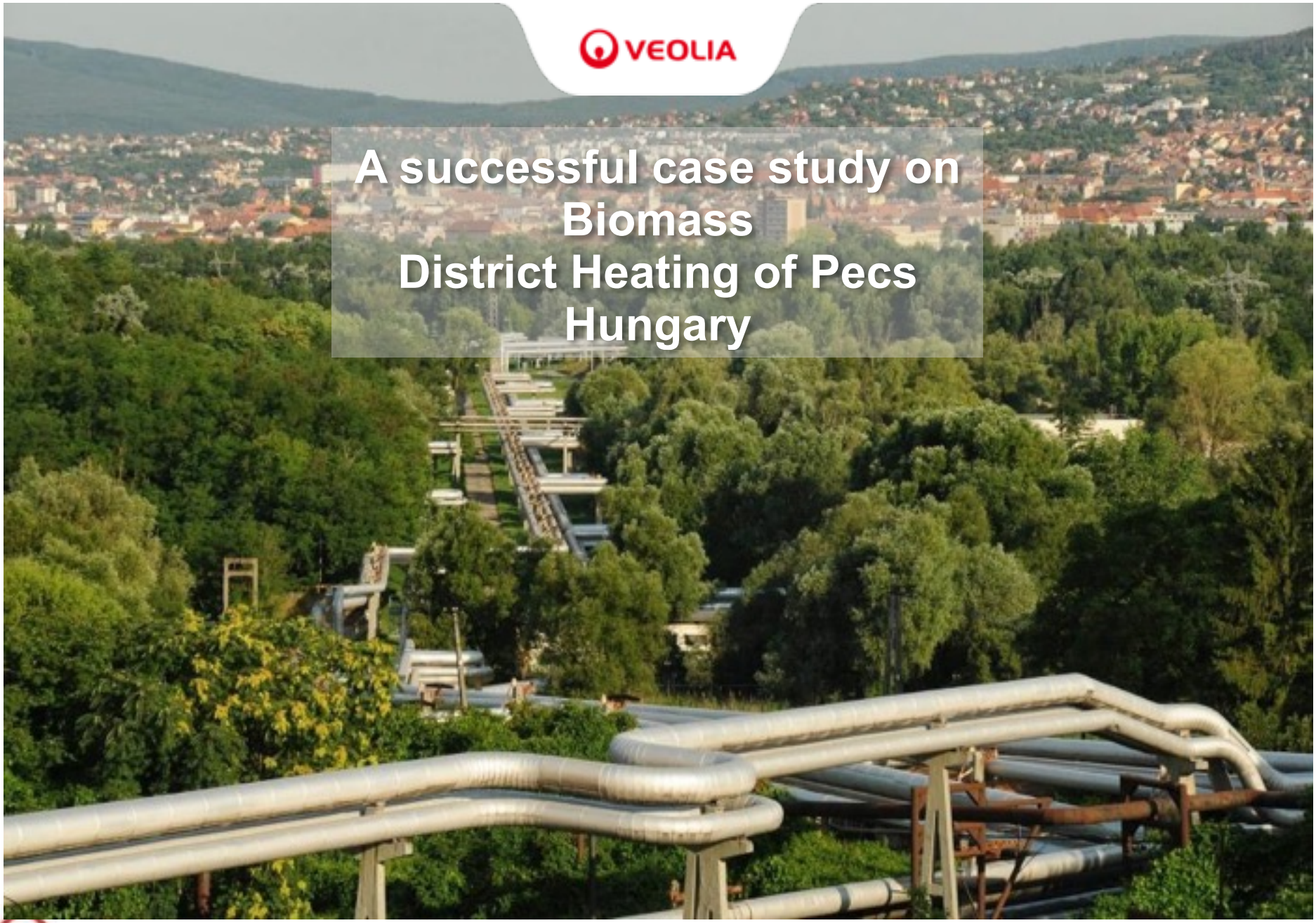
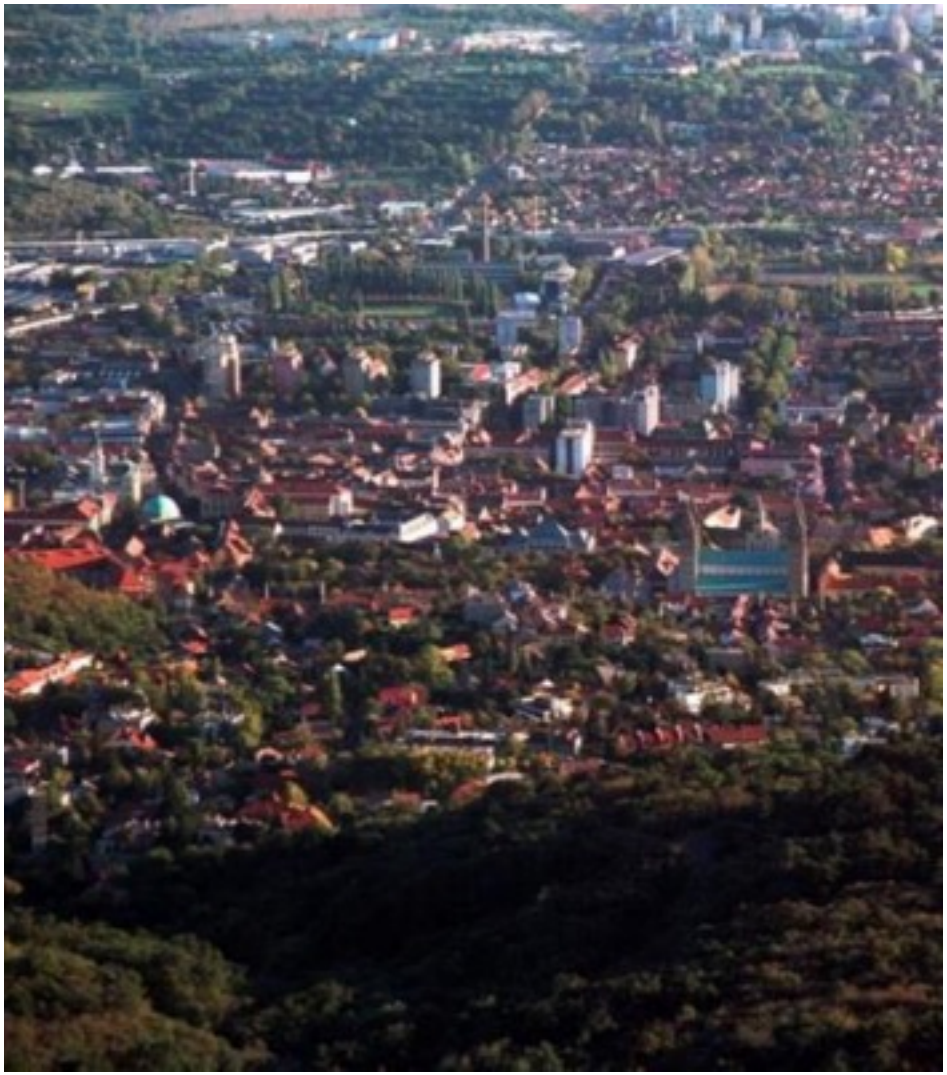
Veolia : Some successful case studies on Biomass and Biogas


VEOLIA
A successful case study on
Biomass
District Heating of Pecs
Hungary

Hungary Pécs: Biomass Renewable Energy



Using biomass in district heating in the Southwestern Hungarian city of Pécs is a profitable and advantageous opportunity for all stakeholders involved

REGIONS & CITIES

- 100% of the heat demand for the district heating system
- 31 thousand flats
- 450 institutions

PEOPLE

- Extra income of 4 billion Hungarian Forints for farmers
- Creation of 170 new jobs.
- 470 seasonal jobs.

Hungary Pécs: Biomass Renewable Energy

Fuels

- 200.000 tons of straw/year
- 400.000 tons of wood/year

Power

- 35 MW electric capacity
- 50 MW of heat capacity

Results

- Prevent 400,000 metric tons of fossil CO_2 emissions/ year

Hungary Pécs: Biomass Renewable Energy

Over 170 jobs have been created locally to manage the plant's entire supply of straw. The same applies to the wood channel which has generated over one hundred jobs along throughout the supply chain.

A secured sector, jobs created
From an environmental point of view, using straw and wood – primarily waste from forest management or processing industries.

Hungary Pécs: Biomass Renewable Energy

Veolia - Hungary Pecs movie


VEOLIA
Veolia Group
Biomass Experience
Poznan & Lodz
Resourcing the world

Lodz and Poznan: Biomass replaces coal

Lodz

- Second-largest heating network in Poland,
- Covers 60% of the city's heating needs
- Serves some 500,000 people.

Poznan one of the Polish biggest urban centers,

- Population of 600,000.
- District Heating network provides heating for 200,000 people.

492,000 MWh of clean electricity per year

634,000 metric tons of biomass burned per year

Lodz and Poznan: Biomass replaces coal

A strong commitment to sustainable development

- Contribution to reduce carbon footprint (Lodz and Poznan)
- 15% of total energy produced for these networks came from clean sources in 2012

- Ensuring the quality, availability and competitive cost of heating through an improved approach to the energy mix

587,000 metric tons of CO2 prevented in Poznan and Lodz

Main benefits

- Operational excellence: optimal management of heating networks
- Contribution to local economic development
- A more secure and diverse power supply


VEOLIA
A successful case study on
Biomass
District Heating of Bansko
Bulgaria

Biomass for Bansko Ski Resort

BANSKO BULGARIA

○ One of the largest and most modern ski resorts in Bulgaria.

○ Approx. 10,000 inhabitants

○ Capacity of more than 30,000 tourists during the peak ski season.

○ 2008 Construction of Biomass boiler plant and connection to the network.

○ **2013 Operation and management contract awarded to Veolia Energy Bulgaria**

○ Main fuel used is **wood ships**, with gas and heavy fuel as back-up.

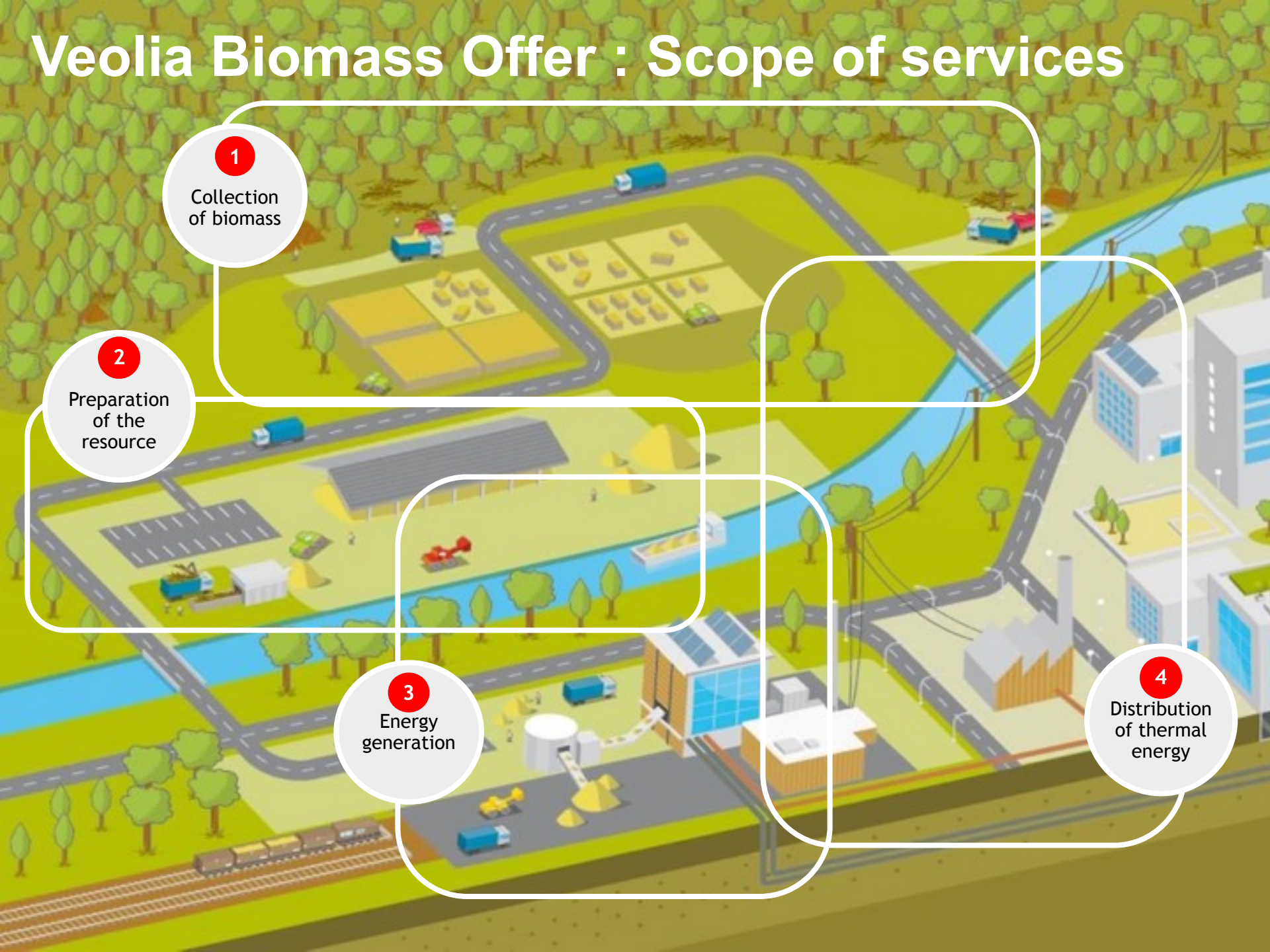
○ Services : heating + sanitary hot water

Biomass for Bansko Ski Resort

BANSKO DISTRICT HEATING (BULGARIA)

- Total length of the network - 5.4 Km
- Heat consumption - 4,300 MWh/ yr
- Biomass heating capacity :2 boilers 5 MWth each
- Number substations connected to the boiler plant : 55
- Heat Price : 53 €/ MWh + VAT
- Operation and maintenance performed by Veolia Energy

Veolia Biomass Offer : Scope of services

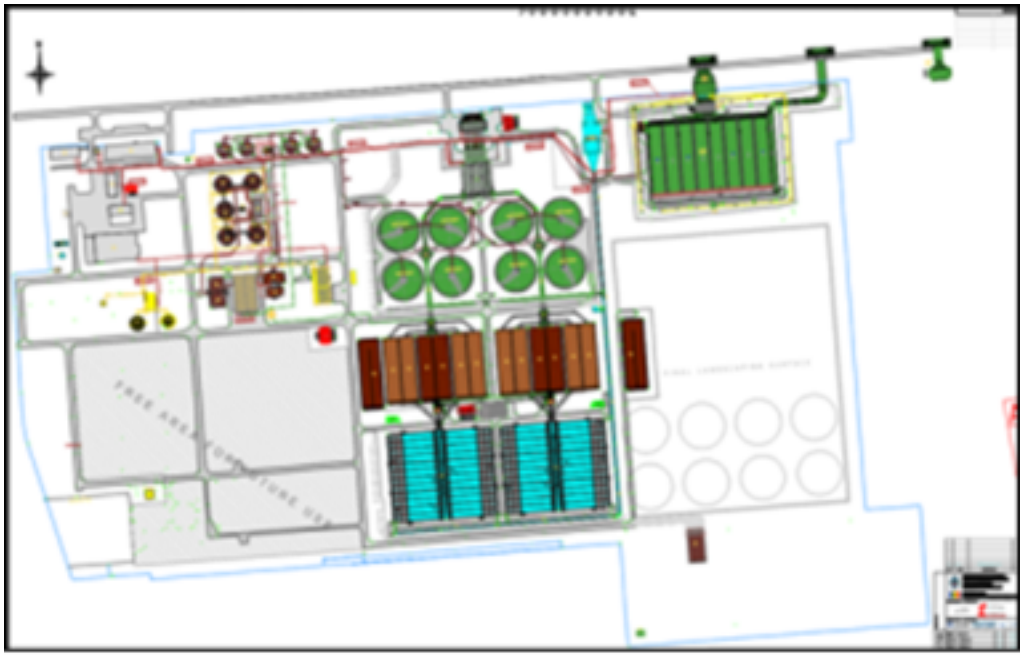



VEOLIA
Cogeneration with Biogas
produced in
Waste Water Treatment Plant
of Glina Bucharest
APA NOVA
o companie
VEOLIA
APA

Apa Nova Bucuresti- Glina WWTP

- Glina Wastewater Treatment Plant was taken over in operation by Apa Nova Bucuresti on 11 July 2011.
- For this project, over RON 23 M have been invested in 2012.
- 1,927,251 people connected to the system
- 2,700 km wastewater collection system

General Information



Water treatment capacity:
10 m3/second (55% of Bucharest's waste water);

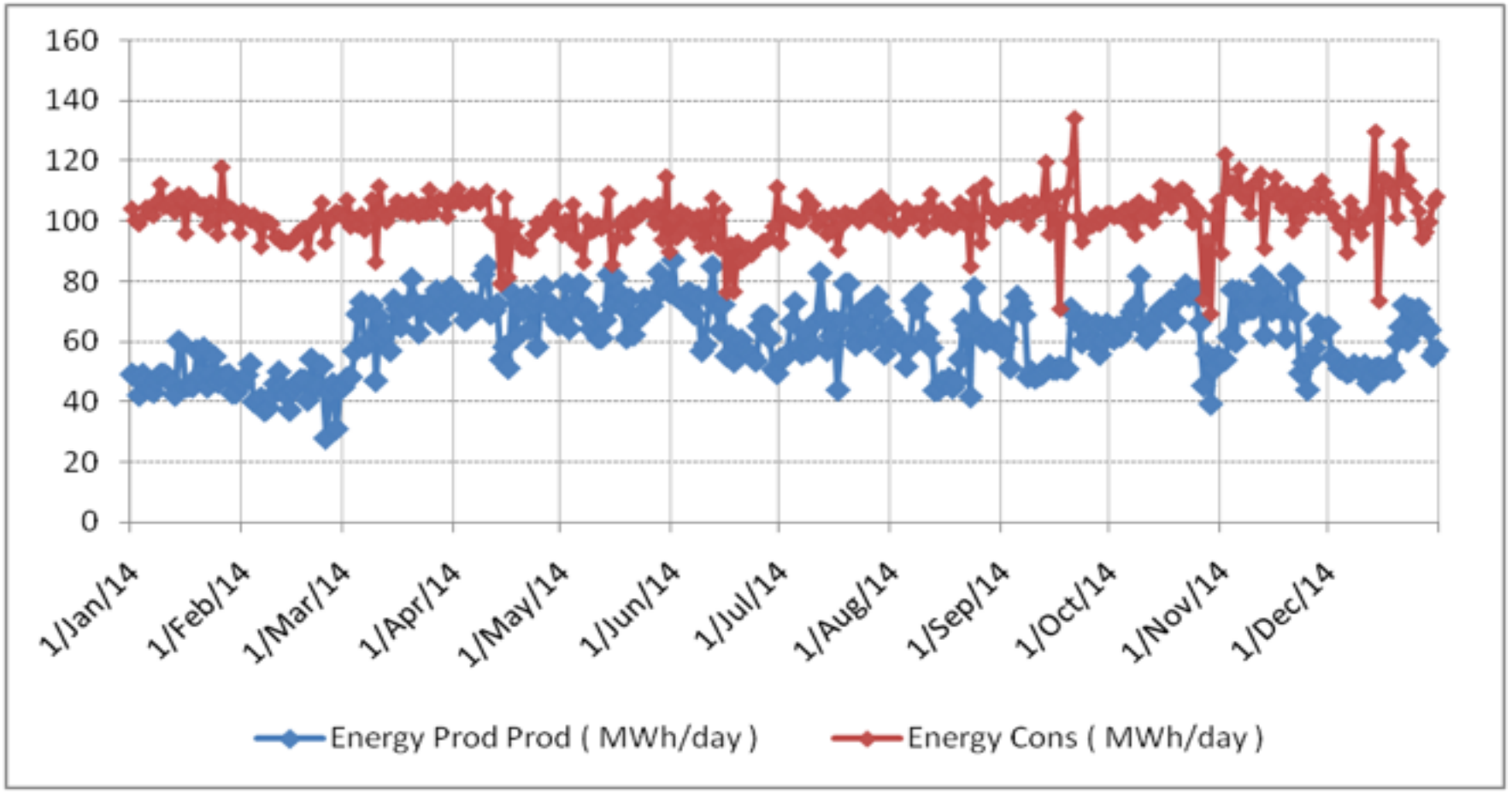
Sewage gas produced in anaerobic digesters from municipal

Average monthly production of bio-gas: 676.000 Nm3;

Installed power:
6.9 MW Heat (boilers);
4.8 MWel CHP
1.45 MW Cooling

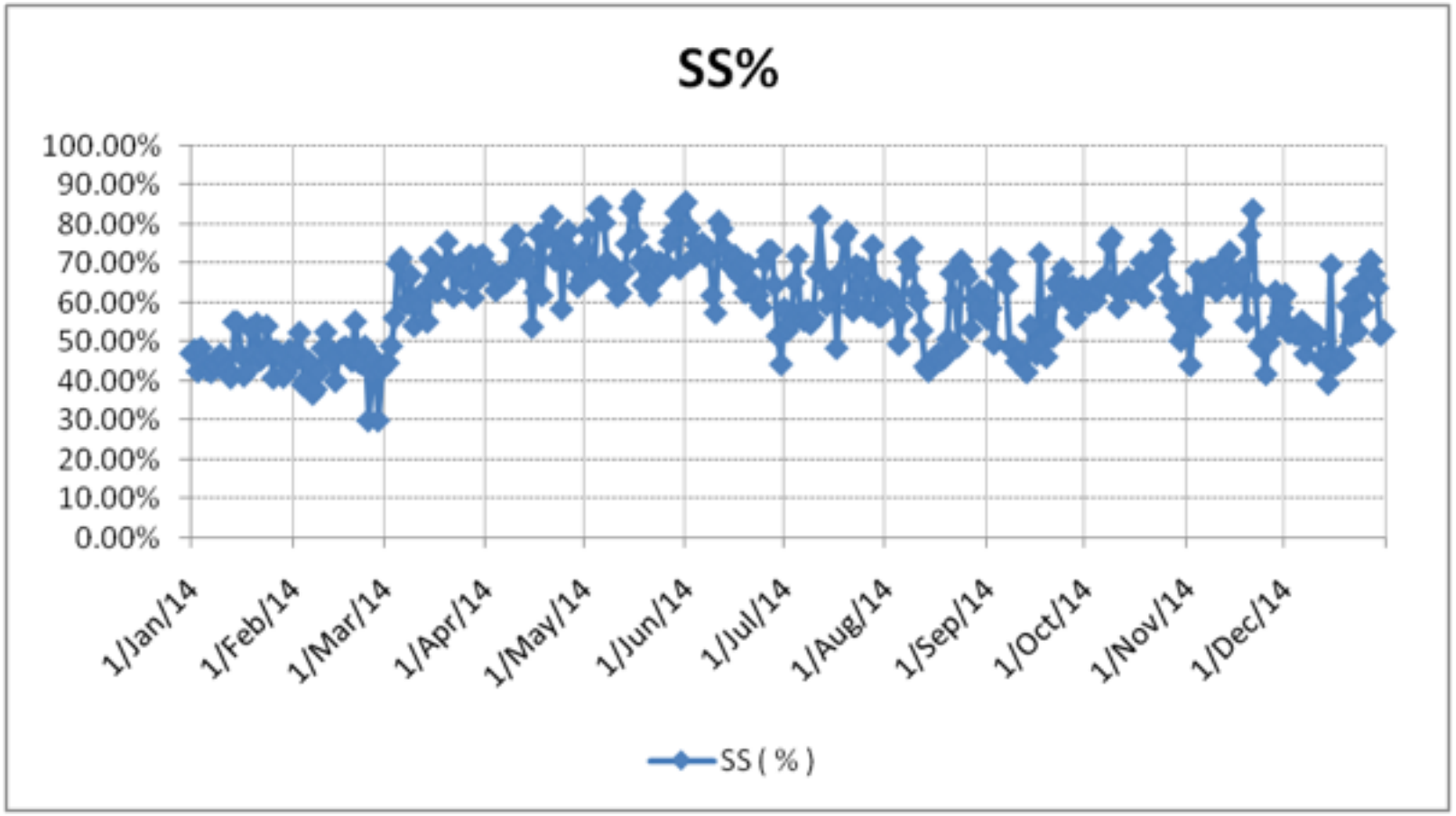
Energy Production Unit

- No. of units : 2
- Engine type: GE JENBACHER JMS 616
- Fuel: Sewage gas
- Electrical output: 2 x 1.942 MW
- Thermal output: 2 x 2.196 MW
- Commissioning: 2010



	Started Value	Average 2012	Average 2013	Average 2014
EP (MWh/	35	54	51	61
EC (MWh/	64	82	96	102

Self Sufficiency



	Started Value	Average 2012	Average 2013	Average 2014
SS (%)	53.85%	65.42%	53.52%	60.39%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Thanks for your attention !