



Israel's Water Industry A history of turning desert into oasis



Next Generation Oasis



The Global Water Challenge

Water has always been the foundation of life on earth, enabling those civilizations with access to the precious liquid to thrive and grow throughout history.

Today, however, humanity faces a tremendous water challenge. The rising world population, global warming and the decrease in the supply of drinking water have combined to create massive water shortages, impacting health, agriculture, economy and international relations on a global scale.

Mankind will need to utilize all of its creativity and technological innovation to bring real solutions to these rising needs.

Water industry fast facts:

1

Over 70% of the Earth's surface is covered by water, but less than 1% of this water is suitable for human consumption.

2

Sanitation and drinking water investments have high rates of return: for every \$1 invested, there is a projected \$3-\$4 economic development return.

3

The estimated total cost of NRW to utilities worldwide stands at \$15 billion USD per year. Current average water loss in worldwide mega-cities accounts for 25%.

4

20% of the world's population faces water shortages today. This number is expected to reach 50% in 50 years.

5

With 7%-8% annual growth, the water market is one of the fastest growing in the world.

6

The size of the international water market is estimated at \$500 billion annually.

"Business-as-usual in the water sector is no longer an option for most countries. The beginnings of change are under way and there is good reason to believe that water will be an important investment theme for public, multilateral and private financial institutions in the coming decades."
McKinsey "Water Resources Group" report 2009.

Smart solutions to global challenges



Creating a "Next Generation Oasis"

What do we imagine when we think of the word "oasis"? Walking, exhausted and thirsty, in a harsh desert and suddenly coming upon a green haven with flowing sweet water. This oasis provides our most basic, most crucial needs; without it, we could not survive.

The "Next Generation Oasis" is the oasis mankind will create to enable humanity to thrive in the wide range of natural geographies and climates. Reaching far beyond past mystical connotations, this oasis represents humanity's advanced abilities to provide sustainable solutions to a variety of environmental challenges.



A history of turning desert into oasis

Since its foundation in 1948, Israel has placed great emphasis on maximizing its water supply, famously turning much of its arid land into fertile agricultural soil. Indeed, David Ben Gurion, Israel's founding father, declared the goal of "making the desert bloom" as one of the central themes of the new nation, believing it could be one of its main contributions to the world. Thus, water technologies have been a national priority in Israel since day one. This emphasis has proven itself in one of the world's most efficient and innovative water systems.

The Israeli water industry is today recognized as a global leader in the water arena thanks to breakthrough technological innovations in areas such as desalination, drip irrigation and water security.

- The Hadera seawater reverse osmosis (SWRO) desalination plant in Israel is one of the largest of its kind in the world.
- Israel reclaims almost 75% of its reused effluents in agriculture.
- Israel's total water consumption has remained nearly the same since 1964, in spite of a growing population and agriculture. This feat has been enabled through improved efficiency and technological innovation.
- By 2013, desalination plants in Israel will supply more than 500 million m³ of water per year, supplying 35% of the country's fresh water needs.

"Water is an extremely precious commodity in Israel. The landscape there provides the perfect environment for researching and developing water technologies in 'real-world' conditions, and then marketing and selling them globally."

Dr. Roger Radke, Former CEO of the Water Technologies Division of Siemens.

Research with a vision





Israel and its unique human resource

A culture of technology & ingenuity

Water is not Israel's only scarce resource. Since its inception, Israel has faced a variety of difficulties emanating from scarce natural resources, and numerous political and geographical challenges. To overcome these hurdles Israel has always relied on its most valuable asset – the human resource.

In spite of its challenges, Israel has achieved considerable success. These amazing accomplishments have come about due to the emphasis placed on education, academia and technology by the Israeli government and society. Moreover, Israelis are widely and deservedly perceived as being driven by a creative entrepreneurial spirit. This spirit and the incredible human resource it drives have enabled Israel to develop considerable expertise in the various fields of water conservation.

Areas of expertise of Israeli companies in the water arena include:

- Water management
- Water for agriculture
- Water treatment
- Desalination
- Water safety and security
- Water IT and communications

Israeli Water Expertise



Water for Agriculture

70% of the world's water supply is channeled into agriculture. Solutions for optimizing the water supply for agriculture are key to meeting the world's water challenges. Israel is known for having "made the desert bloom" and Israel's achievements in irrigation for agriculture are recognized the world over.

Israel's breakthrough solutions in irrigation come about partly due to the close cooperation between farmers and researchers, who share a constant flow of information and development.

This model has led to significant developments, including:

- Drip Irrigation.
- Subsurface Drip Irrigation and Fertigation resulting in lowered water use by growing plants.
- Individual Spray Irrigation allowing for precise irrigation of trees.
- Advanced Computerization of Irrigation Systems allowing for real-time operation, monitoring, and pre-programming of irrigation intervals.
- Buried Moisture Sensors providing information on moisture levels of the soil.

The Drip Irrigation Success Story:

Changing the way the world irrigates

Simcha Blass, an Israeli water engineer, discovered the essence of drip irrigation almost by chance in 1959. He saw that a slow and balanced drip effect led to remarkable plant growth, and created a drip-based tube to capitalize on the concept. Today, drip irrigation is recognized as being perhaps the most valuable innovation in agricultural history.

“Drip irrigation regularly exceeds 90% water efficiency. All told, the technology represents a 30% to 50% savings on water used for irrigation.”

New York Times, September 17, 2009.

In addition to maximizing water efficiency, drip irrigation also successfully:

- Limits evaporation.
- Reduces the requirement for fertilizers and chemicals.
- Enables effective control of plant disease.
- Eases the transferal of pesticides and other materials to prevent plant/crop infestation.
- Prevents salination of soil.
- Reduces weed growth.



Water Management

For decades the Israeli government and various local organizations, ranging from start-ups to long established firms, have worked in conjunction to effectively handle and maximize Israel's limited water resources.

This holistic approach has resulted in considerable innovation and advancement in the field of water management, including:

Efficient National Water Administration Solutions

Israel's national water company has developed cutting-edge technologies to maximize the utilization of Israel's water resources, automate its treatment and efficiently deliver it to domestic, industrial and agricultural users. Additionally, the company will help a planned rerouting of Israel's main water arteries, shifting water from the west of the country to the east and allowing for substantially improved water management.

Multi-Level Resource Management

Another Israeli company, which originated as a governmental subsidiary and has since privatized to considerable success, specializes in a variety of water resource projects on a national, regional and local level. Its vast experience in the water industry has afforded it a significant edge in formulating and implementing effective management solutions.

Municipal Non-Revenue Water Management

An Israeli start-up has developed water efficiency solutions for municipal water distribution systems, providing non-revenue water management. Such management solutions enable governing bodies and institutions to produce/purchase less water, save energy due to improved efficiency, postpone investments in increasing water capacity and extend the lifespan of existing infrastructures.

Unmeasured Flow Reducer Technology

This uniquely-designed valve, developed by a firm focused on the ongoing effort for water management savings, is geared to improve the ability to measure water usage worldwide.



Wastewater & Water Treatment

In order to bring about the oasis for the next generation, humankind will need to not only preserve the water it has, but, in essence, “create” more. This can be done through the rapidly advancing technologies of purification and reclamation, two of Israel’s long-standing specialties in the water arena.

Breakthrough wastewater solutions developed by Israeli companies include:

Suction Scanning Technology

This fast, efficient, self-cleaning technology ensures a continuous flow of filtered water, and is appropriate for all filtering applications.

Laser-based Analysis

This time and energy saving process uses on-line, laser-based particle size analyzers to detect solids in water ranging from lime deposits to sub-micron objects such as viruses.

Microbial Fuel Cell Technology

An Israeli firm has developed a novel technology that allows for the production of electricity directly from the treatment of different types of wastewater.

Attached Growth Airlift Reactor Technology

This biological treatment method integrates fixed film and suspended growth technologies to produce superior effective surface area for biomass growth and optimal oxygen transfer efficiency.

Sewage Recycling System

This integrated solution combines reduced sludge formation for municipal waste water treatment and the recycling of waste water bio-solids to extract bio-solids from raw sewage.

Fine Bubble Aeration System

This unique system creates efficient wastewater treatment by using floating diffusers, avoiding the drawbacks of mechanical surface aerators.



Desalination

Water desalination is another key to sustainability, converting salt water so that it may be suitable for irrigation and pioneering cost-effective ways of providing fresh water for regions where its availability is limited. Israel has considerable experience in this field and local companies have developed a range of innovative technologies and solutions geared to maximizing desalination efficiency.

Breakthrough desalination solutions developed by the Israeli government and commercial sector include:

The World's RO Largest Desalination Plant

Opened in December 2009, Israel's Hadera seawater reverse osmosis (SWRO) desalination plant is the largest of its kind in the world (the runner up is also in Israel – the Ashkelon plant, active since 2005).

Flow Reversal Technology

This technology improves the desalination processes of brackish groundwater, increasing the recovery rate, reducing brine volumes for disposal dramatically and minimizing anti-scalants consumption.

Closed Circuit Desalination Technology

A replacement to the current reverse osmosis desalination process, this technology dramatically reduces desalination production costs while maintaining superior product quality.

China's Largest Desalination Facility

A global Israeli company is providing China with a \$119 million desalination facility which will provide the country with 100,000 m³ of potable water a day.



Water Safety & Security

The world's growing security challenges, including the higher risk of technical failure due to system complexity, the increasing intensity of natural disasters, and the emergence of ever more sophisticated terrorist threats, dictate that the "Next Generation Oasis" will need to be a safe haven; one we will need to constantly watch and protect.

Israel is uniquely suited to this task; its extensive operational defense experience and advanced academic research lead the world in water security, risk management and disaster solution technology.

Examples of Israeli academic and commercial involvement in this field include:

Developing a New Model of Urban Water Security

Hebrew University, which was part of the Sixth EU R&D Framework's 22 million Euro Consortium for urban water security, is researching models for safety and security in urban sewage systems.

Neutralizing Biological & Chemical Water Threats

The Technion's Grand Water Research Institute is conducting interdisciplinary research, funded by NATO, into the placement of monitoring stations that can identify and neutralize chemical and biological contaminants, such as anthrax.

Biosensor Bacteria Protection Technology

This pioneering system makes use of bioluminescence-based technology to ensure water safety and prevent contamination. The unique early warning process utilizes non-pathogenic marine bacteria as biosensors that can rapidly indicate changes in water quality.

Comprehensive Water Security Management System

An Israeli firm has developed an end-to-end water security management system designed to give water security operators an unprecedented level of decision-making confidence in the event of a crisis.

Israeli Water Expertise



One of the most quickly advancing and exciting fields in water research approaches water challenges through the lens of information technology. Making use of modern communications and monitoring processes in conjunction with advanced computer programs, this field brings together two of Israel's greatest strengths - water technology and hi-tech communications.

Israeli companies are developing and implementing IT solutions in the water arena to enable conservation on a major scale and improve water efficiency across a number of industries. The creative use of advanced IT in water systems enables utilities to better monitor and control water resources using less manpower and improving scalability, thus making these cutting-edge solutions extremely efficient and cost-effective.

Water, IT & Communications

Examples of Israeli products and technologies in this developing field include:

Water Distribution Monitoring Software

An Israeli start-up has provided a software-as-a-service solution for monitoring water distribution networks. The system gives unprecedented control over network events in real time, using state-of-the-art statistical and mathematical algorithms to dramatically impact water savings and help cities prevent water loss.

Innovative Smart Metering Technology

This progressive technology acts as a comprehensive remote meter reading solution for walk-by, drive-by, and fix base systems. It requires no physical access or visual inspection of meters and is so responsive that users can be alerted to problems such as water loss the moment they occur.

Comprehensive Instrumentation and Data Management System

Another start-up has developed an innovative and comprehensive water communication and data management system. The technology allows for remote monitoring and the immediate addition and use of measurement instrumentation, reducing water costs and water wastage while improving efficiency and ROI.

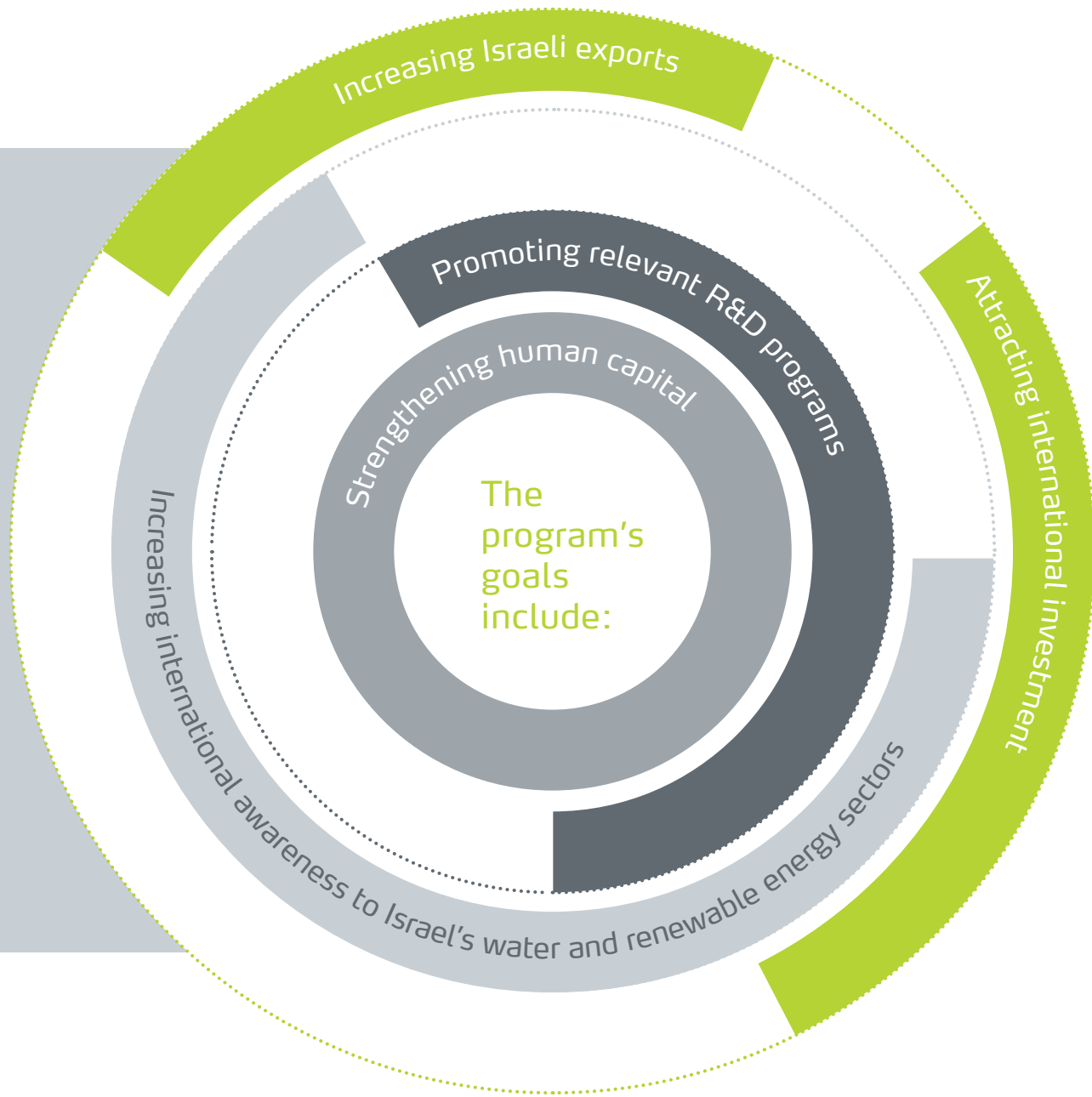
State-of-the-Art SCADA Solutions

An Israeli subsidiary to an international communications conglomerate has developed advanced SCADA and water control solutions, based on state-of-the-art communication and IT technologies.

Israel NewTech

Government support for Israel's growing industries

Israeli NewTech was founded on the belief that the Israeli water and renewable energy sectors have the talent and capability to be strong growth industries for the country, and to play an important part in establishing the "Next Generation Oasis" for the world's rising needs. This pioneering national program is led by the Ministry of Industry, Trade and Labor, and is supported by a number of additional Israeli government agencies. Israel NewTech helps to advance the water and renewable energy sectors by supporting academia and research, encouraging implementation in the local market, and by helping Israeli companies succeed in the international arena.



Find out how Israel NewTech can help you locate the ideal partner in Israel for your water needs. Israel NewTech regularly promotes visits to Israel by international companies in the water industry, and presentations abroad by representatives of Israeli companies, as well as maintains a constant presence in all relevant international conferences and trade shows.

For more information, including a company directory, please visit our website:
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