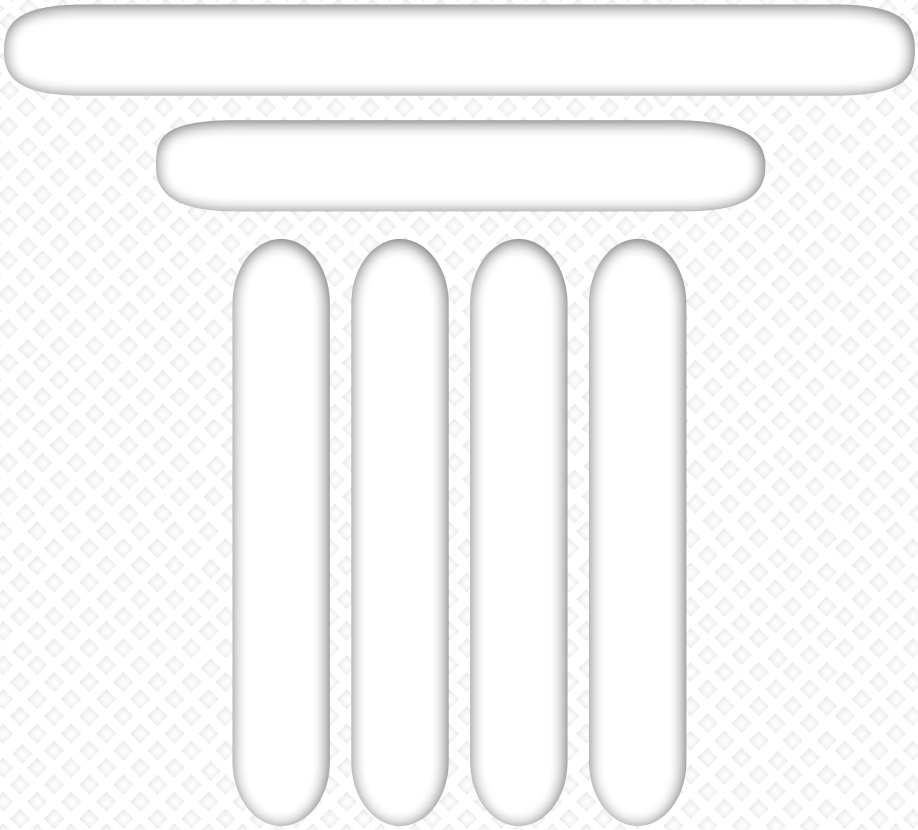
Samuel Neaman Institute
For Advanced Studies in Science and Technology

Samuel Neaman Institute
Annual Report 2013



Technion - Israel Institute of Technology

The Samuel Neaman Institute

The Samuel Neaman Institute was established in 1978 in the Technion at Mr. Samuel Neaman's initiative. It is an independent multi-disciplinary national policy research institute. The activity of the institute is focused on issues in science and technology, education, economy and industry, physical infrastructure and social development which determine Israel's national resilience.

National policy research and surveys are executed at the Samuel Neaman Institute and their conclusions and recommendations serve the decision makers at various levels. The policy research is conducted by the faculty and staff of the Technion and scientists from other institutions in Israel and abroad and specialist from the industry.

The research team is chosen according to their professional qualifications and life achievements. In many cases the research is conducted by cooperation with governmental offices.

So far, the Samuel Neaman Institute has performed hundreds of exploratory national policy research projects and surveys that serve decision makers and professionals in economy and government. In particular the institute plays an important leading role in outlining Israel's national policies in science, technology and higher education.

Furthermore , the Institute supports national projects, such as the Ministry of Industry, Trade & Labor clusters - the MAGNET program in nano-technologies, media, optics and communication, chemistry, energy, environmental and social projects of national importance. The institute organizes also comprehensive seminars in its leading fields of research.

The Samuel Neaman Institute's various projects and activities can be viewed at the Institute website.

The chairman of Samuel Neaman Institute is professor Zehev Tadmor and the director is professor Omri Rand.

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Vision

To promote informed national decisions in Israel through research and analysis of well-established information

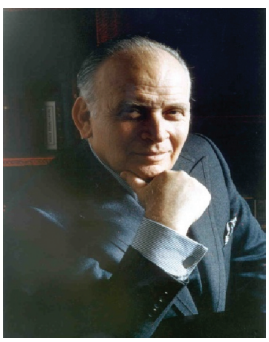
Mission

To be a leading research institute that identifies, formulates and analyzes matters of policy of national importance in the areas of scientific–technological development, economics and social issues in Israel. The Institute's activity is expected to encourage educated public debate, promote and assist the decision making process of the State of Israel and bring to the final adoption of its recommendations.

The Institute focuses primarily on formulating national policies in the fields of science and technology, industry, schooling and higher education, social integration, infrastructure, environment and energy, and other issues of national importance, where the Institute can provide valuable and unique contribution.

Vision

Samuel (Sam) Neaman
1913-2002


Samuel (Sam) Neaman

"I was born in Rosh-Pina in 1913 as the firstborn of my parents, Esther and Pinchas Neaman. My mother was also born in Rosh-Pina and my father was a pioneer who came to Israel with the Second Aliyah. My wanderings began when I was three years old". This is how Samuel (Sam) began his autobiographic story in the book *Israel in and Out*, published by the Ministry of Defense.

The book portrays the life story of Sam Neaman, describing his wanderings from Palestine to Lebanon, Syria, France and back to Israel – to the battlefield of the Second World War in the Middle East and Europe.

During his wanderings, Sam Neaman never forgot his homeland, to which he felt strongly attached. His love for the land of Israel and the state of Israel motivated him to establish the institute for policy research, the "Samuel Neaman Institute", in the Technion, which is considered a leading non-profit research center in Israel, with the goal of transferring academic knowledge, from the vast store accumulated in the State's academic institutions, to applicable routes concerned with delineating a national policy, thus connecting research and the academe with national decision makers.

Samuel Neaman died on November 13, 2002, at the age of 89. To the last, he stayed involved in the Institute's activities, contributing significantly through his ideas and bestowing his vision. He left behind him a life work that continues to breathe and live, and to stimulate Israel's leading researchers and its decision makers.

The Chairman

Prof. Zehev Tadmor
Historic Times?


Prof. Zehev Tadmor

We are living in historic times. Here in Israel, at almost any given moment that old adage rings true. And yet, these past years stand out for their momentous cascade of domestic, regional and geopolitical developments. Well into the second decade of the 21st century, right before our eyes, the rules of the game are changing. The global balance of powers is rapidly shifting in ways that are complex and dangerous, affecting Israel's economy and security and placing its well-being and very future in jeopardy. Thus, more than ever before, long-term, rational thinking which is independent of political and other considerations is imperative. In other words, these are the times when the contribution of national policy research institutions such as the Samuel Neaman Institute, are critical.

At this point, it is obvious that the wave of unrest in our region, that was (hopefully and probably disappointingly) termed the "Arab Spring," is resulting in a new Middle-Eastern world order and presenting challenges that Israel has never before encountered. From our perspective, are these changes positive or negative? Do they present an opportunity for proactive efforts to promote regional stability and the security of our nation, or represent a great and looming danger?

To this complex picture we must add the Iranian aspirations for regional hegemony, which conflict with similar ambitions of Turkey, and Russia's recent efforts to penetrate the area, while China stirs things up in the economic sphere. Again, how is Israel to prepare itself for the unexpected and existential challenges these global struggles can present?

Against this background, the possibility of reaching a peace agreement

with the Palestinians remains stubbornly beyond our grasp. Yet achieving a resolution to the conflict is more essential than ever.

Beyond regional unrest, the global geopolitical situation is changing as well. Instead of an “end of history”, which Francis Fukuyama predicted after the disintegration of the Soviet Union, there is a disturbing return to classical geopolitical strategy, as seen, for example, in the Ukraine, in the growing conflict between China and Japan, in some weakening of the glue that unites Europe, and in the aforementioned Russian attempt to return to the Middle East, among others. In parallel, giant multinational corporations and international organizations, which promote only their own interests and are not accountable to any electorate, have reached unprecedented levels of global power and influence. All these are occurring in the midst of large-scale immigration that continues to change the face of Europe, and other parts of the world.

Clearly, recent shifts in US global policy, which are driven by the sober view that its own best interest is to cease being the “world’s policeman” are having a widespread and profound impact. No longer relying on imported oil from the Middle East or anywhere else, the US is able to limit its involvement beyond its borders to areas deemed vital to American strategic interests. In addition, far-reaching demographic changes within the United States are producing a complex ethnic mix, and within a few decades, Hispanics will become the largest ethnic group in the country. Part and parcel of this process is the rapid assimilation of the large American Jewish community into this newly-created ”ethnic amalgam”. It goes without saying that the implications of these domestic American demographic changes are most significant and far reaching for Israel.

Internally, Israel is also undergoing historic demographic economic and political changes, notably, the exponential growth of the ultraorthodox population

which, according to forecasts by the Central Bureau of Statistic, could reach 4.15 million by 2059, or 35% of the Jewish population. At the same time, the entire population will reach 15.6 million, making Israel one of the most densely populated countries in the world, with all the associated social, economic and environmental challenges and dilemmas. Furthermore the current structure of the economy with the concentration of power in few hands, which severely restricts competition, necessarily leads to an unbearably high cost of living and a devastating income disparity. These economic ills already led to the "cottage cheese protests" of 2011, the largest social justice protests in Israel in recent years.

It is noteworthy to mention that already in 2006-2008, several years before the protests, a large-scale study conducted at the Samuel Neaman Institute in collaboration with the US Israel Science Technology Commission, revealed Israel's binary economic structure, with an advanced high-tech industry that employs less than 10% of the workforce (but, contributes about 45% to industrial exports), along with large, traditional and less efficient industries and services, which employ most of the workforce. Such an economy exacerbates socio-economic gaps and channels much of the wealth created by the nation as a whole to a thin upper crust of society. It is an economy that, despite the recent, enormous gas findings, will have difficulty maintaining the lasting growth upon which global competitiveness and an equitable society both depend.

This study was followed by several large, ongoing projects which address these and other issues of national importance, such as: how to increase the participation of ultraorthodox men in the workforce, how to improve the efficiency of the traditional industries, the environmental consequences of the growing population, the scientific and technological infrastructure of the country, human resource availability and needs, physical infrastructure needs

for a fast-growing population, and the development of a Grand Strategy for Israel to address the myriad challenges outlined above. Most of these projects are described in this Annual Report.

In light of the truly complex and historic times we live in, carefully formulated national strategies are an invaluable resource for the nation's policy-makers. The S. Neaman Institute and its team of experts are dedicated to the mission of providing "well researched studies for informed public debate and responsible decision-making and implementation across the government and private sectors".

Within the pages of this Annual Report of the Samuel Neaman Institute, led by Professor Omri Rand, you will find a wealth of policy studies addressing these and other challenges that Israel must contend with in order to survive and thrive.

The General Manager

Prof. Omri Rand

Prof. Omri Rand

The vision of the Samuel Neaman Institute for National Policy Research focuses on promoting decision making, emphasizing more than ever the value of the research it publishes. Well established decisions in the fields of education, society and science require research, understanding and thought in light of the changes occurring in Israel and the world at large, in all spheres of life. From this perspective, the Samuel Neaman Institute allows a thorough review of decisions and processes that decision makers wish to lead, serving as a thinking platform for making national decisions. The researchers of the Samuel Neaman Institute, considered top experts in their fields, engage in research on national policy and in thinking about various pertinent issues that emerge onto the public agenda. Their fields of inquiry include science and technology, industry, education and higher education, physical infrastructure, environment and energy and other issues of national importance to which they make a unique contribution, such as the integration of the Ultra-Orthodox in the labor market.

In 2013, the Samuel Neaman Institute launched the SNI “Wheels of Life” index, which summarizes the status of the state of Israel in five areas: society, government and higher education, energy and environment, science and technology, innovation, and economics. The data comprising this index, in addition to the analysis, insights and comments by the SNI experts, are crucial in estimating the activities carried out in Israel in the fields in question and reflect accurately the Institution’s areas of activity.

In 2013, the research conducted at the Samuel Neaman Institute focused on an in-depth and comprehensive examination of many areas. Among others,

these examinations included: In-depth understanding of the "ecosystem" of the Israeli high-tech industry, while attempting to preserve its innovativeness, led by Professor Shlomo Maital; Promoting national policy in a variety of industry issues as part of the Industrial Excellence Center, established in 2011, under the leadership of Dr. Gilead Fortuna; Infrastructure issues, led by Professor Yehuda Hayuth; Diverse subjects concerning the environment and sustainability led by Professor Ofira Ayalon; The energy sector, led by Professor Gershon Grossman; R&D policy, space and patents and examining R&D output indices of Israel, led by Dr. Daphne Getz; Education and higher education, under the leadership of Professor Zehev Tadmor; Science education, led by Professor Orit Hazzan; The "People Israel Project" and understanding Generations X and Y for educated management of the country, led by Professor Oz Almog and Dr. Tamar Almog. One of the major projects is that of integrating the Ultra-Orthodox sector in the economy, led by Dr. Reuven Gal, who continued to focus in 2013 on the process of integrating the Ultra-Orthodox sector in the Israeli labor market while offering practical solutions by publishing a guide for employers and a book about success stories and more. Thanks to these activities, the Samuel Neaman Institute won in 2013 extensive public exposure while introducing its research into parliamentary work at the Israeli Knesset and the Israeli media.

The challenges faced by the Samuel Neaman Institute are many and varied and match its vision. The Samuel Neaman Institute is obliged to maintain the tradition of high-level research and professional skills. The team of researchers and information specialists at the Samuel Neaman Institute continually work to identify and deal with issues of national and long-term importance and present their conclusions and analyses to decision makers in Israel. Research at the Samuel Neaman Institute aspires to be integrative, making efficient use of the freedom in choosing its research topics, and

The General Manager

leveraging its capabilities, multidimensional expertise and databases of information accumulated over the years while conducting hundreds of infrastructure research. The Institute also initiates seminars, expert workshops and lecture series to discuss these issues.

This annual report presents a concise description of the activities in 2013. I thank those involved in the work we do and wish us all success in the future.

Research Activities at the Samuel Neaman Institute

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Wheels of Life

A. "Wheels of Life" in Israel

Shlomo Maital & Tsipy Buchnik, with the SNI Research Teams

The Quality of Life in Israel Relative to Other Leading Nations, Over Time, in the Dimensions of Economics, Innovation, Science and Technology, Society, Governance, Education, Energy & Environment

The "Wheels of Life" in Israel is a new index developed by the research teams of the Samuel Neaman Institute, based on a unique method whose purpose is to visually portray the quality of life in Israel and show how it is changing over time.

"Wheels of Life" in Israel is defined by five different dimensions: Economy; Innovation; Science & Technology; Society, Governance & Education; and Environment & Energy. Each "wheel" evaluates Israel for each of these dimensions. For each wheel, there are 5-10 indicators. * Each indicator shows Israel's rank out of 60 leading nations that compete in global markets. The indicators were selected by the research teams. A high rank (#1) places the indicator at the outer circumference of the wheel. A low rank (#60) places the indicator for Israel at the center of the wheel. The colored area inside the wheel shows in general Israel's performance for that dimension. A large area shows that Israel excels; a small area shows that Israel lags. In addition, the "up" and "down" arrows beside each indicator show whether there has been improvement, or decline, during the year in question. Some of the indicators are objective, e.g. GDP per capita. Some of them are subjective in nature, e.g, "Science teaching in the schools is sufficiently emphasized", on a scale of 1 to 5, where 5 indicates "strongly agree".

When we look closely at the "Wheels of Life" in Israel, as shown in the following pages, we see that Israel must meet urgent challenges in economic and social policies, along with education policy, in order to maintain its excellence in innovation, science and technology, and to better

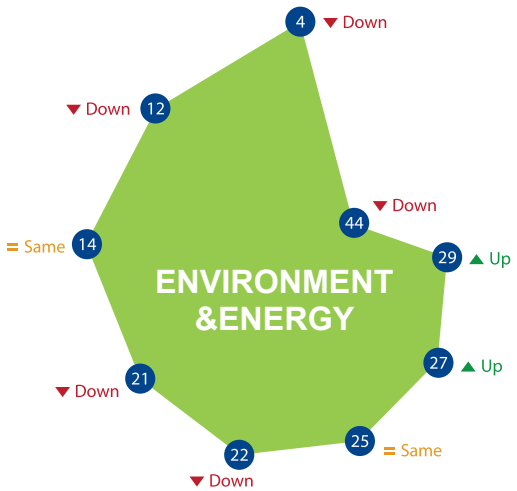
capture the potential such excellence conveys. Israel leads the world in innovation, and in many areas of science and technology, with some exceptions. But in the economic dimension, the economic benefits flowing from Israel's excellence in innovation, science and technology are far below what might be expected. This fact shows that Israel, Start-Up Nation, has not fully succeeded in realizing the potential benefits of its remarkable entrepreneurial energy. This is an issue that requires immediate rethinking, in terms of national policy.

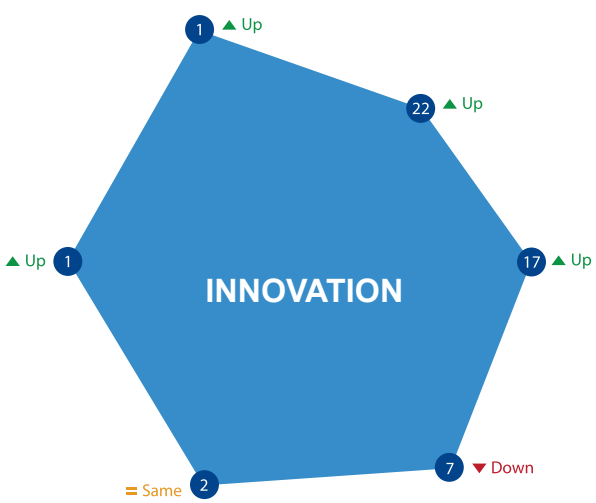
The "Wheels of Life" in Israel can be found in the Samuel Neaman Institute website, www.neaman.org.il, together with links to the relevant research reports of the SNI research teams.

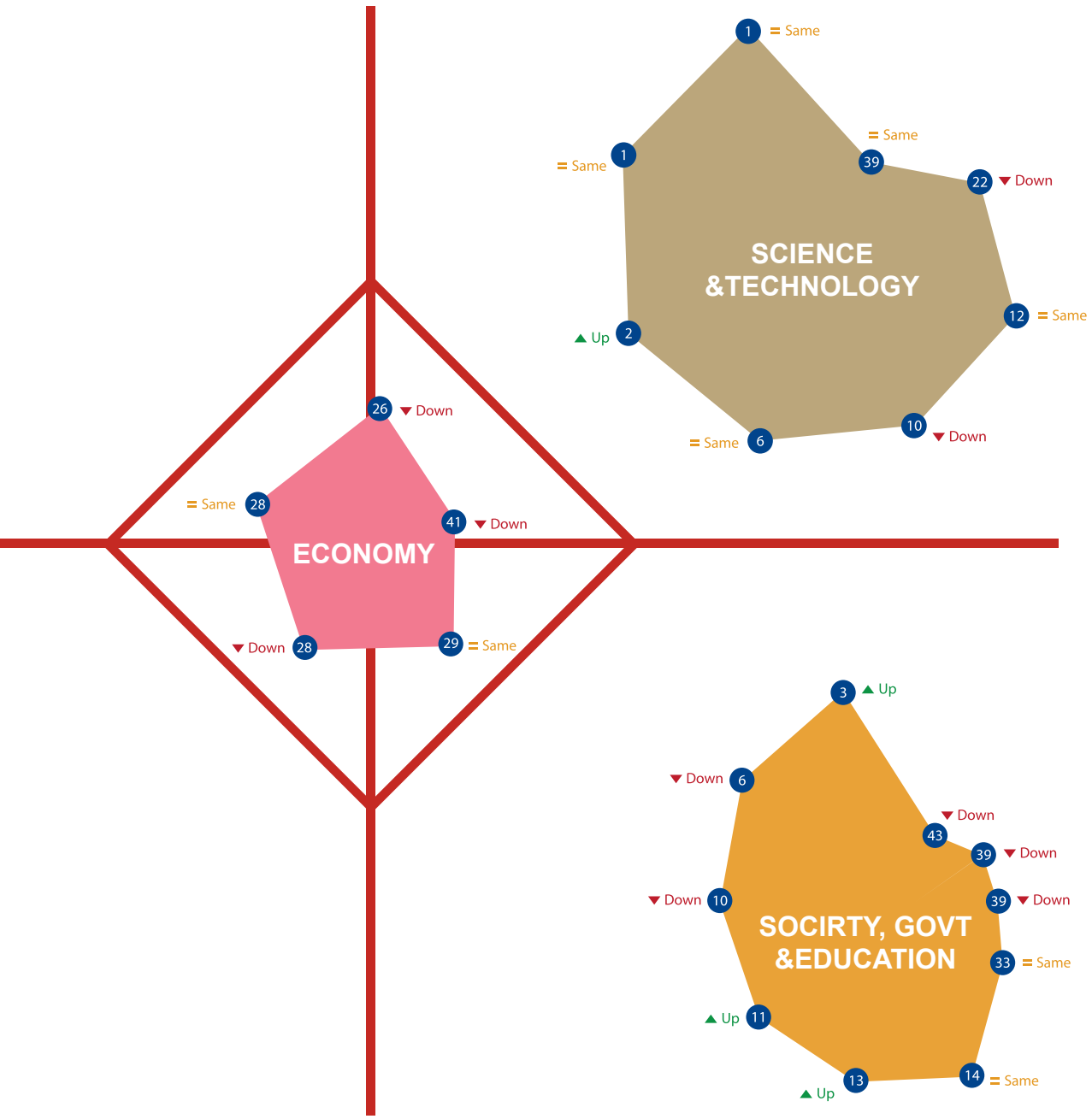
*The source of all the data is the World Competitiveness Yearbook, published annually by IMD, a leading business school in Lausanne, Switzerland. This yearbook provides extensive data on a wide range of variables on global competitiveness for 60 nations.

SNI Israel's Wheels of Life

Wheels of Life






1 = Same
= Same 1
= Same 39
22 ▼ Down
SCIENCE &TECHNOLOGY
12 = Same
▲ Up 2
= Same 6
10 ▼ Down
26 ▼ Down
= Same 28
41 ▼ Down
ECONOMY
▼ Down 28
29 = Same
3 ▲ Up
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▼ Down 43
39 ▼ Down
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39 ▼ Down
SOCIRTY, GOVT &EDUCATION
33 = Same
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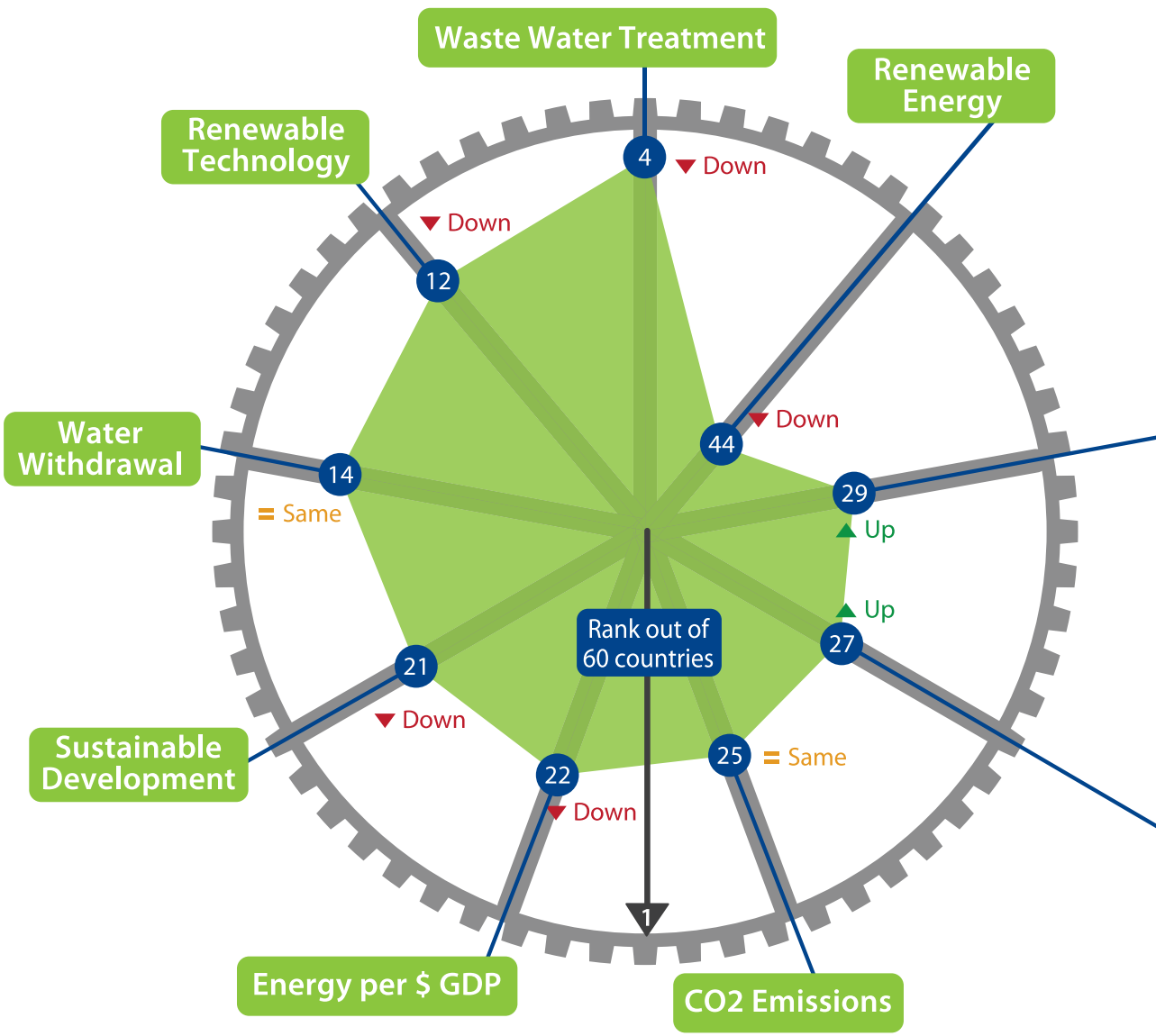
SNI Israel's Wheels of Life
ENVIRONMENT & ENERGY



Pollution

CO2 per $GDP

Waste Water Treatment - 4 (Down)
Waste water treatment plans, % of pop served

Renewable Technology - 12 (Down)
Renewable technologies are quickly turned into competitive advantages

Water Withdrawal - 14 (Same)
Water withdrawal per $1000 GDP, cubic meters

Sustainable Development - 21 (Down)
Sustainable development is a priority in companies

Energy per $ GDP - 22 (Down)
Commercial energy per $ GDP, kilojoules

CO2 Emissions - 25 (Same)
CO2, metric tons of carbon dioxide

CO2 per $GDP - 27 (Up)
CO2 indust. Emissions, tons per million $GDP

Pollution- 29 (Up)
Pollution problems do not seriously affect your economy

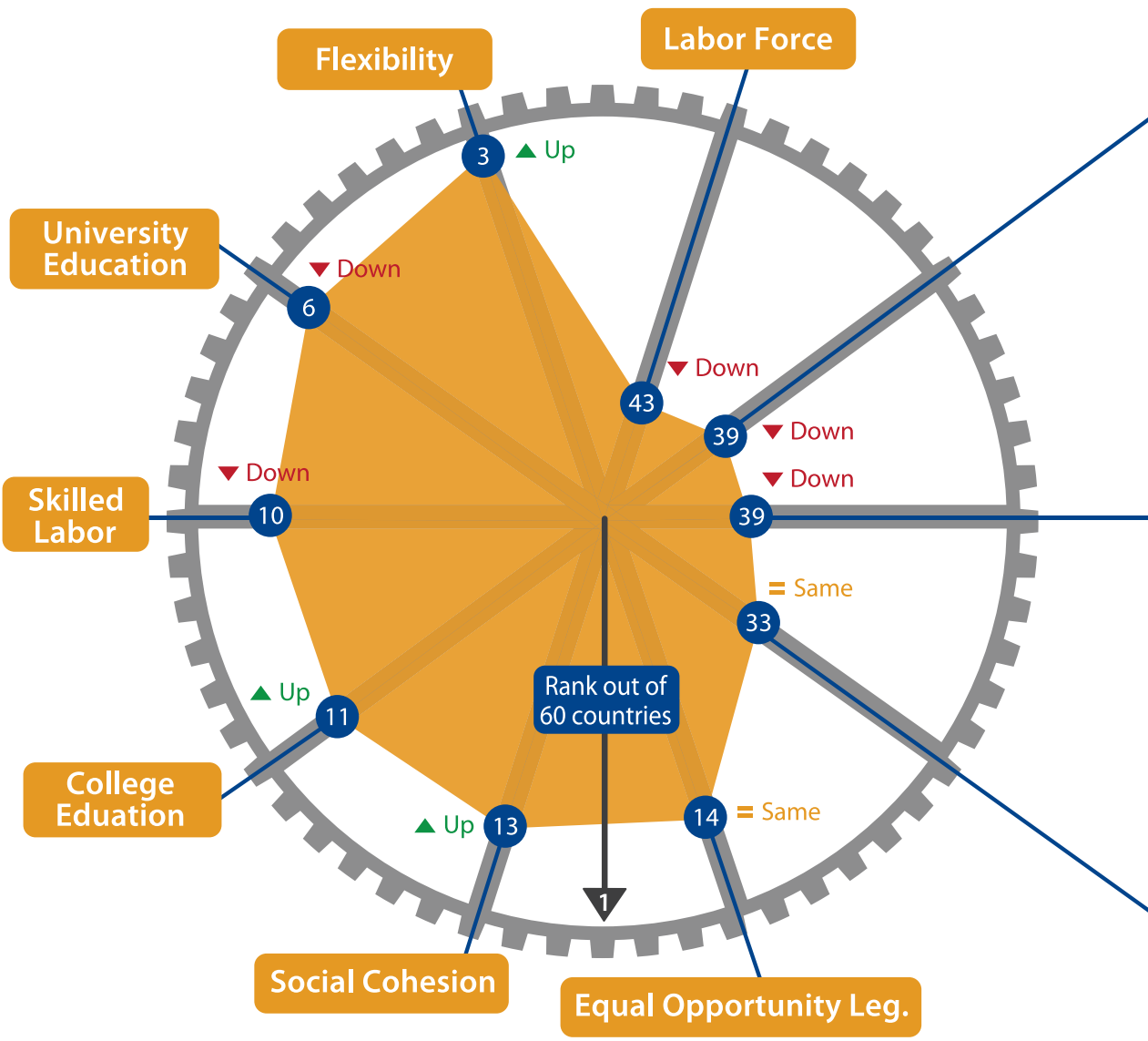
Renewable Energy - 44 (Down)
Share of renewable energy in total energy, %

Numbers, e.g. 4 - indicate global rank out of 60

Change in ramk from 2012:
▲ Up = Same ▼ Down

Wheels of Life

SNI Israel's Wheels of Life
SOCIRTY, GOV & EDUCATION



Wheels of Life

Gini Index

Flexibility - 3 (Up)
Flexibility and adaptability of people are high when faced with new challenges

University Education - 6 (Down)
University education meets the needs of a competitive economy

Skilled Labor - 10 (Down)
skilled labor is readily available

College Eduation - 11 (Up)
% of population that has attained tertiary education for persons 25-34

Social Cohesion - 13 (Up)
Social cohesion is improving

Equal Opportunity Leg. - 14 (Same)
Equal opp. legislation in your economy encourages economic developm

Social Cohesion

Bureaucracy - 33 (Same)
Bureaucracy does not hinder business activity

Social Cohesion - 39 (Down)
Social cohesion is improving

Gini Index - 39 (Down)
Gini index of equality in income distribution

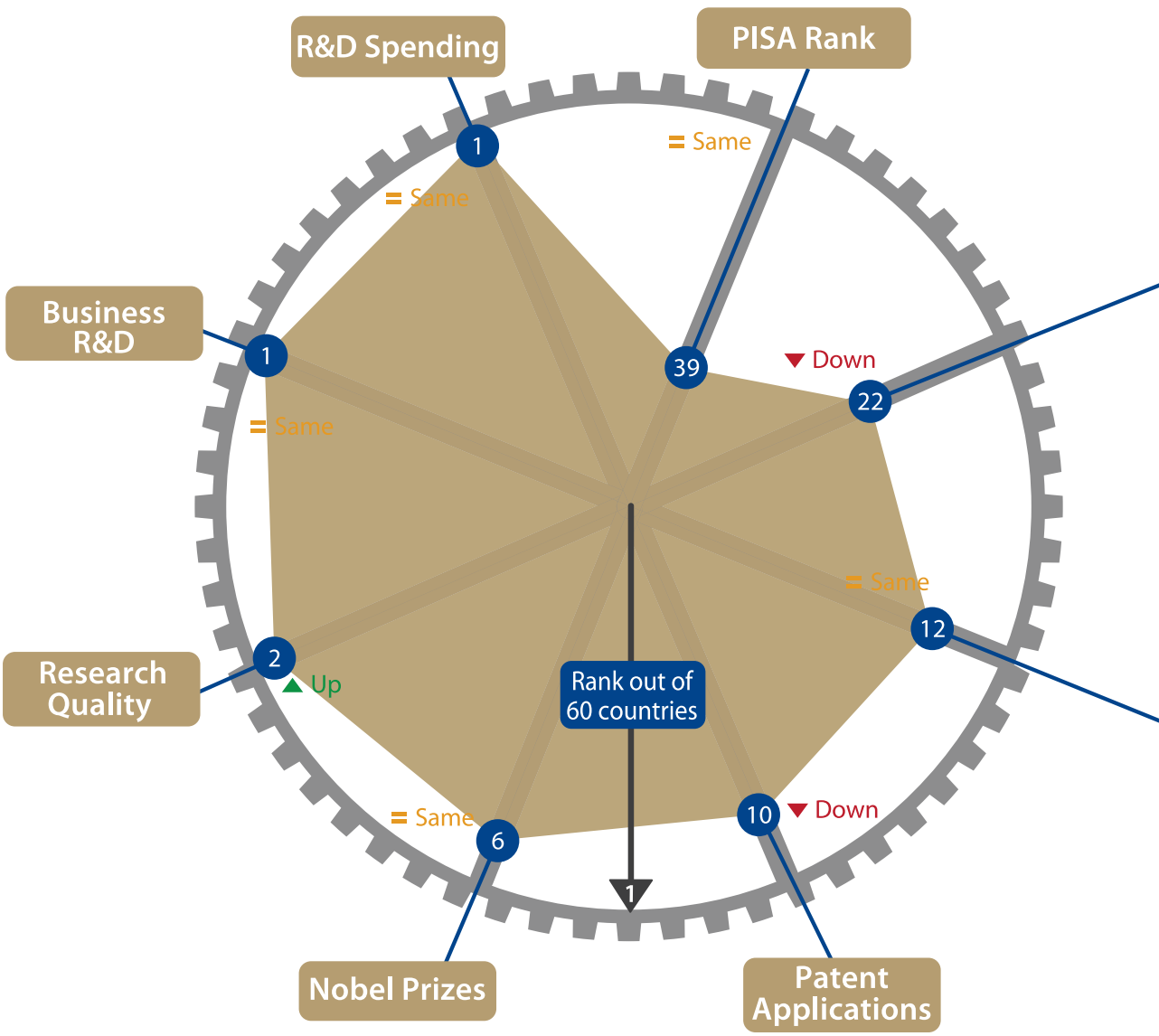
Labor Force - 43 (Down)
labor force: employed and registered unemployed (millions)

Bureaucracy

Numbers, e.g. 3 - indicate global rank out of 60

Change in ramk from 2012:
▲ Up = Same ▼ Down

SNI Israel's Wheels of Life
SCIENCE & TECHNOLOGY



Science in Schools

Science, Eng. Degrees

R&D Spending - 1 (Same)
Total expenditure on R&D as % of GDP

Business R&D - 1 (Same)
Business expenditure on R&D as % of GDP

Research Quality - 2 (Up)
Public & private scientific research is high by international standards

Nobel Prizes - 6 (Same)
Nobel prizes per capita per million pop. (since '50) (phys., chem, medicine, econ.

Patent Applications - 10 (Down)
No. of patent app. filed by applicant's origin, per 100,000 pop.

Science, Eng. Degrees - 12 (Same)
% of total first university degrees in science & engineering

Science in Schools - 22 (Down)
Science in schools is sufficiently emphasized

PISA Rank - 39 (Same)
PISA survey of 15 year olds (reading, math, science)

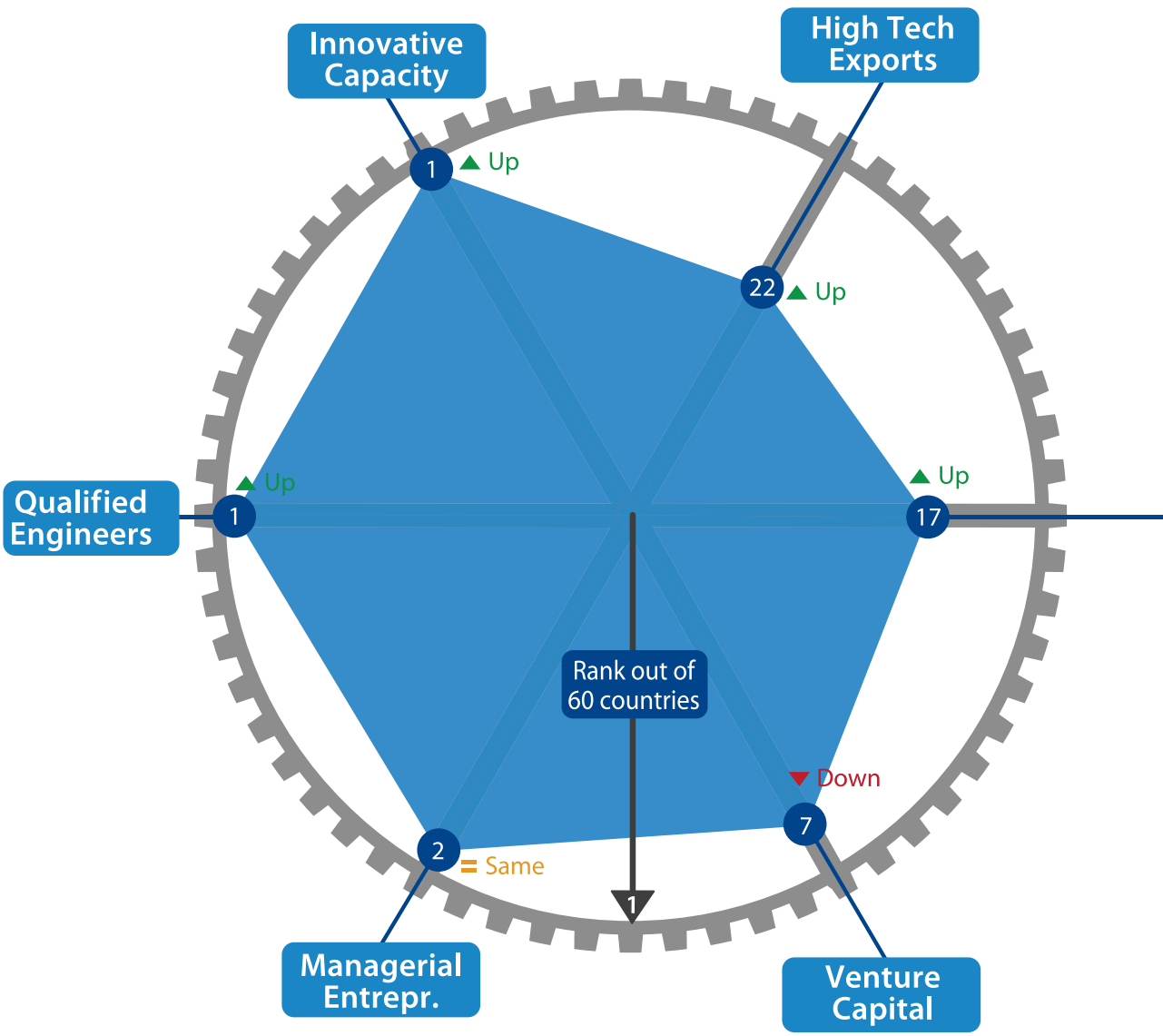
Numbers, e.g. 1 - indicate global rank out of 60

Change in ramk from 2012:

▲ Up = Same ▼ Down

Wheels of Life

SNI Israel's Wheels of Life
INNOVATION



Intellectual Property

Innovative Capacity - 1 (Up)
Innovative capacity of firms (new products, services, processes) is high in your economy

Qualified Engineers - 1 (Up)
Qualified engineers are available in your labor market

Managerial Entrepr. - 2 (Same)
Entrepreneurship of managers is widespread in business

Venture Capital - 7 (Down)
Venture capital is easily available for business

Intellectual Property - 17 (Up)
Intellectual property rights are adequately enforced

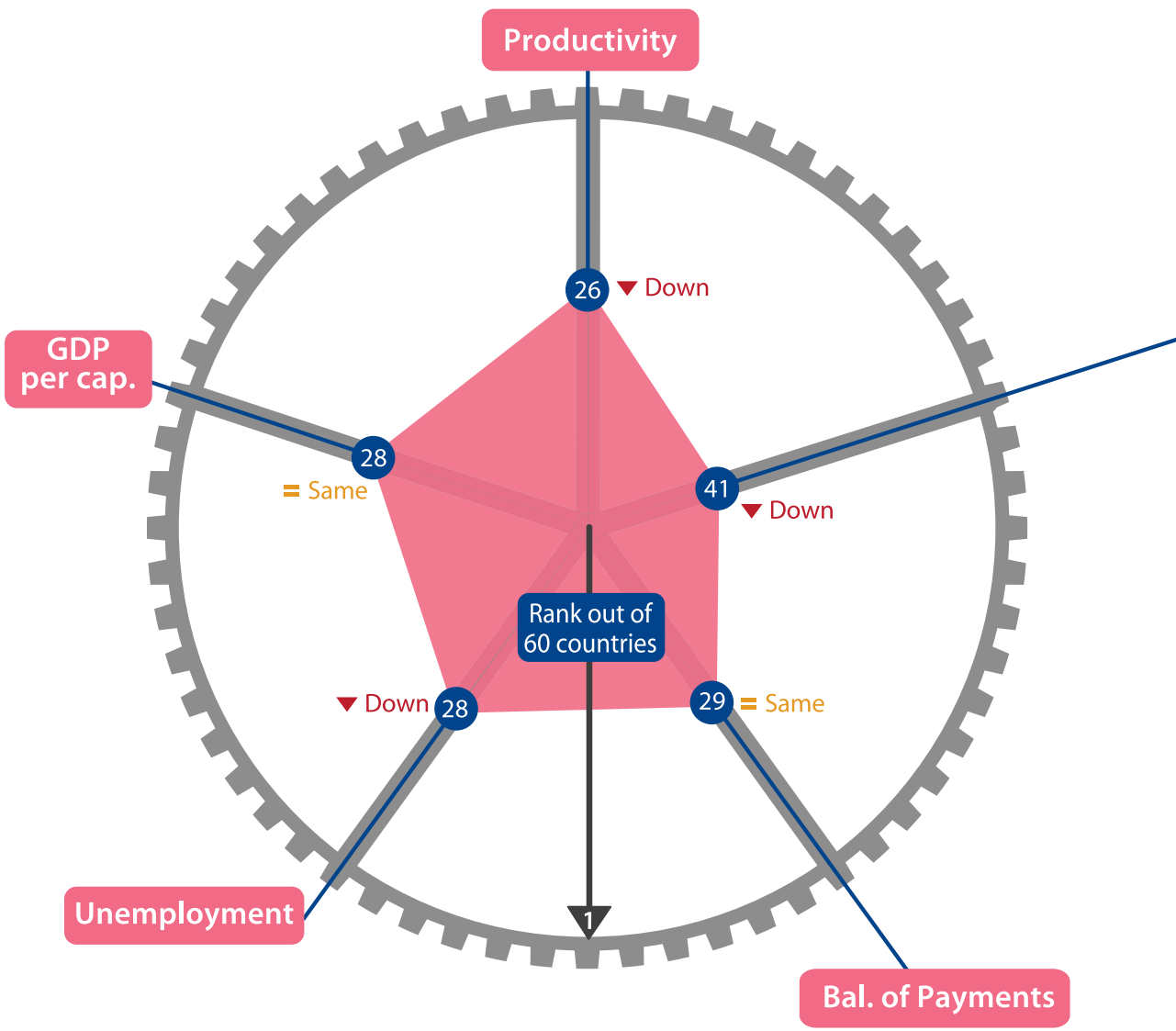
High Tech Exports - 22 (Up)
High tech exports as % of manufactured exports

Numbers, e.g. 1 - indicate global rank out of 60

Change in ramk from 2012:
▲ Up = Same ▼ Down

Wheels of Life

SNI Israel's Wheels of Life
ECONOMY



Capital Formation

Productivity - 26 (Down)
labor productivity: GDP (PPP) per person employed per hour, $

GDP per cap. - 28 (Same)
GDP per capita, at purchasing power parity (PPP)

Unemployment - 28 (Down)
Unemployment rate as % of labor force

Bal. of Payments - 29 (Same)
Current account, Balance of Payments, as % of GDP

Capital Formation - 41 (Down)
Gross fixed capital formation as % of GDP

Numbers, e.g. 26 - indicate global rank out of 60

Change in ramk from 2012:
▲ Up = Same ▼ Down

Wheels of Life

B. Israel 2028: "Vision and Strategy for Israel"

Head of the program: Dr. Gilead Fortuna

The project "Israel 2028 – Vision and Economic-Social Strategy in a Global World" is a national project led by the Samuel Neaman Institute since 2008. The project has progressed to its present stage, and is now focused on:

1. **Integrating the Ultra-Orthodox sector in the Israeli economy**, led by Dr. Reuven Gal. In 2013, the team continued to focus on the process of integrating the Ultra-Orthodox sector in the Israeli labor market, publishing a series of success stories to demonstrate the progress that has been achieved.

2. **The ecosystem of the Israeli hi-tech industry and attempting to maintain its innovativeness**, led by Prof. Maital.

3. **Promoting a national policy on a variety of industry-related subjects,** within the framework of the Industrial Excellence Center, established in 2011 to promote recommendations in coordination with the various government agencies. Emphasis was placed on upgrading classical industries and promoting mature industries that are based on emerging technologies.

4. **Vocational education and leveraging the capacity of start-up companies to build large Israeli companies.**

5. **Infrastructure and environment**, with an emphasis on sustainability in industry and enhancing long-term transport services, led by Professors Yehuda Hayuth and Ofira Ayalon.

* The subjects are further detailed in the report.

B.1 The Grand Strategy Forum

The Forum is headed by: Prof. Uzi Arad, Prof. Zehev Tadmor and Adv. Dror Strum

Israel is a small but vibrant democracy facing powerful enemies in a turbulent region at a time of unprecedented global upheaval. Given the scope of its challenges, and its tiny margin of error, Israel must have a sophisticated national strategy that defines its major mid- and long-term goals and aspirations, and links them to ways and means. Such a grand strategy would harness the various components of national power to clearly defined political goals, ensure Israel enjoys a durable competitive advantage over its adversaries, and grant its leaders the intellectual framework necessary to counter threats, confront contingencies, and seize opportunities.

Israel today confronts an unprecedented array of foreign and domestic challenges. Externally, Israel faces the daunting prospect of nuclear proliferation; the potential fraying of its crucial alliance with the United States; disruptive emerging threats from ballistic missiles, cyber-warfare and biological weapons; and the weakening of state sovereignty among its Arab neighbors. Internally, deteriorating governance, profound demographic shifts, socio-economic divisions, and weaknesses in the educational system are combining to undermine the resilience of Israeli society and erode Israel's qualitative edge in science and technology, which historically has offset its overwhelming quantitative disadvantage.

Despite the gravity of the moment, Israel lacks a comprehensive grand strategy with which to tackle these momentous challenges. Israel has not updated its official national security strategy since its first Prime Minister, David Ben-Gurion authored one in the early 1950s. In the absence of an

intellectual framework for policy, decisions of utmost national importance are being made based on short-term considerations, without regard for the "big picture" in all its complexity, the intersections among issues, or an overarching sense of direction and national purpose. The continuation of this state of affairs places Israel's security and prosperity in jeopardy.

In response to these challenges a new project was launched by the Neaman Institute, to assemble an elite interdisciplinary body comprised of those with the deepest understanding of the manifold challenges facing Israel, the greatest capacity to tackle them, and the biggest influence over the nation's response it comprises leading individuals in law, economics, the sciences, business, military, history, political science and diplomacy into a Grand Strategy Forum for the purpose of crafting an integrated blueprint for policy and strategy that will hopefully help guide the State of Israel towards security and prosperity in the twenty first century.

The Grand Strategy Forum is the initiative of former national security advisor to the Prime Minister and Head of the National Security Council who heads the project in collaboration with Prof. Zehev Tadmor chairman of the S. Neaman Institute and Adv. Dror Strum Chairman of the Israeli Center for Economic Planning – Herzliya Former General Director, Israel Antitrust Authority at the Ministry of Finance. The focus of the project is on three main clusters: geopolitical and security issue, science and technology issues, and social and economic issues. In each cluster only those issues will be tackled that pose mega challenges to the State of Israel. The expectation is to complete the project by mid-2015.

C. The Industrial Excellence Center

Head of the Center: Dr. Gilead Fortuna

The Industrial Excellence Center was established in 2011 and its objective is to promote a national industrial policy. The Center helps formulate and promote a proactive policy of industrial excellence, intended to sustain a balanced and high-quality national industry that maintains a healthy lifecycle, which is tested by its global competitive advantage and quality employment of all sectors of society. The Industrial Excellence Center is also part of the Israel 2028 Vision.

In 2013, the Center continued to promote the following projects:

A. Empowering classical/traditional industries.

B. Expanding the promotion of the Israeli water industry in the global economy.

C. National policy on the realization of natural gas for the local economy and export.

D. Promoting a strategy for commercial space industry in Israel as part of the NCRD.

New projects that started in 2013 with the initiative and leadership of the Industrial Promotion Center:

A. Strengthening the business layout in the north, in collaboration with the Ministry of Economy.

B. Efforts to encourage, enable and find solutions for startups to grow, including measurement of the contribution of large companies to the national economy.

*** All projects described have a dedicated separate chapter further on**

Classical Industry

C.1 Empowering the Classical Industry

Head of the Project: Giora Shalgi in collaboration with Prof. Shlomo Maital and Dr. Gilead Fortuna, as part of the Industrial Excellence Center and in combination with the Innovation Center at the Technion

The activity in 2013 continued to follow the recommendations of the committee to empower the classical industry, with expansion to other areas, mainly in the fields of education.

1. **Scientific, technological, and vocational educational:** focused on encouraging middle school students to choose courses leading to a high-quality technological scientific matriculation certificate, while re-establishing the Bosmat School and assisting the Ministry of Education in leading this development.
2. **Industrial quality and excellence:** setting a standard for industrial excellence.
3. **Extension of the Galilee (north) quality program to the Negev (south).**
4. **Leveraging the growth of small and medium plants through role model organizations.**
5. **Leveraging the emergence of small and medium businesses through the Buy Back.**
6. **Dealing with issues affecting classical industry.**
7. **Image: changing the discourse culture, removing the term LOW TECH, as well as changing the attitude in the EXIT culture.**
8. **Cooperation with the Electronic Industries Association.**
9. **Leading a consulting plan for small and medium businesses.**

C.2 Challenges for Water Usage in the Global Industry

Project team: Dr. Gilead Fortuna together with Shiri Freund-Koren as part of the Industrial Excellence Center

This research project began in 2011 and was designed to increase the competitiveness of the Israeli water industry in the world. The objective of the project is to map and survey water-intensive industrial sectors, highlighting the needs for solutions that will enable Israeli water companies to increase their business.

The project includes mapping water industries that can meet the identified challenges, linking industries to the identified challenges and initiating meetings with the companies, and holding dedicated training seminars. Two additional reports were published in 2013 on the following sectors:

A. **The micro-electronics industry.**

B. **The metal industry.**

In total, six technical reports were published on six water-intensive industrial sectors. A summary report of the first phase, which includes mapping of industries, was completed and released in January 2014. As part of the project, two seminars took place in 2013 with the Israel Export Institute and Newtech training, and discussions with the Israeli water industry on issues of gas and oil production and food production, with the participation of about 80 Israeli industries in each session. In addition, four sessions, led by the Samuel Neaman Institute Team, were held for first the time on industrial water use during the bi-annual International Conference Watec 2013, which was attended by experts from around the world and representatives of leading companies in these industries in Israel.

Dr. Gilead Fortuna traveled on behalf of the Israel Export Institute and with the assistance of the economic attaches to the U.S. to introduce the capacity of the Israeli water industry to large U.S. industrial companies. Follow-up was conducted by Shiri Freund-Koren when she participated in the annual water conference in Chicago in October.

The project was extended by Newtech at the Ministry of Economy for 2014 with a focus on expanding the sectors, and effective communication with the water industries, to provide innovative solutions by combining economies of scale, experience, and innovative technologies.

Another project approved in 2013 deals with international standardization for water industries, which mapped the opportunities for international standardization led by the Israel Standards Institute.

Water

C.3 National Policy on the Chemical and Natural Gas Industry

Head of the program: Dr. Gilead Fortuna

The emphasis in 2013 was on the research and application of natural gas for the energy services in the Israeli industry, and on analyzing issues of government policy regarding export, transportation, and local production of downstream products of high added value to the economy.

In light of the articles we have published and our participation in conferences and discussions in 2013, which placed emphasis on the importance of gas supply to small industries and on the gap between the cost of connection to small companies and large companies, the costs of supply to small companies were significantly lowered. This helped promoting gas supply to small industries was accelerated.

Dr. Gilead Fortuna participated in a team work led by Uzi Arad to discuss the export policy and conservation of gas resources. His conclusions were that the compromise submitted regarding gas export was reasonable in light of the data and these conclusions were quoted in the Israeli and international press.

The activity on the subject continues with the intention of attempting to persuade the Ministry of Economy to adopt the conclusions in full.

C.4 The NCRD Committee on Civilian Space Policy

Samuel Neaman Representative on the Committee: Dr. Gilead Fortuna

Dr. Gilead Fortuna was appointed in 2012 to serve as a member of the NCRD Committee on Civilian Space, so that the Samuel Neaman Institute became active in the committee and contributed significantly to the NCRD decisions. In his role as the head of the sub-committee dealing with R&D strategy in commercial space, Dr. Fortuna held a series of discussions, aimed at formulating major directions for a long-term program that combines the advantages for Israel of building a commercial industry and promoting the infrastructures of science and scientific education.

The role of the committee is to advise on formulating a long-term R&D policy in the field of commercial space that will allow the strategic objectives set out to be effectively achieved. The basis for the civilian space vision is the document submitted to the President in 2010, and the measures of success in achieving the objectives were derived from this document.

The role of the subcommittee is to build strategic thinking that will allow a long-term plan for R&D in the field of commercial space to be presented, from which the tools for presenting indices of success will be derived, and which will also serve as a baseline over the coming years.

In 2012, guidelines were presented for studying the opportunities of and barriers to industrial areas to guide the continued work of the Committee. In 2013, visits were made to major space plants and discussions were held with an emphasis on R&D and the consequences on encouragement policy on the subjects of:

a. Developing sub-systems and components within the framework of international cooperation.

b. Trends in nano satellites/micro satellites and the uniqueness of the industry and academia in Israel that allows effective competition.

c. A balanced mix between satellites and sub-systems.

d. Effective combination of academia with the civilian program.

e. Promotion of ground systems and communication.

f. Connecting defense and civilian R&D.

C.5 Research to Strengthen the Industry and the Economy in the North

Head of the project Dr. Gilead Fortuna together with Giora Shalgi, teams at Samuel Neaman Institute and at the Innovation Center

This project was initiated by the strategy team at the Ministry of Economy following the work done at the Samuel Neaman Institute, at the Center of Industrial Excellence and especially as part of the program for upgrading traditional industry. The objective to connect all the positive initiatives in the North was noted by the Ministry of Economy as an opportunity to promote research on the economic layout of the North in order to formulate national policies and tools to strengthen and upgrade the area. The work is designed to serve as a model for other areas in the future. Work began in 2013 with no external funding.

To this end, it was decided to conduct an in-depth study of the economic-occupational system in the north. The study will include three main steps:

1. A survey to include mapping and analysis of the industry and the business system in the entire country, so that we can develop operational tools and select pilot projects of the highest socio-economic feasibility.

2. An analysis to allow the identification of business opportunities and deficiencies, understanding of the sectorial structure, value chain, regional clusters, mapping gaps in labor supply and more.

3. An economic analysis and formulation of operational courses of action to implement the plan for the economic system in the north.

In addition, during 2013, anchors for strengthening the economy of the North were analyzed. An analysis was conducted regarding the need to allow a deep water port in Haifa and the implications of its establishment in the center of the country. The summary was sent to the government, and will help in leading a series of discussions in government.

C.6 The Contribution of Large Companies to the National Economy

Head of the project Dr. Gilead Fortuna together with Yuval Niv and Dr. Daniel Friedman

This project deals with the contribution of the large companies to the industrial and technological economy, in order to examine whether the existence of the large companies is essential to the industrial-business ecosystem. Related activities began in 2012, and continued in 2013 in cooperation with the economists Dr. Freeman and Yuval Niv. An additional partner in the project is Teva, which helps with the data required to assess its total contribution to the state's economy.

The study consists of three circles of contribution:

The first circle: displaying the direct contribution to the national economy.

The second circle: calculating the multipliers of indirect and total economic contribution.

The third circle: analysis and attempt to build tools to assess the contribution, applying parameters that are not directly economically measurable (soft parameters).

C.7 Supplying Electricity to Ships in the Harbor (Cold Ironing)

Work was carried out by Prof. Yehuda Hayuth with a steering team on behalf of the Shipping and Ports Authority headed by Dr. Dan Livne

The shipping industry in general and the seaports in particular are lately under pressure to reduce greenhouse gas emissions for the purpose of improving the quality of the environment.. In this context, one of the significant measures to reduce pollution and improve air quality at the port and around the city is to change the source of the electric power supplied to ships anchored for loading and unloading from the auxiliary motors of the ships to a power source from shore. This process is called "Cold Ironing" or On-Shore Power Supply (OPS).

The increasing global trend of changing the electrical power source when ships visit ports from the ships' auxiliary engines to an on-shore power supply is reflected in a vast array of ports all over the world that have adopted the method and established such facilities on some of their docks, which have already been working for several years. Installing power supply facilities for the ships anchored in port is currently voluntary, but the relevant international authorities have already started discussions on mandatory action for ports to make the change in question, mainly because of environmental considerations.

In Israel, too, the issue is relevant. The Israel Ports Company, which is responsible for developing ports, plans to integrate Cold Ironing facilities in two new container terminals that are planned to be located in the State of Israel in the current decade. At the end of 2012, a delegation of the French company Schneider Electric, one of the largest companies in the world specializing in

the subject, visited the Samuel Neaman Institute at the Technion. During last year, the study includes new material communicated by the Company following questions that were raised

The study was completed and delivered to the customer, the Shipping and Ports Authority at the Ministry of Transport, in the mid of 2013.

C.8 The Profitability for Israel of Joining the HNS Treaty as Part of IMO

The work is conducted by Prof. Yehuda Hayuth

The State of Israel is a member of the IMO International Maritime Organization acting, inter alia, to increase the safety of sailing and prevent sea pollution by ships. The IMO organization, through the resolutions made by its member states, is the source of international standards (treaties, codes, etc.), so that the state is required to ratify the treaties to which it agreed and/or make the necessary adjustments within the framework of the law of shipping and ports.

The HNS (Hazardous Noxious Substances) Fund and the Malta Protocol of 2010 will be established (after being ratified by at least 12 countries) to compensate victims for the damage caused by spills of chemicals, gas, refined products and more, resulting from marine accidents of all types of ships, excluding radioactive materials and damage caused by crude oil, which is covered by another similar convention (IOPC).

The organization commissioning the research is the Shipping and Ports Authority, Ministry of Transport. The purpose of the study is to examine the feasibility of Israel's joining the HNS Convention.

The first task is to create the required database to analyze the major elements and to analyze the amount and type of cargo that Israel imports, which is relevant to the convention. The next step will focus on identifying and mapping the key customers in the country, which should bear the financial burden of the Fund's activity. The research personnel are required to map the new member states.

To satisfy the need to estimate the potential environmental damage of the specific materials transported to and from Israel and map disasters that included spillage of materials into the sea and the

damage involved, the research will be based on international publications such as those of the Cedre Center in France and insurance companies.

The analysis of the economic profitability of joining the Convention will be based primarily on an assessment of the possible potential damage against the costs imposed on the relevant parties.

D. National Policy on Higher Education

D.1 Higher Education Forum

The Forum is managed by Prof. Omri Rand, the director of the Samuel Neaman Institute, Prof. Avinoam Nir, Representing Bashaar, Adv. Avi Ronen, the Executive Director of "Bashaar", and Dr. Niel Sherman, the CEO of the United States-Israel Educational Foundation

The Samuel Neaman Institute along with Bashaar – the Academic Community for Israeli Society – and the Fulbright Program have shared the Higher Education Forum, which was established following the international conference held in December 2004 at the Samuel Neaman Institute on "Transition to Mass Higher Education Systems." The purpose of the Forum is to hold discussions on issues concerning the higher education system in Israel and to hold an open dialogue between universities, colleges, CHE and PBC, the Government, and other public agencies.

Two meetings were held during 2013:

- On March 8, 2013, a meeting was held on **"The status of Humanities in Higher Education"**, with the participation of Prof. Dan Laor, Department of Literature, The Jacob & Shoshana Schreiber Chair for Contemporary Jewish culture, Tel Aviv University, Prof. Yossi Ben-Artzi – Department of Israel Studies, The University of Haifa. Prof. Ruth HaCohen (Pinczower), Department of Musicology, The Hebrew University of Jerusalem, Prof. Avi Sagi, Department of Philosophy, Bar Ilan University.

- On May 31, 2013, a meeting was held on **"Engineering Education in Higher Education and Science & Technology Education in the High School"** with the participation of Dr. Eli Eisenberg, Senior Deputy General for R&D and Training, ORT Israel, Prof. Paul D. Feigin, Senior Executive Vice President, Technion-Israel Institute of Technology, Dr. Ofer Rimon, Director of Science and Technology Administration at the Israel Ministry of Education, Giora Shalgi, Senior Research Fellow, The Samuel Neaman Institute,

Sessions were filmed and recorded and can be seen on Samuel Neaman Institute website

D.2 The Research Status of Israeli Universities Based on Quantitative Indices

Prof. Uri Kirsch

The main objectives of the work are to reach a reliable assessment of the research output and quality in each of the fields of the Israeli universities, compared to universities in the world, and to indicate the flaws and shortcomings of using the indices' data.

In this study the difficulties involved in the use of indices, which may lead to biased results, were discussed. The indices of publications and citations are based on the databases of Thomson Reuters; university rankings are based on the ARWU Research Institute data. The topics presented include:

- A review of the research output and quality in various fields in Israel, in the world and in each of the universities in Israel.
- Changes that have occurred in recent years.
- A comparative study on issues related to research evaluations.

D.3 The Development of Research Universities in Israel

Heading the project: Prof. Uri Kirsch

Research universities in Israel have developed following the developments in the world. Beyond that, they play a major role in Israel's economic, social, and cultural development. The work describes the major events and processes that took place over decades, during which several unique characteristics evolved, the distinguished academic status of the research universities was established, and the national significant contribution of the universities was formed. The work deals with the following topics:

- Aspects relating to the development of universities in several countries, which influenced the development of universities in Israel.

- A description of the universities' development up to the establishment of the state, from the development of the idea of establishing a university in Israel in 1900-1925. Milestones are presented and the development of the first institutions before the State's establishment (1925-1950) are discussed: Technion, the Hebrew University, and the Weizmann Institute.

- A general view on the development of the higher education system in Israel since the establishment of the state, data related to the increase in the number of institutions and number of students.

Universities

- Landmarks and unique aspects in the development of each of the universities in recent decades.

- The development of the entire higher education system during this period, including the unique role of research universities and academic colleges.

- The contribution of universities to the research status of Israel in the world. General aspects related to the national contribution of the universities are discussed.

E. Science, Technology, Industry, Economy and Human Capital

E.1 Indices for Science, Technology and Innovation in Israel and International Comparison

Project team: Dr. Daphne Getz, Prof. Dan Peled, Tzipi Buchnik and Ilia Zatcovetsky

At the beginning of the 21st century, the Samuel Neaman Institute identified the need to establish an infrastructure for advancing a systematic and ongoing process of forming a national policy on research, technology, and innovativeness.

The objective of this program is to improve the understanding of the R&D and innovation system and to answer the question of how processes associated with the development of science, technology, and innovation contribute to increased knowledge, increased productivity, improved economic performance, professional employment, sustainable development, and social welfare. Understanding of the process is based on the collection, analysis, and correct presentation of the various relevant indices and on the analysis of trends as they change over time and in comparison with other countries.

This program, which includes an updated database of comparable data and indices, is a source of knowledge and provides policy makers a broad and updated picture of science, technology, and innovation. The program helps them map and evaluate R&D activities in Israel, the skills, the scientific infrastructures, and their financing over the years, and draws comparisons on the international level.

Within this framework, four publications on the subject of “Indices for science, technology, and innovativeness in Israel: A comparable database” were published.

The fourth report, published in 2013, is organized around seven themes: national expenditure on R&D` human capital in science and technology` economic returns and productivity indices associated with activities in science and technology` R&D and innovation by selected industries and research institutions` globalization in R&D and scientific creativity` technological readiness.

The database is not a final product in itself, but provides a factual starting point for discussion and brainstorming by experts and policy makers.

E.2: R&D Outputs in Israel: A Comparative Analysis of PCT Applications and Distinct Israeli Inventions, 1990-2111

Research team: Dr. Daphne Getz, Dr. Eran Leck and Amir Hefetz

The Samuel Neaman Institute at the Technion, in collaboration with the National Council for Research and Development (NCRD) operating under the auspices of the Science and Technology Ministry, conducted a study on the characteristics of the inventive activity in Israel and its comparison with equivalent activity in other OECD countries. Special emphasis was placed on studying the characteristics of the inventive activity of foreign R&D centers in Israel.

Two major indices were used in the study to describe and analyze the characteristics of inventive activity - PCT applications at the international stage and "distinct inventions." The index of distinct inventions is an indicator based on data obtained from patent families, designed to overcome the biases caused by double counting patent applications due to their filling in different patent offices around the world.

The third study in the series, expected to start in 2014 (Researchers: Dr. Daphne Getz and Dr. Eran Leck), will focus on indicators that may provide insights to the quality of Israeli patents. The analysis will be based in part on a methodology developed by the OECD for estimating the economic and technological value of patents (OECD Patent Quality Indicators). In addition, emphasis will be placed on identifying emerging technologies and disciplines. Areas will be identified by crossing several data sources, such as the technological fields of patents and leading fields and sub-fields in scientific publications and citations. The main actors in these areas will be identified and trends will be mapped over time.

E.3 R&D Outputs in Israel: International Comparison of Scientific Publications, 1990-2011

Research team: Dr. Daphne Getz, Dr. Avishag Gordon, Yair Even-Zohar, Iris Eyal, Ella Barzani and Dr. Noa Lavid

This work is the second study in the joint venture of the Samuel Neaman Institute and the NCRD, whose aim is to examine the outputs of research and development in Israel, as expressed in scientific publications in academic journals, according to different criteria and over time. The first study in this series was published in 2011 and the present study was published in 2013.

The work was conducted using bibliometric tools and the Thomson Reuters data. These were used to evaluate research outputs quantitatively (number of publications), in terms of the priority of science areas in the country (rate of publications of a scientific area out of the total scientific publications in the country) and qualitatively (as reflected in the number of citations), using international comparison and timeline analysis.

E.4 Personnel in Science and Technology - Technological forecasting models

Research team: Dr. Daphne Getz, Tsipy Buchnik and Bella Zalmanovich

This work was commissioned by the Academy-Industry Relations Committee at the National Council for Civilian Research and Development (NCRD) and its purpose was to conduct a study that would survey processes and models to forecast science and technology work force needs and to test their suitability for the Israeli economy.

The first part of the work is a literature review of technological forecasts in selected countries. According to the common definition by the OECD, technological forecasting is a systematic process in which an attempt is made to look into the long-term future (usually five to thirty years) in science, technology, economy, and society, in order to identify strategic areas of research and emerging generic technologies that will probably lead to the largest economic and social gains. There are dozens of methods for creating technological forecasts, and most national programs integrate several methodologies to achieve this. In this part of the work the methodologies and findings of two national technological forecasts are described in detail: the British and the Japanese.

The second part of the work includes a literature review of models used to anticipate requirements and needs for work forces, models to forecast personnel and how they are applied in different countries (U.S., Canada and Ireland), and a review of forecasts in terms of occupation conducted in Israel in the fields of high-tech, teaching, health, etc.

The work was submitted and presented to the Academy-Industry Relations Committee of the NCRD in 2013 and can be downloaded from the Samuel Neaman Institute website.

At the request of the Committee, a proposal was submitted for continued work on the subject of adapting and formulating technological forecasts for Israel, with the objective of creating a document that shows the technological forecasts for the next five to ten years for the State of Israel.

E.5 Evaluating the Infrastructure Program of the Science, Technology and Space Ministry

Research team: Dr. Daphne Getz, Vered Segal, Oshrat Katz-Shacham

A continued research to evaluate the short and long-term effects of research and knowledge centers that received funding from the Ministry of Science, Technology and Space from 2000 to 2010 as part of the infrastructure program.

The scientific infrastructure program of the Ministry of Science and Technology has been operating since 1995 in order to bridge the gap between basic academic research and the development of applications, and its objective is to reduce the maturation time of useful technological ideas. The development of applications, toward which this program is oriented, may lead to the realization of economic potential, and in the long term also to the growth of the Israeli economy and to Israeli scientific research being positioned at the forefront of science and technology in the world.

This evaluation study is a continuation of a research study conducted by the Samuel Neaman Institute in 2005 to examine the economic effects of scientific research and programs conducted as part of the infrastructure program.

The evaluation results of the present study indicate the importance of research and knowledge centers funded under the program. Research conducted in the framework of the program was important in the training of students, training academic personnel, troubleshooting in the industry, cooperation between basic research and hospitals, and more.

The commercial effects of the of research and knowledge centers were discerned in the establishment of companies, patents, licenses granted to use technology and commercial applications based on research and knowledge centers' activity.

E.6 Policy Incentives for Creating Knowledge: Methods & Empirical Evidence Pick-Me

Research team: Dr. Daphne Getz, Prof. Amnon Frenkel, Prof. Shlomo Maital, Dr. Eran Leck, Dr. Emil Israel and Vered Segal

This project was done in the 7th Framework project of the European Union (FP7), as part of a consortium of researchers from seven nations (Germany, France, Italy, Spain, Poland, UK and Israel). The purpose of the project was to examine empirically the role played by demand-side factors in creating technological knowledge, in recognizing technological and organizational innovation, and in fostering higher productivity. The acronym Pick-Me stands for Policy Incentives for the Creation of Knowledge: Methods and Evidence.

The project examines the structure of the network connections linking various institutional agents (research infrastructure, the business community and policy decision-makers) involved in creating and exploiting technological knowledge at the level of the individual firm, the technological sector and the spatial dimension in which innovation processes occur.

This year, work was completed on three Work Packages: Work Package 5, which evaluated demand and the evolution of stores of knowledge in sectors and regions that are knowledge-intensive; Work Package 6: “Adapting the demand for training knowledge workers in local labor markets, and Work Package 7: Development of demand, sectoral development and the organization of innovation activities. The Pick-Me project began in January 2011 and scheduled to be completed in October 2014.

E 6.1 The Evaluation of Demand and the Evolution of Stores of Knowledge in Sectors and Regions that are Knowledge-Intensive

Research team: Prof. Amnon Frenkel, Prof. Shlomo Maital and Dr. Emil Israel

This research was done within the framework of Pick-Me project – WP 5. The study analyzing data collected in a field survey of the ecosystem created by the RAD Bynet group of companies, which fostered some 130 startups of various types. Using statistical models, we examined the factors that contribute to the interaction and collaboration among the companies in this remarkable 'cloud', their link with one another and with the 'mother ship' RAD, as factors that generate the exchange of knowledge. The results of the analysis show that the tendency to have sustained contacts and interaction is more likely for companies with which the mother company RAD played a business role in establishing them, or for which a senior company executive once had a senior role in RAD. These results indicate, apparently, the contribution of mutual trust built between companies, that influences their willingness to maintain sustained business links. Our research found that social and technological proximity encourage the tendency of companies to have business links, which in turn foster exchanges of knowledge. In addition, it emerged that geographical proximity in itself is not sufficient for creating interactions among companies, but rather additional factors are necessary for such collaborations, in particular proximity based on personal connections and individual mutual trust, which were more important even that technological proximity.

E 6.2 Adapting the Demand for Training Knowledge Workers in Local Labor Markets

Research team: Prof. Amnon Frenkel and Dr. Eran Leck

This research was done within the framework of Pick-Me project – WP 6. In this study data gathered in an Israel Central Bureau of Statistics survey among more than 5,000 Israeli university and colleage graduates were analyzed. The survey examined the extent of the graduates' integration into the labor market. The research studied the existence of match (or lack of it) between the education graduates acquired and the labor market requirements in the context of the gap between central Israel and the peripheral regions. With the aid of statistical modeling and simulations, the contribution of an innovative environment was estimated, along with other regional and individual characteristics, to the match between graduates' training and labor market needs. The results of the research indicated that the likelihood the graduates' education was compatible with the demands of the labor market are higher, among graduates of the exact sciences and engineering, than the graduates of the social sciences and humanities programs. And for exact sciences and engineering, the likelihood of a good match between training and labor market demands is higher for graduates of universities than the graduates of colleges. The findings of the research indicate that there is a lack of compatibility between the supply of university and college graduates in the peripheral regions and the demand for such graduates in local labor markets. The results of the simulation stressed the crucial importance of an innovative environment and its contribution to the wellbeing of the region. At the same time, it is important to recognize that creating an innovative environment is a gradual process that is mainly demand driven. Such environments tend to thrive and develop in core regions or large urban areas characterized by economic agglomerations and plentiful production resources. Thus, in peripheral regions, demand-

driven enterprises alone cannot shrink the lack of compatibility between higher education and market demands. Reducing this incompatibility is essential to diminish the out-migration of educated persons from the peripheral regions. In parallel, measures must be taken, on the supply side, in which local government authorities play a key role in ensuring the necessary conditions for adapting labor market demands to the education of academic institutions in these peripheral regions.

E 6.3 Innovativeness of Multi-National Companies in Israel: Evidence from Patent Data and R&D Centers

Research team: Dr. Daphne Getz, Dr. Eran Leck and Vered Segal

This research study was conducted within the framework of Work Package 7 of the Pick-Me project: "The development of demand, sectoral development and the organization of innovation activities" and is part of task no. 4 "The demand for innovation and location considerations of multi-national companies".

The purpose of the study is to examine the impact of multinational companies on the Israeli economy in terms of demand for innovation. The study focuses on two impacts of multinational companies on the Israeli economy: (1) Knowledge spillovers and the positive effects on the local economy stemming from the activity of foreign R&D centers in Israel that create domestic demand for innovation; (2) the potential loss to the Israeli economy caused by foreign exploitation of Israeli technology, knowledge, and intellectual property.

Firm-level data, containing information on the characteristics of foreign and local companies, were linked to the patent database PATSTAT to capture the extent of inventive activity performed by these companies. In addition, a short questionnaire, consisting of open-ended questions, was sent to representatives (at the CEO, VP, or Director of Business Development levels) of the foreign R&D centers. The purpose of the questionnaires was to gain an understanding of the intellectual property policy of the foreign R&D centers and to investigate the relationship between the multinational companies and local companies.

E.7 Mapping National Innovation Ecosystems: Foundations for Policy Consensus

Project team: Prof. Amnon Frenkel and Prof. Shlomo Maital

This book deals with technological innovation and is based on research results compiled in the framework of Work Package 2, in the Pick-Me project for the 7th Framework, European Union. In this work package, a new methodology for mapping technological innovation ecosystems at the national level was devised and tested successfully, for Israel and several other European nations participating in this project.

The book was written by Prof. Amnon Frenkel and Prof. Shlomo Maital, and will be published by Edward Elgar Ltd., UK. The two authors expanded the original five-country study under Pick-Me, to include three additional ecosystems: Singapore, Zhangjiang Science Park (Shanghai, China) and the Ontario (Greater Toronto) Health Care Innovation system. The eight innovation ecosystems presented in this book provide a global comparison of similarities and differences in innovation across nations.

E.8 Mapping Research Infrastructures in Israel

Research team: Dr. Daphne Getz, Vered Segal, Bella Zalmanovich and Oshrat Katz-Shacham

The Samuel Neaman Institute is conducting in 2012-2014 a further study on the subject of 'Mapping National Research Infrastructures in Israel'. The goal of the study is to build the knowledge database that would allow the creation of a road map for planning national research infrastructures in Israel and to formulate a policy that will define budgets and priorities within a national policy on large research infrastructures in Israel.

The study findings are summarized in a report that deals with mapping the large research infrastructures in Israel and includes three chapters: the first chapter deals with an update of the mapping of research infrastructures. The report includes 120 existing research infrastructures in Israel and 10 international research infrastructures, the use of which by researchers from Israel is funded by the state via state/public budgets.

The second chapter of the report examines three key topics of all existing research infrastructure at the national level: nanotechnology and nano-scientific infrastructures, brain research infrastructures, and genomics and proteomics infrastructures. This view allows an examination of the position of the State of Israel in in terms of the research infrastructures available to researchers in these fields.

The third chapter of the report reviews the process undergone by selected countries in building a roadmap of national research infrastructures. The countries surveyed are Finland, Australia, Netherlands and the European Forum for Research Infrastructures – ESFRI. This report can be useful in studying the process other states followed to build a roadmap, and allows the selection of an appropriate outline suitable for building a roadmap for research infrastructures in Israel.

E.9 A Policy on Levering Stem Cell Research through Intellectual Property

Research team at Samuel Neaman Institute: Dr. Daphne Getz, Bahina Eidelman, Bella Zalmanovich, Miriam Asotstky and Yair Even-Zohar; Project team at Haifa University: Prof. Niva Elkin-Koren, Dr. Yael Bergman-Eshet, Sharon Bar-Ziv, Talya Ponchak and Dalit Sagiv

The goal of the research is to create an infrastructure for designing a policy on research, development, and knowledge transfer in the field of stem cells. This policy was intended to encourage scientific innovativeness as well as help lever Israel's position as a leader in this field in the global arena.

The research focused on mapping the existing situation in stem cell research in Israel; examining alternative models for levering stem cell research and cooperation between various research sectors; and developing a legal framework that will assist cooperation between the actors in this field in the various sectors and the leveraging of stem cell research.

This innovative study provides policy makers with a broad picture of the stem cell research situation in Israel and the legal aspects involved in managing it. This study combines the expertise areas of two leading research institutions: the Samuel Neaman Institute and the Law and Technology Center at Haifa University. Samuel Neaman Institute researchers analyzed the scientific activity in Israel in the stem cell field in the academe, industry, and hospitals, using three questionnaires that were administered to companies, researchers in the academe, and research institutes and researchers in hospitals, including interviews with representatives of the various sectors. In addition, data from research questionnaires that were administered

to lawyers and/or patent editors who are involved in the stem cell area were collected and analyzed, including application companies at the universities. A framework and methodology for analyzing and presenting the data was built, and the data from several different sources, including a bibliometric analysis of the quantity and quality of scientific output in the field of stem cell publications and patents as compared to other selected countries, was integrated. A report summarizing the findings was submitted to the Ministry of Science.

This is a joint research project of the Samuel Neaman Institute and Haifa University and it can be downloaded from the Samuel Neaman Institute website.

E.10 A Survey of Israel's Foreign Relations in Science, Research, and Development at the National and Institutional Level

Research team**:** Dr. Daphne Getz, Eliezer Shein, Bahina Eidelman, Ella Barzani, Oshrat Katz-Shacham and Golan Tamir

The State of Israel has extensive Scientific Relations and ties with many international bodies. In recent years the number of these collaborations has increased dramatically due to the high level of the Israeli researchers, scientific research and academic institutions. Over the years, established international connections, collaboration and relations were fertile ground for the exponential growth of many scientific achievements of Israel. The results of these scientific achievements are reflected in joint scientific publications and patents and through the many startup companies in a wide range of scientific fields and technologies.

International cooperation in science takes place at several levels ranging from cooperation between scientists, through collaborations between academic institutions, research institutions, research funds and all the way to cooperation at the state-level.

The purpose of conducting the Survey of Israel's Foreign Relations in Science, Research & Development at the National and Institutional Level and the rationale for its implementation is twofold:

- To create a basis for building a computerized database which will be compiled to include all the available information on Israel's Scientific Foreign Relations.
- This computerized database should be a tool to be used by the national committee on scientific Foreign Relations of the Israel National Council for Research and Development known as the "MOLMOP" and other relevant bodies.

Foreign Relations

The international R&D Relations of Israel are diverse and numerous, and most of the information on them is distributed among various agencies.

The database that was created and embedded within the Ministry of Science infrastructure is based on the analysis of a survey that was conducted by the Samuel Neaman Institute among all the relevant organizations dealing with Scientific Research in Israel.

It is our hope that the “MOLMOP” database will enable potential users to make recommendations on scientific fields of interest, organizations and countries which are favorites for the development of R&D relationships. We believe that it will also be instrumental in furthering the diplomatic relations of Israel thus, increasing the positive exposure of the state of Israel worldwide.

E.11 Examining R&D Activity Areas, Infrastructure and labor Force – in subjects involving space

Research team: Dr. Daphne Getz. Tzipi Buchnik, Bella Zalmanovich, Ella Barzani and Dr. Noa Lavid

This work was commissioned by the National Space Committee, the National Council for R&D. The objective of this study is to provide data and information to all entities operating in the field of space R&D on their role and the status of personnel and infrastructure at their disposal, in order to help the NCRD formulate a national plan for the development, preservation, and promotion of R&D in the field of space.

Over the years, Israel took part in international technological and research projects in the field of space and gained international recognition and reputation of its achievements and capabilities.

The study covers the following topics:

- Mapping the centers of knowledge and infrastructure in the field of space in the different sectors, the academe, industry and the government, engaged in R&D in the field of commercial space.
- Analysis of the status of Israel relative to the leading countries in this field, identifying gaps and unique advantages of the State of Israel while focusing on changes in the last five years and on the directions in which the space industry should develop in Israel in the field of civilian space.
- Presenting the status of academic research in the field of space in the state of Israel and comparing it with other countries around the world, as measured by bibliometric indicators.

- Presenting indicators that reflect the R&D activity in leading countries in the field of space in relation to Israel.
- Review of educational activities for children and youth on the subject of space.

This work is a continuation of research carried out at the Neaman Institute over the years 2007 to 2009 about assessing the impact of the aerospace industry on the economy of Israel.

Space

E.12 Israel's SETI system – a series of studies by UNSESCO on science, engineering, technology and innovation policy

Research team: Dr. Eran Leck, Dr. Daphne Getz, Prof. Ofira Ayalon, Tzipi Buchnik, Vered Segal, Orly Nathan, Ilia Zatcovetsky, Ella Barzani and Efrat Kerem

The study was commissioned by the Israel Academy of Sciences and carried out through joint funding by the Academy and Samuel Neaman Institute. The report will be published in a series of studies by UNESCO on the subject of science, engineering, technology, and innovation policies.

In recent decades, the importance of formulating a comprehensive and inclusive SETI (science, engineering, technology, and innovation) policy that will help ensure long-term and sustainable economic growth is growing worldwide. In many countries, institutions, statutory bodies, state executive agencies have been established, with the aim of helping decision makers identify the opportunities and barriers in the field of SETI. These organizations are responsible for the creation of incentives for innovation and R&D and promote the integration of specialized tools and best practices to guide the SETI policy.

The purpose of the proposed project is to map the SETI structure and system in Israel, to describe it using relevant metrics, and to examine the strengths and weaknesses of Israeli science and technology and innovation policy, while placing special emphasis on policy tools and best practices. The project is a pioneering work, containing outputs and success stories, which will assist other countries to plan studies of their SETI policy. The study will explore the historical background of the national SETI system. It will describe its political, social, economic, and environmental structure and its impact on the SETI

policy. It will address the legal framework that supports the SETI policy; analyze the tools and instruments through which the SETI policy is promoted; and map the macro-economic performance and frameworks for innovation, while considering relevant indices.

E.13 Bibliometric Mapping and Evaluation of Leading Research Groups in Life Sciences

Research team: Dr. Daphne Getz, Dr. Noa Lavid and Ella Barzani

This work deals with the mapping of the leading researchers in the seven academic institutions in Israel (Hebrew University of Jerusalem, Tel Aviv University, Bar Ilan University, Haifa University, Ben-Gurion University of the Negev, the Weizmann Institute and the Technion - Israel Institute of Technology) in the following areas of life sciences: genomics, proteomics, bioinformatics, chemical genomics, and personalized medicine.

The prominent researchers were selected by bibliometric indicators: the number of publications in the areas in question; average citations per publication in all years, and in recent years (2008-2012) in particular; and h-index. In addition, the relevant faculties and departments in all academic institutions and university hospitals were also surveyed, as well as the associations and research centers engaged in these fields, grantees in the fields in question, and publications in major journals. For the researchers included on the list, bibliometric indices were calculated and information was collected on research grants, awards, multi-disciplinary studies, and publications in esteemed journals. An analysis of joint working relationships between the various researchers was carried out. The entire study was conducted using open information from various sources and bibliometric database. The summary and discussion chapter includes recommendations for further research with other means.

E.14 Tax Benefits for R&D in Israel

Research team: Prof. Dan Peled, Prof. Benjamin Bental, Dr. Daphne Getz, Tsipy Buchnik, Ilia Zatcovetsky and Avi Sasi

This project examines the tax incentives system to encourage R&D in the business sector in Israel. More than two thirds of OECD countries and many others encourage R&D activities in the business sector with tax benefits based on the volume of R&D expenditures reported by the firms.

How does the world incentivize R&D? And what should Israel do to adapt itself to the global competition on R&D projects and R&D resources? These are the main issues of this research. The study reviews tax incentive methods used to encourage R&D in the world, and their effectiveness. The work combines theoretical and empirical studies of the impact of various tax incentives on the R&D performed by firms, the number of firms that choose to invest in such activities, and the effects of increasing R&D activities on economic growth and output.

The work is a joint venture of the Samuel Neaman Institute and the National Council for Research and Development at the Ministry of Science and is expected to end by mid-2014.

E.15 Specialization and Distribution Indices of R&D Activities

Research team: Prof. Dan Peled, Prof. Benjamin Bental, Dr. Daphne Getz, Dr. Eran Leck, Tsipy Buchnik and Ilia Zatcovetsky

Although R&D share of GDP in Israel is among the highest in the world, the intensity of Israeli R&D does not necessarily indicate a desirable distribution of R&D across disciplines and economic branches. Continued growth rates of the magnitude observed over the last decade may be vulnerable due to excessive concentration of R&D activities in certain areas. In the absence of appropriate data and appropriate concentration measures in the Israeli economy and comparable data from other countries it is difficult to assess the distribution of R&D activities and government support measures.

This work complies R&D data by economic branches and develops concentration measures of such activities across industries. These measures will enable comparison of R&D intensity of economic branches, monitor trends in R&D over time, and making international comparisons of R&D according to sectors and industries in different countries. In October 2012, an interim report was written, which included data on R&D investments and outputs across sectors, patents, and areas of economic activity, and a review of possible distribution indices.

The work is a joint venture of the Samuel Neaman Institute and the National Council for Research and Development at the Ministry of Science. The study began in 2011 and is expected to be completed in 2014.

E.16 Israeli Research Universities in the National R&D system

Research team: Prof. Dan Peled, Prof. Benjamin Bental, Prof. Zehev Tadmor, Prof. Uri Kirsch, Dr. Tzameret Rubin, Dr. Daphne Getz, Dr. Eran Leck, Dr. Noa Lavid, Tsipy Buchnik, Vered Segal, Ella Barzani and Ilia Zatcovetsky

This work was commissioned by the National Council for Research and Development (NCRD) at the Ministry of Science. It examines the impact of research universities on the national R&D system and the mutual influences that exist between these two systems for the development of knowledge, technology, and innovation.

Work began in early 2013, and toward the end of the year an interim report was submitted. That report provided a database, from Israel and other countries, of R&D and higher education systems, and reviewed output measures of academic activities in the universities. The final report will contain a comparative overview of the R&D and higher education systems in Israel and in a number of comparison countries, (Germany, UK, Sweden, Switzerland, the Netherlands and Korea). Specifically, governance mechanisms and government support of academic research will be examined, as well as the mechanisms for transferring knowledge and encouraging collaboration between the academe and industry, both in Israel and worldwide. Additional chapters in the report will present and analyze additional measures of outputs and inputs of research universities.

F. Evaluating Performances and Contributions Made by Immigrant Scientists Employed by the KAMEA Program of the Ministry of Absorption in the Academe in Israel

Research team: Prof. (Emer.) Avraham Shitzer, Mechanical Engineering, Technion and the Samuel Neaman Institute;
Research assistants: Miriam Asotsky,
Irada Kazimova and Smadar Shaul

The purpose of the study was to evaluate the contributions and achievements of the immigrant scientists participating in the Kamea program. The program was designed to ensure job security to outstanding senior scientists until they reach retirement age, by appointing them to research positions in research institutes. The program was funded by the Ministry of Immigrant Absorption through the Center for Absorption in Science in collaboration with the Planning and Budgeting Committee of the Council of Higher Education and the employing institutes. The study sampled 338 of the 680 immigrant scientists who took part in the Kamea program starting in 1998 until the end of 2011. The overall cost of financing the Kamea program in these years is estimated at one and a half billion shekels. The average length of stay of scientists in the program was about nine years.

G. The Information Centers of MAGNET Consortia

Manager of the information centers: Dr. Daphne Getz; Coordinator: Josef LinhartInformation specialists: Orly Nathan, Ella Barzani, Bella Zalmanovich, Ayelet Raveh and Tamar Dayan; Information systems manager: Golan Tamir

A computerized information center, one of the largest in Israel, is operated at the Samuel Neaman Institute. The center was established to fulfill the needs of knowledge management and to supply information science services to consortia that operate within the MAGNET program, and is part of the MAGNET program of the Economy Ministry. The information centers are based on a computerized system, planned according to the requirements of the staff of the Samuel Neaman Institute, in collaboration with the consortia.

During 2013, the Samuel Neaman Institute operated eight information centers for MAGNET consortia providing assistance in: databases, informatics services, tools to support organizational management, and more. **The information centers for consortia operated by Samuel Neaman Institute in 2013 include:**

Broadband communications for rapid deployment by rescue forces (RESCUE), focusing on technologies for the next generation of communication systems for emergency and rescue forces. HDTV quality video in real-time on the open internet network (NET-HD): technologies to increase the effective capacity of the Internet to deliver video at HD quality, while doubling the volume 10,000 times. Nanotube Empowerment Solutions (NES): vital generic technologies that allow the use of nanotubes in selected and groundbreaking applications. Cognitive radio networks (CORNET): Building blocks in the technology of cognitive radio in the areas of sensing, cognitive engines, platforms, and networks that will constitute a breakthrough

in the design of radio networks. Sensing at low level lighting (HySP): which addresses the development of technologies of digital cameras, and processes and methods to produce arrays of hyper sensitive photonics. Advanced optical high-speed telecommunications networks (TERA SANTA): developing technologies and building blocks to realize the next generation of optical networks. The Israeli Smart Grid Consortium (ISG): Developing a technological infrastructure for integrating the communication network and elements of command and control in the electricity network through optimal utilization of the energy available to realize a greener world. Silicon wafer metrology (Metro450): Focusing in underlying technologies involved in large wafers measurement equipment and chalenges mutual to all measurement machines.

H. Environmental Protection

For over a decade, a comprehensive environmental program has been under way at the Samuel Neaman Institute. The program is conducted by a professional Environment & Energy (E&E) team headed by Prof. Ofira Ayalon, and deals with the preparation of studies, white papers, surveys, and policy recommendations for a variety of environmental matters pertaining to the leading issues in the environment in Israel.

The studies include topics such as waste management (municipal, hazardous, and packaging), reducing greenhouse gas emissions (mitigation), and adapting to climate change, as well as various topics related to energy and to the planning of the energy sector in Israel. Documents on national priorities, designed to provide a current picture about what is being done in this area in Israel and abroad and to formulate policy recommendations in order to reach desired destinations are also included.

The documents prepared by the staff are used by the managements of government offices such as Finance, Environment, Energy and Water, Economy (former Trade and Industry, etc.), the Knesset's Information Center, editors of Wikipedia entries, professionals, students and journalists. These documents are considered to be of primary importance in Israel and they also form the basis for opinion columns on environmental issues that are published in the printed and electronic media.

H.1 Greenhouse Gas Emissions Registry in Israel

The project staff: Prof. Ofira Ayalon, Dr. Miriam Lev-On,
Dr. Perry Lev-On, Tal Goldrath and Yaara Grinberg

The subject of climate change and global warming attracts worldwide attention due to the environmental and economic implications of these changes for the developed and developing world. The Israeli government is aware of the importance of activities in the field of reducing greenhouse gas emissions (despite the absence of a formal international commitment by Israel in this field at present and the freezing of the national program to reduce greenhouse gas emissions) and operates accordingly. Thus, about four years ago, the government launched a voluntary project to register greenhouse gas emissions. The project is conducted in collaboration with the Ministry of Environmental Protection and includes industrial, commercial, and financial organizations, among others.

The system came into force in mid-2010 (defined as a pilot year) and 36 organizations filed their reports for 2011. In 2012, 42 organizations reported their emissions. The total reported emissions constitute about two-thirds of the total emissions in the Israeli economy. The process of designing the procedures and methods for the Israeli system, as well as the support and the monitoring of the reports, was undertaken by the E&E team at the Samuel Neaman Institute at the Technion and a team of the Ministry of Environmental Protection, in collaboration with a wide range of stakeholders.

In addition, Israel participates in a pilot of the World Resources Institute organization which conducts monitoring and tracking of the progress of government offices regarding the reduction of greenhouse gas emissions in Israel. Data collection and reporting

to the organization are performed by the E&E team of Samuel Neaman Institute.

A paper entitled “Greenhouse Gas Emissions Reporting in Israel: Means to Manage Energy Use” was accepted for publication in *Energy Conversion and Management* journal.

H.2 Israeli Climate Change Information Center (ICCIC)

Information Center Manager: Prof. Ofira Ayalon; Project staff: Prof. Nurit Kliot - University of Haifa, heading the water sector research; Prof. Haim Kutiel - University of Haifa, heading the climatic change research; Prof. Manfred Green - University of Haifa, heading the health research; Prof. Marcelo Sternberg - Tel Aviv University, heading the biodiversity research; Dr. Tami Trup – University of Haifa, heading the green building research; Dr. Tzipi Eshet – University of Haifa and Samuel Neaman Institute – economy and Ms. Yaara Grinberg of Samuel Neaman Institute

According to a government resolution, the Ministry of the Environmental Protection was asked to prepare a national plan for adaptation to climate change in Israel. For this purpose, the Ministry initiated the establishment of the Israeli Climate Change Information Center to work to strengthen existing scientific knowledge regarding climate change adaptation in Israel and market the accumulated Israeli knowledge to other target countries.

In 2013, following the publication of two earlier reports (published in 2011, 2012), ICCIC research team was asked to prepare a third report, concentrating on recommending adaptation policies for the **local authorities**. This implies improving the resilience of the local authorities under climate change situations.

Climate change is expressed by extreme weather events that already occur frequently and for which we must prepare as part of the overall preparation of the local authority, in terms of City and Regional Planning, in terms of water, health, and bio-diversity conservation in the city and in open spaces. This preparation will naturally require long-term investments that will impact the Israeli economy. The resilience of local authorities is measured not only in the preparation

of the necessary physical infrastructure for emergencies resulting from climate events, such as creating coordinated systems between all relevant bodies and shortening warning times and the systems' response time, but also in instilling the need for awareness in the residents and in the public's participation in the processes. The study contains the background and a detailed review about the preparedness of local authorities in the world and in Israel on the subject of climate change in the areas of water, health, bio-diversity conservation, and urban planning. The study also includes an outline for assessing the economic costs and benefits arising from these preparations.

H.3 Reduction of food loss due to surpluses and overproduction in agriculture in Israel

Research team: Prof. Ofira Ayalon, Dr. Tzipi Eshet – University of Haifa and Samuel Neaman Institute and Ms. Yaarit Licht

In the world at large and in Israel in particular there is food waste (raw and processed) at levels and of a scope that are not always known, for which the reasons are many and varied. In Israel, some of the reasons for the waste were related in the past to the need to maintain the farmers' production quotas (and surplus crops are destroyed; this is especially true for milk and eggs). Agricultural produce is also destroyed in order to maintain high price levels. These residues find their way, finally, to landfills in the worst case, or at best are delivered to the needy. The study is conducted in collaboration with the Leket Israel organization.

This study examines the extent of the problem and the methods used to resolve it around the world, through an international overview of the problem of agricultural surpluses and of agricultural products on the one hand and starvation on the other. The environmental problems related to surpluses are also shown in the report, which reviews also the solutions/policy instruments for common surpluses worldwide. Further research will map the extent of the problem in Israel, and will provide a chronological overview and assessments of the surplus problem in Israel, assessing the current situation and the problems involved from the farmers' perspective (part of the methodology will include surveys/interviews with farmers to hear their opinion on the matter). Finally, recommendations will be submitted for application (including the examination of the transfer of surpluses to the needy in Israel).

H.4 Substitute Fuels A. Production of fuel substitutes from waste B. Using Electric and hybrid vehicles

Research team: Prof. Ofira Ayalon, Idan Liebes and Yaara Grinberg, together with Kivun Strategic Consulting Ltd., and Tznobar Ltd.

This research is conducted within the framework of the government decision of 2011 regarding the operation of a national program to reduce global dependence on oil, and further to another government decision of 2013 regarding the reduction of Israeli dependence on oil for transportation.

The study includes several layers; however, the present layer presents the area of promoting the transition of the transportation sector in Israel to alternative energy sources and in particular to waste-derived fuel substitutes. The study is submitted to the Ministry of Environmental Protection and to the Ministry of Energy and Water.

The main conclusions to be drawn from the study are that most of the technologies presented are not currently commercially used for the production of fuels from waste, since their application is mostly to recoverable electricity and/or heat.

Turning all waste into fuel, after the implementation of the recycling policy of the Ministry of the Environment, can yield about 7% of all fuel consumed in Israel, but the fuel cost for transportation is significantly higher than that of gasoline, diesel or natural gas based fuel.

As part of the work required by the Ministry of Energy, we were also asked to introduce the economic aspects and the technologies of electric and hybrid vehicles. Although Israel is not a manufacturer of such vehicles, technological advances will affect not only the fuel or electricity consumption for transportation, but also a reduction of environmental pollution associated with the transport sector.

H.5 Examination of the amount of landfill tax in Israel

Research team: Prof. Ofira Ayalon, Dr. Tzipi Eshet

The landfill tax is a regulatory tool that helps compare the cost of landfilling with the cost of waste treatment using different technological alternatives that are more environmentally friendly, but also more expensive than the landfilling alternative.

The landfill tax in Israel has been collected since 2007, and the Ministry of Environmental Protection examines what is the level of the tax required to advance sustainable waste treatment in Israel.

This work, conducted at the request of the Ministry of Environmental Protection, explores the external costs of landfilling worldwide and in Israel as well as landfill tax policies around the world and.

Based on the international review and on the estimated external costs, a recommendation was made to update the level and type of landfill taxes to be adopted in Israel.

H.6 Financial mechanisms for financing the implementation of cost-effective technologies in construction and in the upgrading of residential buildings

Research team: Prof. Ofira Ayalon

One of the areas affecting most the consumption of natural resources and energy in the world, in general, and in Israel in particular, is the area of residential buildings, due to population growth and the concentration of residents in cities and buildings. EcoFinance Ltd. was selected by the Ministry of Housing to examine and recommend economic mechanisms to finance the implementation of cost-saving technologies in construction and the upgrading of residential buildings, and this work is conducted in collaboration with Dor-Ad Sustainability Ltd. And the Samuel Neaman Institute.

The work includes an examination of the prevailing economic mechanisms around the world, examination of technological means, their costs and benefits in terms of energy conservation and efficiency, and recommendations for implementing similar mechanisms, adapted to the Israeli economy.

Professor Ayalon serves as an academic consultant in this research.

H.7 The Water Forum

Forum coordinator: Prof. Eran Friedler Research team: Miki Zaida, Prof. Abraham Shaviv

The "Water Forum", established in 2009 by the Samuel Neaman Institute in cooperation with Israel Water Authority and the Grand Water Research Institute at the Technion, serves as a platform for discussing and analyzing key issues in order to contribute to the formulation of white papers on a variety of topics in the field of water related strategy and policy. The discussions in the Water Forum are conducted in an academic and professional framework by a team that comprises experts in various academic and research institutions and public and governmental entities dealing with topics related directly and indirectly to policy issues in the water sector. The discussions are an important stage in the examination and analysis of the emphases and main directions of the water policy in Israel, and we hope that they will help in formulating long-term strategies for the water sector in Israel. The Forum documents are edited in a format that is suitable for the use of policy makers and decision makers in the water sector.

At the third meeting of the Water Forum, held on January 2013, initiated in collaboration with the Energy and Water Minister, Dr. Uzi Landau, the issue of "**Water for Nature and the Restoration of Streams**" was discussed. A full day was devoted to the meeting, with the participation of the best experts in dealing with different aspects of water: **nature, streams restoration, and the interactions between water for public needs and wildlife, and water for the supply needs of other sectors; the interaction between runoff management and water for nature; environmental economics; and the interaction between government departments, academics, and representatives of the third sector.**

I. Energy
I.1 Energy Forum

Head of the project: Prof. Gershon Grossman; Research assistants: Yaara Grinberg and Idan Liebes

The purpose of the energy forum is to maintain a professional infrastructure in the field of energy in Israel, and to allow meetings, symposiums and discussions that encourage the promotion of projects in the field of renewable energy and energy conservation. Through the forum, the Samuel Neaman Institute formulates professional and applicable positions, on which experts and stakeholders in the field and decision-makers in various government offices that participate in the forum agree.

In 2013, four Energy Forum meetings were held:
Smart Grid as a growth engine for the industry in Israel (2.1.2013): This Forum focused on the business potential of Smart Grid for Industry in Israel

1. Sustainable road transport: Energy and Environmental Aspects (29.4.2013): The Forum discussed transportation problems, mainly in cities, from the standpoint of congestion, pollution and energy consumption

2. Smart City (9.10.2013): The Forum discussed the possibilities of converting Israeli cities into Smart Cities, considering transportation, electric grid, communication etc.

3. Solar electricity in Israel (24.12.2013): The Forum discussed the relative merits and problems of solar thermal vs. photovoltaic systems and their suitability for the Israel electrical grid.

I.2 Master Plan for Energy

Research team: Prof. Ofira Ayalon, Idan Liebes and Yaara Grinberg

The E&E team of the Samuel Neaman Institute is a member of the consulting team of TAHAL, which in 2011 won the tender to establish a master plan for the energy sector.

The role of the staff is to examine the environmental implications as part of possible energy scenarios in Israel, as well as practices to reduce the economic and environmental costs to the Israeli economy. As part of the master plan, the environment team examines the environmental parameters that are being influenced and will be affected by the energy sector, such as electricity production, reviewing the costs in terms of environmental damage, as well as the benefits, of different power stations and making an environmental-economic comparison between different energy sources for electricity generation. The team addresses: energy efficiency and its environmental implications, demand management and deflection, renewable energy, transportation, and energy usage in industry – efficiency in the field of energy demand in industry. The use of renewable sources (including solar water heating in the industry) and oil substitutes will be examined in the plan in light of their costs and environmental benefit.

During 2013, reports were filed describing the progress of work and presenting the characteristics of the various models in the electricity, oil and gas sectors, and a comprehensive methodology for building the models of the energy sector.

I.3 Clean Energy Innovation Policy in Israel

Head of the project: Prof. Gershon Grossman

The goal of the project is to analyze policy lessons emerging from Israel's successful efforts to spark, direct, and accelerate the process of technological innovation in the clean energy sector. The intention is to identify fundamental policy design principles that can be applied across various technology groups and in other countries with different political, economic, and technological contexts. Based on a detailed analysis of these principles, the project formulates a series of more general recommendations of best practices for clean energy innovation policy.

In 2013, a study was conducted under the above project in cooperation with the London School of Economics, entitled: Clean Energy Innovation Policy in Israel: Identifying Fundamental Principles through a Case Study of Smart Grid Policy.

J. Society, Education, Health and National Strength
J.1. Ultra-Orthodox Integration Project

Head of the Project: Dr. Reuven Gal; Research Assistant: Ilia Zatcovetsky; Research team: Yehezkiel Farkash. Project coordinator: Moshe Papo; Volunteer: Hudi Zak. Writers of "Success stories": Moshe Berman and Haya Feder; Researchers of "Integrating English, Mathematics & Computers in the Ultra-Orthodox Education System," Maayan Shahaf and Yehuda Morgenstern

The 'Ultra-Orthodox Integration Project' has been in progress for four years, combining research, application, and field activities. The project's foci are on three main channels of integration: Military and civilian service (military – mainly the "Orthodox service" programs in the IDF - *Shahar*; civilian - participation in the National-Civic Service); Education (expanding study subjects, academic studies, professional training); and integrating the Ultra-Orthodox into "official" employment. In 2013, the project recorded impressive achievements due to its ongoing activity.

Military and Civic Service - Formulation of new legislation aimed at replacing the "Tal Law" (which was canceled by the Supreme Court). At all stages of the legislative work, the study data and position papers, formulated and written by the project team, were used by the members of the various committees, and the project leader actively participated in deliberations held in the various committees and served as a professional consultant on issues.

Education - a number of research reports were published, on the

one hand indicating the potential of the Ultra-Orthodox students in Israel, and on the other hand monitoring and reporting on the achievements of the Mahar project (on behalf of the PBC/CHE) so far. In addition, the Ministry of Education adopted the "English, Mathematics & Computers Report" (published by us in March 2012) and budgeted the first pilot program, based on the report's recommendations. The project team also continues to accompany the new preparatory courses launched at the Technion and other institutions for Haredi students.

Employment - Two major publications appeared, 'An information booklet for employers' and the book 'Success stories,' which have aroused great interest and were widely distributed. The Shachmat Project (integrating the Ultra-Orthodox in technological plants) continued its activities in promoting the integration of the Ultra-Orthodox in high-tech industries. 2013 also saw the beginning of a new channel of activity related to the project: intervention in internal circles among the Ultra-Orthodox community to encourage and foster 'social activists' within the Ultra-Orthodox community and build 'bridges' with the spiritual leadership of this community.

J.2 Science and Technology Education Forum

Forum chairperson: Prof. Orit Hazzan Members of the Steering Committee of the Forum: Shmuel (Muli) Adan, Senior VP at Intel and president of Intel Israel; Rabbi Dr. Zvi Elani, head of Lustig Institute, JCT Jerusalem; Lt. Keren Ben - Nathan Krueger, head of administration for technological and research personnel, Personnel Department, IDF; Prof. Mahmoud Khalil, president of Sakhnin College for training teaching staff; Rachel Matuki, Haifa District Director, Ministry of Education; Vera Sanitzki, teacher and the TOV project coordinator at Rogozin ORT school in Migdal Haemek, and lecturer at Nazareth Illith College; Prof. Omri Rand, CEO of Samuel Neaman Institute

The Forum for Science and Technology Education was established in 2013. The purpose of the forum is to create cooperation between different sectors of the Israeli society to promote K-12 science and technology education.

As a background for the forum's discussions, a report was prepared. Its purpose is to create the basis for a risk management strategy in relation to the expected shortage of teachers in STEM (science, technology, engineering and Mathematics) subjects.

The report consists of six chapters and presents a model to forecast the number of teachers required in the future for teaching STEM in Israel under three scenarios:

- The percentage of students in high schools who study S&T subjects does not change; in this case no shortage of teachers is expected.
- The percentage of students in physics, chemistry, computer science and technological subjects is multiplied; in this case there is a shortage of teachers.

- A quarter of the students in high schools study physics and/ or chemistry and/or computer science and/or a technological profession; in this case there is a serious shortage of teachers.

On the basis of the report, the two major challenges faced today by S&T education in Israel are: a. the anticipated shortage of teachers in S&T subjects, and b. the relatively small number of students in technological education. These two challenges are interrelated and the solution for both can be found in teachers with excellent engineering and scientific background. One of the report recommendations is to design training programs for those who have an excellent engineering and science background and who are interested in considering integration into the education system at some stage of their professional development.

J.3 Mathematics Without a Break: Interweaving Mathematical News Snapshots in the Teaching of High School Mathematics

Project leader: Prof. Nitsa Movshoviz-Hadar,
Research team: Dr. Batya Amit, Dr. Atara Shriki. Dr. Ohad Zohar,
Ort high-schools contacts: Dr. Eli Eisenberg, Senior VP and Head of R&D and Training Administration; Lea Dolev – Head of Mathematics Teaching

Mathematics curricula in most countries, including Israel, do not reflect the ongoing work and the new results being accumulated in mathematics. Many graduates of the education system develop a misconception that mathematics is a closed and stagnant area, where all the answers are known and very little, if anything, is left to stimulate their curiosity and desire to invest in creating new results. In an attempt to deal with the problem, the project team developed a set of Mathematics News Snapshots (abb. MNSs) in the format of short PowerPoint presentations each focusing on a single breakthrough in the field of mathematics, taking into account the limited background of high school level students. The ultimate goal is to decrease the gap between the ever-growing nature of mathematics and the stagnated nature of school curriculum. The underlying assumption is that by perceiving mathematics as a creative human endeavor, more students will opt to consider a choice of their future career in mathematically-based occupation.

As of the last quarter of 2011 Neaman Institute joined the Israel Science Foundation in partial support of a feasibility study named: Mathematics Without a Break.

Its goal is to expose students of secondary schools in Israel to contemporary mathematics, as a live, vibrant, and creative field,

without affecting the pace of progress in teaching the mandatory curriculum and without harming students' achievements in the matriculation exams, thus increasing their motivation to study mathematics and consequently the likelihood of their willing to select a math-related profession for their future career.

In every school year since then an experimental intervention was conducted in two schools of the ORT network every year. The entire team of math teachers in each school was trained on a weekly basis to interweave MNSs on a regular basis in at least one of their classes. 336 students of 16 teachers participated in the study during Sept 2011-June 2012; 338 students of 21 teachers participated during Sept 2012-June 2013. Each student was exposed to 6 MNSs. Students' response and teachers' attitudes encourage the countrywide expansion of the study while investing a continuing effort in the development of new MNSs and updating existing ones.

Here is a link to a sample MNS

http://edu.technion.ac.il/docs/sudoku.ppsx

J.4 The People Israel Project – the Guide to the Israeli Society www.peopleil.org

The project team: Prof. Oz Almog and Dr. Tamar Almog

"People Israel" is an Internet magazine, which is a comprehensive textual and visual guide to Israeli society, based on the belief that by providing current, rich, varied, and reliable information, along with a comprehensive analysis and interpretation of different phenomena, it would contribute to an in-depth knowledge about the various sectors in Israel, formulating effective public policy and reducing prejudices and stereotypes among the Israeli public, to encourage tolerance for others and give legitimacy to the wealth of diversity.

Major achievements during 2013

1. **Growth in the scope of information in the website:** As of the end of December 2013, the website includes 620 articles and information pages in diverse areas (an increase of about 30 articles and information pages as compared to last year). In the pipeline are another 30. Also, the site includes 160 Israeliana photo albums [Israeli history] (in the pipeline are about another 80 albums).

2. **Tours exploring the Haredi sector**: tours of various institutions in Bnei Brak were held for the senior journalists of Yediot Aharonot and for members of the National Security College.

3. **New exhibitions at "The Israeli Spirit" Digital Gallery,** shown

this year: “The Israeli Record – A History of Design” (Eran Dinar); “Israeli Dance” (Mula Eshet); “Israeli Nostalgia” (Mula Eshet); “Vintage Advertising” (Mula Eshet); “The Landscape of our Country” (Azaria Alon).

4. **Documenting synagogues at Rosh Ha’ain**: The project of documenting the synagogues of Rosh Ha’ain was completed. As part of the project, about 80 synagogues out of the 130 in Rosh Ha’ain were documented. The celebration of the project’s completion, which the mayor attended, was held in Rosh Ha’ain. Lectures were given by Dr. Tamar Almog and Prof. Oz Almog.

J.5 The Israeli Generation Y Project

The project team: Prof. Oz Almog and Dr. Tamar Almog

Generation Y is a stratum of secular young people born in the 80s and 90s of the 20th century. They grew up and were shaped in an era of commercial channels, the PC revolution, the Internet and the mobile phone, the development of cultural feminism, civil rights and individualism, the Iraqi missile attack, the Rabin assassination, the economy of abundance and entrepreneurship, suicide attacks and the war on Muslim terror, leadership crisis, leisure and entertainment revolution, the normalization of travelling abroad, and the development of the broad Ashkenazi-Mizrahi middle class (reducing ethnic disparities). The impact of this generation on the Israeli society is enormous and its cultural profile raises many questions.

We live today in a transitional period, a period in which social conventions and arrangements that prevailed for many years are no longer functional, and the need to build an updated systems that are tailored to the zeitgeist is increasing. Public and private organizations are feeling their way to the future, testing options, experimenting, making mistakes and correcting them "on the go." Many decision makers at the strategic level design policies based on social axioms of loose hold. They are not sufficiently aware of the fact that the younger generation has grown up with a different cultural language and new aspirations. The tent protest in the summer of 2011, led by disaffected youths, demonstrated the growing generation gap and the deepening problems as a result of a fossil social structure that does not meet the changing needs. The scientific research draws a multidimensional portrait of the Israeli Generation Y. The writing of the report is expected to be completed in August 2014.

To obtain feedback on findings and interpretations, we posted chapters from the study on the website "People Israel." Following what has already been published (articles, interviews and our lectures), we received many responses: Facebook comments, letters and invitations to lecture and seminars to diverse audiences.

J.6 Assessing the Bashaar Website as a Communication Tool among Scientists, Teachers, and Students

Project Team: Prof. Yehudit Judy Dori in collaboration with Dr. Zehavit Kohen, Dr. Orit Herscovitz, and Ms. Rana Abed

This research was designed to explore and analyze the usage of the *Bashaar* website, www.bashaar.org.il which is an Israeli academic website that allows teachers and students to pose questions and receive responses from leading university professors in their field of expertise. The purpose of the website is to expand the relationship between the senior academic staff in higher education institutions in Israel and teachers and students throughout the country, thereby updating and deepening the scientific knowledge of the teachers and their students.

The research investigated teachers' and students' attitudes towards the usage of the website, and scientist's perceptions toward this platform of communication and toward science communication in general.

The research population included about 50 science teachers and about 20 students who posted questions and responded to a feedback questionnaire, 11 scientists who were interviewed after they posted answers at the *Bashaar* website, as well as the director and the initiator of the *Bashaar* website.

Research results demonstrated that the main reasons behind constructing this website were to encourage students to elect a scientific or engineering career, narrow the gap between students (especially from the periphery) and professors, and provide teachers and students with a framework for inquiring about complex scientific topics. Most of the teachers and students were highly satisfied from the professors' responses to their questions and indicated the

website role in providing expert thoughts on complex questions. The assessment of the participants' responses showed that overall the website strengthened the communication among scientists, teachers, and students, and contributed to deepening the scientific knowledge of both teachers and students. The scientists pointed out the importance of communicating between scientists and the community through the website, the challenges facing them while answering questions and presented additional recommendations for other means of communication between scientists and the public.

Some of the research results were presented in **the conference of the International Association for Educational Assessment (IAEA) in Tel Aviv and in the** conference of Communication Science in Israel: Science, Knowledge or Opinion in Tel-Aviv.

SNI Website

Samuel Neaman Website
WWW.NEAMAN.ORG.IL

The website is managed by Golan Tamir, Chen Bar-Lev, Shir Goldfarb and Shai Zelman

The Samuel Neaman Institute's website serves as a platform for the work of the Institute and its researchers. In fact, the website serves as the Institute's information center and as a home for the Samuel Neaman Institute's activities. Furthermore, all the Institute's publications since 1987 can be downloaded from the website, and visitors can register for the conferences organized and led by the Samuel Neaman Institute and contact the various researchers working at the Institute. The website's languages are Hebrew and English and it is updated regularly, thus exposing the Samuel Neaman Institute to both professionals and the general public. The home page of the Institute's website shows research in progress, new publications, media, news, events, opinion pieces, media news, and other issues. On the Researcher Page, one can see all of activities of each researcher at the Samuel Neaman Institute: Projects, publications, opinion pieces, press, and events that he/she led. In 2013, the number of visitors was 43,000, most of whom (65%) were new; about 5,000 were visitors from abroad. The number of publications downloaded from the website is 5247.

The five leading publications based on the number of downloads are:

	Name of publication
1	Solar air conditioning in Israel – Summary and recommendations by the Energy Forum at the Samuel Neaman Institute
2	Orthodox Employment - Information Booklet
3	Science , Technology and Innovation Indicators in Israel: An International Comparison (Third edition)
4	A Smart Energy Grid as a Growth Engine for the Israeli Industry - Summary and recommendations of the 27th Energy Forum
5	Science & Technology Education in Israel: Selected Indicators for the Development of a Risk Management Strategy regarding Possible Future Shortages of S&T Teachers in Upper-Secondary Schools

The Samuel Neaman Institute distributes a quarterly newsletter to about 8000 subscribers, to which one can register on our Facebook page, http://www.facebook.com/NeamanInstitute.

Visitors can be notified about future events, news from the press and recent publications; visitors can respond to and share any article or news.

SNI Website

Publications

List of Publications for 2013

Articles can be downloaded from the Samuel Neaman Institute's website

www.neaman.org.il

Water uses in chosen industries – challenges for the water industry, Dr. Gilead Fortuna, Shiri Freund-Koren

Changes in productivity amongst Jewish women, Ilia Zatcovetsky

Macha'r is already here, Ilia Zatcovetsky

Integration and mutual influences, Ilia Zatcovetsky

Global challenges for the water industry in the Micro Electronics industry, Dr. Gilead Fortuna, Ivon Shia, Shiri Freund-Koren

Science & Technology Education in Israel: Selected Indicators for the Development of a Risk Management Strategy regarding Possible Future Shortages of S&T Teachers in Upper-Secondary Schools, Prof. Orit Hazzan, Tsipy Buchnik, Orly Nathan, Ayelet Raveh

Water for nature and rivers restoration – Summary and recommendations of the 3rd Water Forum, Prof. Eran Friedler, Miki Zaide, Prof. Abraham Shaviv, Yael Gilboa

Orthodox Employment - Information Booklet Second Edition, Ilia Zatcovetsky, Dr. Reuven Gal

Mapping of National Research Infrastructures in Israel: updated mapping of Israel research infrastructures and international research infrastructures, which are used by Israeli researchers, Dr. Daphne Getz, Vered Segal, Bella Zalmanovich, Oshrat Katz Shacham

Success Stories, Dr. Reuven Gal, Yehezkiel Farkash, Moshe Papo

Evaluation of the contribution and achievements of the KAMEA Program scientists in enhancing the scientific research and the industry in Israel, Prof. Avraham Shitzer, Miriam Asotsky, Irada Kazimova, Smadar Shaul, Amir Hefetz

Energy Forum 29: Smart Cities, Prof. Gershon Grossman, Yaara Grinberg, Idan Liebes

Oil Shale Occurrences in Israel - Geological Updated information, Dr. Tsevi Minster

Adaptation to climate change in the local authorities, Prof. Ofira Ayalon, Yaara Grinberg, Idan Liebes – Samuel Neaman Institute. Prof. Haim Kutiel, Prof. Nurit Kliot, Prof. Manfred Green, Dr. Tami Trop, Dr. Tzipi Eshet – Haifa University. Prof. Marcelo Sternberg, Dr. Carly Golodets – Tel-Aviv University.

Global challenges for the water industry in the Micro Electronics industry, Dr. Gilead Fortuna, Shiri Freund-Koren

Science , Technology and Innovation Indicators in Israel: An International Comparison (Fourth edition), Dr. Daphne Getz, Prof. Dan Peled, Tsipy Buchnik, Ilia Zatcovetsky, Dr. Eran Leck, Ella Barzani

Publications

Publications

Science , Technology and Innovation Indicators in Israel: An International Comparison (Fourth edition) English version, Dr. Daphne Getz, Prof. Dan Peled, Tsipy Buchnik, Ilia Zatcovetsky, Dr. Eran Leck, Ella Barzani

Outputs in Israel: International Comparison of Scientific Publications, 1990-2011, Dr. Daphne Getz, Dr. Avishag Gordon, Dr. Noa Lavid, Yair Even-Zohar, Iris Eyal, Ella Barzani

Clean Energy Innovation Policy in Israel: Identifying Fundamental Principles through a Case Study of Smart Grid Policy, Elad Shaviv, Mark E. Caine, Prof. Gershon Grossman

Predictions for human resources in science and technology :Models and Indicators, Dr. Daphne Getz, Tsipy Buchnik, Bella Zalmanovich, Noa Zemer-Batsir

Sustainable Road Transportation: Energy and Environmental Aspects - Summary and recommendations of the 28th Energy Forum discussion at Samuel Neaman Institute, Prof. Gershon Grossman, Yaara Grinberg

R&D Outputs in Israel – A Comparative Analysis of PCT Applications and Distinct Israeli Inventions, Dr. Daphne Getz, Dr. Eran Leck, Amir Hefetz

Annual Report 2012 Samuel Neaman Institute

Policy on Levering Stem Cell Research through Intellectual Property, Dr. Daphne Getz, Prof. Niva Elkin-Koren, Bahina

Eidelman, Miriam Asotsky, Bella Zalmanovich, Yair Even-Zohar, Dr. Yael Bergman-Eshet, Sharon Bar-Ziv, Talya Ponchek, Dalit Sagiv

Unique Characteristics in the Development of the Technion – Academic Excellence, National Contribution, Managerial Culture, Prof. Uri Kirsch

Green House Gases emissions registry in Israel - accounting and reporting protocol, Prof. Ofira Ayalon, Dr. Miriam Lev-On, Dr. Perry Lev-On, Tal Goldrath

From Research infrastructures mapping stage until research infrastructure roadmap - Review the experience of selected countries, Dr. Daphne Getz, Vered Segal, Bella Zalmanovich, Oshrat Katz Shacham

A Computational Analysis of R&D Support Programs, Prof. Dan Peled, Dagoberto Garza, Yahel Giat, Steve Hackman

A Smart Energy Grid as a Growth Engine for the Israeli Industry - Summary and recommendations of the 27th Energy Forum discussion at Samuel Neaman Institute, Prof. Gershon Grossman, Yaara Grinberg

An Examination of the Collaboration between Industry and the Technion's Nanotechnology Infrastructure Centers, Dr. Daphne Getz, Vered Segal, Bella Zalmanovich

Solar electricity in Israel, Summary and recommendations of the 30th Energy Forum discussion at Samuel Neaman Institute, Prof. Gershon Grossman, Idan Liebes

Publications

Greenhouse Gas Emissions Reporting and Registration System in Israel: Summary of Reports for 2012, Prof. Ofira Ayalon, Dr. Miriam Lev-On, Dr. Perry Lev-On, Tal Goldrath, Efrat Kerem

Demand-Driven Innovation: An Integrative Systems-Based Review of the Literature, paper accepted for publication in the International Journal of Innovation and Technology Management, Frenkel, A., Maital, S., Leck, E. and Israel, E

Study Days, Seminars, and Conventions Held During 2013

Samuel Neaman Annual Lecture:

"The Unheard Cry for Citizenship". The 11th Samuel Neaman Annual Lecture was given on December 17, 2013. Lecturer: **Mr. Sayed Kashua.**

Higher Education Forum Meetings:

- **"The status of Humanities in Higher Education"**, Meeting No. 24 was held on March 8, 2013. Lecturers: Prof. Dan Laor, Prof. Yossi Ben-Artzi ,Prof. Ruth HaCohen (Pinczower), Prof. Avi Sagi.
- **"Engineering Education in Higher Education, Science & Technology Education in High Schools"** Meeting No. 25 was held on May 31, 2013. Moderator: Dr. Eli Eisenberg. Lecturers: Prof. Paul D. Feigin, Dr. Ofer Rimon , Giora Shalgi.
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Energy Forum Meetings

- "Smart Grid as a growth engine for the industry in Israel". Energy Forum No. 27, January 2, 2013
- "Sustainable road transport: Energy and Environmental Aspects", Energy Forum No. 28, April 4, 2013
- "Smart City" Energy Forum No. 29, October 9, 2013
- "Solar electricity in Israel", Energy Forum No. 30, December 24, 2013

Conferences

Water Forum meeting

The third Water Forum meeting, “Water for Nature and River Restoration” was held on January 15, 2013

A conference on the subject of the Ultra-Orthodox Employment

An executive conference, entitled “The next thing in employment” was held on 10.12.13 in Jerusalem. The conference was a joint initiative of JCT and the Ultra-Orthodox Integration Project at Samuel Neaman Institute, together with the non-profit organization Temech, and the Jerusalem Development Authority. The conference was hosted by **Sivan Rahav Meir**, and included lectures by Dr. **Reuven Gal**, Mr. **Ilya Zatcovetsky**, Dr. **Shlomo Kalish** and others..

Participation of researchers in conferences in Israel

The Activities of the Centerfor Industrial Excellence

Date	Conference/ meeting	Location	Researcher	Subject
3.1.2013	A discussion by the senior staff on preparing the gas session for the Hertzliya Forum – presentation, suggestions and discussion	The Inter-disciplinary Center Herzliya	Dr. Gilead Fortuna	Our position paper was requested for the Herzliya meeting and I was invited to speak at the plenary discussion
30.1.2013	Annual Cleantech Conference 2013	TLV Convention Center	Dr. Gilead Fortuna	Implications of gas on the industry and recommended policy
25-26.11.2013	Seminar	Tel Aviv	Dr. Gilead Fortuna	EU - Israel Seminar on Technology Transfer with an Emphasis on Clean Tech
31.1.2013	DNA design of organizational excellence - lessons of RAPHAEL	Ministry of Education	Giora Shalgi	Lecture at a Ministry of Education forum

Research Activities

6.5.2013	The journey to excellence in the Galilee	Quality Conference	Giora Shalgi	Lecture at a meeting
31.5.2013	Higher Education Forum – meeting no. 25	Youtube	Giora Shalgi	An invited lecture on the subject
11.9.2013	The professional solution to quality education	Y	Giora Shalgi	Invited lecture
1.10.2013	How to turn a small business into great success?	The Marker	Giora Shalgi	
6.11.2013	Moving up – the professional staff	A conference at the Technion	Giora Shalgi; Gilead Fortuna; Shlomo Maital	
22.10.2013	Water	WATEC Conference	Gilead Fortuna	Entrepreneur-ship and Man-agement
	Challenges in the Oil & Gas Industries	2013	Gilead Fortuna	1. A seat at the Water Challenges for the Gas Industry 2. Round table with teams from abroad and Israel

10.6.2013	An invitation for a work group on the subject of water treatment in the Food & Beverage industry	Export Institute	Shiri Freund-Koren & Gilead Fortuna	A training conference in which we presented our work to the Israeli industry
2.7.2013	Members of the "Technion Leadership" Association	A meeting sponsored by the Technion President	Gilead Fortuna	A member of the Association's Founding Committee and Board
20.11.2013	The Industry Conference in Eilat 2013	The Manu-facturers Association	Gilead Fortuna	A lecture on energy
28.10.2013	Exit, developing a large company and work productivity – the real and the ideal	The Forum of the 100 Club of the Technion Alumni	Gilead Fortuna	Initiating and managing a panel of entrepreneurs on the subject of the desired policy
8.10.2013	Natural gas as a building block for a clean chemical in industry in Israel	The Agriculture Faculty at Rehovot	Gilead Fortuna	An invited lecture for the Annual Conference for Science and Environment

Research Activities

8.9.2013 up to 16.9.2013	A series of meetings with the leading food and energy industries in the USA	The Export Institute and New-tech at the Organiza-tion of the Economic attachés in the USA	Gilead Fortuna	A week-long visit that included meetings to present the advantages of the Israeli water industry in the USA, at the request of Newtech and the Export Institute
22.10.2013	The next goal of the Israeli water industry	H	Gilead Fortuna	Cleantech/ Water
3.11.2013	A starting meeting of the Excellence Centers in Elbit	Elbit	Gilead Fortuna	An invited lecture by the Elbit board on innovation and excellence centers
18.11.2013	EU - Israel Innovation Seminar	An inter-national convention on the re-alization of innovation through greenhous-es	Gilead Fortuna	Leading an analysis and summary panel at the invitation of the Repre-sentatives of the EU in Israel
20.2.2013	Second annual EU - Israel Innovation Seminar	iteam.co.il	Gilead Fortuna	Innovation

6.11.2013	Moving up – the professional staff	Technion	Giora Shalgi; Gilead Fortuna; Shlomo Maital	Industrial Excellence
12.11.2013	WATEC 2013 Wrap-Up – a one of a kind opportunity for Israel's water industry	israelnew-tech.com	Shiri Freund-Koren; Gilead Fortuna	Summary and conclusions of the WATEC 2013 Conference and Conclusions for the WATEC 2015 Conference
	Lectures to the pupils of Leo Beck and BOSMAT high schools		Giora Shalgi	"Why is a high-quality scientific-technological stream important and worthwhile?"

Study days, seminars and conferences on the subject of Environmental Protection

Date	conference	Place	Presenters and topic	Role
17, June, 2013	Business and Environ-ment 2013	Tel Aviv	O. Ayalon. The role of academia in environmental studies	Oral presen-tation

Research Activities

9, September, 2013	The 1st International Conference- Technological innovations in waste management	Hiria, Tel Aviv	O. Ayalon._ Environmental Taxation- The Case of Municipal Solid Waste	Oral presentation
30, September, 2013	Oil substitutes. Ministry of Environmental Protection and Prime Minister's office.	Maale Hachamisha	O. Ayalon. Waste to transport fuel	Oral presentation
7-9, October, 2013	41st Annual conference of the ISEEQS	Rehovot	O. Ayalon, M. Lev-On, P. Lev-On Corporate GHG Emissions Reporting- means for efficiency and transparency	Oral presentation
19-20, November, 2013	Tel Aviv	The 11th annual Energy & Business summit	Ofira Ayalon On the environmental benefits of converting coal fired power plants to gas.	Oral presentation

Activities of the Ultra-Orthodox Integration Project

Date & Location	Conference/event	Details
15.1.13 Jerusalem	**The Haredi Hi-Tec Forum**	**The Forum was established by Itzhak Krumbi**, a hi-tech Haredi, with the support of **Ariel Margalit** (MK of the Labor Party). The Ultra-Orthodox Integration team participated in the convention, presenting its works in the field of Ultra-Orthodox employment.
17.1.13 David Intercontinental Hotel, Tel Aviv	The Annual Conference of the Hi-Tech Industries Association	The Ultra-Orthodox Integration team participated in the convention and the booklet entitled "Orthodox Employment" was a hit…
03.3.13	A meeting between representatives of the institutions engaged in the integration of the ultra-Orthodox in the labor market and the Chairman of the Association of Electronics & Software Industries Mr. **Elisha Yanai**	An effort was made to increase ultra-Orthodox employment
22.4.13 Tel Aviv	Annual Conference of the Institute for National Security - INSS	Findings and recommendations were presented at the conference.

11.6.13	Attending a special session of the Board of Governors (Board of Trustees) of the Technion	
07.7.13	Working meeting between the ultra-Orthodox project team, at the Samuel Neaman Institute and the **Kamatech project** people	An initiative designed to help the integration of the ultra-Orthodox in Israeli high-tech with the support of Cisco. This meeting was intended to discuss the promotion of the **Shachmat** document, which has been upgraded through cooperation between SNI and Kamatech.
10.12.13 College of Technology (GT) in Jerusalem	**"Managers Conference - the next thing in employment"** to integrate the Ultra-Orthodox in the labor market	Collaboration between the College of Technology in Jerusalem and the "Ultra-Orthodox Integration" project at SNI, together with the Temech Association and the Jerusalem Development Authority.

Lectures and study days on the "Israeli Generation Y"

1	Almog, Oz	11.3.13	Tel Aviv-Jaffa Academy	Y&Me: The challenges in dealing with Generation Y	They're not like us – the characteristics of Generation Y
2	Almog, Tamar	11.3.13	Tel Aviv-Jaffa Academy	Y&Me: The challenges in dealing with Generation Y	How do they learn, or not learn?

3	Almog, Oz	30.5.13	INSS	The decision makers conference of the next generation: national security as reflected in Generation Y	The characteristics of Generation Y as a challenge to the defense system - background
4	Almog, Tamar	30.5.13	INSS	The decision makers conference of the next generation: national security as reflected in Generation Y	The characteristics of Generation Y as a challenge to the defense system – revealing the survey results
5	Almog, Oz	9.5.13	The Inter disciplinary Center, Hertzliya	The International Interdisciplinary Forum, inspired by TED	Patriot-yuppie-nerd: The collapse of the Western Culture
6	Almog, Oz and Almog, Tamar	9.6.13	Discount Bank	Senior representatives of the bank	Economic aspects of Generation Y
7	Almog, Oz	23.6.13	Beit Berl	Academic staff study day: Generation Y – how do they learn or not learn?	They're not like us – the characteristics of Generation Y

Research Activities

8	Almog, Tamar	23.6.13	Beit Berl	Academic staff study day: Generation Y – how do they learn or don't?	Israeli youth: How do they learn (or don't)?
9	Almog, Oz	27.6.13	Eretz Israel Museum	A series of lectures as part of Kathedra: Cultural heroes - biography and imprint	The Post-Sabra generation
10	Almog, Oz	24.7.13	The Central School for Training Welfare Workers, Ramat Gan	A study day for welfare workers	The Post-Sabra generation
11	Almog, Tamar	20.8.13	Haifa Municipality, Education Department	Meeting opening the year: Educational Empowerment Department, Haifa	The Israeli Generation Y: How would they like to learn?
12	Almog, Oz	26.8.13	Eretz Israel Museum	A series of lectures as part of Kathedra	A generation without heroes - the Post-Sabra generation

13	Almog, Oz	8.10.13	Sapir College	Conference opening the year for the staff: Boundaries in a world without frontiers: to make a change and be changed	They're not like us – the characteristics of Generation Y
14	Almog, Tamar	8.10.13	Sapir College	Conference opening the year for the staff: Boundaries in a world without frontiers: to make a change and be changed	Israeli youth: How do they learn (or not learn)?
15	Almog, Oz	10.10.13	Van Leer Institute	A series of meeting: Marriage and Divorce in Israel, hosted by Prof. Ruth Gabison	Lecture and discussion: Intimate Relationship and Family Life in Generation Y
16	Almog, Oz	1.11.13	Venture capital firm, PineApp Hertzliya	Forum of HR managers in high-tech	The emergence of Generation Y - background

Research Activities

17	Almog, Tamar	1.11.13	Venture capital firm, PineApp Hertzliya	Forum of HR managers in high-tech	Generation Y: How do they work and study?
18	Almog, Tamar	12.12.13	MOFET Institute	Lecturers and guides in information technologies and communication	Generation Y and Generation X – what separates them?
19	Almog, Tamar	22.12.13	Even Yehuda, Aluma Association	"The Next Thing" program, coordinators' training – development and support of specialized programs	Generation Y: How do they work and study?
20	Almog, Oz and Almog, Tamar	14.11.13	Foreign Affairs Ministry, Jerusalem	Meeting with the senior strategic staff of the Political Planning Division	The characteristics of Generation Y and their implications on the Israeli Diplomatic Service
21	Almog, Oz	26.12.13	Erdinast Law Office (one of the leading lawyer offices in Israel)	The office staff and law interns	Generation Y and its influence on the Israeli society

A conference on Mathematical Education Research

Date	Conference	Place	Subject	Lecturers
17-19, February, 2013	The 1st Jerusalem RME conference	Lev Academic Center - Jerusalem	Integrating snapshots from contemporary mathematics in high-school teaching	Prof. Nitsa Movshovitz-Hadar, Dr. Ohad Zohar, Dr. Atara Shriki, Dr. Batya Amit.

Researchers' Participation in Conferences Abroad

Date& Place	Conference and topic	Presenters
June, 28th 2013	Pick-Me - Progress Review Meeting	Frenkel, A.
April, 30th 2013	"National Innovation Ecosystems – A Comparative Analysis among Eight Nations with Emphasis on Markets & Demand" Presentation to Roberto Proença De Macêdo, President, Association of industrialists, Ceara (FIEC), Brazil, and Senior Delegation, visiting to Technion.	Frenkel, A.

October 25-27, 2013	International Conference of the Inter-University Seminar on Armed Forces and Society. Chicago, Illinois, USA.	Dr. Reuven Gal
October 21-22, 2013	The Yom Kippur War: 40 Years Later --an International Research Conference	Dr. Reuven Gal

Conferences on the subject of Environmental Protection

Date	conference	Place	Presenters and topic	Role
16-19, July, 2013	26th International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy System.	Guilin, China	Ofira Ayalon, Miriam Lev-On, Perry Lev-On. Greenhouse Gas Emissions Reporting in Israel: Means to Manage Energy Use	Speaker. Member of Scientific Committee, Conference track on Energy systems: Social, environmental and sustainability issues.

18 – 19, July, 2013	Fifth International Conference on Climate: Impacts and Responses	Port-Louis, Mauritius	M. Shechter, O. Ayalon, R. Palatnik, A. Davidovitch: Adaptation to Climate Change- Israel and Eastern Mediterranean	
10-11, September 2013	Air & Waste Management Association - Climate Change Impacts, Policy, and Regulation Conference	Hyatt Dulles, Herndon, VA, USA	Ofira Ayalon , Miriam Lev-On, Perry Lev-On: Greenhouse Gas (GHG) Emission Mitigation Plan for the State of Israel: Strategies, Incentives and Reporting	Oral presentation

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