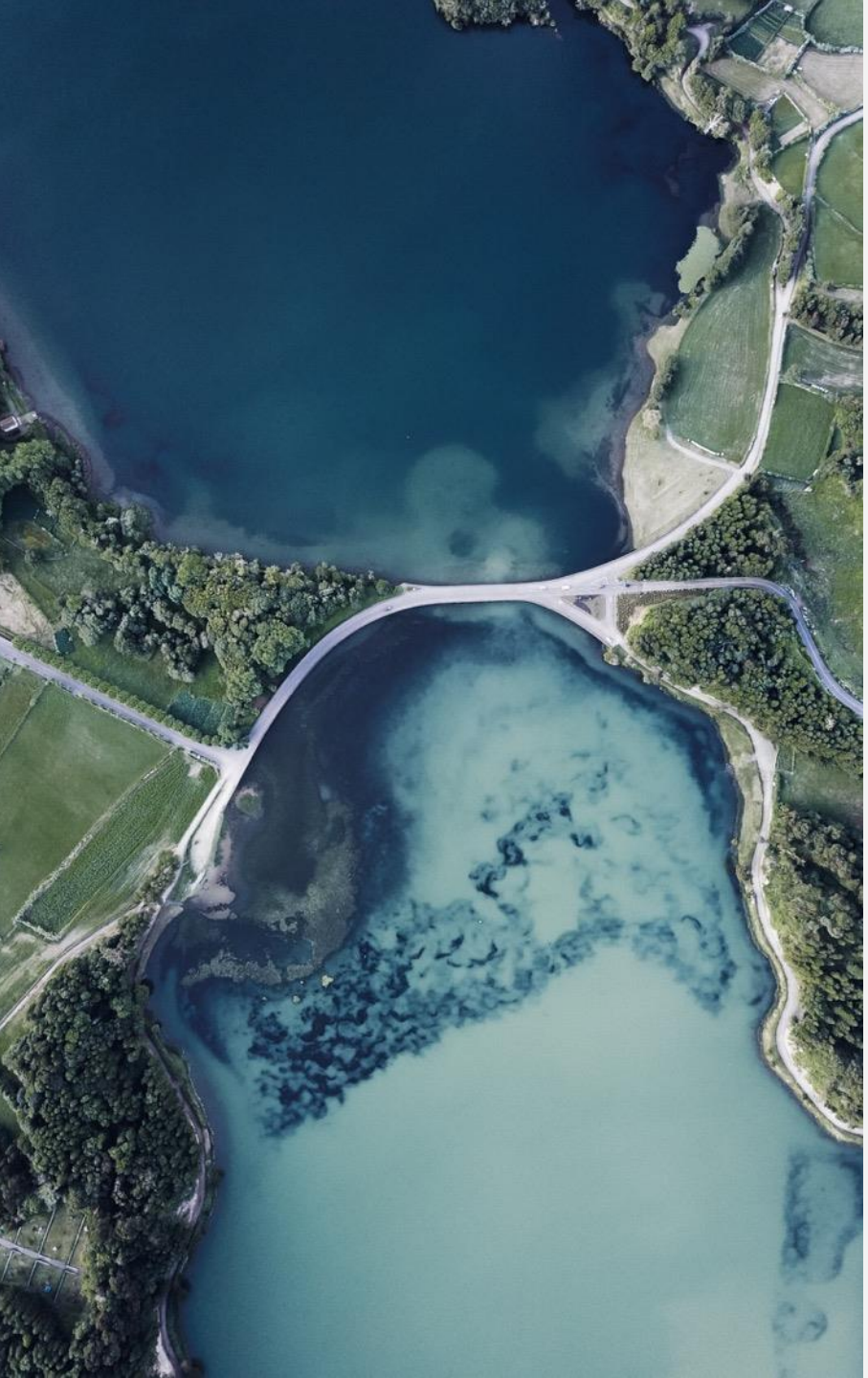


SYCHEM
ADVANCED WATER TECHNOLOGIES

SYCHEM GROUP OF COMPANIES

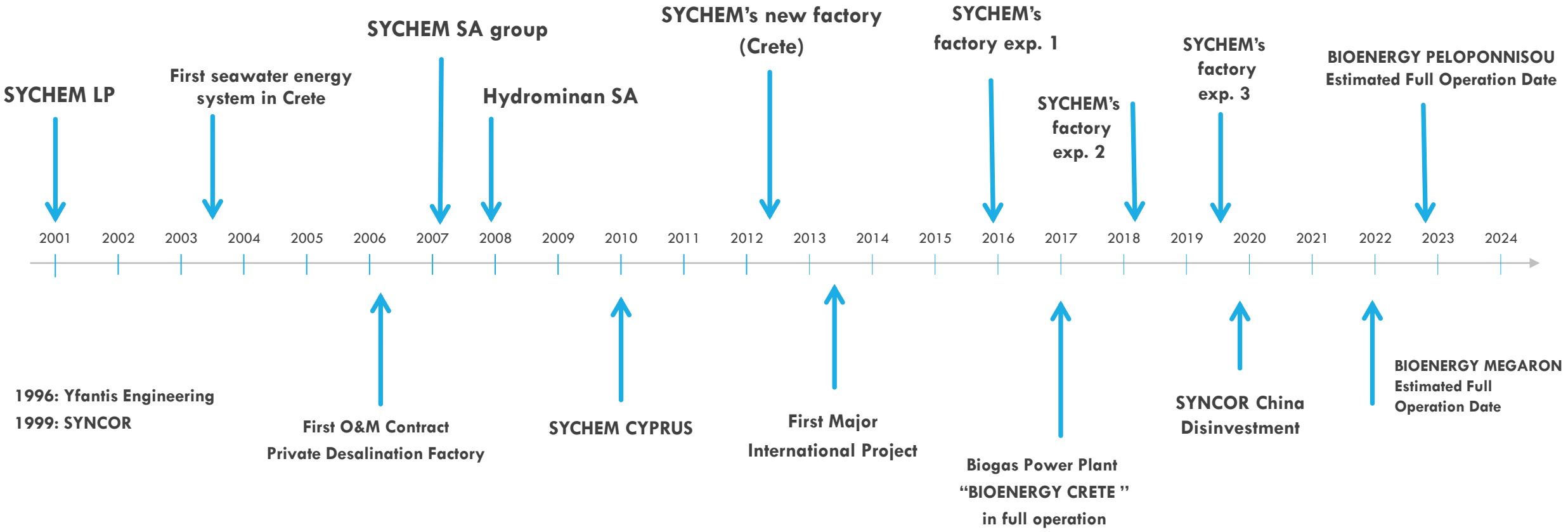
WATER AND ENERGY TECHNOLOGIES

WHO WE ARE ?

- The biggest Greek manufacturer of **Water Desalination Plants**
- The biggest private **Producer of Desalinated Water** in Greece
- State of the Art **Wastewater Solution Provider**
- The biggest manufacturer of open loop **Geoexchange Energy Projects** in Greece
- State of the Art **Biogas Power Plant Provider**

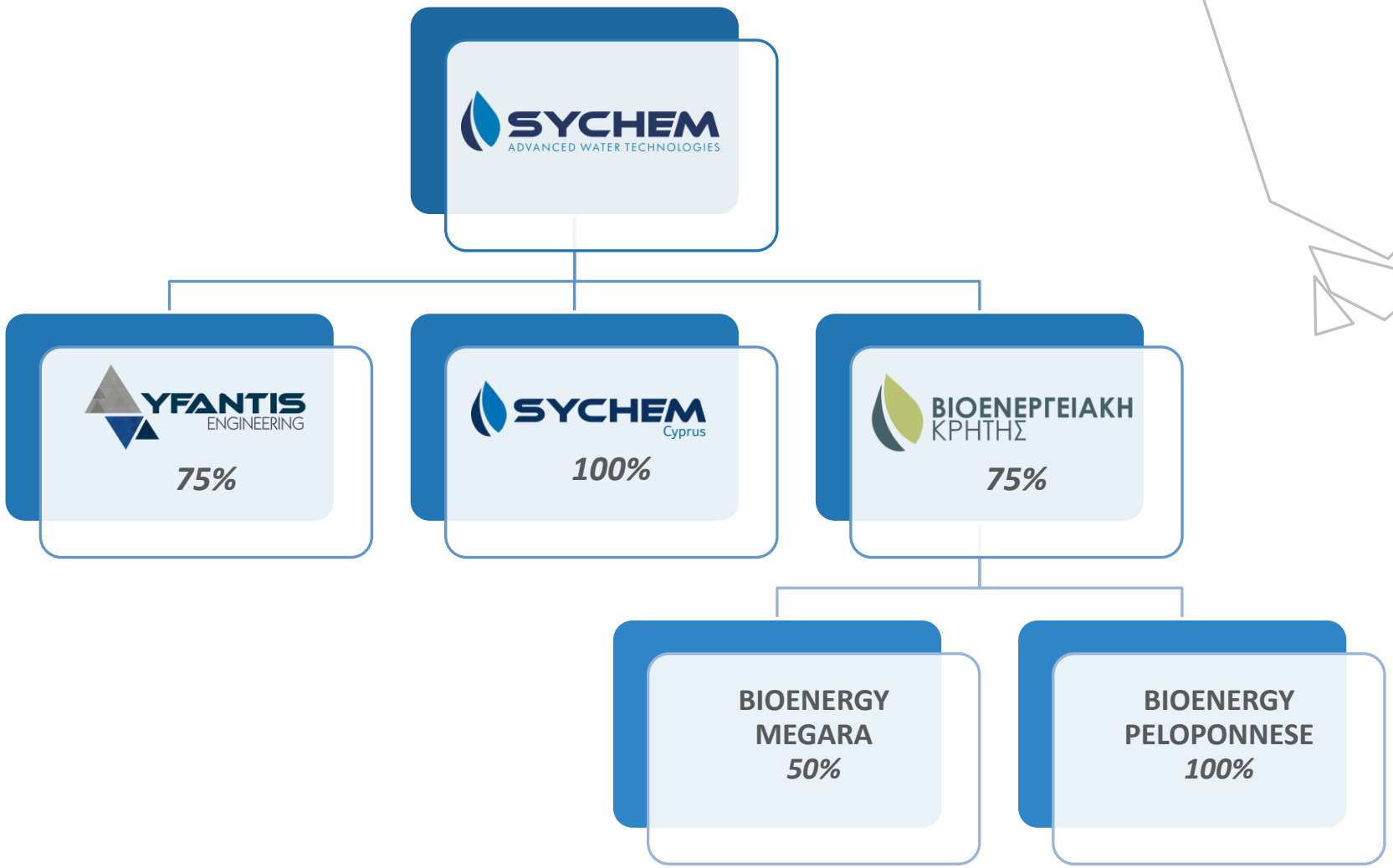
SYCHEM ADVANCED WATER TECHNOLOGIES

OUR HISTORY



SYCHEM ADVANCED WATER TECHNOLOGIES

GROUP STRUCTURE



OUR PRODUCTION CAPACITY (CRETE)

Indoor Production Area:	Outdoor Production Area	Warehouse Area	Administration/ engineering office	Total Area
4.500 m^2	2.200 m^2	3.000 m^2 indoor 1.600 m^2 outdoor	700 m^2	12.000 m^2


SYCHEM
www.tipeurope.com
TIP

PRIVATELY OWNED FACILITIES IN CRETE

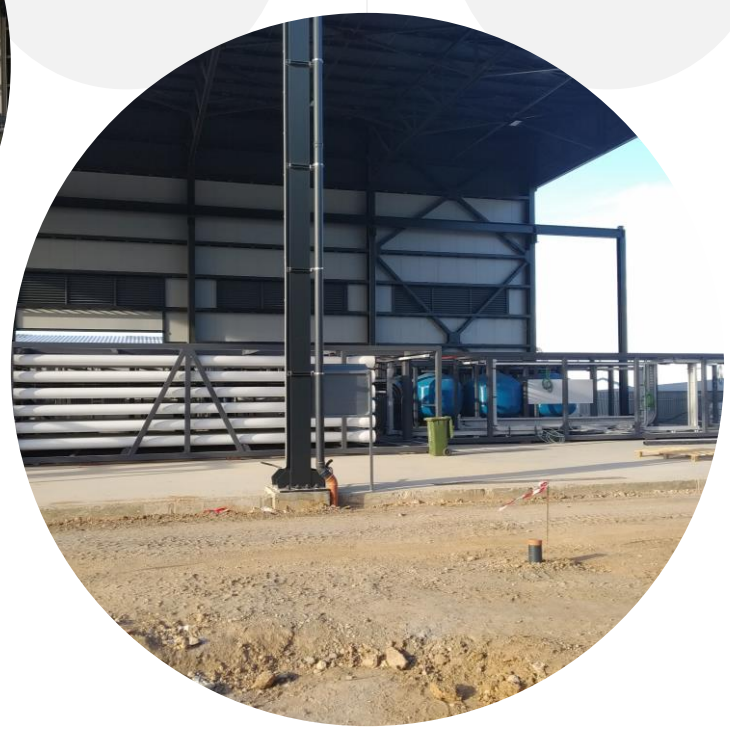
Administration/ Engineering Office

Water Treatment Sector

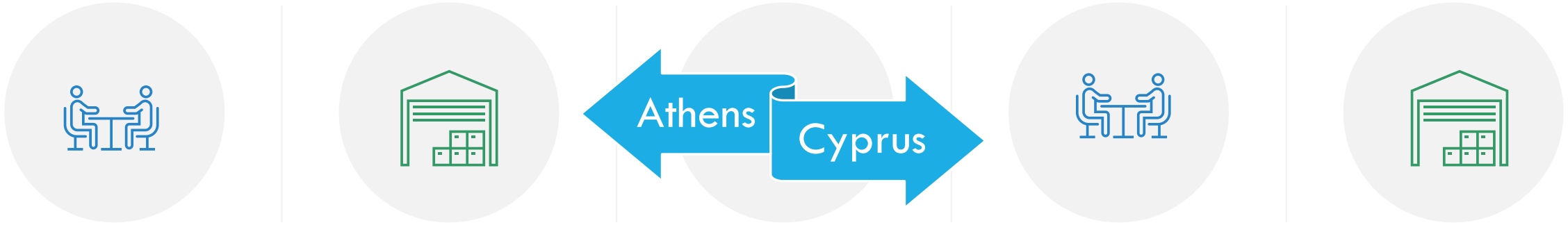
Raw materials Warehouse

SYCHEM
ADVANCED WATER TECHNOLOGIES

PRIVATELY OWNED FACILITIES IN CRETE



FACILITIES IN ATHENS AND CYPRUS



Administration/ Engineering Offices

800 m^2

Warehouse Area

700 m^2 indoor

administration/ engineering office

150 m^2

Warehouse Area

300 m^2 indoor

New SYCHEM group investment Under Construction

SYCHEM ADVANCED WATER TECHNOLOGIES

SYCHEM CYPRUS New investment Under Construction

SYCHEM ADVANCED WATER TECHNOLOGIES

THE OVAL LIMASSOL – SYCHEM CYPRUS OFFICE

OUR PEOPLE IN NUMBERS

172 People working for SYCHEM group

60 Engineers

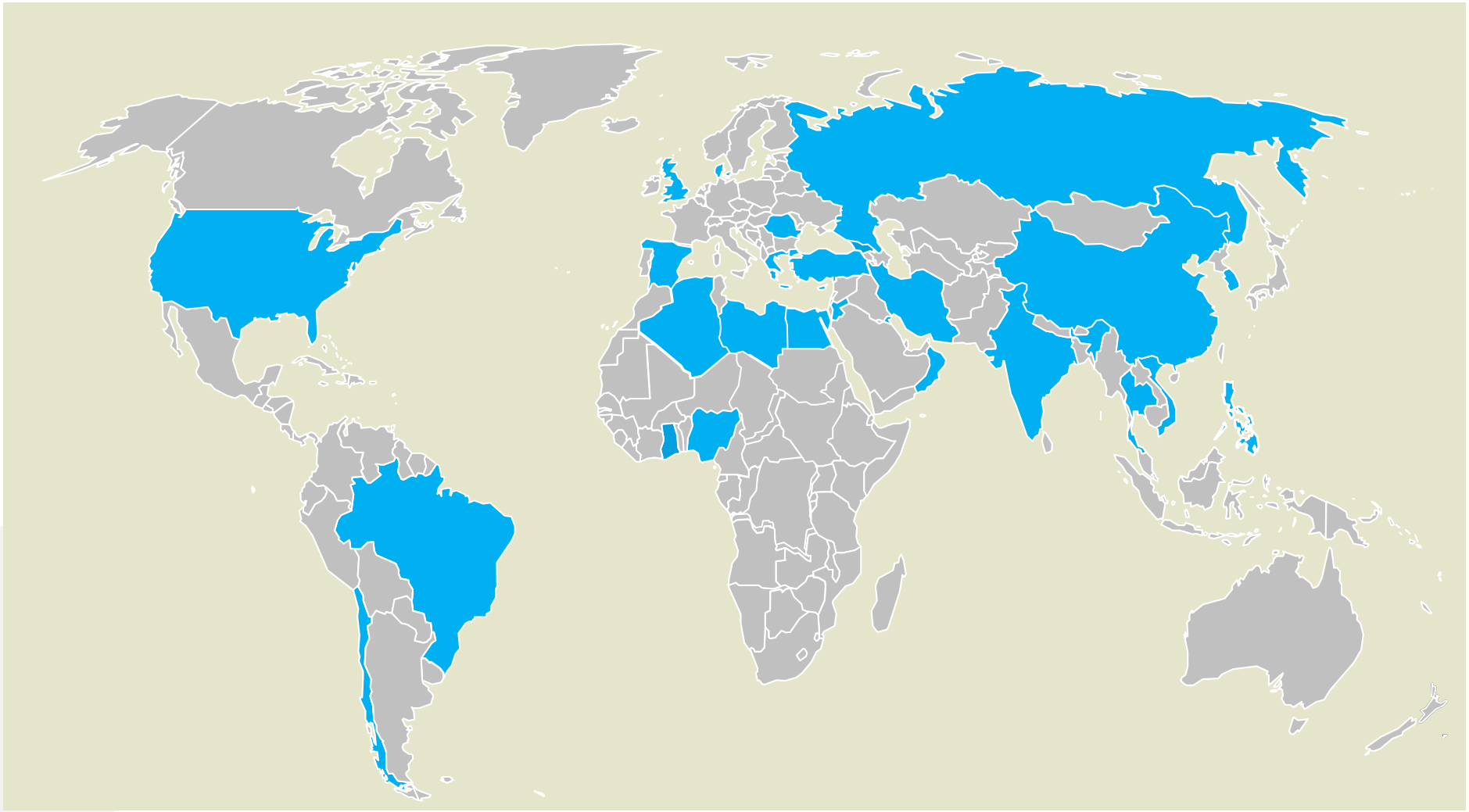
(17 Field Engineers)

69 Technicians / Field Technicians

43 Administration / Office Support

SYCHEM ADVANCED WATER TECHNOLOGIES

INTERNATIONAL PRESENCE



WATER DIVISION

Desalination Units

Water Waste Treatment

O&M – LEASING – RENTAL – BOO / BOOT CONTRACTS

PROJECT NAME: OTEKO

Capacity: 11.000 m^3/day (two trains)

Location: Taman Seaport, Russia

Client: IDE Technologies

Type: Seawater Reverse Osmosis (SW-RO)

Capacity: 11.000 m^3/day (two trains)

Year of installation: 2017

PROJECT NAME: PROJECT AL SULAIMI

Capacity: 10.000 m^3/day (2 trains)

Location: Aseelah, Oman

Client: Aqua Swiss

Type: Seawater Reverse Osmosis (SW-RO)

Capacity: 10.000 m^3/day (2 trains)

Year of installation: 2016

PROJECT NAME:
WWTP FOR CARLSBAD DESALINATION PLANT

Capacity: 8.500 m^3/day

Location: Carlsbad, USA

Client: IDE Technologies

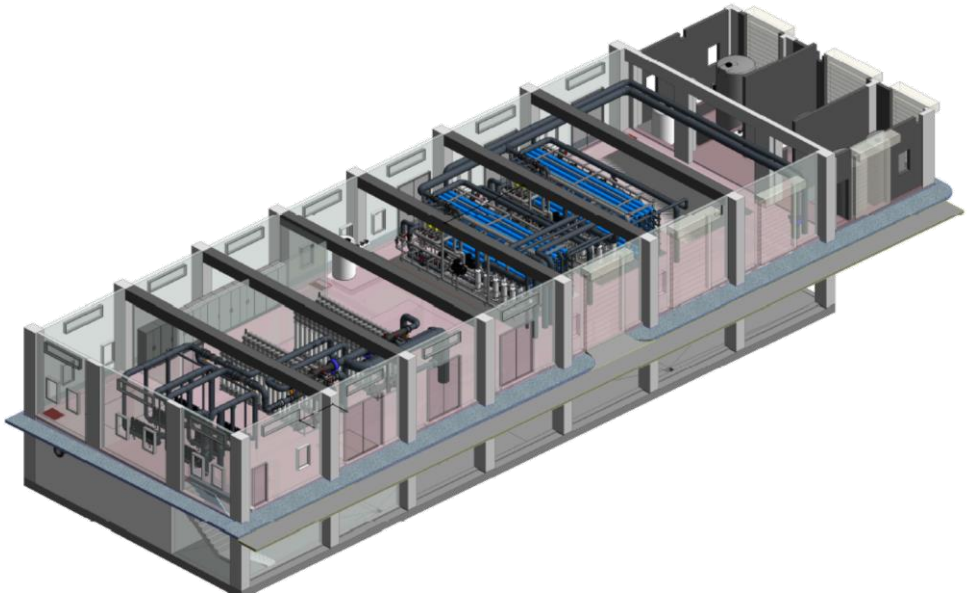
Type: DAF Effluent Waste-Water Treatment

Capacity: 8.500 m^3/day

Year of installation: 2016

THE SANTORINI (THIRA) PROJECT – LARGEST SEAWATER DESALINATION FOR POTABLE WATER IN GREECE

Capacity: 5.000 m^3/day



Project Name: Installation Of Sea Water Reverse Osmosis Desalination Plant

Location: Agia Paraskevi Location- Thira Santorini, Greece

Client: J/ V PROTEUS S.A.- ERMON S.A.

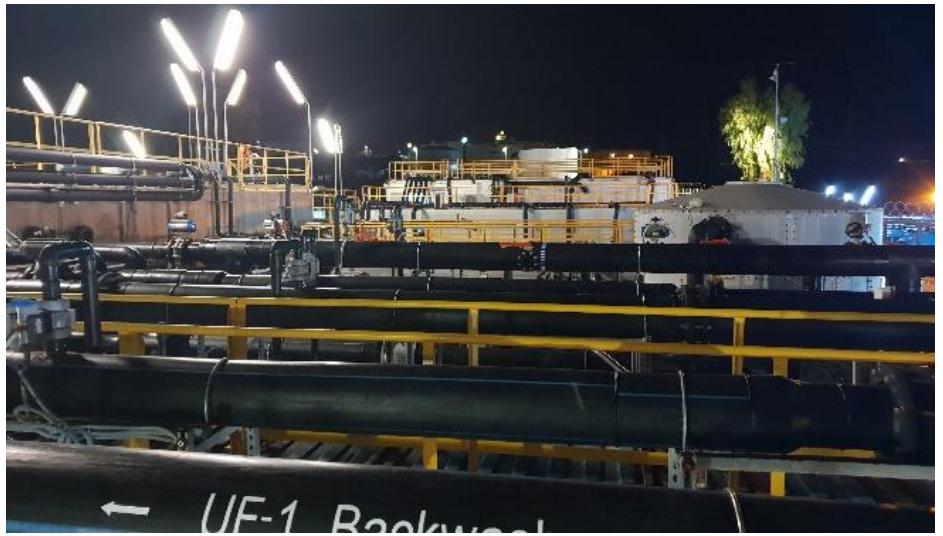
Type: UF-SW-RO

Capacity: 5.000 m^3/day (two trains)

Year of installation: 2019

MOTOR OIL
A REMARKABLE PROJECT 2007 - 2027

Capacity: 14.000 m^3/day



Location: Greece, Corinth

Client: Motor Oil Hellas

Type & Capacity:
Total Installed Plant Capacity:
2007 – 2018 (in 4 phases) - 28.000 m^3 /day UF(Pretreatment),
13.500 m^3 /day (Seawater RO), 12.000 m^3 /day (2^{nd} Pass RO),
10.800 m^3/day EDI – BFW water.

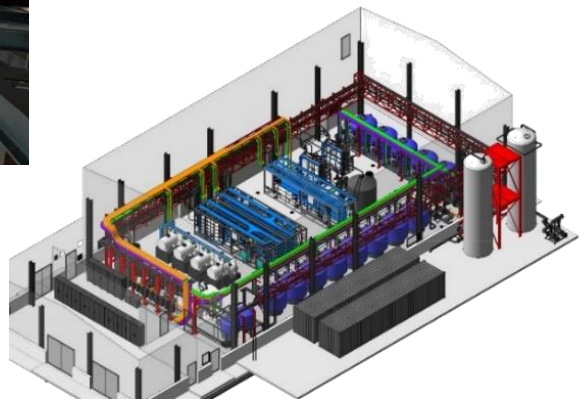
O&M Contract Capacity:

4.000.000 m^3/ year Boiler FeedWater

550.000 m^3/ year PotableWater

Year of installation: 2007-2027

More info: The Biggest Desalination Plant in Greece



AMANDI COMBINED CYCLE POWER PLANT IN GHANA

Capacity (Demi Water): 1.920 m^3/day

Project Name: Amandi Combined Cycle Power Plant In Ghana

Location: Takoradi, Ghana

Client: METKA (Mytilineos Group)

Type: SWRO-DWRO-EDI

Capacity:

2.600 m^3/day (Seawater RO)

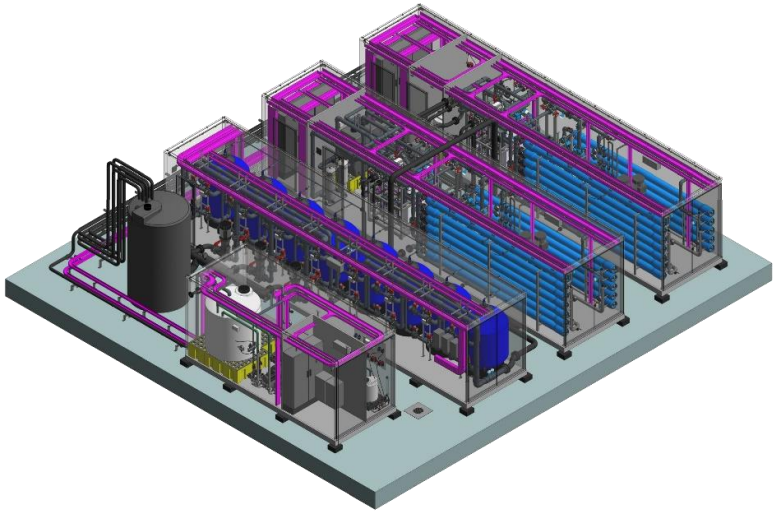
2.000 m^3/day (2nd Pass RO)

1.920 m^3/day EDI – Demineralized water

Year of installation: 2018

PROJECT NAME: BRIDGE COMBINED CYCLE POWER PLANT IN GHANA

Capacity (Demi Water): 1.680 m^3/day



Location: Tema, Ghana

Client: METKA (Mytilineos Group)

Type: BW-RO-EDI

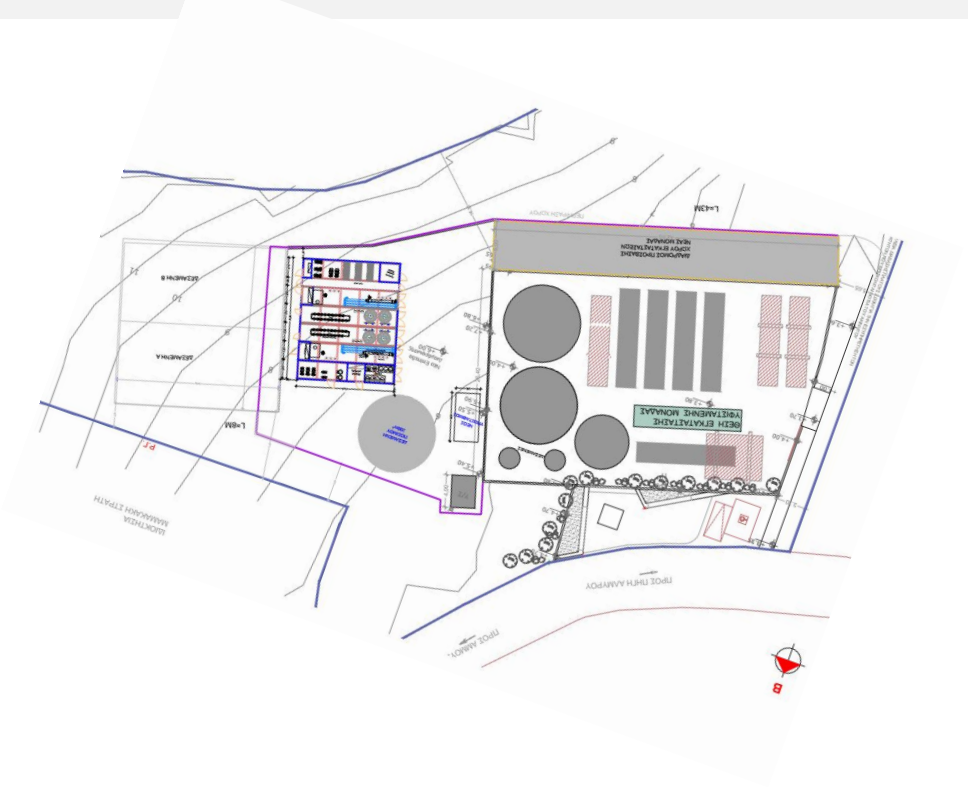
Capacity:

2.600 m^3/day (Brackish water RO)

1.800 m^3/day (2nd Pass RO)

1.680 m^3/day EDI – Demineralized water

Year of installation: 2019



ALMYROS EDUCATIONAL DESALINATION PARK

Capacity: 5.000 m^3/day

Project Name: Almyros Educational Desalination Park

Location: Malevizi, Crete Island- Greece

Client: Municipal Enterprise for Water Supply and Sewerage of Malevizi

Type: Brackish Water RO with Energy Recovery &Ultrafiltration Pretreatment (UF-BW-RO)

Total Capacity: 5.000 m^3/ d

Year of installation: 2019

More info: SYCHEM SA with Grundfos, Praher and Pentair

Sponsored the Almyros Educational Desalination Park

MUNICIPALITY OF PAROS ISLAND

Capacity: 2.500 m^3/day

Location: Paros Island, Greece

Client: Paros Municipality

Type: Seawater R/O - Potable Water Production

Total Capacity: 2 x 1.250 m^3/ d

Year of installation: 2019

MUNICIPALITY OF LIPSOI ISLAND

Capacity: 600 m^3/day

Location: Lipsi Island, East Aegean

Client: Ministry of Aegean & Islands

Type: Seawater R/O - Potable Water Production

Total Capacity: 600 m^3/ d

Year of installation (completion): 2019

MUNICIPALITY OF ALONISSOS ISLAND

Capacity: 600 m^3/day

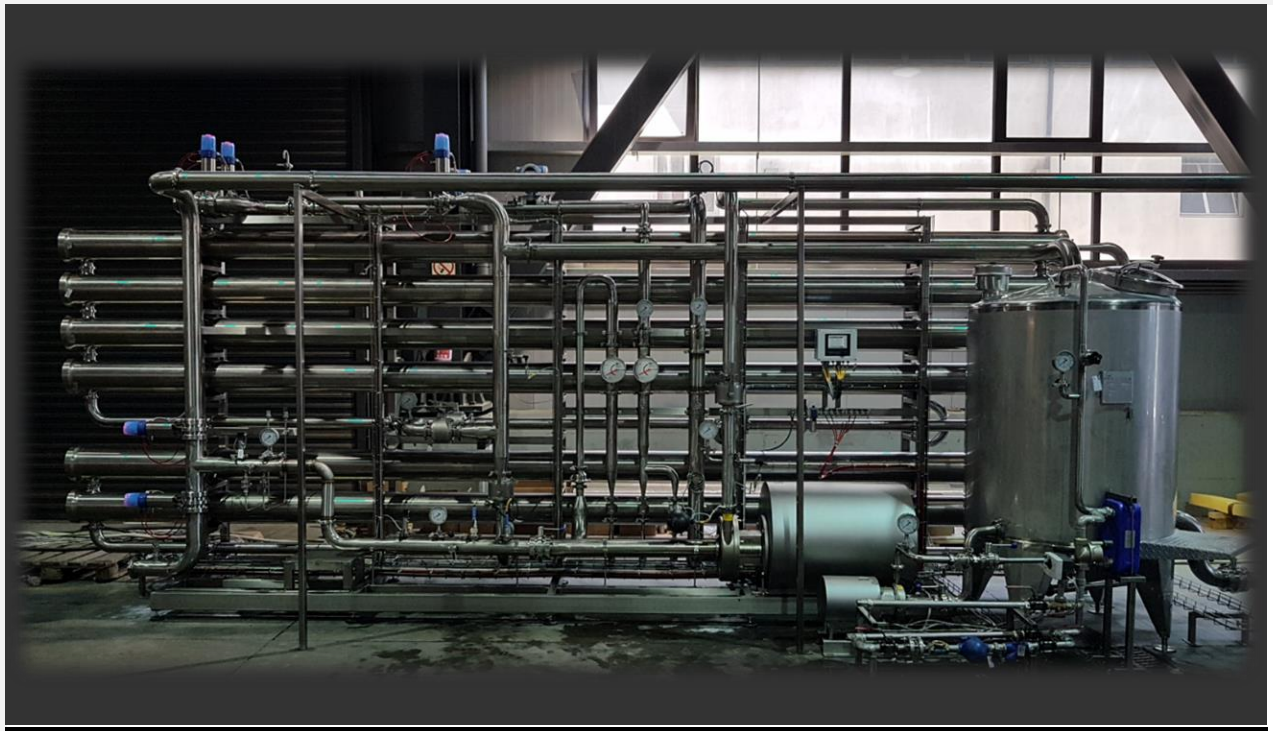
Location: Alonissos Island, Greece

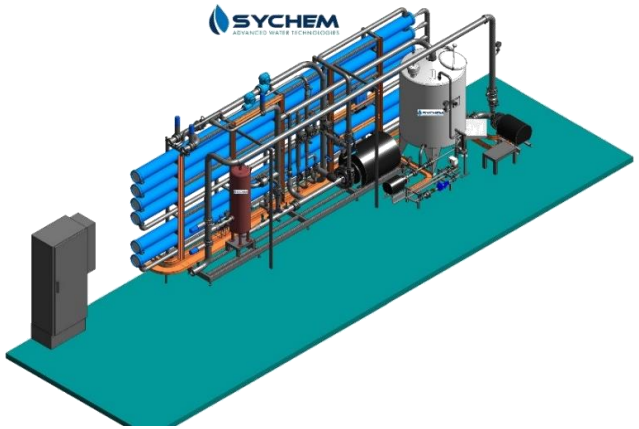
Client: MUNICIPALITY OF ALONISSOS

Type: Seawater R/O - Potable Water Production

Total Capacity: 600 m^3/ d

Year of installation: 2019





COCA COLA HBC MEGA PLANT REVERSE OSMOSIS SANITARY UNIT

Capacity: 840 m^3/day

Project Name: Coca Cola HBC Mega Plant Reverse Osmosis Unit

Location: Schimatari - Greece

Client: HBC

Type: Tap Water RO acc. to sanitary standards

Installed Capacity: 840 m^3/day

Year of installation: 2019

PRE-ASSEMBLED WATER TREATMENT PLANT FOR FLOUR MILLS OF NIGERIA

Capacity: 1.560 m^3/day

Project Name: Pre-assembled Water Treatment Plant units at Ibadan – Nigeria

Location: Ibadan, Nigeria

Client: Star Trading Company LTD / Flour Mills of Nigeria

Type: BW-RO, RO-CEDI

Capacity:

- 1.200 m^3/d (1st Pass RO, POT Water)
- 360 m^3/d (2nd Pass RO - EDI BFW)

Year of installation: 2013

More info: Full Pre-assembly and Testing at Sychem's Factory

MAVRORACHI LANDFILL SITE

Capacity: 2 x 250 m^3/day

Project Name: Mavrorachi Landfill Site

Location: Greece, Thessaloniki

End Client: FODSA OF CENTRAL MACEDONIA

Type: Landfill Leachate WaterTreatment With Reverse Osmosis (LW-RO)

Capacity: 2 x 250 m^3/day

Year of installation: 2020

LEACHATE TREATMENT UNITS IN ALGERIA

Capacity: 3 x 110 m^3/day

Project Name: 3 Leachate Treatment Units in 3 Landfill sites in Algeria

Location: Annaba-Guelma-Skikda, Algeria

End Client: National Waste Agency, Algerian Ministry of Environment

Type: Leachate Wastewater Treatment Plant (LWRO)

Capacity: 80 m^3/d permeate (110 m^3/d leachate inlet)

Year of installation: 2019-2020

ENERGY SAVING PROJECTS

HOTELS / HOSPITALS

INDUSTRIAL / HIGH RISE BUILDINGS

ESCO

MIRAGGIO THERMAL SPA RESORT 5*

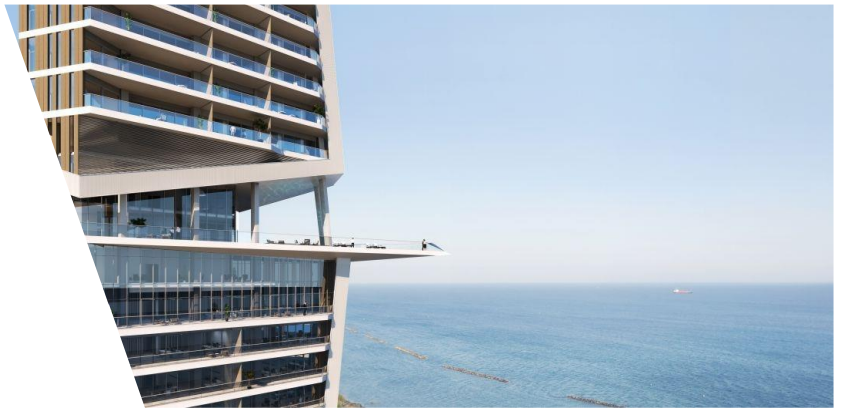
Scope of work

- Complete design of MEP installations & Combined Sea Water Geo-exchange system.
- Testing , Balancing & Start-Up for all mechanical installations.

Technical data

- 2.400kW cooling capacity
- 1.300kW heating capacity
- 1.000 beds
- 32.500 m² total built-up area
- 67m maximum elevation variation for building services

THE TRILOGY – LANITIS SEA FRONT



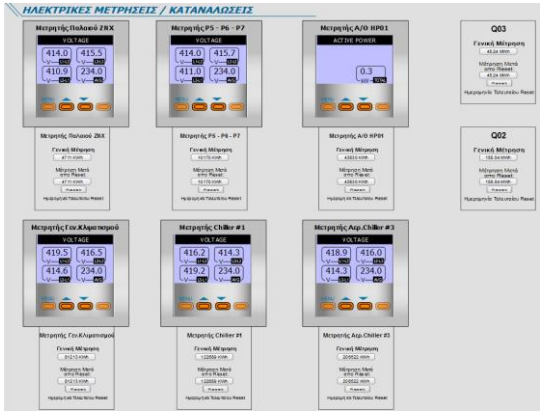
Scope of Work:

- Design & Supervision of MEP Installations and BMS (Yfantis Eng.).
- Open loop decentralized geo-exchange system with separate water source heat pump for each apartment.
- Heat Recovery for Domestic Hot Water production.
- Recycle of HVAC condensation water for irrigation purposes
- PRESSURIZATION for staircases & elevator shafts.
- Ductless SMOKE EXTRACTION & VENTILATION of underground Parking area with jet fans

Technical Data:

- 4.100 kW total cooling capacity.
- 48.180 m² total air-conditioned area.
- 59.096 m² total PARKING AREA.
- 153 m maximum level difference.

MARBELLA BEACH HOTEL 5*



Employer : Marbella SA

Area : Corfu, Greece

Type : Hotel

Designed : 2017 / 2018

Constructed : 2017 / 2019

Scope of Work :

- ✓ Main Plant modifications for energy saving (2019)
- ✓ Installation of air-cooled chiller with partial recovery for DHW (2019)
- ✓ Installation of water-cooled chiller and geothermal Heat Pump for DHW (2017)
- ✓ BMS installation and upgrade (2017 / 2019)

Technical Data :

- ✓ 900kW cooling capacity
- ✓ 327m2 solar panels
- ✓ 170kW DHW heating capacity
- ✓ 600 beds

THE OVAL - LIMASSOL

Scope of work

- Complete design of MEP installations & Combined Sea Water Geo-exchange system.
- Testing , Balancing & Start-Up for all mechanical installations.

Technical data

- 2.400kW cooling capacity
- 1.300kW heating capacity
- 1.000 beds
- 32.500 m² total built-up area
- 67m maximum elevation variation for building services

AMERICAN MEDICAL CENTER

Employer : American Heart Institute

Area : Nicosia, Cyprus

Type : Medical Center

Designed : 2008

Constructed : 2009-2010

Scope of Work :

-Re-design of central AC and Domestic Hot Water plant room and BMS

Testing , Balancing & Start-Up for all mechanical installations

-Contractor (SYCHEM) for 2nd phase AC/DHW installations & BMS.

Technical Data :

1.400kW cooling capacity, 350kW heating capacity

11.700m² total built-up area

IKAROS BEACH RESORT SPA

Employer : Sapounakis SA

Area : Malia, Crete, Greece

Type : Hotel

Designed : 2008 / 2016 / 2018

Constructed : 2009 / 2016 / 2018

Scope of Work :

Complete MEP design for AURA SPA (2008)

Consulting services and site inspection of MEP installations (2008)

Sea water geo-exchange HVAC & DHW system (2016)

Main plant room renovation (2019)

Technical Data :

330kW cooling capacity (Hotel)

348kW cooling capacity (SPA)

348kW cooling capacity (Hotel 2016 addition)

127kW DHW heating capacity (Hotel 2016 addition)

855 beds

ELECTRICITY/BIOGAS PRODUCTION

A "Green" Challenge for Sychem Group

Project Name: Biogas Power Plant

Location: Greece, Crete Island, Nea Alikarnassos-Heraklion

Client: Technical Bioenergy Crete (TBK), member of **SYCHEM Group of Companies**

Type: WWTP (MBR –MBBR – UF – RO) liquid digestate management

Capacity: Installed Electrical Capacity 1000 kW upgradable to 2 MW

More info:

- The biogas plant was entirely designed and constructed by SYCHEM Group, applying cutting-edge technology
- Includes innovative WWTP with Cross-Flow UF Bioreactor 100 m^3/day for the Biogas Digestate effluent
- The Plant aims to become a European pattern for the management and utilization of organic waste

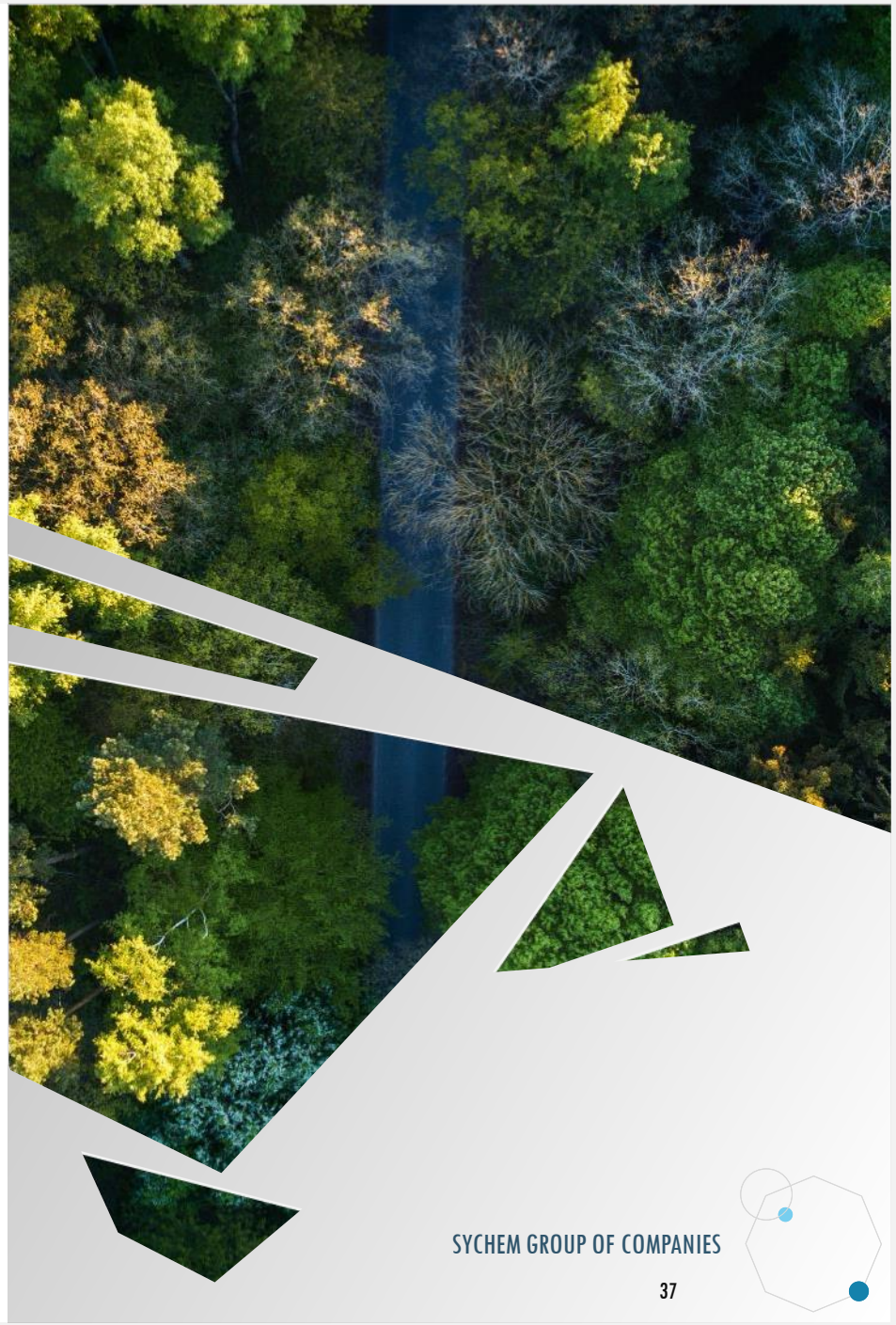
Year of installation: 2017

THE CHALLENGE

Manure (Pig, Chicken, Etc)

Expired Food / Leftovers

Slaughterhouse Waste



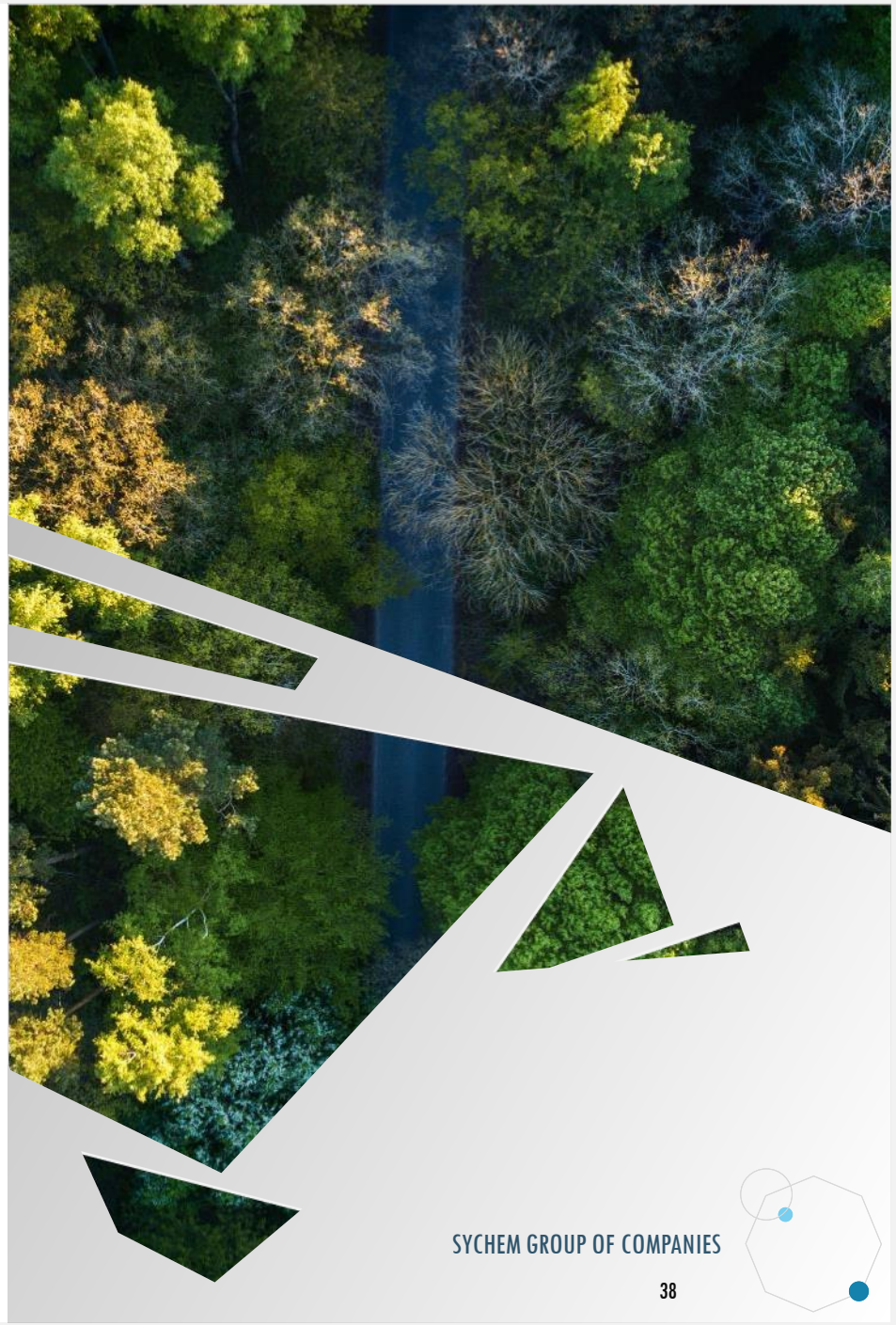
SYCHEM ADVANCED WATER TECHNOLOGIES

FACING THE CHALLENGE

Clean Energy: Electricity & Heat

Solid Residue: becomes Organic Fertilizer

Liquid Effluent: becomes Clean Water for Irrigation

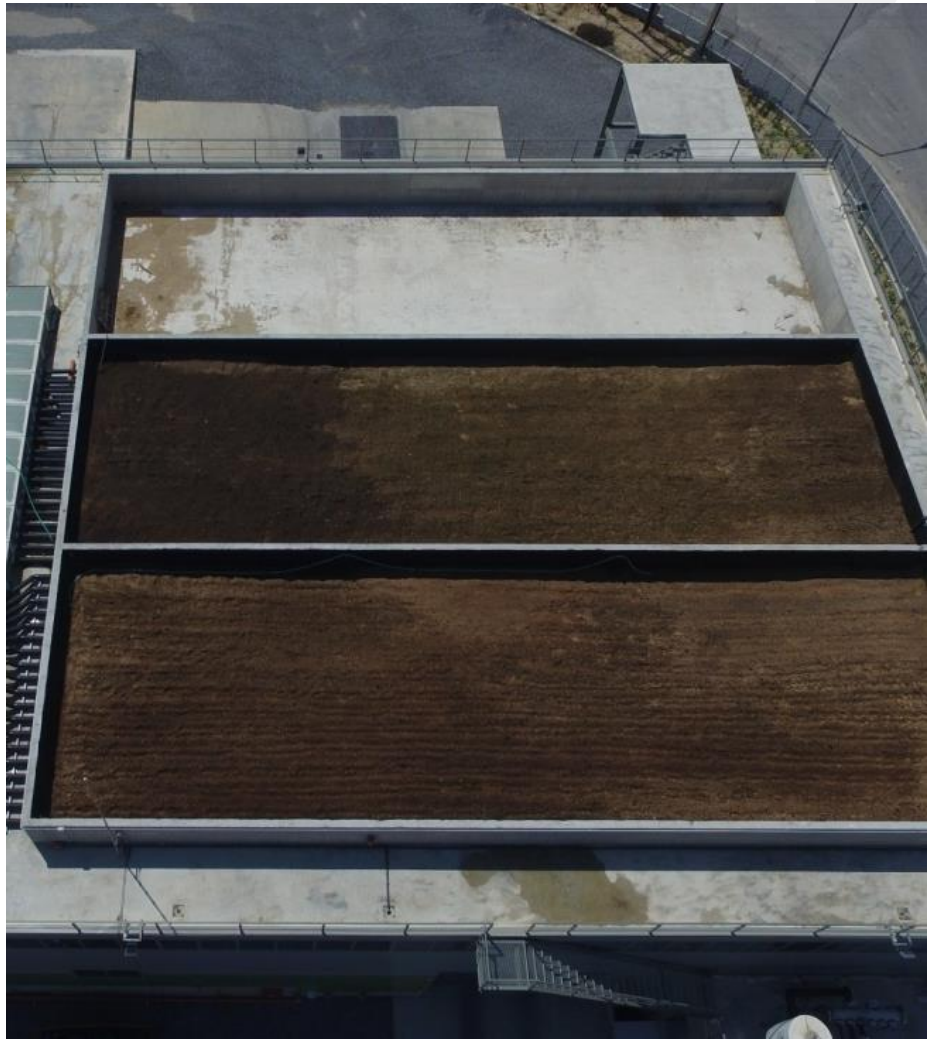


SYCHEM ADVANCED WATER TECHNOLOGIES


ΤΕΧΝΙΚΗ
ΒΙΟΕΝΕΡΓΕΙΑΚΗ
ΚΡΗΤΗΣ

THE INNOVATION

THE INNOVATION



AWARDS AND DISTINCTIONS

SYCHEM SA JOINED THE GLOBAL NETWORK OF ENDEAVOR IN 2016

endeavor GREECE

INTERNATIONAL PUBLICATIONS IN PRESS FOR BIOENERGY CRETE PROJECT.

Bioenergy International, Digital Biogas Special 1, 2020

BIOENERGY INTERNATIONAL
"Whenever and wherever bioenergy is discussed"
Digital Biogas Special 1- 2020

Crete has many breathtaking mountains like these to the west of Chania. It is this kind of scenery that is loved by hundreds of thousands of tourists who, unfortunately, also leave lots of waste on the island. However, it is efficiently taken care of by three recycling and biogas facilities.

Biogas expansion on Crete

On Crete, the largest Greek island, biogas was produced by two existing landfills, as well as from the sewage treatment plants in Chania and the capital Heraklion. As of May 2017, biogas is also produced in a new anaerobic digestion (AD) and cogeneration plant. Bioenergy International paid a visit.

– THIS BIOGAS PROJECT Techniki Bioenergeiaki Kritis 2, was designed by the SYCHEM S.A. It is an expansion of the existing cogeneration plant located in the Industrial Area of Heraklion. The primary purpose of this biogas application is the production of electrical energy, which is sold to the public power corporation, explained Giannis Petrakakis, Plant Manager for the biogas facility plant.

Petrakakis explained that the first plant started at the end of 2016 with an installed power capacity of 500 kW.

– Already during 2018, we could increase the power capacity to 1 MW. Our plant receives more than 14 000 tonnes per year of slaughterhouse waste, food waste, expired food products from supermarkets, food processing industry waste including cheese whey, pig manure, chicken manure, oils and fats from the entire island of Crete, giving a viable solution to the management of such organic waste, Petrakakis added.

In the beginning, the plant was using GE:s Jenbacher JMS 312 GS-B. L v. D25 cogeneration unit fueled with biogas which is produced by the AD plant.

– The second GE:s Jenbacher unit, model JMS 312 GS-B. L v. D225, was installed to extend the electrical power capacity. The thermal energy produced from the CHP unit is used for heating the digester, said Petrakakis.

SYCHEM Group plant

The biogas plant was constructed by SYCHEM Group, that according Petrakakis, applied "cutting-edge technology" at the most critical points of the production process such as the collection and management of the incoming organic waste, the deodorisation system, heat recovery and the innovative wastewater system for the digested effluent treatment.

The EUR 6 million green investment by the European Financing Tool «JESSICA» was used to protect the environment and create new jobs at the plant.

– This biogas power plant manages all types of organic waste ranging from slaughterhouse residuals to manure, and its great advantage of being odourless recognises it, Petrakakis said.

Deodorization system

– Our innovative digestive treatment system, ZERO land application, our odour control system and our waste reception and processing line, all of which were also engineered and constructed by SYCHEM group, Petrakakis underlines.

The Biogas Plant features a unique deodorisation system that enables plant's integration into the urban environment and a highly specialised wastewater treatment system for the effluents avoiding any contamination of the environment. – We have built a fully sealed underpressurised plant building to prevent odour escape into the environment. Also, we installed innovative biofilters for odour neutralisation, Petrakakis stated.

Giannis Petrakakis, Plant Manager of Sychem Biogas says that his company is able to provide integrated solutions for the management of organic waste and the production of biogas by designing plants incorporating novel technologies such as odour control biofilters, fully automated feeding system and advanced biological treatment of the liquid digestate.

Only a few characteristic waste odours were noticable but these came from the trucks leaving the facility. Those should not though bother anybody because the plant is middle of a vast area of compactly built factory halls.

The automated process in the facility and management secures the separation of the organic fraction from the packaging material

– Our new anaerobic digester with a capacity of 4 500 m³ is almost ready för production. The investment regarding the mechanical equipment is just over EUR 4 million, while the total including land purchase and civil works is estimated at EUR 6 million, said Giannis Petrakakis.

Greek energy and water major

Apart from energy, Sychem Group is the biggest Greek manufacturer regarding water desalination plants with significant share in private sector engineering and industrial construction projects such as oil refineries, power plants, hotels,. The Group is also the biggest manufacturer of open loop geoexchange energy projects in Greece with a focus on the sea water energy exploitation and the most prominent private producer of water in Greece.

The company, with headquarter in Athens, is also an international provider of cathodic protection equipment and anodes and industrial facilities and keeps offices in Crete, Cyprus and China.

A few years ago the Sychem Group relocated and expanded its Hydrominoan subsidiary to the new modern desalination facility within the industrial area of Heraklion.

Hydrominoan S.A is the largest private water producer in Greece, owning the largest desalination unit for potable water production and is currently the only desalination plant in Crete.

The installed capacity is 5,000 cubics per day and owns a modern production and quality control equipment.

Along with the future desalination units development in the Almiros river of Malevizi, the plant will contribute significantly to the final resolution of the drought issue in Heraklion and to the assurance of high-quality potable water.

Text and photos: Markku Björkman
BI105/6308/AS

The new biogas fermentor/digester at Sychem's plant in Heraklion. The digester will be operational soon and which will further increase the plant's total capacity (photo courtesy Sychem Group).

The Heraklion Biogas Plant features here in this part of the facility a special deodorization system that enables plant's integration into the urban environment and a highly specialized wastewater treatment system for the effluents avoiding any contamination of the environment.

Chania, the tourist hot spot of Crete. The DEDISA waste-processing centre of this seasonally crowded city serves a population of 155 000 inhabitants, which represents around 25 percent of the island's total population. Furthermore, the Chania prefecture also provides another 88 000 beds for tourists, and most of the region's municipalities fall within the DEDISA plant's catchment area.

SYCHEM GROUP OF COMPANIES

AWARDS
2014-2019

Best City Awards, 2016

SYCHEM has been given 2 Gold Awards at the Best City Awards Ceremony held on 24/10/2016, for the Almyros Desalination Park & the Miraggio Thermal Spa & Resort Chalkidiki Projects.

Environmental Awards 2016

The gold award in the category «Human Environment – Sustainable Leisure & Tourism», was given to Dr. Nikolaos Yfantis for "Miraggio Thermal Spa & Resort Chalkidiki" Project, where SYCHEM constructed the innovative combined geoexchange/ energy recovery and water production system for the project "Miraggio Thermal Spa & Resort Chalkidiki".

«Best Circular City Biogas plant» & «Best Biogas Plant below 1MW» 2019

SYCHEM through its subsidiary Technical Bioenergy Crete (TBC) was honored with the award for the «Best Circular City Biogas plant» and the distinction for the «Best Biogas Plant below 1MW» in the AD and Biogas Industry Awards 2019.

Best City Awards 2017 Alonnisos Municipality for Desalination Unit

Best City awards 2017 SILVER

Alonnisos Municipality had been given a Silver Award for SYCHEM Desalination Plant Capacity 600 m3/day, at the Best City Awards Ceremony, held on Thursday, October 05, 2017 at Technopolis City of Athens, by Bousias Communications Company.

Honorary Distinction By Made In Greece awards, 2017

The distinction was awarded to SYCHEM SA for the category «Export Excellence in Industrial Product».

Honorary Distinction By Greek Stock Market, 2016

The Chairman & Managing Director of Sychem S.A Dr-Ing.A. Yfantis (3rd from the left) declaring the closing of the Greek stock market session.

THANK YOU

SYCHEM
ADVANCED WATER TECHNOLOGIES

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