



Project information

Project type:	New Eco-dwellings, passive house standard.
Address:	Granåsen gård Trondheim 2012
End construction year:	Single house/ row house
Building type:	17 single/ 45 row
Units:	-
Persons in buildings::	3 082 m ² / 6 232 m ²
Gross areal BTA:	2 517 m ² / 4 556 m ²
Net heated area:	n.a.
Additional cost for eco-application:	435 €/m ² / 214 €/m ²
Total building cost:	n.a.

Special ECO-technologies used:

- Passive house standard all units
- Extra thick insulation in walls and ceiling
- Windows with low U-value
- Extra high building tightness specifications
- District Heating

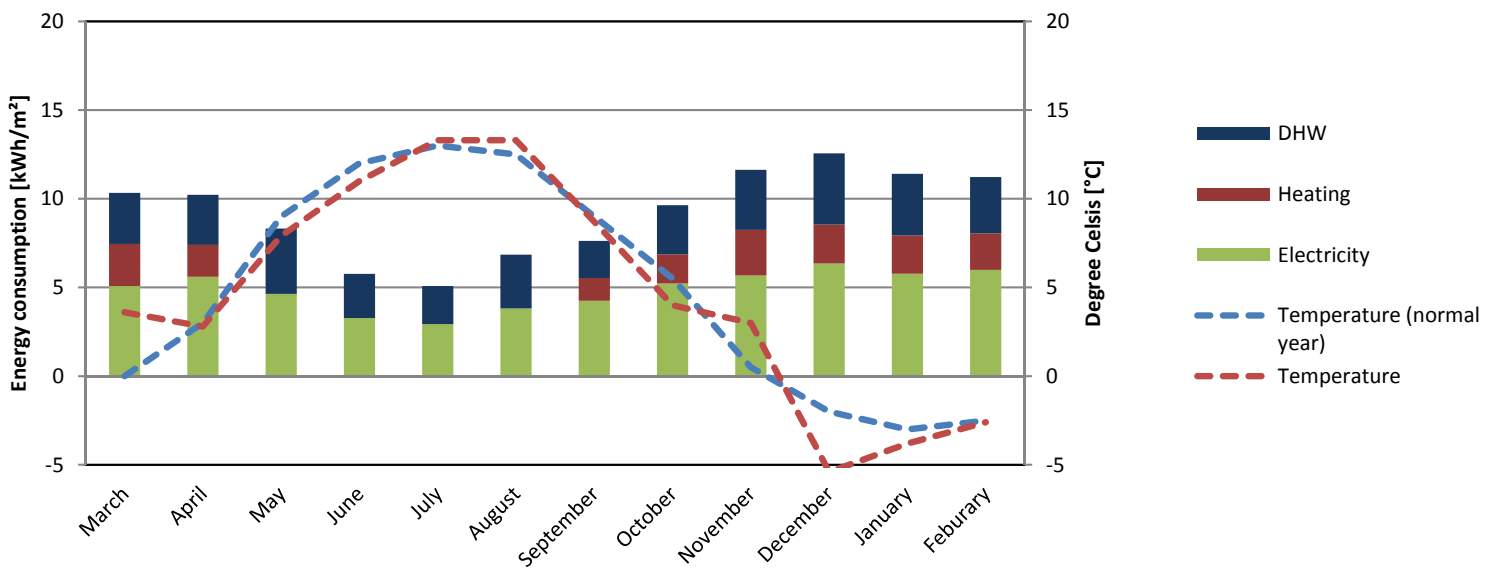
COMMENTS:

- Initial specifications were increased to full passive house standard for all units.
- Construction work under tent to prevent moisture damage to insulation.



Energy consumption

Energy Consumption 2012/13



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What has been done:

Regulatory plan grip

- Sunny building orientation
- Bedrooms on the north side
- Use of daylight

Structural measures

- Windows and doors with low U-value
- Well insulated building shells
- particular attention to thermal bridging and leakage issues
- Compact building forms

Enclosure

- Training of contractors
- Construction under tents
- Density measurements, thermography, moisture data logging

Operating

- Easy smart house technology
- Balanced ventilation with high heat recovery in aggregate
- Training of residents

Why it has been done:

Miljøbyen Granåsen shall be in all respects an environ-mentally friendly residential area:

- Proximity to major employment and educational
- Close to kindergarten
- Close to the countryside
- Close to bus route
- No traffic in the fields
- Waste extraction along the highway

How it was done:

The building construction is confirmed conducted according to NS3700 – "Passive House standard" (Norwegian Standard). SINTEF (Research foundation) has issued Passive House Certificate for all units.



Key figures

U-values (ECO-new build)

W/m ² K	National Regulation (new build)	Concerto Specification	Actual
Facade wall	0.22	0.17	0.12
Roof	0.15	0.11	0.09
Ground Floor	0.15	0.11	0.09
Window	1.6	1.1	0.75
Glazing	1.6	1.1	0.75
Shading			
Doors	1.6	1.1	0.8
Infiltration (n50)	2.5	0.6	0.5

ENERGY

[kWh/m ²]	National Regulation	CONCERTO specification	Actual 2012/13
Heat	95	54	52.3
space heating	51	15	
ventilation	6	3	
pipe loss	8	6	
DHW	30	30	35.9
Electricity	40	20	58.6
lighting	17	8	
cooling	0	0	
equipment	23	12	
other	0	0	
Total	135	74	111.0

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