



### Project information

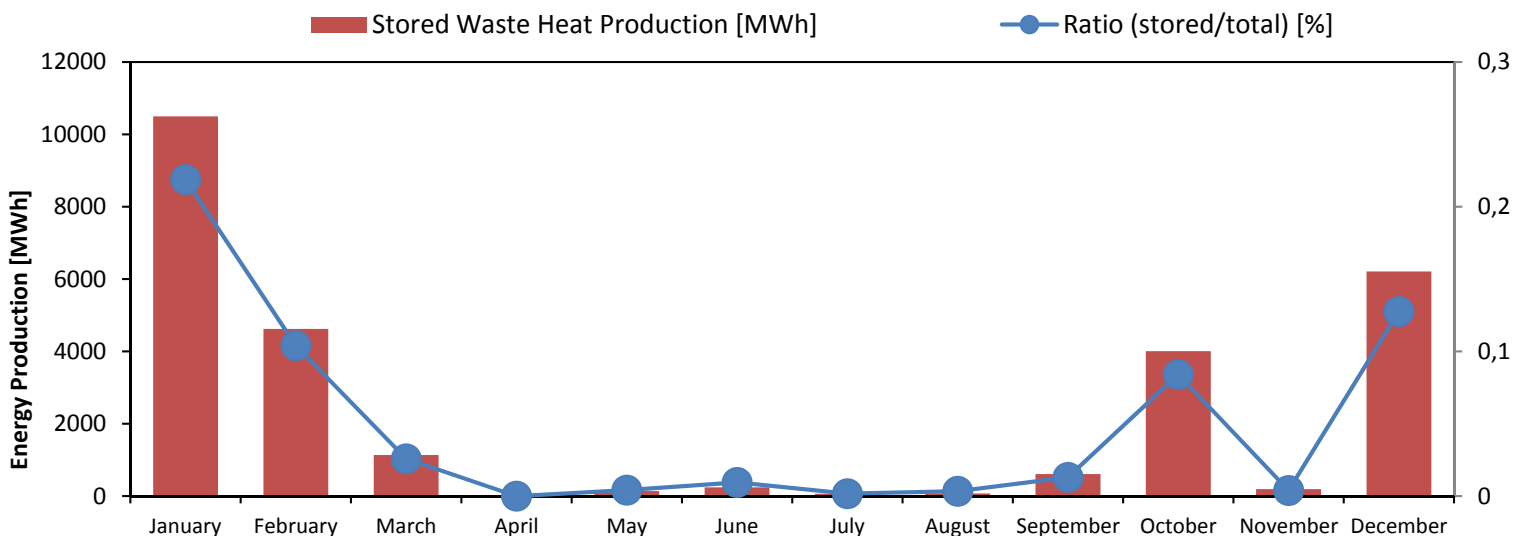
Project type:	Industrial waste crusher
Address:	Heggstadmoen, Trondheim
End construction year:	2010
Capacity:	15 ton/hour
Additional cost for eco-application:	627 780 €
Total project cost:	675 000 €

### Special ECO-technologies used:

- Dry waste is stored during spring and summer for combustion in cold season
- Waste wrapped in plastic for storage and transport
- The wrapped waste balls must be broken up into smaller pieces before the incinerator feed for the combustion plant
- Special engineered equipment ("ball crusher") has been designed to break up waste balls
- Heat Supplying to the district heating
- The project has developed and tested custom equipment in cooperation with the supplier



## Energy production



## ECO-City project partners

### What has been done:

Waste is wrapped in plastic foil like balls for better storage conditions. It is developed a cutting machine for waste balls so that the waste balls is cut up / solved up (removal of the straps and plastic) to combustible fractions. The machine ensures that manual handling of balls is avoided.

### Why it has been done:

The reason for the project was to develop a cutting machine for waste balls that contribute to increased energy utilization of waste.

The reason for the project can be summarized in the following main points:

- Storage of waste from the summer for use during the winter period through the packaging sorted food waste
- Reduce the need to "fire the crows" in the summer
- Increased amount of waste burned in the winter results in lower energy costs because the waste replaces the use of oil / gas in the winter period

### How it was done:

#### Goal 1:

Develop a cutting machine for waste balls so that the waste balls is being cut up / dissolved (removal of the straps and plastic) to combustible fractions. Target partially achieved. Sometimes it happens that the ball goes through the mill without being dissolved. This happens if a ball is laying on its side, or with the narrow side through the machine. This is prevented by visual monitoring of the waste reception facility.

#### Goal 2:

Develop a solution that allows one to avoid manual handling of the balls. Goal achieved. The balls are tipped directly into the Walking Floor and Cutting Machine is located in the end so that the Walking Floor automatically transports the balls through the cutting machine

#### Goal 3:

Treat 40 tons of waste balls in 20 minutes. Target not achieved. It takes about 1 hour and 15 minutes to process 30 tons of waste (full car with trailer). The goal was not realistic to achieve. The use of time is still acceptable, as it is added to a solution, where the waste reception facility is able to monitor the treatment of the balls from the weighing bridge by use of camera.



## Energy production

year 2012	OAT normal [°C]	OAT actual [°C]	Stored Waste [tons]	Total Waste [tons]	Heat Content [kWh/ton]	Production Stored [MWh]	Production Total [MWh]	Ratio stored/total [%]
January	-3.0	-1.9	4 200	19 194	2 500	10 500	47 985	21.9 %
February	-2.5	-0.6	1 849	17 777	2 500	4 623	44 441	10.4 %
March	0.0	3.6	454	17 606	2 500	1 135	44 015	2.6 %
April	3.0	2.8	0	16 883	2 500	0	42 207	0.0 %
May	9.0	7.9	55	13 291	2 500	138	33 227	0.4 %
June	12.0	11.0	96	10 144	2 500	240	25 359	0.9 %
July	13.0	13.3	25	14 877	2 500	63	37 193	0.2 %
August	12.5	13.3	30	8 938	2 500	75	22 345	0.3 %
September	9.0	8.7	244	18 810	2 500	610	47 024	1.3 %
October	5.5	4.0	1 603	19 085	2 500	4 008	47 712	8.4 %
November	0.5	3.0	77	19 802	2 500	193	49 504	0.4 %
December	-2.0	-5.4	2 484	19 466	2 500	6 210	48 665	12.8 %
<b>Total 2012</b>	<b>4.8</b>	<b>5.0</b>	<b>11 117</b>	<b>195 871</b>	<b>2 500</b>	<b>27 793</b>	<b>489 678</b>	<b>5.7 %</b>

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