals of the EU FP demands the establishment of a consortium, involving six-seven (or even more) entities from different countries, while the binational calls for proposals require only two companies, one from each country.

In Conclusion: each of the funding options is suitable for different companies. It should be stated that in many cases a project that started off as a binational one evolves into a multinational project under the umbrella of the EU FP. On the other hand, multinational projects can reach the final product implementation and marketing stage through binational agreements involving two companies which were part of an original FP consortium.

Moreover, some companies can submit parallel funding requests, using both the binational and multinational channels. ISERD is always happy to provide the Israeli R&D community with the full range of funding opportunities it can offer. ●

European countries with which Israel currently has industrial R&D cooperation agreements:
Austria, Cyprus, the Czech Republic, Finland, France, Germany, Greece, Hungary, Italy, Lithuania, Poland, Russia, Spain and Sweden.



ISERD's Team

ISERD is holding weekly orientation presentations to introduce the European R&D programmes.

Call now for more information and registration:

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