

# Private Sector Interaction in the Decision Making Processes of Public Research Policies

## Country Profile: Israel

### 1. Political, institutional and economic framework and important actors

Israel's National Science and Innovation System is characterised by an R&D intensity above EU average (overall R&D investment: US\$ 6,670 bn = 4.9% of GDP)<sup>1</sup> and a highly developed Public and Private Sector research infrastructure. 69% of Israel's GERD is contributed by the Private Sector, who at the same time is the most important performer of research (3.6% of GDP).<sup>2</sup>

Israel possesses a well developed and established National Science and Innovation System. Research policy decision making takes place with significant Private Sector involvement at its various stages. Given the lack of national resources, Israel positions itself as a 'brain' and knowledge exporting economy with a historically strong international orientation both of its scientific community and of its economic activities.

In this system, a multitude of actors interact on several levels, as depicted in Figure 1.

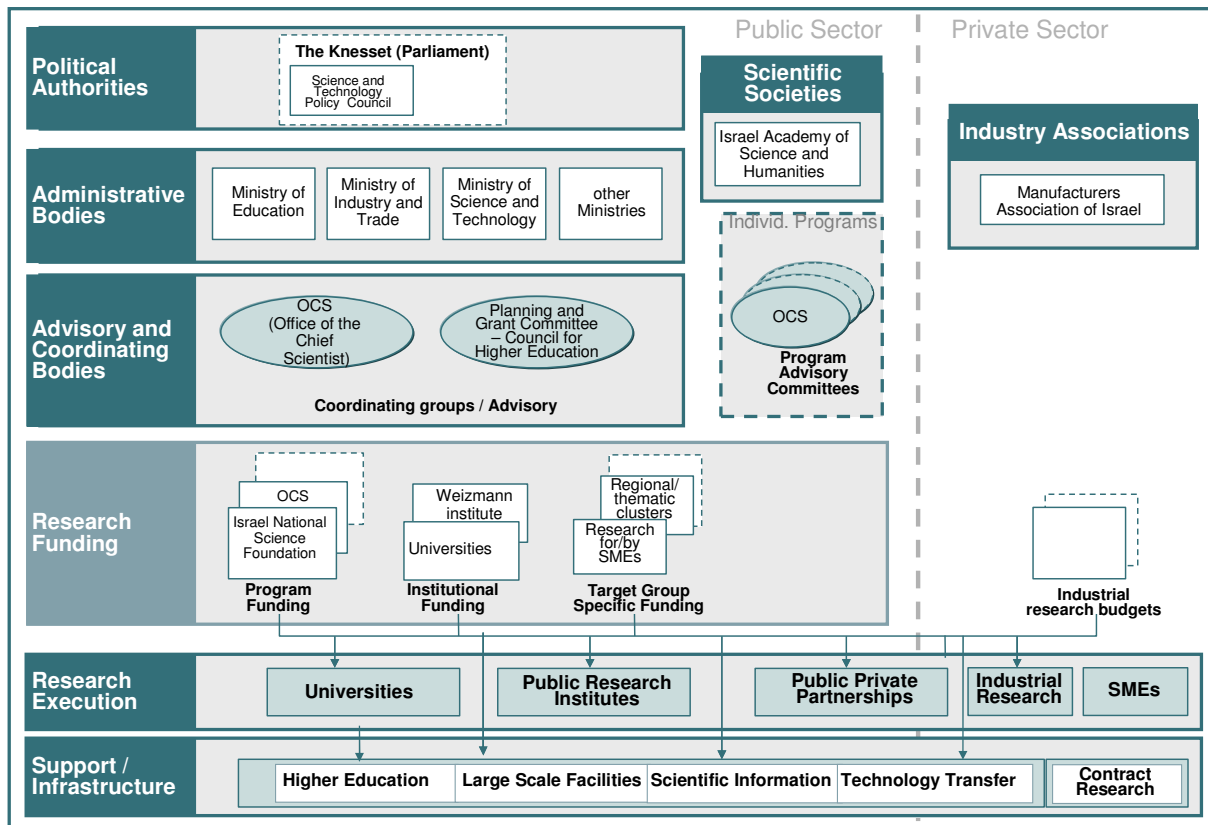


Figure 1: Relevant decision structures of the Israel National Innovation System

#### a. Political and governmental authorities

The *Knesset* is the parliament of the state of Israel. The *Knesset's Science and Technology Committee* is responsible for the design and approval of policy measures for civilian research. For this purpose, it interacts with the government offices' *chief scientists* and the *National Council of R&D*. All government ministries employ *Chief Scientists* with respective offices.

The *Ministry of Industry & Trade* is concerned, by and large, with financial incentives for preferred industrial activities. The majority of public grants for research are provided by the *Ministry of Industry and Trade* through the *Chief Scientist Office*.

<sup>1</sup> Source, OECD MSTI database; EUROSTAT 2006

<sup>2</sup> Source, OECD MSTI database; European Commission 2005, Trendchart Report

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The *Ministry of Defence* funds directly defence-related research projects. In line with mandatory army service<sup>3</sup>, army in many cases serves as first employer for the hi-tech workforce during their formative years. Many start-up companies in ICT can be traced back to former employment of founders with army laboratories.

The *Ministry of Agriculture* is directly engaged in R&D through the *Agricultural Research Organisation (ARO)*<sup>4</sup>. The *Ministry of Science and Technology* influences R&D chiefly through its responsibility for the scientific research strategy.

The *Ministry of National Infrastructures* is directly involved in R&D through its Chief Scientist and Division of Research and Development, funding research with direct short to mid term application potential.

The *Ministry of Immigrant Absorption* is an important actor through its role in the absorption of educated population migrating to Israel since the early 1990s. This immigration accounts for almost 20 percent of the country's total population and about half of the technological workforce.

The *Ministerial Committee for Science and Technology* appoints the *National Council for Research and Development (Committee for the Development of Scientific and Technological Strategic Research)*. The Council consists of representatives of the Public Sector, academia and the Private Sector. The council serves as an advisor to the government.

### **b. Intermediate bodies**

Under the auspices of the Ministry of Science and Technology, the *Academy of Science* develops strategic plans for the future technological development. The *Committee of Infrastructure* advises the Ministry of Science and Technology on national science infrastructure issues.

The *Council for Higher Education*, chaired by the Minister of Education, Culture & Sport, is the state institution in Israel responsible for tertiary education, including teaching and research. The *Planning and Budgeting Committee* of the Council has the exclusive authority for disbursing the global authorised budgets to HEIs. The Council moreover is directing education focus areas in close cooperation with the Private Sector as well as taking responsibility for research infrastructure issues. This Council, together with the Ministry of Industry and Trade, is by far the organisation with the largest budget. Therefore these organisations have the most influential roles.

### **c. Research performing institutions**

Israel possesses a well developed research infrastructure. Among the major actors are eight universities and a number of government supported non-profit R&D oriented organisations. Israel's research infrastructure is accompanied by a very active venture capital industry and a strong R&D-orientated industry, mainly in ICT-related fields as well as a in the growing biotechnology sector.

### **d. Private Sector**

The Private Sector performs the by far largest share of research (73.4% of GERD).<sup>5</sup> The majority of Private Sector research is financed from industry funding sources (90%).<sup>6</sup> The Private Sector is represented by the *Manufacturers Association of Israel (MAI)* and the *Federation of Israeli Economic Organizations (FIEO)*. MAI has the sole responsibility to represent Israel's Private Sector in all relevant policy decision making with economic impact through the preparation of position statements participation in council boards and informal direct contacts to the Public Sector.

## **2. National research policy decisions and Private Sector involvement**

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<sup>3</sup> three years male, two years female

<sup>4</sup> the ministry's research arm

<sup>5</sup> Source: OECD MSTI database, EUROSTAT 2006

<sup>6</sup> Source: OECD MSTI database, EUROSTAT 2006

As described in the previous chapter, Israel's National Science and Innovation System is characterised by close geographical and institutional proximity. Thus informal relations play a dominant role. Furthermore, significant defence-related research expenditure influences general civil R&D strategy decisions. As in other comparable National Science and Innovation Systems, military R&D plays a role in education of research-oriented human resources rather than direct civil application of military research results.

### **Instigation stage and Design stage**

Usually the Private Sector is involved in the instigation of research policies by consultations with the Research Committee and sector-specific organisations i.e. the Nanotechnology Council etc. The Private Sector is regularly involved through industry organisations or institutional bodies with Private Sector participation. Private Sector representatives either take the initiative or are officially asked by the respective ministry.

The Private Sector contribution varies depending on the type of policy issues. For example in the case of the national biotechnology strategy development, the Private Sector was involved formally through hearings as well as through joint working groups. Other policies under development are characterised by informal involvement, with the preparation of white papers by the Private Sector instead of officially established hearings or working groups. In the case of the higher education strategy, the Private Sector took the first initiative to initiate policy measures in priority areas by specifying education and human resources needs.

The Private Sector is regularly involved through the provision of estimates of expected future prospects of technology fields / research areas and resources required. Since grants from the R&D fund by the Ministry of Industry and Trade are accompanied by a royalty reimbursement programme, realistic assessments of resources required can be expected from the Private Sector.<sup>7</sup> This defines a quasi co-decisive role of the Private Sector in the design of this type of research policies.

In principle, the Private Sector involvement in the instigation stage is perceived conducive to the performance of Israel's economy and National Science and Innovation System. Due to the limited resources available for public R&D, much attention is given to early involvement of the Private Sector in this process in order to allocate the public funds most effectively and efficiently.

Joint efforts between the Public and the Private Sector turned out to be a major success factor for building and growing Israel's ICT industry. Though much research was done in the military R&D sector, financial resources were scarce. In consultation with the Private Sector, the Public Sector took the initiative to design financial support schemes, including the development of Israel's venture capital industry.

A common feature of the Israeli Science and Innovation System is the active involvement of the Private Sector in research policy design through the bottom-up collection of ideas for research projects.

### **Implementation stage and Assessment/revision stage**

In the course of the overall research policy implementation, the Private Sector mainly contributes specific information related to research projects, e.g. clear descriptions of uniqueness and value added of research projects for Israeli society. Here the Private Sector finally reserves the rights to use and further exploit technologies developed under such programmes. Furthermore, staff exchange programmes are used to enhance the mobility of research staff between the academic and Private Sectors.

Another type of involvement of the Private Sector takes place in research consortia funded by the Public Sector for applied research projects. Consortia partners jointly develop project

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<sup>7</sup> After completion of research projects, Private Sector participants are expected to reimburse the grant under certain conditions based on royalties.

plans, including milestones and targets in advance. Another precondition is a minimum 10% financing of the project budget by the Private Sector.

Through the design of direct research policy measures mainly by the Ministry of Industry and Trade's Chief Scientist Office, the Private Sector is regularly involved in the assessment of policy measures. The success of research projects is measured by the commercial success and/or the contribution of the research grant to the commercial success.

Evaluations of research programmes are usually undertaken by external Private Sector parties. Such evaluations, related conclusions and recommendations are regularly used to adjust and further refine research programs. Private Sector involvement is formally initiated by the Public Sector. Private Sector representatives usually participate in steering committees and are asked to submit their opinions.

### **Observations: Possible barriers and current initiatives**

To align the numerous responsibilities for R&D among ministries, chief scientist offices regularly host roundtable meetings to coordinate and bundle research policy-related activities.

The incubator programme implemented during the last 15 years is currently under review with the aim to privatise several incubators. Currently, there are 24 Incubators of which 13 have been privatised already, including one incubator dedicated to biotechnology projects.

The Ministry of Science and Technology supports selected virtual laboratories. Such laboratories are networks, based on existing R&D infrastructure. Network members are mainly universities. Since networks are funded and managed by the Ministry of Science and Technology, a compulsory review after 3 years is essential with definite go/no-go decision. The Private Sector is involved through opinion collection in these programs.

Other current initiatives aim at strengthening university-industry collaborations. Here, major lessons learned from other developed countries are considered. In line with stronger university-industry relations, universities are increasingly forced by the ministry to shift attitudes towards stronger commercial orientation of research activities while keeping the balance between basic and applied research. The Private Sector regularly participates in workshops and roundtable discussions.

Although Israel is very open towards the international communities, there is an ongoing effort to further strengthen the opening of the national R&D infrastructure towards global trends. Special attention is given to technology foresight studies on a global level, namely through the establishment of the Interdisciplinary *Center for Technological Analysis and Forecasting* with Tel Aviv University (ICTAF). These technology foresight studies involve the Private Sector through workshops, surveys and opinion collection.

### **3. Other important policy decisions with Private Sector involvement**

Since Israel lacks natural resources, research policies are geared towards alternatives for raw materials and towards exporting scientific knowledge. Therefore, intellectual property-related issues have a high importance. Other important research areas include military research and energy research. Israel is for example among the leaders in renewable energies and desalination. To explore and exploit such technology areas, public-private partnerships are sought to share technological risk and to secure successful market application. Policy approaches focus on combining existing public research infrastructure with Private Sector R&D in interdisciplinary research consortia. The Private Sector is regularly approached by the Public Sector to identify and specify such promising research fields.

### 4. Types of industry involvement and degree of use

The Private Sector involvement depends on the stages of research policy decision making and on the thematic context. Categories of Private Sector involvement instruments mainly used are as follows:

- *General dialogue* initiated by the Public Sector is occasionally used. Such dialogue does not focus on specific decisions but rather serves the instigation and to a limited extent the preparation of the design phase. General dialogue is also initiated with reference to mid- to long-term general framework conditions, e.g. education and human resources requirements.
- *Informal involvement* without direct participation in research policy decision making, initiated by policy makers, is part of the design and the implementation phase. Here, the Private Sector serves as advisor with no real (co-)decision power. Private Sector opinions are collected on specific themes and general official statements.
- The Private Sector is *formally involved* upon Public Sector initiative in the design, implementation and assessment of direct research policy measures. Involvement here refers mainly to the estimation and assessment of market and technology trends and respective risks. Such estimates and assessments are essential preconditions for research grants by the Ministry of Industry and Trade's Chief Scientist Office.
- *Joint activities* between the Public and the Private Sector are essential in direct public research funding by Ministry of Industry and Trade. The MAGNET program is one of the support programmes which aims to support generic research with academic and industrial partners. Here either consortia's or public-private partnerships (ppp's) are a precondition for grants. Other experiences with ppp's refer to large scale research intensive infrastructure related projects.
- *Staff interaction* does not play a dominant role on a temporary basis between the Private and the Public Sector. Staff exchange is an instrument used to enhance the mobility of research staff between academia and the Private Sector research facilities.
- *Proactive involvement* sought and initiated by the Private Sector usually refers to the instigation and design of mid- to long term measures related to national innovation framework conditions.

Different types and degrees of involvement are explained in more detail in Table 1 on page 7.

### 5. Examples of transferable approaches and experiences

The following examples represent typical approaches used in Israel with the potential to be used also in other countries.<sup>8</sup>

#### 5.1 MAGNET / MAGNETON program

The MAGNET / MAGNETON programme focuses on unique research themes which add substantial value for Israel's society through technology transfer between public research and the Private Sector. Based on the Private Sector requirements, publicly employed scientists are given the opportunity to work up to half-time at Private Sector premises. Usually, consortia between the Private Sector and academia are created as legal entities. Prior to funding, work documentations and contracts are developed and negotiated by and between partners. These documentations include work plans as well as financial and intellectual property regulations. After completion of the research project, the decision whether to further exploit and commercialise is left to the industrial partner under the condition that the publishing right for scientists from public institution is assured in an adequate time frame. The Pri-

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<sup>8</sup> Representative examples to highlight good practices. Not intended to serve as a comprehensive list and description.

vate Sector hence is given access to leading edge technology and know how from the public science base.

### **5.2 University governance system**

The biotechnology related Higher Education Strategy is an example for building a tertiary education system adopting future technological demands and requirements. Prior to the establishment of the education infrastructure as well as the related research infrastructure by the Public Sector, mid- to long-term needs of the Private Sector were collected and jointly evaluated. On the basis of these requirements, the public research and education institutes were approached by the Public Sector to prepare potential actions. Based on the collected information from the Private Sector and the HEI infrastructure, investment plans were developed. Through this, the Private Sector had a significant influence on the design of the relevant education and research infrastructure.

**Appendix 1: Overview of identified instruments for Private Sector involvement and their use in Israel**

| Instrument                    |   | Intensity of use | Initiated by  | Used for   | Used in     |        |            |        | Examples and remarks   |
|-------------------------------|---|------------------|---------------|--|-------------|--------|------------|--------|--|
|                               |   |                  |               |  | Instigation | Design | Implement. | Review |  |
| General dialogue              | Insight studies, roadmapping, foresight                           | Regular          | Public Sector | Awareness, identification of emerging technologies & trends                  | ✓           | ✓      |            |        | Biotechnology strategy   |
|                               | Conferences   | Regular          | Either side   | Discussion platform  | ✓           | ✓      | ✓          |        |  |
|                               | Brainstorming / task forces                                       | Regular          | Public Sector | Identification of priorities and possible policy actions                     |             | ✓      | ✓          |        | Committee for the Development of Scientific and Technological Strategic Research |
| Informal decision involvement | Evaluation studies  | Regular          | Public Sector | Programme review, identification of policy needs                             |             |        |            | ✓      | 'Virtual labs'   |
|                               | Advisory groups   | Regular          | Public Sector | Participation in design, evaluation, etc.                                    | ✓           |        | ✓          |        | 'Virtual labs'   |
|                               | Informal consultations  | Regular          | Either side   | Exchange of viewpoints between stakeholders                                  |             | ✓      |            |        |  |
|                               | Formal consultations  | Regular          | Public Sector | "Official" opinion   | ✓           |        |            |        | Biotechnology strategy   |
| Formal decision involvement   | Task force  | Occasional       | Public Sector | Joint policy development   |             | ✓      |            |        | Biotechnology strategy   |
|                               | Participation in decision making bodies (observer status)         | Regular          | Public Sector | Decision involvement   |             |        | ✓          |        | MAGNET   |
|                               | Participation in decision making bodies with (co-) decision right | Not common       |               |  |             |        |            |        |  |
|                               | Administrative / supervisory boards                               | Regular          | Public Sector | Private Sector representatives involved in important institutional decisions | ✓           | ✓      | ✓          | ✓      | HEI strategy (ICT / biotech)   |
| Joint activities              | Initiation of networks  | Regular          | Public Sector | Stimulation of joint public-Private Sector initiatives                       |             | ✓      | ✓          |        | 'Virtual labs'   |
|                               | Co-financing of projects / programmes                             | Regular          | Public Sector | Sharing of cost / risks  |             |        | ✓          |        | MAGNET program   |
|                               | Public Private Partnership  | Regular          | Public Sector | Pooling of resources   |             | ✓      | ✓          |        | Energy related (solar power / desalination)                                      |
| Staff interaction             | (Temporary) Staff exchange  | Occasional       | Public Sector | Enhance mutual understanding and mobility                                    |             |        | ✓          |        | MAGNETON   |
|                               | Staff mobility  | Regular          | Public Sector | Public Sector expertise in research leadership positions                     |             |        | ✓          |        | MAGNETON   |
| Unsolicited contributions     | Statements, studies, white papers, etc.                           | Occasional       |               | Express views, recommend changes, influence decisions                        | ✓           |        |            | ✓      | ICTAF studies  |
|                               | Dialogue platforms  | Occasional       | Public Sector | Initiate / facilitate dialogue with Public Sector                            | ✓           | ✓      |            |        | Biotechnology strategy   |
|                               | Research funding  | Regular          | Either side   | Initiate / support research in desired areas                                 |             | ✓      | ✓          |        | Nanotech / biotech / ICT focus   |

Table 1: Overview of instruments used for Private Sector involvement

### Appendix 2: Sources and Literature

#### 1. General and country information

Central Bureau of Statistics in Israel, *Business Research and Development 2002*, June 2005

European Commission Enterprise Directorate-General, *European Trend Chart on Innovation - Annual Innovation Policy Report for Israel Covering period September 2003 – August 2004*

European Commission, Enterprise Directorate-General, *European Trend Chart on Innovation, Annual Innovation Policy Trends and Appraisal Report Israel 2004-2005*

Eurostat, *Science and Technology in Europe, Data 1990 – 2004*, Office for Official Publications of the European Communities, Luxembourg, 2006

#### 2. Important actors

|   |  |
|---|--|
| <a href="http://www.moit.gov.il">http://www.moit.gov.il</a>   | Ministry of Industry & Trade                 |
| <a href="http://www.mod.gov.il">http://www.mod.gov.il</a>   | Ministry of Defence                          |
| <a href="http://www.moag.gov.il">http://www.moag.gov.il</a>   | Ministry of Agriculture                      |
| <a href="http://www.eng.mni.gov.il">http://www.eng.mni.gov.il</a>   | Ministry of National Infrastructures         |
| <a href="http://www.most.gov.il">http://www.most.gov.il</a>   | Ministry of Science and Technology           |
| <a href="http://www.moia.gov.il">http://www.moia.gov.il</a>   | Ministry of Immigrant Absorption             |
| <a href="http://www.cms.education.gov.il">http://www.cms.education.gov.il</a>   | Ministry of Education, Culture & Sport       |
| <a href="http://www.che.org.il">http://www.che.org.il</a>   | Council for Higher Education                 |
| <a href="http://www.industry.org.il">http://www.industry.org.il</a>   | Manufacturers Association of Israel          |
| <a href="http://www.knesset.gov.il/committees/eng/committee_eng.asp?c_id=13">http://www.knesset.gov.il/committees/eng/committee_eng.asp?c_id=13</a> | Knesset Committee on Science and Technology  |
| <a href="http://www.knesset.gov.il/committees/eng/committee_eng.asp?c_id=8">http://www.knesset.gov.il/committees/eng/committee_eng.asp?c_id=8</a>   | Knesset Committee on Education               |
| <a href="http://www.iva.co.il/">http://www.iva.co.il/</a>   | Israel Venture Association                   |
| <a href="http://www.iaei.org.il/">http://www.iaei.org.il/</a>   | Israel Association of Electronics Industries |

#### 3. Other

*Recent Economic Developments*, 104, July 2003 - December 2003

<http://www.bankisrael.gov.il/develeng/develeng104/develeng.pdf>

E N I P - European Network of Indicators Producers, *Country report Israel*, 2005

OECD, *MSTI database*, Paris 2005

#### 4. Further information and feedback

This country profile has been prepared by Dr. Dirk Meissner. For further information and feedback, please contact the responsible author under [Dirk.Meissner@proneos.com](mailto:Dirk.Meissner@proneos.com)