



# Sofia WWTP – energy self-sufficient with green energy

*Municipal sector*

## | The challenge

The main challenge before the team of Sofia WWTP is to treat the wastewater of Sofia and return it back to nature clean.

The second challenge was to make Sofia WWTP fully energy self-sufficient.

Last but not least, the sludge produced from the treatment of the wastewater to be successfully utilized as a fertiliser in agriculture.

## | Veolia's solution

Sofia WWTP treats wastewater from domestic and industrial users as well as rainwater from the combined sewerage network of Sofia. It has a design capacity of 1.5 million people and treats more than 400 000 m<sup>3</sup> of domestic and industrial wastewater daily in line with the most stringent EU requirements (including nitrogen and phosphorus removal).

The plant was commissioned in 1984 and is one of the largest in the Balkans. Historically it has consumed between 16 000 and 24,000 MWh of electricity per annum.

Following the installation of CHP units in 2009 the green energy produced at the WWTP increased from 1500 MWh to over 23 600 MWh in 2021.

The measures implemented to reduce the energy consumption of the WWTP led to an excess of 3 190 MWh in 2021, i.e. the plant produced 16 % green energy in excess to what was needed for its operation.

This progress was achieved through targeted initiatives, particularly in 2017, when the company commissioned new frequency-regulated air blowers for the biological treatment step, which increased the efficiency of the process by 11%.



Sofia, Bulgaria



### Wastewater treatment:

Duration: 25 years since 2000

Type: Concession

**>126 M cub.m. p.a.**

of treated wastewater discharged in the Iskar river

**116 %**

Energy independence



In parallel, a project for utilizing exhaust heat from the CHP installation was implemented and it added 570 kW to the installed capacity, which has been of great importance as an additional heat source to increase the temperature of the anaerobic digesters. This project has resulted in a 13% increase in the energy produced on site.

**Key figures** since the commissioning of the cogeneration installation in 2010 until the end of 2022:

- 256 million kWh generated green energy
- 131 million m<sup>3</sup> utilized biogas
- 770 K tons reduced CO<sub>2</sub> emissions
- 1 million tons of sludge utilized in agriculture (2013 – 2022)

## | The benefits

- Thanks to the continuous work of Sofia WWTP, each year over 126 million m<sup>3</sup> of treated wastewater discharged into the Iskar river.
- The production of green energy fully covers the energy needs of the facility.
- Saving over 75 000 tons of carbon emissions per annum.



<https://www.veolia.bg/en/news/sofia-wastewater-treatment-plant-kubratovo-won-prize-category-water-and-waste-water-management>



### REGIONS & CITIES

Greener city  
Cost efficiency



### PLANET

Over 119 M m<sup>3</sup> treated  
wastewater returned to nature  
Reduced carbon emissions  
Protecting the environment by  
sludge waste



### WOMEN & MEN

Provides on-the-job training  
ground for young engineers