



### Project information

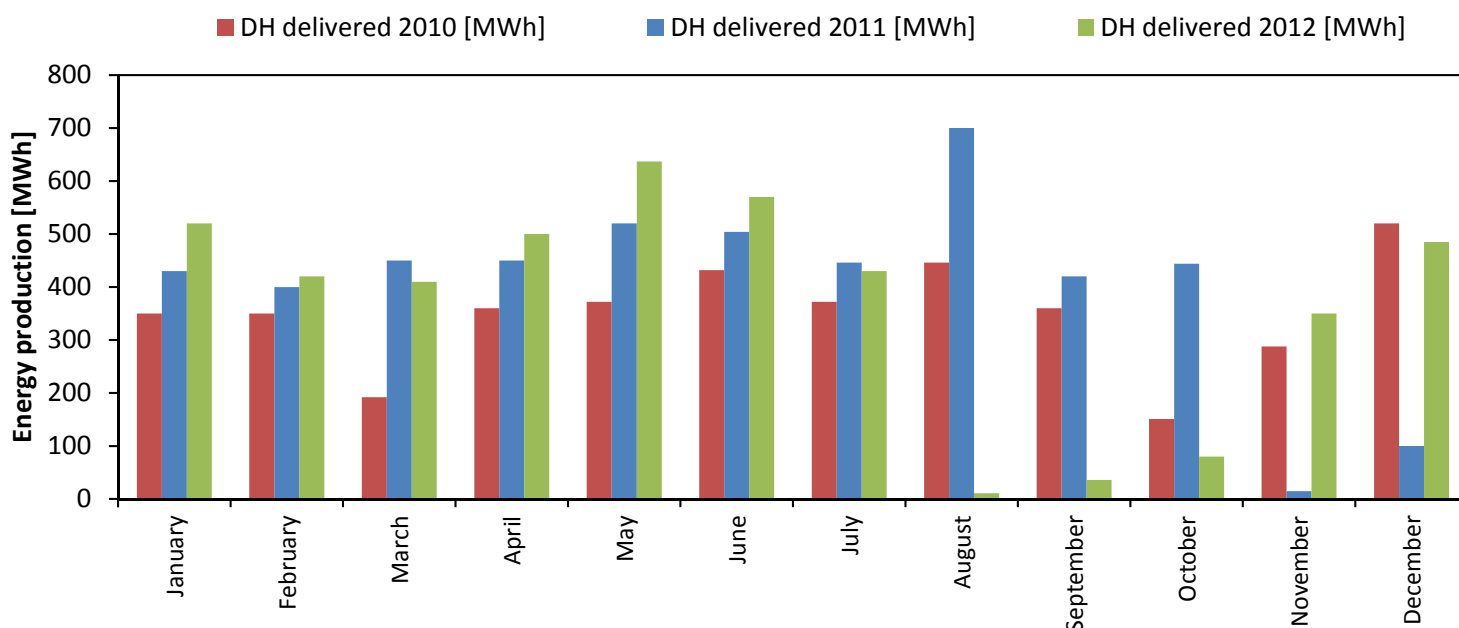
Project type:	Biogasskjel
Address:	Ormen Langes vei 29 Trondheim
End construction year:	2009
Rated capacity:	1000 kW
Additional cost for eco-application:	€ 567 000
Total building cost:	€ 712 500

### Special ECO-technologies used:

- Ladehammeren wastewater treatment plant cleans sewers and drains from the east side of Trondheim
- The process separates methane gas
- Biogas boiler for combustion of methane gas
- Heat produced from the boiler used in the cleaning process
- Excess heat from the boiler comes into the district heating network in Trondheim
- Before biogas boiler was installed, the gas was burned outside by a flare.



### Energy production



### ECO-City project partners

### What has been done:

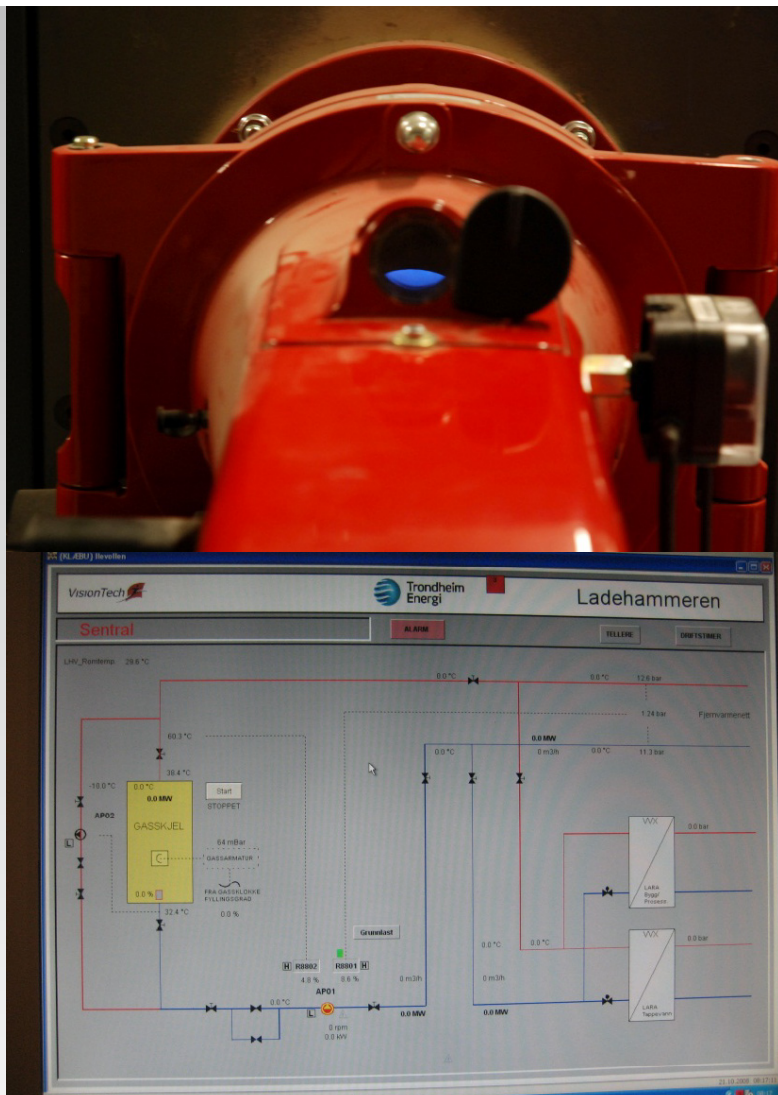
By Ladehammeren purification plant (LARA), owned by the Municipality of Trondheim, Trondheim purified waste water from the east area of town. The cleaning process is formed sludge, and the organic portion of the sludge is putrefied and converted to biogas. This biogas is burned in a boiler, producing hot water for heating municipal buildings. Excess gas was earlier flared off. The project installed a larger boiler to take advantage of excess gas in the production of district heating for delivery on Statkraft Varme district heating network. District heating network is built up to the treatment plant, and a pump installed to pump energy into the district heating network. In periods where the purification plant earlier not had enough biogas to heat their buildings, oil was used. From now on, all the biogas produced in the wastewater treatment plant will be utilized and the treatment plant uses heating when needed during cold periods or auditing work.

### Why it has been done:

The intention of the project was to exploit waste heat source (excess of biogas), while oil peak load was replaced by district heating. LARA has an average biogas production of 2,750 m<sup>3</sup>/day. This corresponds to approximately 6.5 GWh / year. LARA use approximately 3.1 GWh themselves, while 3.4 GWh / year was flared off. This excess energy contributes to the district heating production in Trondheim may reduce its peak load inputs, which at times are gas and oil.

### How it was done:

The plant was designed in 2007 and from May 2008 LARA was able to receive district heating, and the old boiler could be removed. New boiler was installed in autumn 2008 and has been operational since December 2008. It is identified variations in biogas production during the year, but the intentions of the project are achieved.



## Energy production

year	HDD normal [17C base]	OAT normal [C]	OAT normal [C]	OAT actual [C]	Gas Production [MWh]	District Heating [MWh]
<b>2012</b>						
January	602	-3	-3	-1.9	520	520
February	535	-2.5	-2.5	-0.6	420	420
March	512	0	0	3.6	410	410
April	406	3	3	2.8	500	500
May	255	9	9	7.9	637	637
June	157	12	12	11	570	570
July	109	13	13	13.3	430	430
August	124	12.5	12.5	13.3	11	11
September	228	9	9	8.7	36	36
October	360	5.5	5.5	4	80	80
November	480	0.5	0.5	3	350	350
December	569	-2	-2	-5.4	485	485
<b>Total 2012</b>	<b>4 337</b>	<b>4.8</b>	<b>4.8</b>	<b>5</b>	<b>4449</b>	<b>4449</b>

## ECO-City project partners