



Frederiksberg
Forsyning

Welcome to Frederiksberg

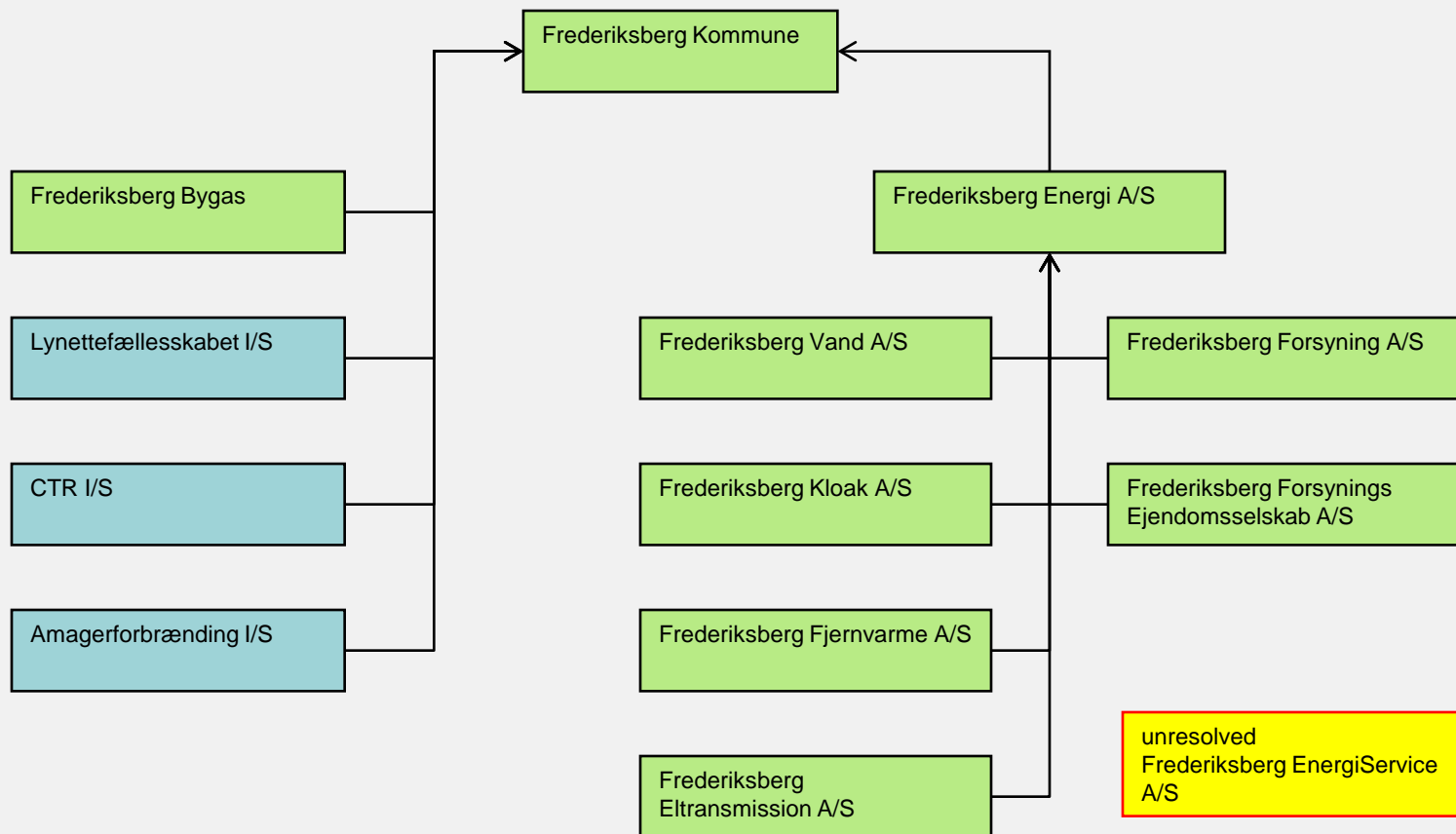


- Municipality in Greater Copenhagen
- 92,000 inhabitants
- 96 % live in flats
- 97 % district heating



Company overview

Frederiksberg Kommunes portefølje af forsyningsvirksomheder - september 2009



Welcome to Frederiksberg Forsyning



- District heating
- Water
- Sewage
- Gas
- Turnover 500 mill. DKK
- 135 employees



District heating since 1903



- Denmark's first district heating
- Heat from CTR since 1984
- Partly steam until 2000



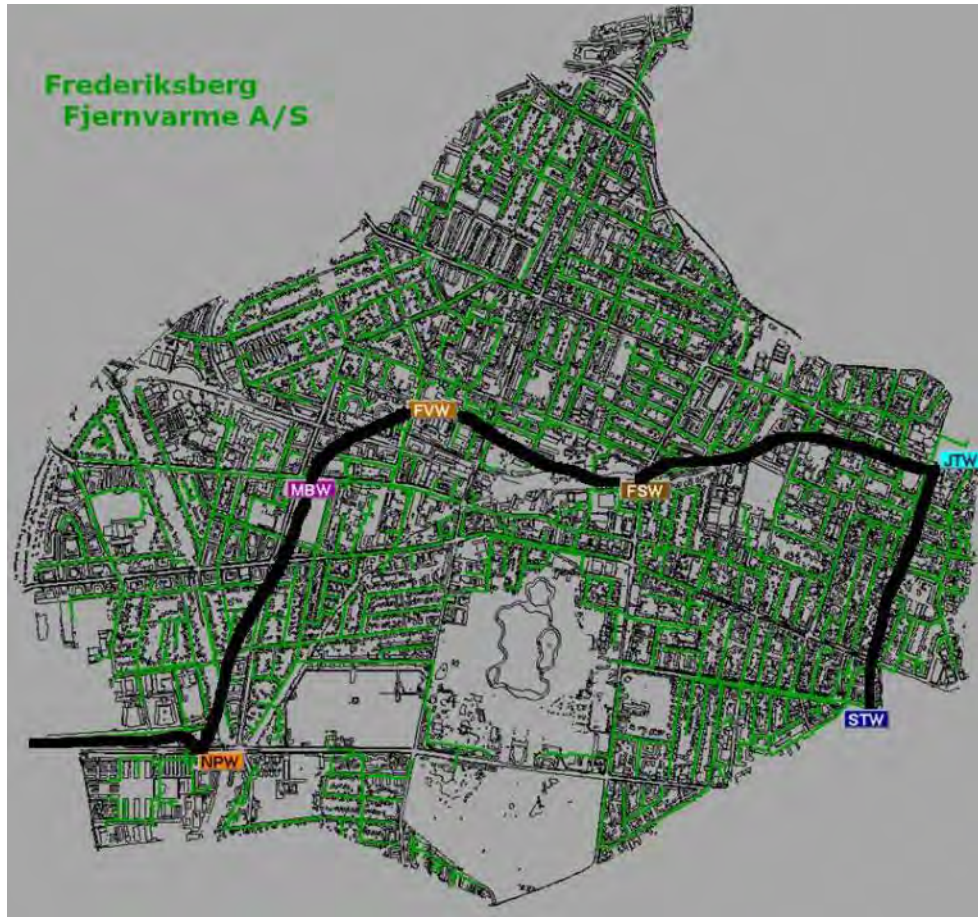
CTR - Greater Copenhagen Heating Transmission



- 5 municipalities
- About ½ mill.
- 95 % District heating
- 70 % Heat and power
- 25 % Refuse incineration
- 14 peak load units
- 54 km network



District heating on Frederiksberg



- 6 heat exchanging stations
- 87 km large pipes
- 63 km small pipes

Experience of supplying multi utilities

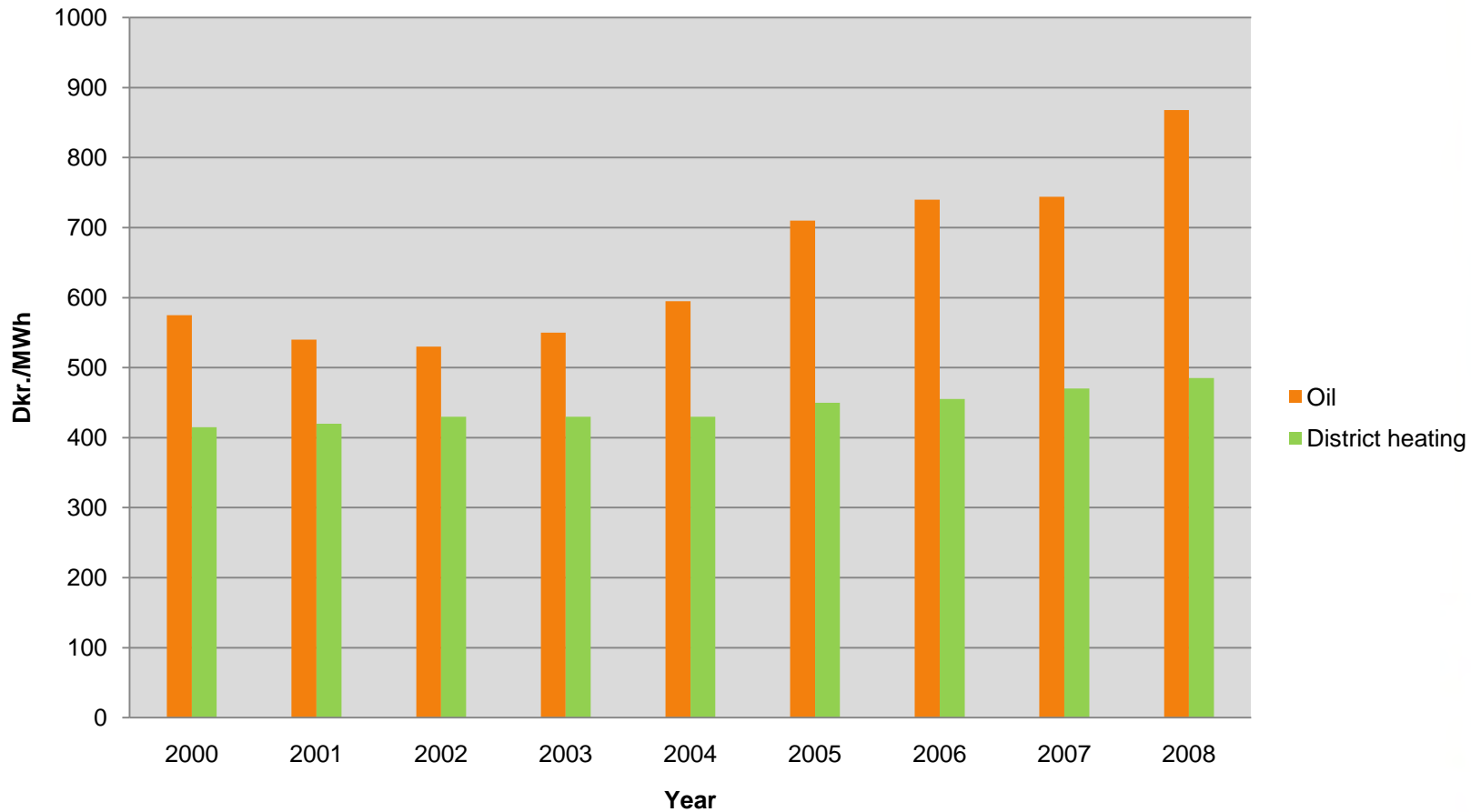


Synergy through

- cable work
- administrative work
- rent, storage facilities, car parks etc.
- branding and advertising
- a single bill and a single consumer overview
- single point of contact (address, telephone number, email address, internet)



Cost of district heating versus oil



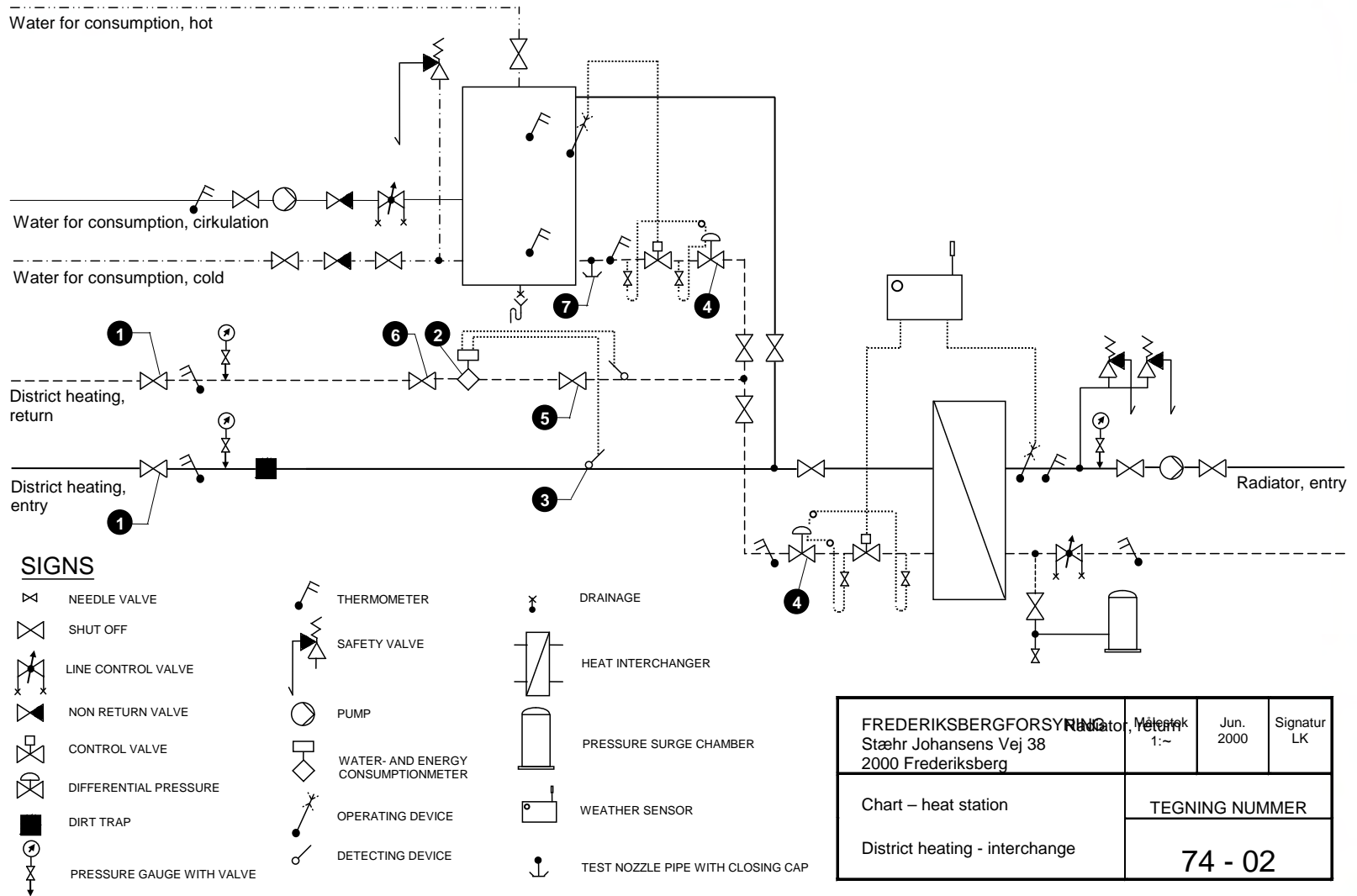
District heating service subscription



- 425 service subscriptions
- Yearly visit from one of our service engineers
- Adjustment of equipment
- Detailed report
- Special offers on plumbing, heating and sanitation installation and maintenance work



Customer Installation



Attention - Energirapport

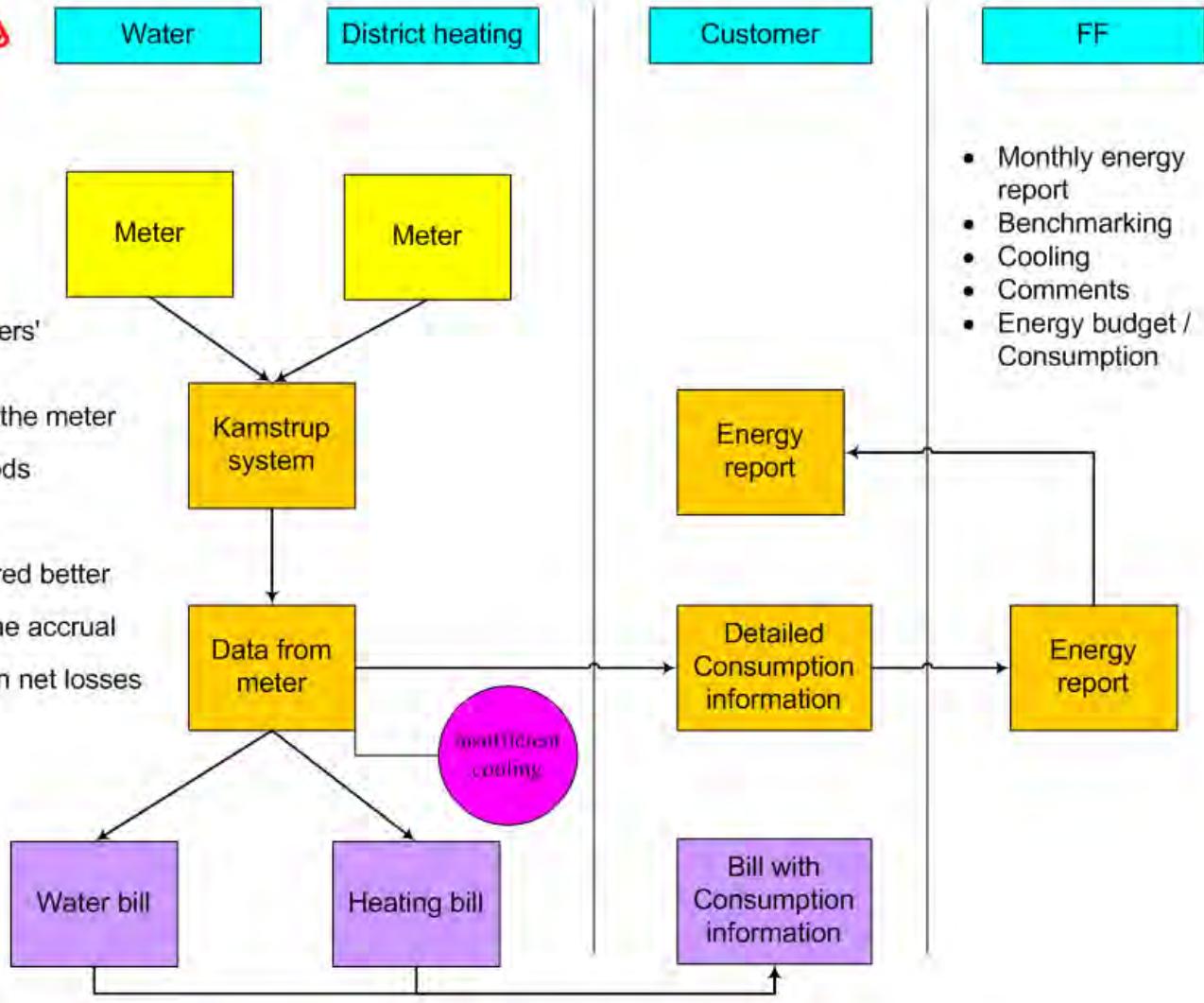
- Electronic repatriation of values on a monthly basis - Electricity, water, heat.
- Prepares and commenting on the energy report. Graphic presentation (Monitor / web / paper)
- Access to website
- All data are corrected degree-days
- Monitoring of cooling and alarm on lack of cooling
- Comparison of energy economy between installations, Benchmarking MWh/m²



Remote meter reading

Remote meter reading

- Ability to support customers' environmental efforts
- Customer must not read the meter
- Flexible accounting periods
- Real time reading
- Trickle water is measured better
- Less uncertainty about the accrual
- more accurate calculation net losses

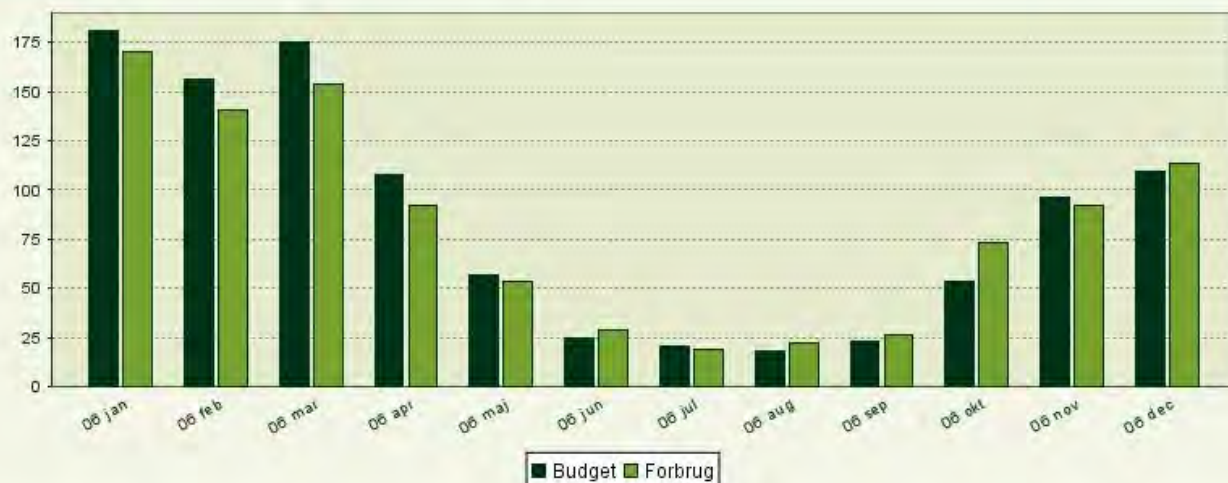


Energy report

[-] Fjernvarme [MWh]

[skiul tabel](#) | [skiul graf](#)

Periode	Budget	Kor. budget	Forbrug	Afviqelse	Afviqelse %	Ref.	Afkøling
2006 jan	175,11	181,23	169,89	11,34	6,3 ●	5.551,6 m ³	26,3 °C
2006 feb	164,50	156,45	140,59	15,87	10,1 ●	4.911,8 m ³	24,6 °C
2006 mar	151,01	174,85	153,90	20,95	12,0 ●	4.753,0 m ³	27,8 °C
2006 apr	108,27	107,76	91,91	15,85	14,7 ●	3.038,8 m ³	26,0 °C
2006 maj	57,82	56,52	53,53	2,99	5,3 ●	1.685,1 m ³	27,3 °C
2006 jun	26,97	24,94	29,00	-4,06	-16,3 ●	976,4 m ³	25,5 °C
2006 jul	15,40	20,17	19,31	0,86	4,2 ●	734,9 m ³	22,6 °C
2006 aug	14,12	17,95	22,35	-4,40	-24,5 ●	808,9 m ³	23,8 °C
2006 sep	37,57	23,21	26,43	-3,23	-13,9 ●	890,5 m ³	25,5 °C
2006 okt	74,85	53,06	72,96	-19,91	-37,5 ●	2.413,7 m ³	26,0 °C
2006 nov	117,91	96,56	91,67	4,88	5,1 ●	2.968,4 m ³	26,6 °C
2006 dec	156,47	109,31	113,74	-4,43	-4,1 ●	4.051,2 m ³	24,1 °C
Total	1.100,00	1.022,00	985,29	36,72	3,6 ●	32.784,3 m³	25,8 °C
Prognose	1.100,00	1.022,00	985,29		3,6 ●		
kWh/m²	128,35	119,25	114,97				



Benchmarking

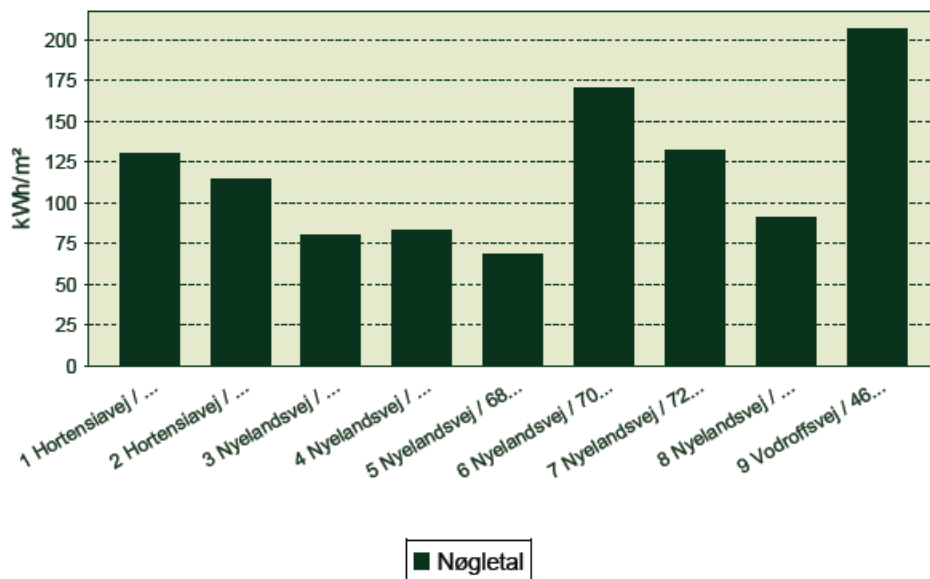
Fjernvarme [kWh]

Forbrug i parentes indikerer at perioden for den pågældende rapport ikke er fuldt afsluttet.

Afvigelse er i forhold til budget (korrigeret for varme).

Farveindikationer på afvigelser er givet i forhold til en grænse på $\pm 10\%$.

ID	Navn	Forbrug	Afvigelse %	Afkøling	Nøgletal
1	Hortensiavej / 11 1 / Bygning / 358193	(11.768,38)	-29,4 •	38,7 °C •	(130,23) kWh/m ²
2	Hortensiavej / 13 / Bygning / 357480	(5.263,69)	-13,8 •	42,4 °C •	(114,88) kWh/m ²
3	Nyelandsvej / 25 A / Bygning / 358991	(6.205,78)	-4,3 •	43,3 °C •	(80,32) kWh/m ²
4	Nyelandsvej / 25 B / Bygning / 358894	(10.698,88)	-5,8 •	43,5 °C •	(83,41) kWh/m ²
5	Nyelandsvej / 68 / Bygning / 358711	(18.180,50)	6,3 •	47,1 °C •	(68,51) kWh/m ²
6	Nyelandsvej / 70 / Bygning / 357804	(12.944,60)	-11,4 •	45,3 °C •	(170,32) kWh/m ²
7	Nyelandsvej / 72 / Bygning / 357812	(13.110,99)	-11,1 •	39,6 °C •	(132,16) kWh/m ²
8	Nyelandsvej / 75 1 / Bygning / 07356	(8.001,39)	-0,3 •	44,3 °C •	(90,70) kWh/m ²
9	Vodroffsvej / 46 / Bygning / 359831	(38.051,36)	-19,5 •	40,0 °C •	(206,78) kWh/m ²



Monitoring - caretaker

- Data are stored on a daily basis
- Monitoring of operating and energy data
- Monthly report with comments
- Energy and operational report
- Alarmnotifikation via email and SMS



Adjustment and optimization – Enhanced care taker

- Online communication 24/7/365
- Manage and Optimize operating
- Deploy staff for emergency call



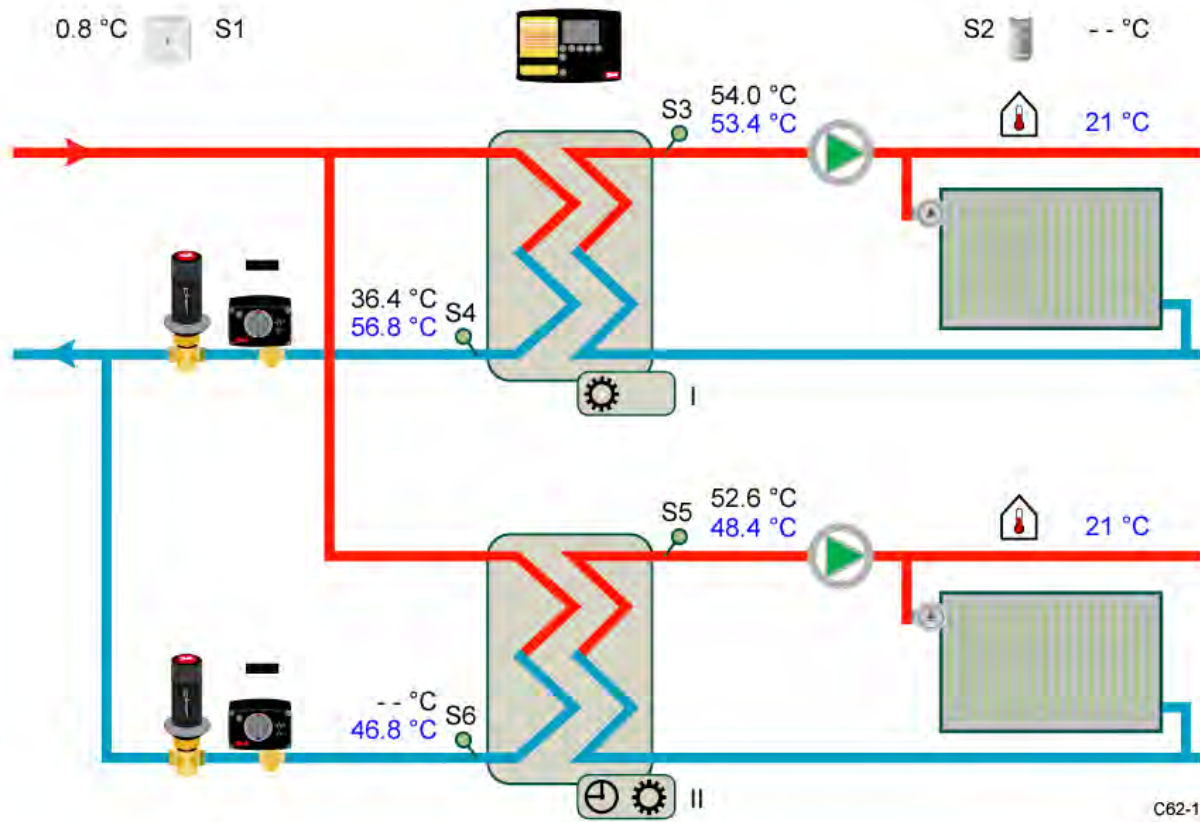


A1-9.1 | A1-9.1 | ... | ...

Frb-forsyning

- Basis
- Rumtemperatur I
- Rumtemperatur II
- Dato og Tid
- Ugeplan
- Varmekurve I
- Varmekurve II
- Varmeudkobling I
- Varmeudkobling II
- Returbegr. - varme I
- Returbegr. - varme II
- PI-parametre varme I
- PI-parametre varme II
- Avanceret I
- Avanceret II

Basis Alarm Graf Funktion Konfiguration Moduler Support ECL Comfort 300 + C62



Velkommen til Danfoss ECL WebAccess - Microsoft Internet Explorer

Adresse: <http://87.62.33.163/>

Returbegr. - varme II

Øvre grænse (x1,y1): (10,40) °C
 10 40
 Nedre grænse (x2,y2): (-10,55) °C
 -10 55

Min. begrænsning Indflydelse: 0,0
 Max. begrænsning Indflydelse: -2,0
 Adaptiv funktion: On

Indstil værdi

[http://87.62.33.163/proxy/pid4000/romProxy/\\$ZqYUH0Tuv1k4/](http://87.62.33.163/proxy/pid4000/romProxy/$ZqYUH0Tuv1k4/) Internet

Danfoss A/S - Dialogboks til webside

Ugeplan

Varmekreds I

Dag	Periode 1		Periode 2		Periode 3	
	Start	Slut	Start	Slut	Start	Slut
Mandag	6:00	24:00	0:00	0:00	0:00	0:00
Tirsdag	6:00	23:00	0:00	0:00	0:00	0:00
Onsdag	6:00	23:00	0:00	0:00	0:00	0:00
Torsdag	6:00	23:00	0:00	0:00	0:00	0:00
Freitag	6:00	23:00	0:00	0:00	0:00	0:00
Lørdag	6:00	23:00	0:00	0:00	0:00	0:00
Søndag	6:00	23:00	0:00	0:00	0:00	0:00

Indstil værdi

<http://87.62.33.163/proxy/pid4000/romProxy/> Internet

Danfoss A/S - Dialogboks til webside

PI-parametre varme I

P-Bånd (Xp): 80 K Integrationstid (Tn): 120 sek.
 80 120

Motor-/ventilkøretid: 105 sek. Neutral zone (Nz): 2 K
 105 2

Indstil værdi

<http://87.62.33.163/proxy/pid4000/rc/> Internet

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Rumtemperatur II

Aktuel: 21 °C
 21

Aktuel: 17 °C
 17

Indstil værdi

<http://87.62.33.163/> Internet

