

SOFIA UWWTP AN EXAMPLE FROM BULGARIA

Софийска вода



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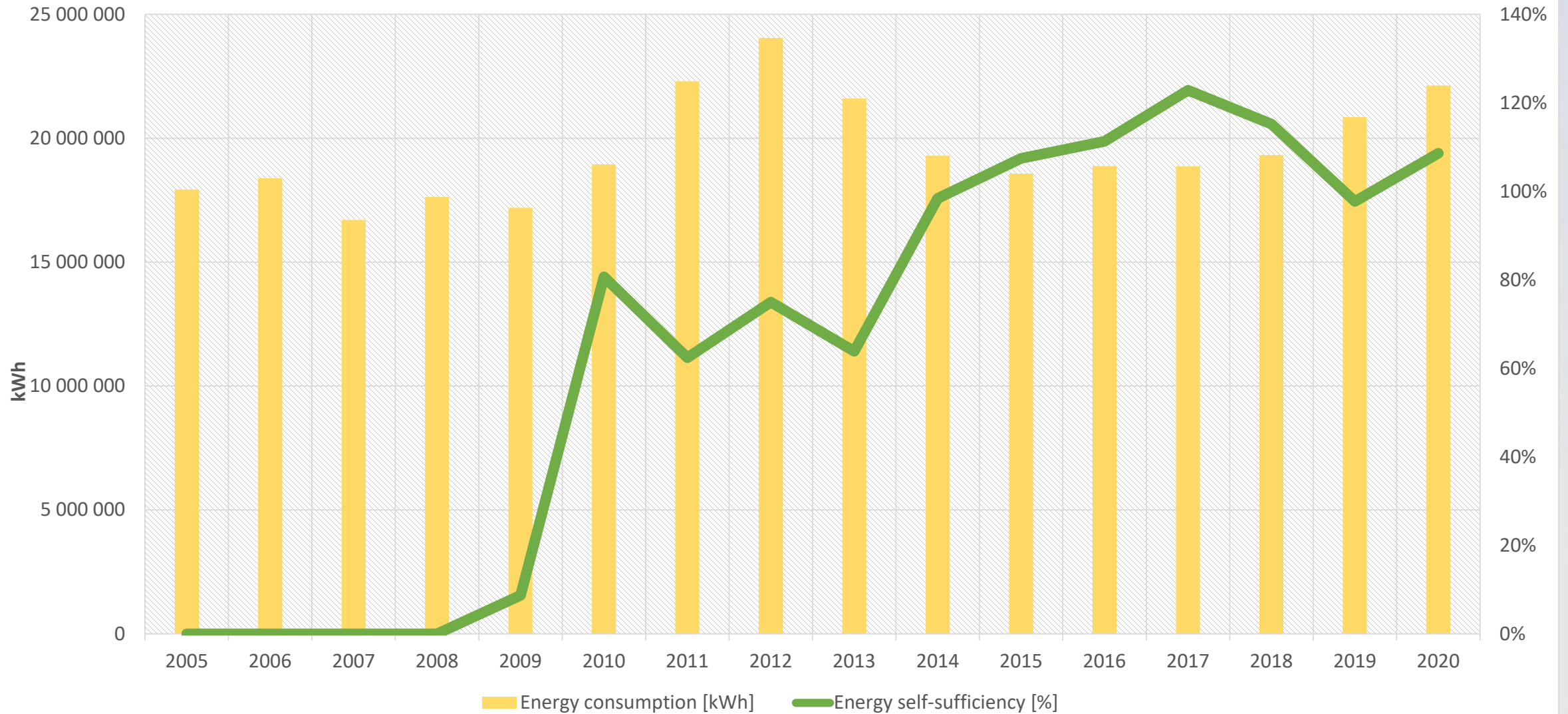


Overview of Sofia WWTP

- The plant was designed during the 1970s
- Until recently the biggest on the Balkan Peninsula with an area of 60 ha
- Treatment capacity 480,000 m³/day
- Located in the lowest part of Sofia valley
- Commissioned on September 4 1984



The special feature of Sofia UWWTP - its energy efficiency



Our path towards renewable energy production

2007

Restart of
anaerobic
digesters

EUR 4.8 M

2009

Commissioning of
co-generation
units

EUR 2.6

2016

Commissioning of
an additional
gasholder

EUR 0.3

2021

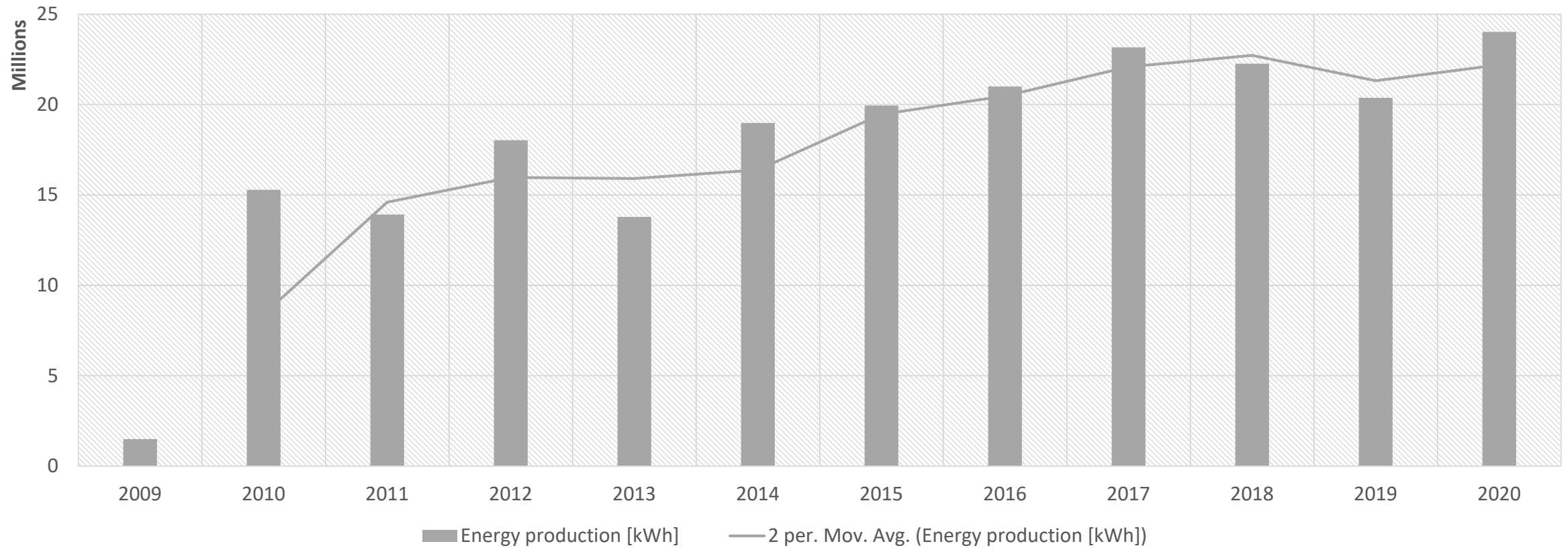
Commissioning of
an additional
anaerobic digester

EUR 2.6

A total of 12.6 M EUR has been invested in producing renewable energy for the period 2004 - 2020

Our path towards renewable energy production

Renewable energy production (M kWh)

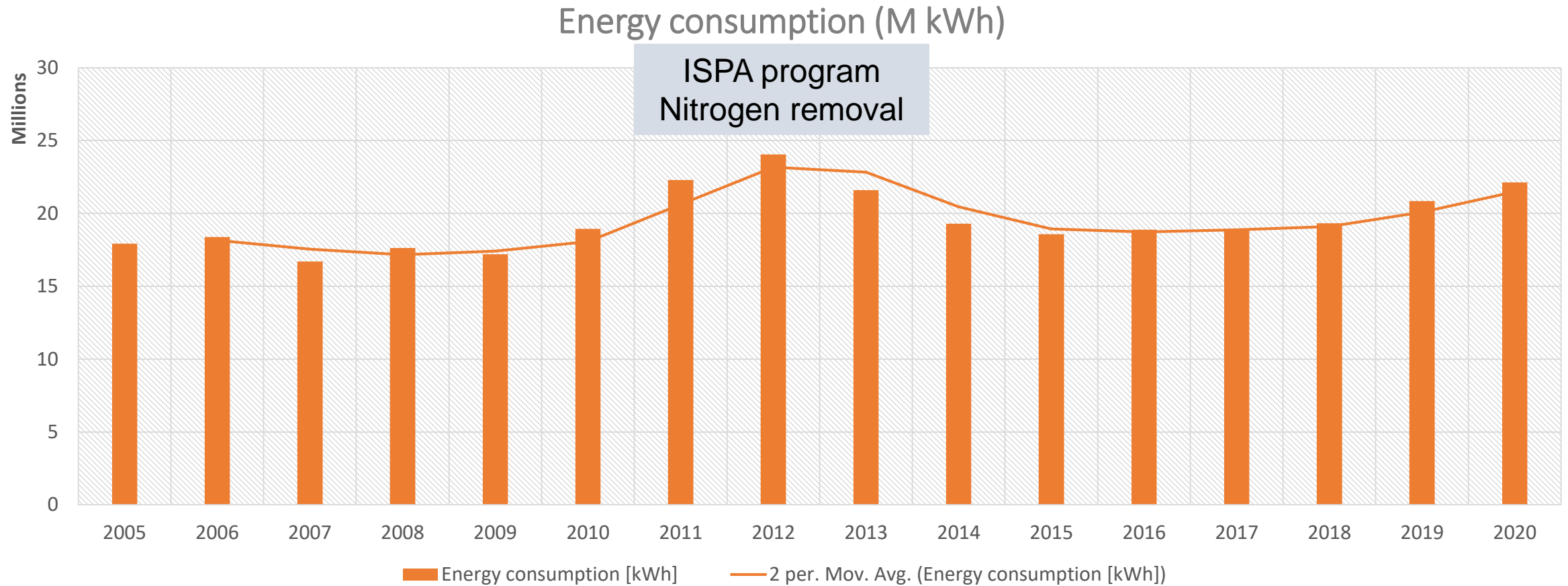


Our energy conservation measures

2012	2016	2017	2019	2019
Energy efficiency on lights and process	Replacement of airblowers	System for utilizing exhaust gases	Buildings energy efficiency	Upgrade of aeration system at biological step
EUR 0.2 M	EUR 0.8 M	EUR 0.1 M	EUR 0.7 M	EUR 0.3 M

A total of 3.6 M EUR has been invested in energy conservation measures for the period 2010 - 2020

Our energy conservation measures

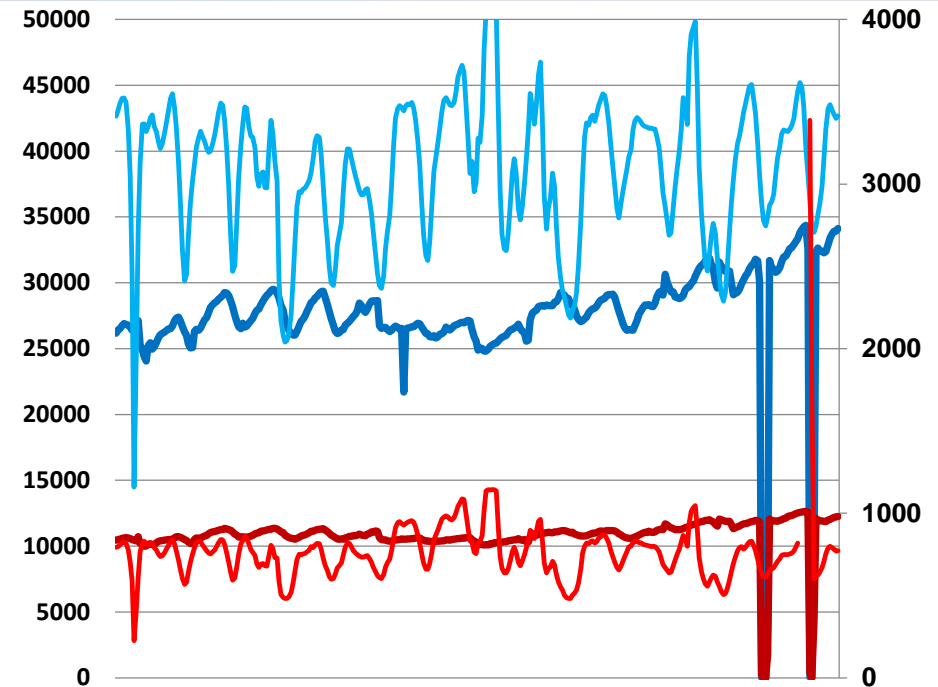


An example – replacement of airblowers



Investments in state-of-the art airblowers

- 11 per cent reduction in power needed for the technological process



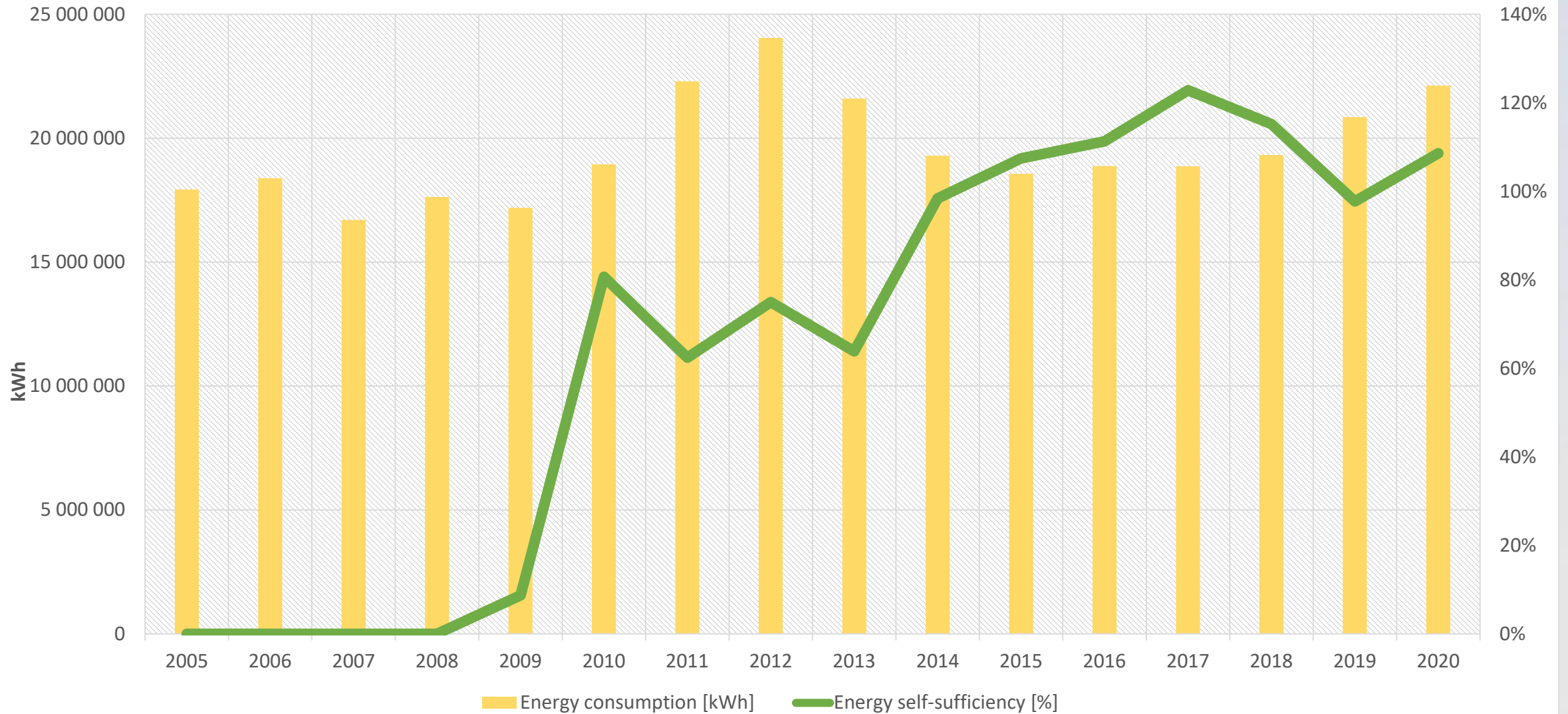
An example - heat utilization unit of CHP



10 per cent increase in thermal energy produced



Trend of WWTP energy consumption and self-sufficiency



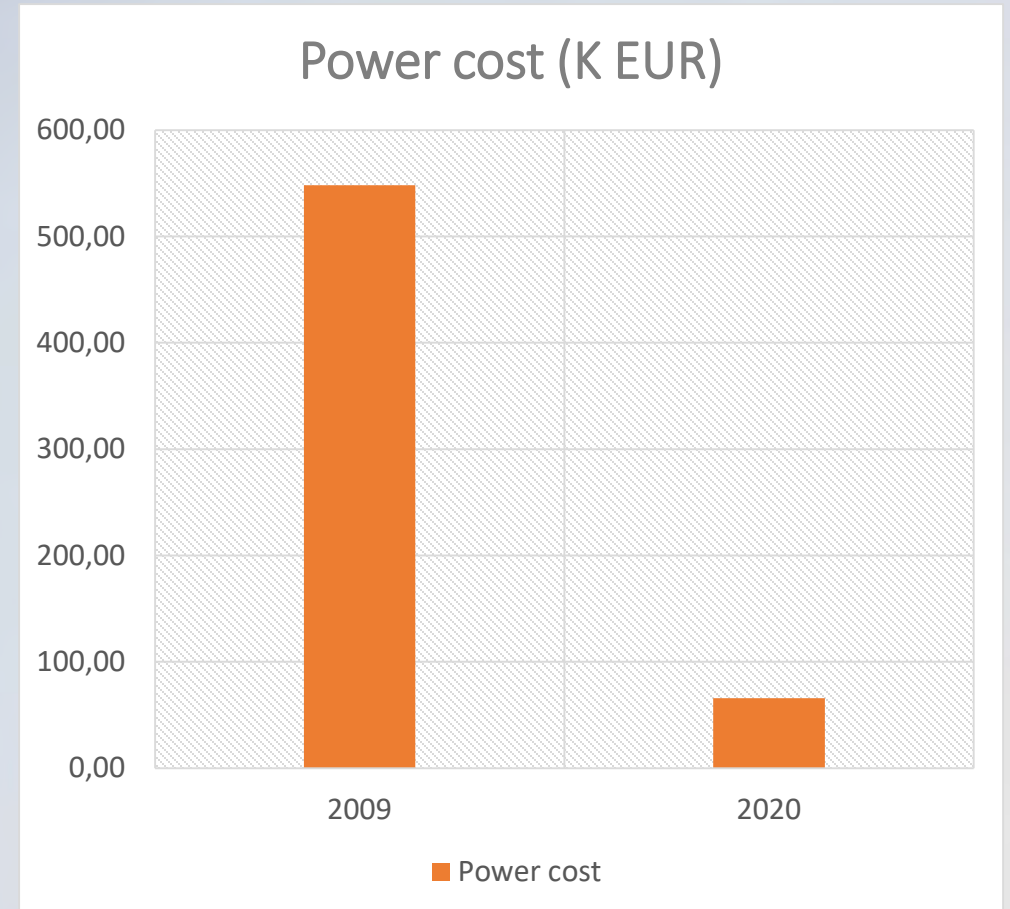
Effect on operational costs

Additional revenues

- Over 160 K EUR of revenues from sales of renewable energy
- Over 230 K EUR of revenues from sales of VERs under Gold standard scheme

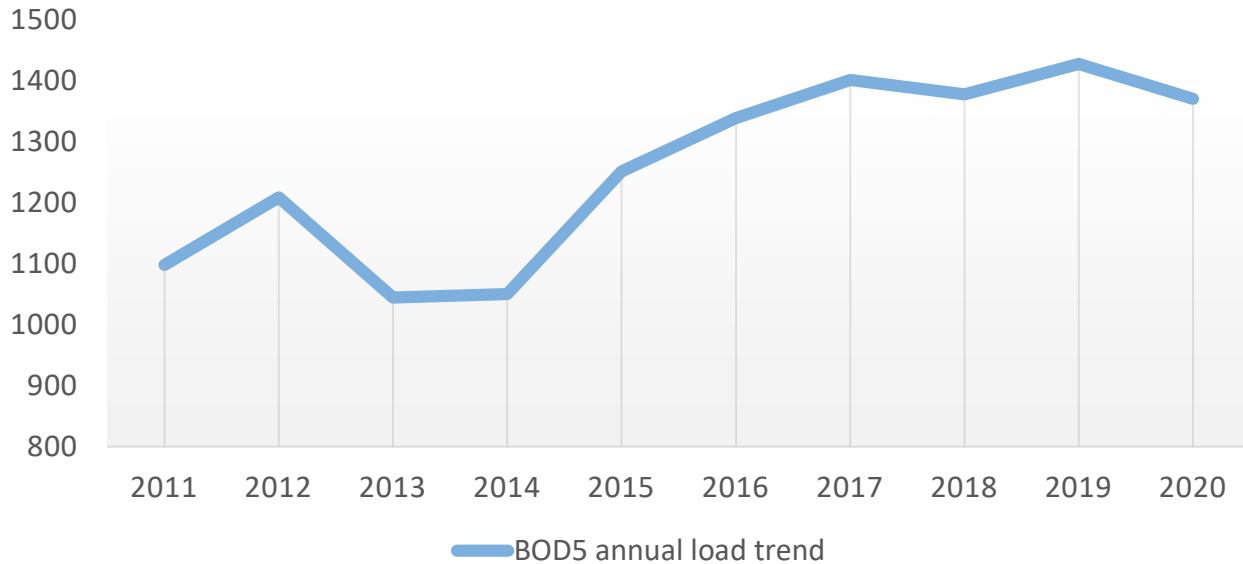
Savings

- Over 480 K EUR of lower cost for power in 2020 vs.2009



Finding a fine balance between treatment objectives and energy efficiency (1 of 2)

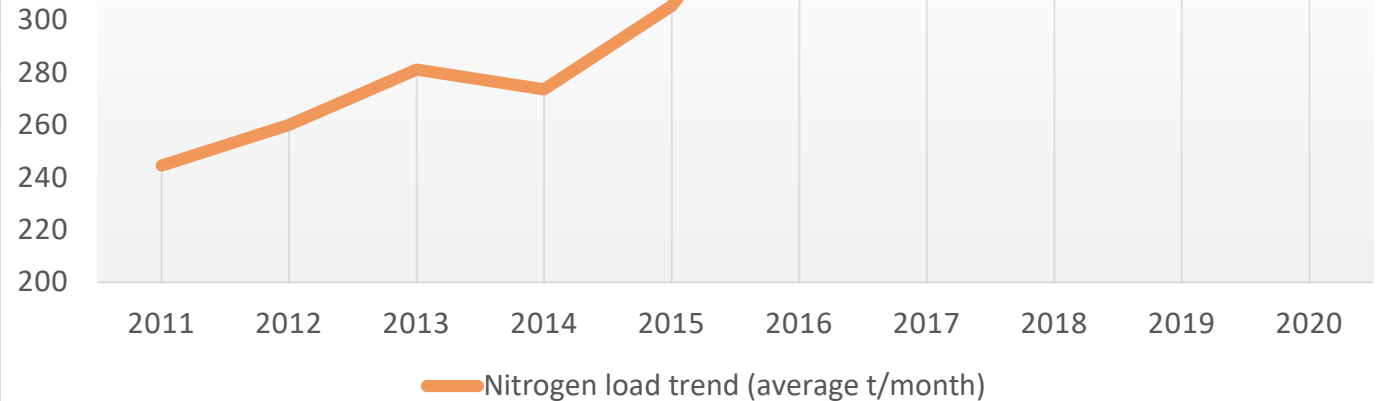
BOD5 load trend (average t/month)



Evolution of pollutants load at WWTP inlet

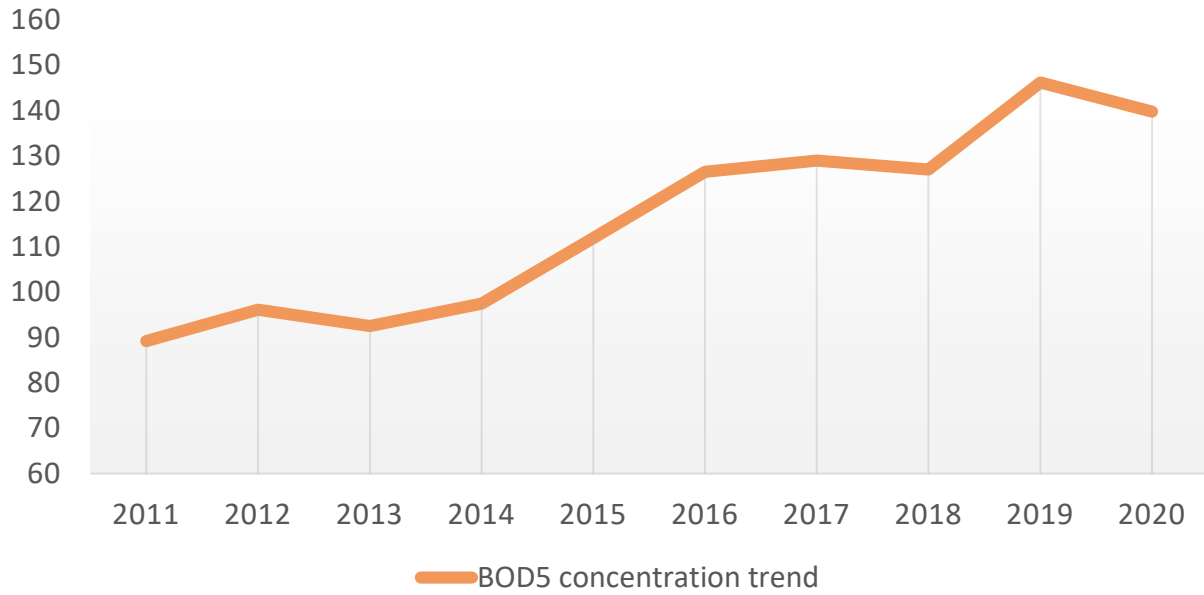
- 25 % increase in BOD5 load between 2011 and 2020
- 34 % increase in Nitrogen load between 2011 and 2020

Nitrogen load trend (average t/month)



Finding a fine balance between treatment objectives and energy efficiency (2 of 2)

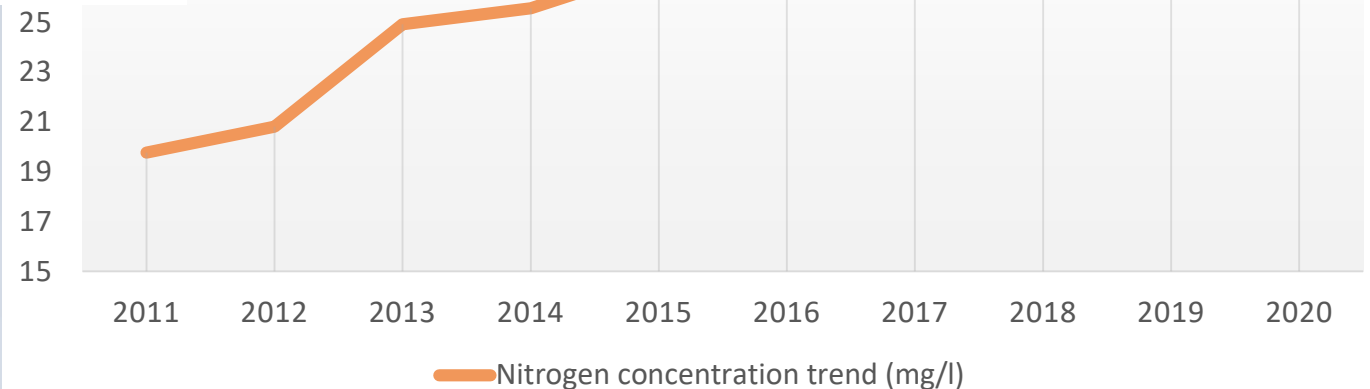
BOD5 concentration trend (mgO₂/l)



Dynamics of pollutants concentration at WWTP inlet

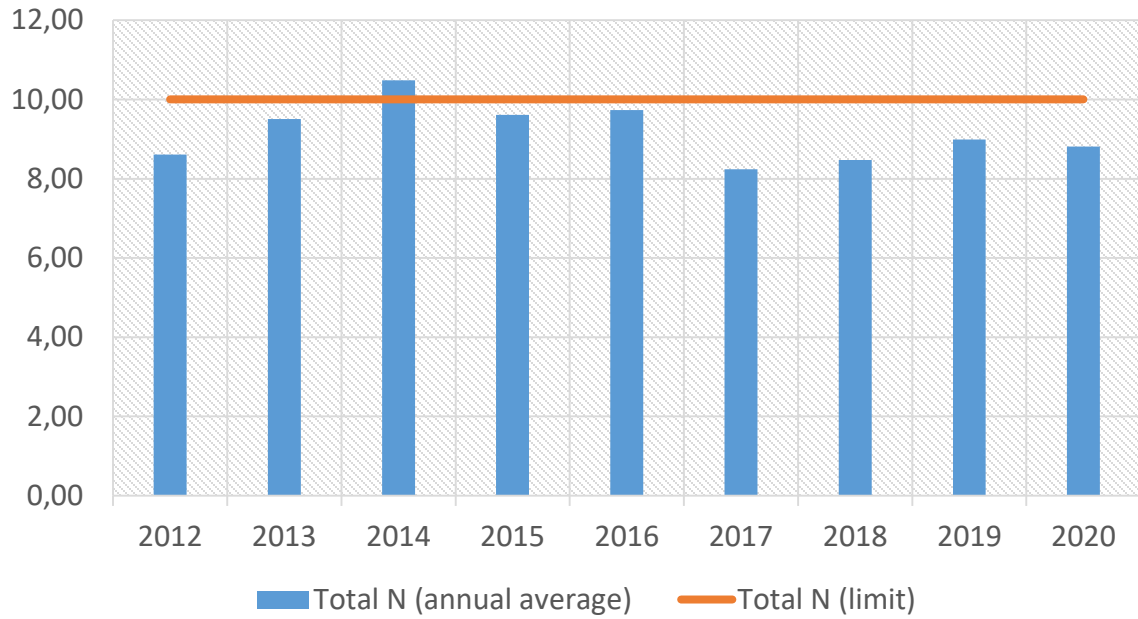
- 57 % increase in BOD5 concentration between 2011 and 2020
- 70 % increase in nitrogen concentration between 2011 and 2020

WWTP inlet nitrogen concentration trend (mg/l)



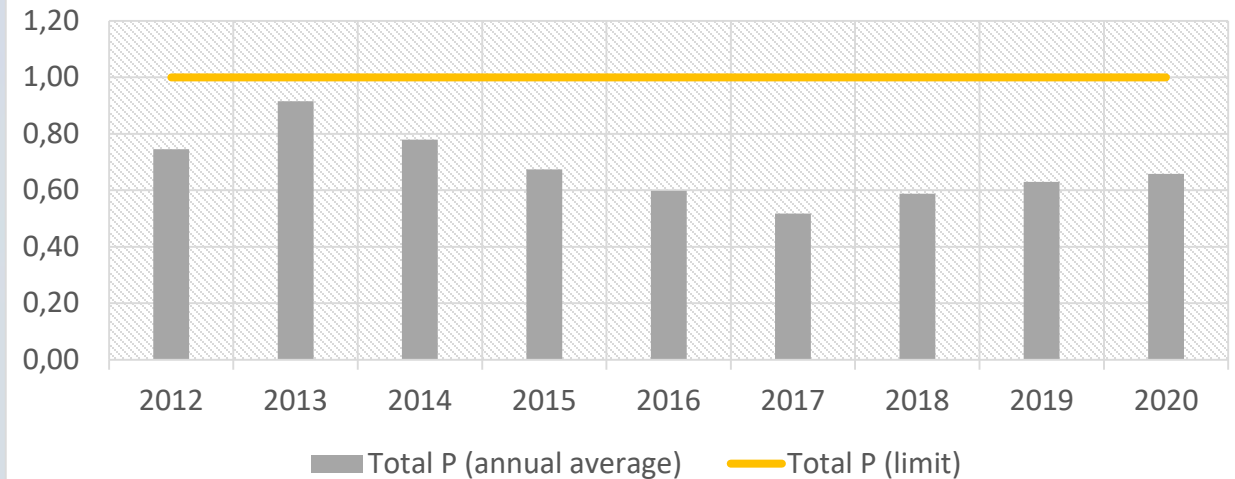
What about the environment?

Nitrogen compliance of final effluent (2012 - 2020)



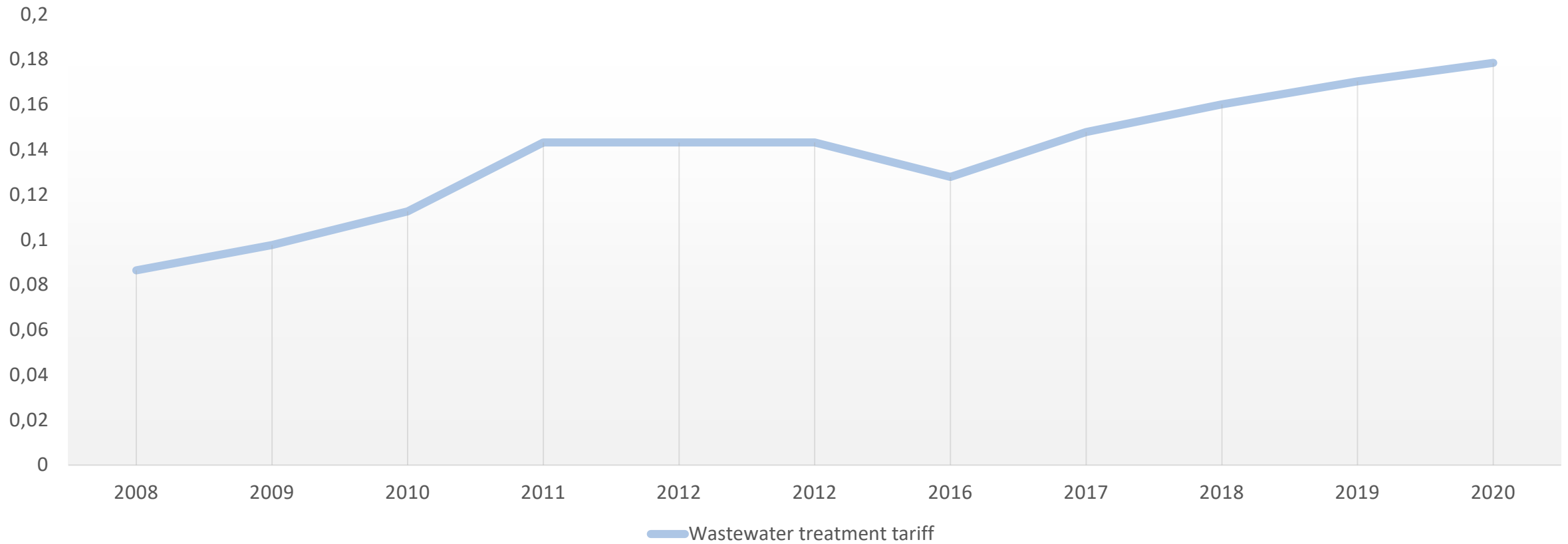
Final effluent in full compliance with EU directives

Phosphorus compliance in final effluent (2012-2020)



And what about our customers?

Wastewater treatment tariff evolution (EUR/m³)



Thank you for your attention



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