

Waste-to-Energy

Heating the Heart of Paris

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SVDU

Once upon a
time...



Paris' district heating network

CPCU (Compagnie Parisienne de Chauffage Urbain)



8 CPCU generation sites









2 of which are CHP

3 Waste-to-Energy (WtE) plants ★

470 km heating network

12 municipalities

16 hot water loops

-  CPCU generation sites
-  CPCU co-generation sites
-  CPCU geothermal site
-  SYCTOM Waste-to-Energy sites ★
-  CPCU dispatching
-  CPCU steam/water exchange
-  CPCU network
-  Interconnected networks

Juin 2010



ISSY-LES-MOULINEAUX

0.5 TWh thermal
 → 66 000 homes

The new **Issy-les-Moulineaux WtE plant (Isseane)** came into operation in 2007 and treats **460,000 tonnes** of residual waste a year. This plant is widely known for its innovative design, as it has been built partially underground and the chimney has been designed in such a way that no large stack is visible on the Paris skyline.

<http://www.syctom-paris.fr/pdf/doc/isseane.pdf>

The **Saint-Ouen WtE plant**, in operation since 1990, treats some **600,000 tonnes** of household waste. In order to reduce the amount of road traffic, bottom ashes are transported from the plant by boat along the river Seine.

<http://www.syctom-paris.fr/eat/come/comm/stouen/presentation.htm>



SAINT-OUEN

1.1 TWh thermal
 → 104 000 homes

The **Ivry-Paris XIII WtE plant** was built in 1969. It has been regularly modernized over the years and currently has a treatment capacity of **700,000 tonnes** of household waste per year.

<http://www.syctom-paris.fr/pdf/doc/PlaquetteIvry2006.pdf>

IVRY-SUR-SEINE

0.8 TWh thermal
 → 75 000 homes

Paris' 3 Waste-to-Energy plants



Waste-to-Energy Plant



Climate friendly

- ▶ The 3 plants treat household waste not suitable for recycling from some 5.7 million inhabitants of the Parisian Metropolitan area.
 - From 84 municipalities
- ▶ The energy produced by the 3 W-t-E plants prevent:
 - The consumption of 300,000 tonnes of oil equivalent each year and
 - The release of some 900,000 tonnes of CO₂ into the atmosphere each year.

Source: <http://www.syctom-paris.fr/edi/traiter/trait/valo/index.html>

Energy production

▶ The steam from the combustion process is used to generate:

- **Electricity**, a small part of which is used by the plants, with the majority being sold to EDF (Electricité de France) to supply the electricity grid.

The 3 W-t-E plants generate some **200,000 MWh of electricity**



- **Heat** is sold to CPCU (Compagnie Parisienne de Chauffage Urbain) the Parisian company for district heating.



50% of Paris heating network demand is supplied by the 3 W-t-E plants

▶ 5.1 TWh of heat is distributed by CPCU

- Heating 1/3 of Paris buildings
- 50% comes from the 3 Waste-to-Energy plants in Paris



The CPCU dispatching centre was entirely re-engineered in 2010. It is a world first for such a large network.

<http://www.cpcu.fr/La-chaaleur-urbaine/SUPERVISION-ET-CONDUITE>

▶ 465,000 home equivalent are heated by the CPCU network

★ i.e. more than 1 million inhabitants ★

- 245,000 home equivalent heated by the 3 W-t-E plants



The 21 Parisian hospitals are heated by Waste-to-Energy

- ▶ 20% of homes are heated by district heating in Paris
- ▶ 100% of Parisian hospitals
- ▶ Most Parisian monuments and museums
 - ☆ including the Louvre museum ☆



For Parisians, and many French people, waste is as well a source of energy

- ▶ **Renewable** (biodegradable part, directive 2009/28/EC)
- ▶ **Low carbon** (replacing fossil fuels)
- ▶ **Reliable** (not dependant on weather conditions) operating 7/7 (days) and 24/24 (hours)
- ▶ **Affordable** (Steam Paris = 1.63 c€/kWh versus gas = 4.17 c€/kWh European average)
- ▶ **Local** (not dependant on import of fuel)
- ▶ **Available** (13,000 tonnes of waste/day in the Parisian region)



The background of the slide is a reproduction of the Mona Lisa painting. The text is overlaid on the upper and lower portions of the image.

Happily ever after...

**... Mona Lisa keeps smiling
thanks to
Waste-to-Energy !**