

Kalvosarjan
käyttöohje



Granlund Group

Headquarters



Insinööritoimisto
Olof Granlund Oy, Helsinki

- Established 1960
- 360 employees
- Sales 27,4 million euros (2008)
- Headquarter export 19%
- Largest building services design engineering and consulting firm in Finland

Subsidiaries



Insinööritoimisto
Granlund Lahti Oy



Insinööritoimisto
Granlund Tampere Oy



Insinööritoimisto
Granlund Vaasa Oy



Insinööritoimisto
Granlund Kuopio Oy



Insinööritoimisto
Granlund Riihimäki Oy



OOO Granlund
Moskova

Granlund Services

Building Services Design

- HVAC & plumbing, building automation, fire protection
- Electrical, telecommunication, lighting, audio-visual, security engineering

Services for Construction

- Supervision, commissioning, project management, maintenance consulting

Monitoring and Auditing Services

- Continuous commissioning and monitoring, auditing of facilities

Facilities Management Services and Software

- Maintenance consulting, procurement and auditing of services
- Operation and maintenance manuals, RYHTI software

Expert Services

- Energy audits and energy certificates for buildings, condition assessments, technical Due Diligence (DD)
- Special analysis, building information model consulting (BIM), life cycle and environmental studies

Development

- Granlund design methods, software, environment, energy, international collaboration



References



Commercial buildings



Hotels



Office buildings



Hospitals and health care



Cultural buildings



Sports arenas



Laboratories



Schools and universities



Industrial buildings



Traffic buildings



Underground spaces



Churches



Energy efficiency survey for Vuokatti area 2009

Project phases



Background 1/2

Climate changes have caused EU directives to change and this requires also holiday resorts really push energy saving solutions and the use of renewable sources of energy

Snowpolis and the area of the Vuokatti Sports Institute form an excellent possibility to integrate, save and develop low-energy construction solutions and to gain energy savings

Possibilities to save energy with a centralized ground heat production and with the integration of cold/warm energy:

- The cross-country skiing tunnel and the ice rink require large amounts of energy to maintain the cold conditions
- The nearby lake could be used as a source of ground heat

Background 2/2

- In this project the multiple energy source possibilities are identified and the whole complex used as a single entity to best utilize the various energy sources.
- The target is to attract companies and research organisations to Kainuu area and to build a network of experts, as well as a concept, which would enable exporting this kind of sustainable construction of tourism- and sports center technology.
- Realized during the years 2008-2009
- Mainly funded by the Kainuu Centre of Employment and Economic Development

Facilities

7 facilities

- Snowpolis (technology park)
- Vuokattihalli (sports hall)
- Uimahalli (swimming hall)
- Hiihtoputki (indoor skiing tube)
- Sokos Hotelli (hotel)
- Jäähalli (indoor ice rink)
- Vuokattiopisto (education / hotel building)



Project team

Insinööritoimisto Granlund Kuopio Oy



Jussi Korhonen



Jukka Vasara



Timo Oravainen



Tommi Miettinen



Timo Kauppinen



Mika Savolainen

Energy Auditing

Gaia Consulting



Jari Hiltunen



Markku Hagström



Iivo Vehviläinen

Piloting alternative power production

Project phases

Startup meeting

- February 12th, 2009
- General information of the project for the participants
- Timetable of the project

Present energy consumption

- Facility holders delivered their present consumption figures



START-UP MEETING

COLLECTING
BASIC DATA

Project phases

Startup meeting

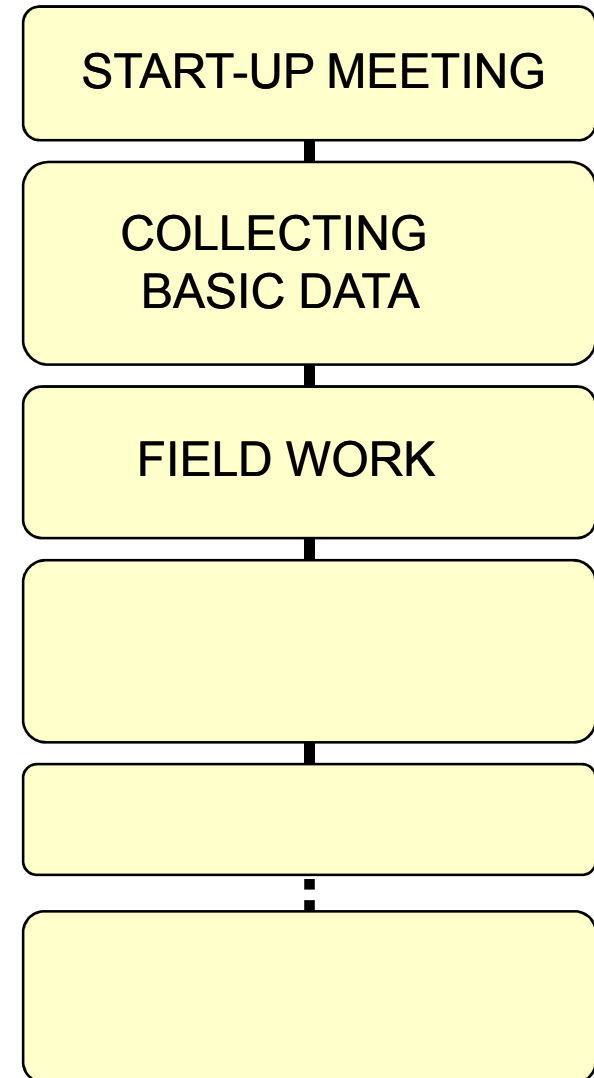
- February 12th, 2009
- General information of the project for the participants
- Timetable of the project

Present energy consumption

- Facility holders delivered their present consumption figures

Building overviews

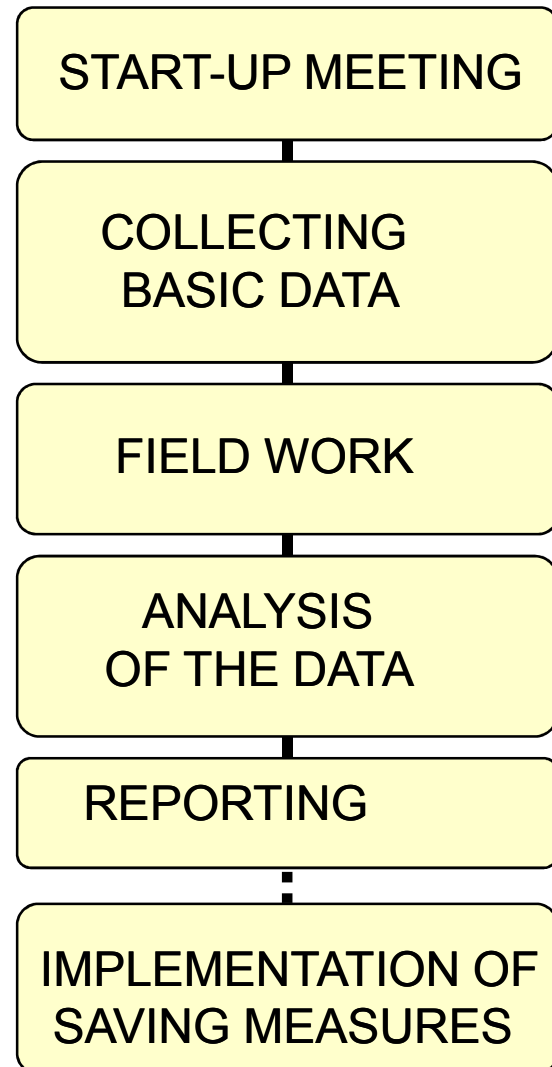
- Duration: February 2009 to March 2009
- Must be undertaken during the yearly heating period.
- Task to get an overview of the
 - Usage routines
 - Operating times
 - Heating, cooling, ventilation and electrical equipment
 - Building automation efficacy



Project phases

Reporting

- Calculations to identify
 - Largest energy consumptions
 - Saving possibilities and required investments
 - Payback time of the investment
- Final report
 - Consists of 7 reports (one for each facility)
 - Description of the present situation
 - Saving possibilities, including payback calculations





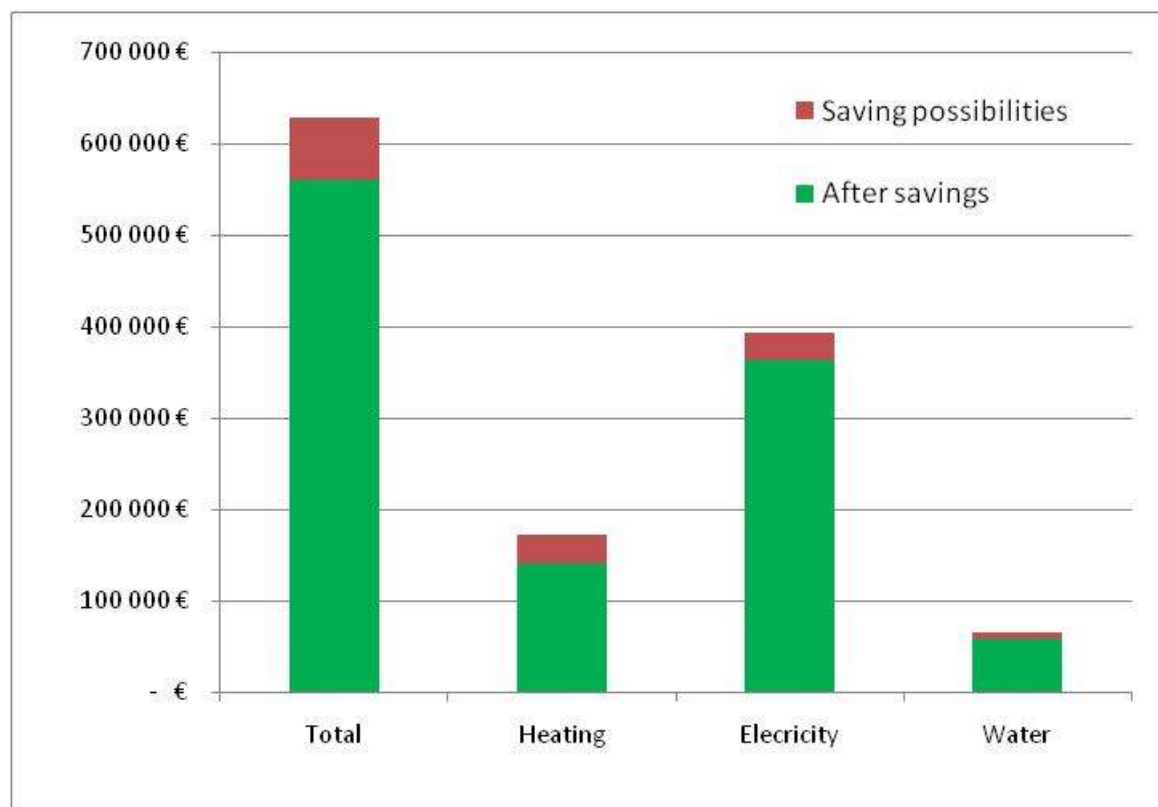
Energy efficiency survey for Vuokatti area 2009

Final results



Summary of the results

Total consumption and savings

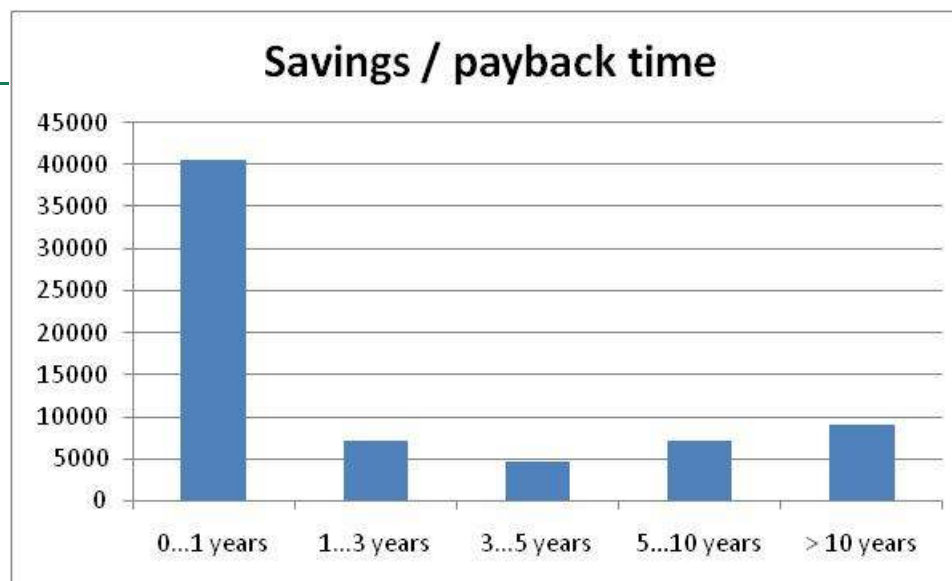


Summary of the results

Total consumption (7 facilities), savings and investments

Present consumption		Saving possibilities				Investment	
2008							
Heating							
4 632	MWh/a	791	MWh/a	17 %		158 150	EUR
171 135	EUR/a	30 892	EUR/a	18 %			
		266	t CO2/a				
Electricity							
4 613	MWh/a	311	MWh/a	7 %		58 380	EUR
393 198	EUR/a	30 768	EUR/a	8 %			
		42	t CO2/a				
Water							
30 893	m3/a	2 270	m3/a	7 %		13 000	EUR
64 248	EUR/a	6 939	EUR/a	11 %			
Total consumption		Total savings				Total investment	
628 581	EUR/a	68 600	EUR/a	11 %		229 530	EUR
		308	t CO2/a				

Summary of the results



Savings vs. payback time

PAYBACK TIME	TOTAL SAVINGS EUR/a	INVESTMENT EUR	CO ₂ REDUCTION t/a	SAVINGS HEATING				SAVINGS ELECTRICAL				SAVINGS WATER	
				total		energy	CO ₂	investment	energy	CO ₂	investment	water	
				energy	CO ₂	investment	energy	CO ₂	investment	energy	CO ₂	investment	m ³ /a
				MWh/a	t/a	EUR/a	EUR/a	MWh/a	t/a	EUR/a	EUR/a		
0...1 years	40642	16650	215	557	192	21250	0	176	23	16206	0	1540	3185
1...3 years	7117	13130	6	6	2	287	0	39	4	2680	4150	0	0
3...5 years	4666	18180	24	88	22	3385	0	10	2	727	0	730	554
5...10 years	7080	58500	22	26	9	1135	0	74	13	5945	0	0	0
> 10 years	9095	121500	41	115	40	4835	0	12	0	1060	0	0	3200
	68600	227960	308	791	266	30892	0	311	42	26618	4150	2270	6939



Thank you