

# Households: waste out, energy in Vienna, Austria



Population: 1,805,681

Area: 414.65 km<sup>2</sup>

Density: 4,326/km<sup>2</sup>

Total waste: 1,011,961 t

Household waste: 932,007 t

Commercial waste: 79,954 t

Recyclable: 227,444 t

Non-recyclable: 660,746 t

Organic waste: 123,771 t

Success Stories: anaerobic digestion of biodegradable municipal solid waste in European cities

The City of Vienna is responsible for the entire chain of waste management from collection to treatment and, finally, disposal. At least once in six years, Municipal Department 48 (MA 48) develops a Waste Management Plan, as well as a Waste Avoidance Programme, both on behalf of the Provincial Government of Vienna. Every year, the Austrian capital produces roughly one million tonnes of waste; more than 350,000 tonnes of this volume are collected separately. In fact, Vienna introduced separate waste collection already in the early 1980s. By 1991, this system covered all of Vienna. 1991 was the year when biowaste started being collected separately, too.

Waste is collected in over 400,000 garbage containers, 17,000 trash cans and 19 waste collection points. Salvage materials like paper, glass and plastic bottles are collected and disposed of separately, as is organic waste. Non-recyclable and bulky wastes are treated thermally and subsequently deposited in the department's own environmentally compliant landfill.

## Wiener Kommunal-Umweltschutzprojektgesellschaft gmbH (WKU)

WKU is a 100% subsidiary of the City of Vienna. It was founded in 2002 to project the third incinerator (MVA Pfaffenau) and the first (and only) biogas plant in Vienna. The first biogas plant was opened in 2007 next to the existing waste incinerator in Simmering. The main reason was the EU-Regulation 1774 (now: 1069) and the necessity for treatment of liquid or semi liquid kitchen waste from big kitchens and other catering companies. 13 May 2015 was a monumental year as biomethane flew into Vienna's gas network

Digesters: 27,000 m<sup>3</sup>

Capacity: 34,000 t/y

Treated: 22,000 t

Raw biogas: 1,700,000 Nm<sup>3</sup>/y

Biomethane: 1,000,000 Nm<sup>3</sup>/y

Employees: 5

## Anaerobic digestion

The delivery of the biowaste is carried out in a closed hall, after being emptied from the collection vehicles into a feed hopper system. Thus an automatic feed of bio-waste treatment possible. Liquid waste can be pumped directly from the tank wagons.

The biogas is produced by mesophilic wet process. After crushing the solids and the separation of ferrous parts other contaminants such as plastic, wood and inert waste are screened. The remaining smallest light and heavy materials are deposited in a compact rake sand trap system. The substrate is then fed into two intermediate buffer tanks and then forwarded to sanitation in the fermentation reactor. The residence time in the fermentation reactor is 20 days.

## Biogas upgrading

It starts with desulfurization of the raw biogas. In order to feed it as biomethane into the gas grid, it is necessary to separate the carbon dioxide contained in the biogas. This separation is carried out by a modern membrane separation process. This ensures that from the biogas with a methane content of 64%, a new gas is produced – biomethane, with a methane content of 99%. After quality control, the biomethane is compressed to the feed pressure of up to 70 bar and then arrives at the Wien Energie customers.

## Energy for the city

The upgrading of biogas to biomethane to be fed into the natural gas grid has won in recent years clearly more relevance and offers many advantages. Biomethane is a full replacement for natural gas, so that the entire spectrum of use of natural gas is covered. Wien Energie customers are now available with CO<sub>2</sub>-free gas supplies, which is used for gas water heaters, gas stove and the refuelling of vehicles. This represents a further step towards increasing the share of renewable energy sources and reduction of gas imports to the City of Vienna. The further processing to biomethane also allows a better utilization as the gas is easy to be stored.