MINI CHP PLANT

CASE STUDY

14-03-2016

Mini CHP plants in primary school, Ålsgårde, Denmark

The system has a payback time of less than 4½ years, and has reduced the carbon emission footprint by about 57-83 tonnes a year

Mini CHP units combined with heat pump reduce greenhouse emission.

The greenhouse gas emission reduction is calculated by comparing the change in gas and power supply, where a demand change from power supply to natural gas means a carbon emission reduction of 0.204 g/kWh. The average carbon emission from power supply is 500 g/kWh (Energinet, 2012) where a part of the power production is from renewable energy. Mini CHP's hardly have any impact on renewable energy production but more likely the fossil fuel based production. The later increase the greenhouse emission reduction.

Short description of the installation

The site

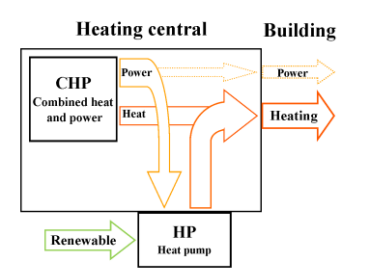
Is a primary school consisting of 800 pupils, in the age ranging from 8 to 16 years old.

The installation

Is composed of two mini CHP plants, three air source heat pumps and two gas boilers. The mini CHP plants are combined with a heat storage tank for increased usage and profitability.

Energy flows

Below figure illustrates the energy flows from the installation.



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The technical part

CHP data

- Installation year	2012
- Annual heat output	316,000 kWh
- Annual electric generation	185,000 kWh
- Annual gas consumption	21,000 Nm^3
- Annual electricity consumption	14,000 kWh

Financial data

- Installation cost	136,400 EUR
- Payback time	4,2 years
- Annual cost savings	32,500 EUR
- Surplus after 10 years	188,400 EUR

Facts

CHP units combines heat and power hence the acronym CHP. The advantage is more efficient fuel use where the excess heat from power generation is utilized as heating energy. The implementation of heat pumps further reduces the fuel consumption and thus the carbon emission footprint.

Installation data

	Model	Units	Specification
- Mini CHP	EC POWER XRGI 15	2	Heat capacity 17-32 kW per unit Electricity generation 6-15 kW per unit
- Heat pump	Eltron WPL 13/18/23/33A	3	Nominal heat capacity 23 kW
- Gas boiler	Weishaupt WTZ GB-300 (condensing)	2	Heat capacity 50-280 kW per unit
- Heat storage tank	-	1	-

MORE INFORMATION: CONTACT

Your local energy company • Energy advisor •Product supplier

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