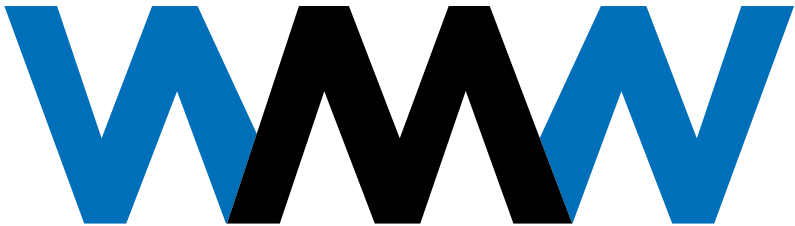


P.b.b. 022030115 M, WEKA Industrie Medien GmbH, Dresdner Straße 45, 1200 Wien, Retouren an Postfach 100, 1350 Wien

JANUARY–FEBRUARY 2018

Official Publication of:  
**ISWA**  
International Solid Waste Association



WASTE MANAGEMENT WORLD®

Euro 12,-

**Special Edition**  
**BIOWASTE**



# Going Green

Helector completes first PPP waste project in Greece



## Fighting Food Waste

Champions 12.3 making progress  
**Page 22**

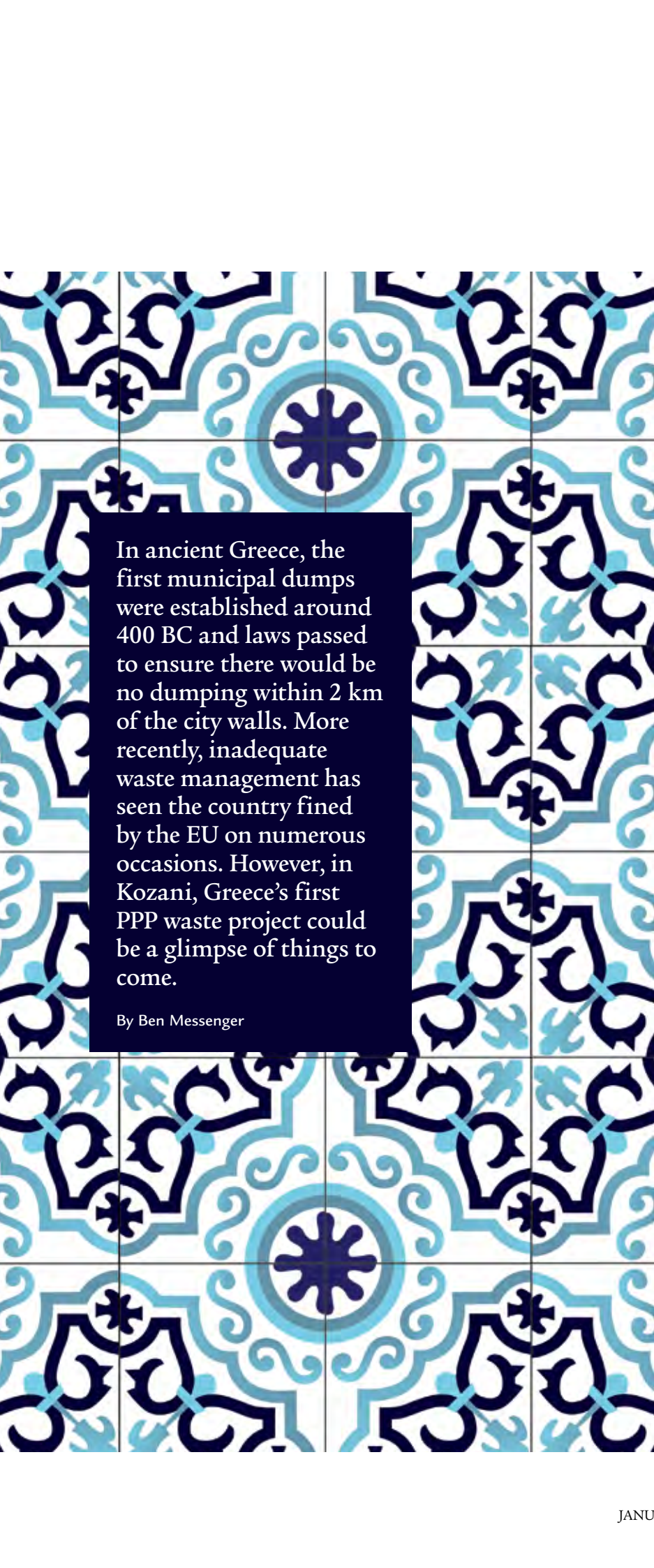
## Plastic Plans

World first EU strategy for plastics  
**Page 36**



# Going Green





In ancient Greece, the first municipal dumps were established around 400 BC and laws passed to ensure there would be no dumping within 2 km of the city walls. More recently, inadequate waste management has seen the country fined by the EU on numerous occasions. However, in Kozani, Greece's first PPP waste project could be a glimpse of things to come.

By Ben Messenger

**W**ith mounting urgency over the need to comply with European directives relating to waste management as well as to provide a better quality of life for its citizen, in June 2015, a PPP contract was awarded for the construction and operation of an Integrated Solid Waste Management System (ISWMS) in the Greek region of Western Macedonia.

Following a competitive tender process the publicly owned company,

## FINANCE

**€48 MILLION**

Total budget for the project

**€13 MILLION**

Funding through the European Investment Bank

**€13 MILLION**

Through the Urban Development Fund (Jessica) for Western Macedonia, handled by the Investment Bank of Greece, contributing to the absorption of EU funds that would not have been used otherwise

**€5.6 MILLION**

From the National Bank of Greece, which covered the financing need of the construction VAT of the project

DIADYMA, awarded a 27 year contract to design, build and operate the plant to E.P.A.DY.M. – a joint venture formed of waste management and construction firms, HELECTOR and AKTOR CONCESSIONS. DIADYMA was founded in 1998 to serve waste management needs of Western Macedonia's 12 municipalities and 300,000 residents. Its shareholders include the Municipalities of Amydaio, Argos Orestikou, Deskati, Eordaia, Florina, Grevena, Kastoria, Kozani, Nestorio, Prespes, Servia – Velvento and Voio.

The project included the construction of the ISWMS, which includes a Mechanical Biological Treatment (MBT) plant, Residual sanitary Landfill, Waste Water Treatment Plant (WWTP), as well as auxiliary projects such as weigh bridges, an administration building, a washing facility, a workshop, office build-



ings, a service station, a fuel station, a laboratory and a new waste transfer station in Kozani. It also included the operation of the existing facilities including nine waste transfer stations.

Following a two-year construction and testing period, on 10 June last year, HELECTOR opened the plant on time. The opening ceremony was attended by George Stathakis, Minister for the Environment and Energy, who inaugurated the facility, as well as representatives of local government and solid municipal waste management bodies from across Greece.

HELECTOR "took the risk, provided the technology and outlined the terms on which the entire PPP arrangement was carried out, closely monitored by our ministry in collaboration with the Ministry of Economy, which was reflected in the contractual terms," explains Stathakis.

## OPERATION

The ISWMS is able to receive around 120,000 tonnes of municipal waste each year via 10 regional waste transfer stations. Trucks arriving at the facility are weighed on a weighbridge which records incoming waste and then proceed to the reception unit. Once tipped into the reception bunker, a crane is used to feed a moving floor which in turn feeds the material to a pre-treatment unit where a manual sorting process of bulky material occurs.

"At the beginning of the line we have some bag openers," explains Fanis

**JENZ BA 915 D****Easy handling,  
full power**[www.jenz.de](http://www.jenz.de)

JENZ GmbH Maschinen- und Fahrzeugbau  
Wegholmer Str. 14 · 32469 Petershagen · Germany  
+49 5704 / 94090 · [info@jenz.de](mailto:info@jenz.de) · [www.jenz.de](http://www.jenz.de)







The Integrated Solid Waste Management System developed by HELECTOR in Western Macedonia is able to process up to 120,000 tonnes per year of waste and produces a Type A compost material.

Tsilionis, Director of the Engineering at HELECTOR. "Then we have two screens – a drum screen and a vibrating screen – to separate three different fractions depending on the size of the material.

The fine stream is sent to the composting facility while the intermediate and large fractions are sent for further sorting. First a pair of TOMRA optical sorters identify plastic materials suitable for recycling. The next pair removes paper from the stream. A ballistics separator is also used to sort plastics based on their shape, with films separated from 3D plastics such as bottles. A further pair of optical sorters separate 2D plastic films into two streams – transparent and coloured.

"The plant recovers five different types of plastics – transparent film and mixed coloured film, PET, HDPE and PP. We

also recover paper and card, and ferrous and non-ferrous metals. Residual, non-recyclable waste is disposed of at an adjacent sanitary landfill. The remaining material, with the paper and plastics removed, passes over band magnetic separators for ferrous recovery and eddy current separators for the recovery of aluminium cans," says Tsilionis.

The recovered materials are baled prior to sale. The plant operates six days per week on two shifts and all the maintenance takes part in the downtime.

The project also includes an Event Hall, where the educational programme of EPADYM is implemented in collaboration with DIADYMA. Its scope is to provide information to the pupils, students and residents of Western Macedonia about the operation of the plant and raise awareness on issues of



Upcoming events

POLLUTEC 2018

**IFAT**  
A6.308 - hall 6

info@menart.eu www.menart.eu  
Tel: +32 (0)65 61 07 60





### ENVIRONMENTAL BENEFITS

**<36%**

Of residual waste now going to landfill

**>80%**

Diversion of the biodegradable fraction from landfill

**35%**

Expected recycling rate by weight of recyclable material entering the plant

**Type A**

Compost being produced

waste management and sustainable development.

### ORGANICS

The organic fraction is diverted to the composting facility for biological treatment in enclosed horizontal aerobic bioreactors. Back in 2005, the firm acquired German technology developer Herhof and its composting technology, which significantly improves the biological stability of the material.

“We produce a Compost Like Output (CLO),” explains Tsilionis. “We could produce a Solid Recovered Fuel (SRF), but since the plant is located in a major lignite mining centre where the CLO can be used for restoration purposes. We are working on a contract with the Public Power Corporation of Greece which gives us an option to sell all the materi-

als we’re going to produce for the next 25 years.”

According to Herhof, its computerised system processes organic waste into a hygienically sound product. Organic material is aerated for approximately two weeks in composting boxes with regulated temperature, ventilation and humidity. In order to ensure a hygienic output, the composted material is heated up to 60°C. In addition, odours and groundwater pollution are managed within the closed system.

The semi-stabilised material produced is then transferred to a maturation shed where it remains for 4 to 6 weeks and is turned using a windrow turner as required by temperature, humidity and oxygen content. Following this period, the fully stabilised material is sent to a refinery unit where the organic material is separated from any residual materials

- ▶ FULL PERFORMANCE
- ▶ LESS COSTS
- ▶ BEST AVAILABLE TECHNOLOGY



BIODEGMA®





such as hard plastics, glass, gravel, films and other inert wastes. The end result is a Type A compost which is considered to be fully refined and meets the requirements of Greek legislation.

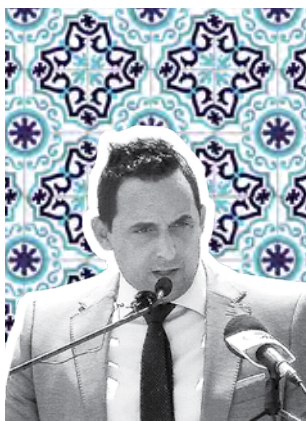
The plant is currently diverting more than 80% by weight of biodegradable wastes from landfill and achieving a recovery rate of recyclables of more than 35% by weight of the quantity of recyclable materials entering the SWTP.

#### NAVIGATING FINANCIAL HEADWINDS

According to George Skouteropoulos, finance manager at Helector,, the project was a breakthrough: "It was the first PPP in waste management. Of course it was a challenge. It was the first robust project with backing from the European Investment Bank. The process requirements are quite challenging. It was a big challenge, and a big success. Also bear in mind that financial closure took place on the 10th of June 2015, at the peak of Greece's financial turmoil with a lot of pressure from lenders and the European Commission."

"We signed the deal and 20 days later capital controls were imposed, so we had to undertake the project in a capital controlled environment while having to acquire equipment from abroad. Nevertheless, we managed to bypass the

**"WE SIGNED THE DEAL AND 20 DAYS LATER, CAPITAL CONTROLS WERE IMPOSED SO WE HAD TO UNDERTAKE THE PROJECT IN A CAPITAL CONTROLLED ENVIRONMENT."**



**Nikos Perdikaris**  
General Manager of EPADYM

problem and deliver the project within two years. We're very proud to have made such an achievement," he adds.

#### THE FUTURE

While not currently implemented, the new national waste management plan (NWMP), is expected to see additional measures such as the separate collection of organic wastes come into force. This will result in the availability of additional waste streams. Because of this, to future proof the plant, HELECTOR says that the biological treatment and the mechanical sorting technologies are designed to be compatible with these additional waste streams.

The plant currently receives mixed municipal waste. However, the firm is discussing with the public authority the option of processing pre-sorted organics, as well as other types of pre-sorted materials such as mixed plastics which can be handled with the mechanical separation unit operating as a kind of MRF operation.

With the implementation of the NWMP Nikos Perdikaris, general manager of EPADYM, believes there is potential in Greece for significant additional waste infrastructure, and Kozani's MBT provides an ideal model for financing those projects. Time will tell. Watch this space... —

## BEKON®

### The proven plant concept.

The BEKON® dry fermentation process offers efficient and modular systems for biogas production from waste materials. The ideal solution for municipalities, waste management companies and agriculture.

#### BEKON GmbH

Feringastrasse 9  
85774 Unterföhring / GERMANY  
Fon +49 89 9077959-0  
contact@bekon.eu | www.bekon.eu

 a company of  
**Eggersmann**



**BEKON** 