Israel showing the water-technology way

BY MARTIN ZHUWAKINYU

Israel, a water-constrained country, is leaving no stone unturned in conserving this precious resource through a range of measures, including recycling, efficient use and desalination.

The country currently recycles about 75% of its municipal effluent for irrigation, mostly in the arid south, which receives a measly 100 mm/y of rainfall. An ambitious target of 100% recycling by 2014 has been set and, by that date, all agriculture in Israel will be based on retreated water, according to water utility Mekorot professional instructor Gal Shoham.

He told journalists from across the globe during a recent tour of Mekorot’s Shafdan wastewater treatment plant, in the Dan region, that, while the recycled water is used for irrigation, it is of potable quality and contributes to preserving the environment by curbing ecological damage caused by untreated wastewater.

Serving about two-million people in the densely populated Dan region, which incorporates the city of Tel Aviv, the Shafdan plant – Mekorot’s largest and one of the most advanced in the Middle East – treats 130-million cubic metres of wastewater a year.

Secondary effluent from the plant is used to infiltrate fields in Rishon Letzion and Yavne. From these fields, the effluent is recharged into aquifers, where it undergoes natural physical, biological and chemical processes that improve its quality. Water from the aquifers is pumped to the Negev desert, about 90 km away, where it is used for irrigation by citrus, carrots, potato, lettuce, wheat and flower growers.

Besides the Shafdan plant, Mekorot operates five other wastewater treatment plants with a daily flow of 460 000 m3 and a yearly capacity of about 180-million cubic mètres.

Mekorot accounts for about 40% of the wastewater treated in Israel, or
about 200-million cubic metres a year, and for the reuse of 60% of the
country’s treated wastewater for agriculture.

The touring journalists – from all continents of the world – were also
able to visit Ayala Water & Ecology, which has developed natural
biological systems for the purification and enhancement of water, soil
and air. The wastewater Ayala treats includes effluent from dairy farms,
poultry farms and abattoirs, as well as other agricultural enterprises.

The company’s natural biological systems are also capable of treating
domestic and industrial effluent containing oils, fats, hydrocarbons,
emulsions and detergents, besides other things.

The company operates a facility at the Hiriya landfill site, in the Dan
region, that treats landfill leachate as well as fresh garbage and
contaminated drainage.

Ayala’s cutting-edge technology has been recognised internationally
and its founder, Eli Cohen, is Israel’s representative on the North Atlantic
Treaty Organisation’s environmental specialist team in the
phytotechnology applications field.

Ayala’s Hiriya site is a stone’s throw away from Arrow Ecology, which
has developed technology that separates biodegradable organics like
food and paper out of solid municipal waste before it is used to produce
biogas that is fed into combined heat and power plants. The Hiriya site
generates 1 MW of its electricity needs.

Solids like plastics are sold for recycling, while sludge from anaerobic
reactors is used for agricultural purposes.

CEO Yair Zadik said the company’s 150 t/d plant treated 5% of all the
garbage generated in Israel and that its technology could reduce
landfilling by up to 80%.

Arrow Ecology built the first plant outside Israel, in Sydney, Australia, in
2008 and is to soon build further plants in Italy, China and India.

On the efficient water use front, Israel’s Netafim is perhaps the most well
known enterprise, with its drip irrigation systems now manufactured or
distributed in several regions of the world.

The drip systems ensure that water is released directly onto a plant,
tremendously cutting back on the amount of water used by irrigation
methods such as flooding or sprinkling.

Netafim chief sustainability officer Naty Barak said during a tour of the
company’s plant at the Hatzerim kibbutz – or gated community – that,
thanks to drip irrigation, Israel’s Arava desert, which receives only about
20 mm of rainfall, has been turned into a significant agriculture hub,
accounting for 65% of the country’s vegetable exports.

Netafim president and CEO Igal Aisenberg said the major success
stories of drip irrigation on the African continent were the 11 600 ha
Simunye sugar estate, in Swaziland, and the Kitui irrigation scheme, in
Kenya’s arid east.

“At Simunye, a cost analysis of seven different irrigation options was
undertaken, and the one that offered the best return was the conversion
of the dragline sprinkler system to subsurface drip irrigation.

“A postinvestment audit confirmed a sucrose increase of 15% and a
water saving of 22%, compared with the sprinkler system, and this was
better than originally expected,” said Aisenberg.

At Kitui, donors led by the United Nations Food and Agriculture
Organisation launched a drip irrigation project for 200 poor small-scale
vegetable growers, most of whom were women and old people who could not continue irrigating their crops with buckets.

Moving from bucket to drip irrigation increased yields and income by 140% and 200% respectively, and saved water use by around 60%.

Meanwhile, desalination will account for 450-million cubic metres of Israel’s yearly water consumption of 1.4-billion cubic metres — up from about 300-million at present — when the Sorek seawater reverse-osmosis (SWRO) plant, currently under construction, starts operating in mid-2013.

The 150-million-cubic-metre-a-year plant is being built by IDE Technologies, a joint venture between Israeli enterprises ICL Group and Derek Group. IDE built and operates — under a 25-year ‘build, operate and transfer’ (BOT) deal — the 118-million- cubic-metre-a-year Ashkelon plant, which was commissioned in 2005, and the 127-million- cubic-metre Hadera plant, which has been operating since 2009.

The Hadera plant — currently the biggest of its kind in the world — is also a 25-year BOT project.

The Via Maris consortium runs Israel’s third operational SWRO desalination plant, Palmachim, with a capacity of 45-million cubic metres a year.

IDE Technologies executive VP for special projects Fredi Lokiel told Engineering News that the use of technologies like IDE’s proprietary three-centre technology and cascade boron treatment had helped the company to achieve some of the lowest costs for high-quality desalinated water at both Ashkelon, where a cubic metre costs $0,53, and at Hadera, where the cost is $0,57/m3.

He said that of the 1.4-billion cubic metres of water consumed in Israel each year, about 750-million cubic metres is used for domestic purposes, which meant that the 300-million-odd cubic metres supplied by the Ashkelon, Hadera and Palmachim plants accounts for close to 50% of Israel’s domestic water, as desalinated water is not used for agriculture or industrial purposes.

• Israeli companies and many others from across the globe will showcase their water, environmental and renewable-energy technologies at the Water 2011 conference and exhibition, in Tel Aviv, in November. The last Watec event, held in 2009, was attended by more than 20 000 people from 94 countries.

• Zhuwakinyu visited Israeli as a guest of the Israel Export and International Cooperation Institute

Edited by: Martin Zhuwakinyu
Ari · 4 years ago
@Tcherkessi. You got it backwards. Israel provides Jordan with millions of cubic meters of water yearly. Also, it was Syria that tried to starve Israel of its water resources by attempting to divert the upper Jordan headwaters. Thankfully, Israel put a stop to that nonsense. Israel also provides the Arab residents of Judea and Samaria with assistance in waste management and water purification techniques. I think if the parties work cooperatively, as Israel has attempted to do, water problems in the region would be less acute. Unfortunately, it appears that most of the Arab governments want to perpetuate aggression simply to deflect attention away from their own domestic problems.

GeorgeA · 4 years ago
reading this article seems Israel is making a bundle exporting/contracting tech all over the world.Odd thing about Israelis--crying all the time needs Canada/USA/EU/NZ/Aus's aid.
In USA folks are lossing their homes/jobs and t drinking polluted water and many eating out of garbage dumpsters.The author is a sucker and on a junket to sell goods from Israel aboard :^/

Tcherkessi · 4 years ago
Ari - I use Israeli writing and research as well as Amnetys International's. Israel has been taking waters from Jordanian aquifers since 1967. The peace deal was supposed to stop this. Israel offered water from "other sources" bit said it would not stop taking Jordanian water. Apart from some pretty unusable, dirty water nothing has happened despite propaganda to the opposite effect. Avi Shlaim has written on this matter.

So we are all wrong and supporters of the regime in Israel are right? A depressingly familiar line that only the feeble minded still believe.

Anonymous · 4 years ago
Funny, no mention of Israel's deliberate low-tech siphoning of water table under occupied territories. Making the "desert bloom" using other folk's water supply.

Anonymous · 4 years ago
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