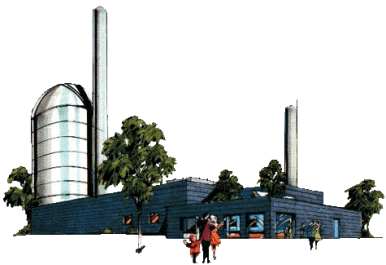


Støvring Kraftvarmeværk



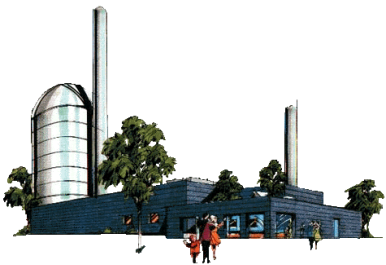


Støvring Kraftvarmeværk



Dagsorden:

- **Kort om Støvring Kraftvarmeværk**
- **Varmepumpe 7,3 MW - 2019**
- **Elkedel, 10 MW & 3.700 m³ akkutank 2023/24**
- **Nye gasmotorer, 2024**
- **Varmepumpe 3,3 MW, 2024**
- **Solceller & vindmøller, er det noget?**



Placering

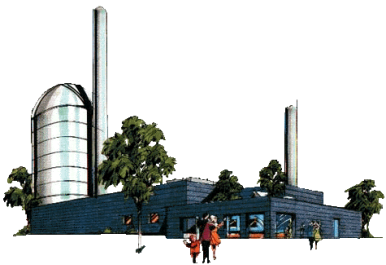




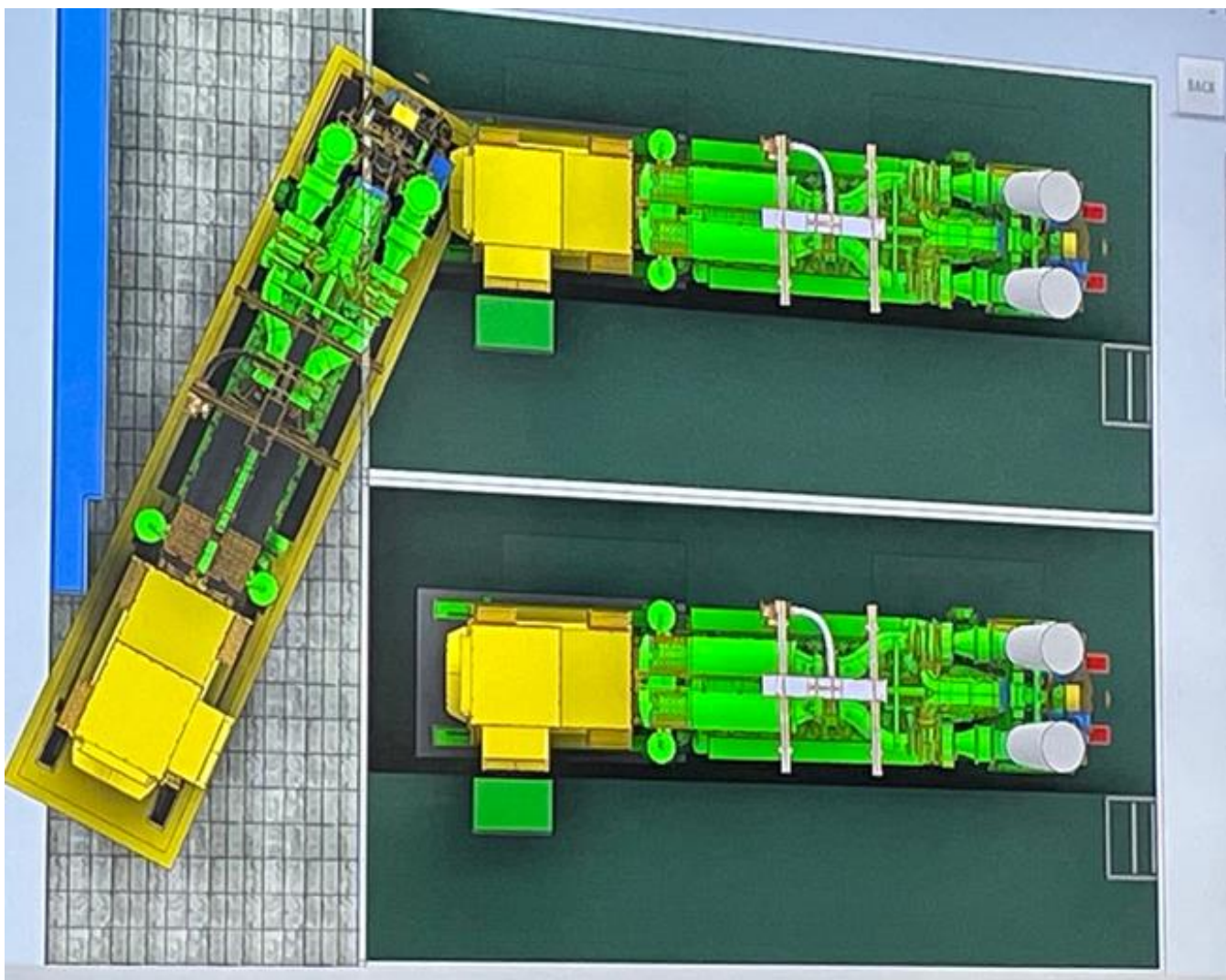
Støvring Kraftvarmeværk



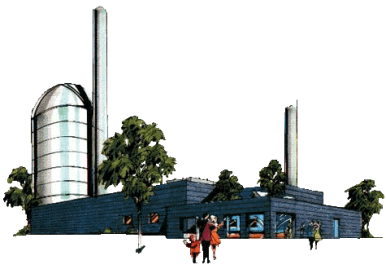
3 GASENGINES



3 nye gasmotorer



24-05-2024



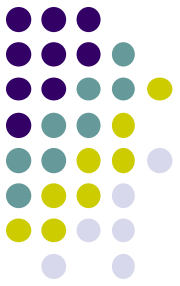
Støvring Kraftvarmeværk

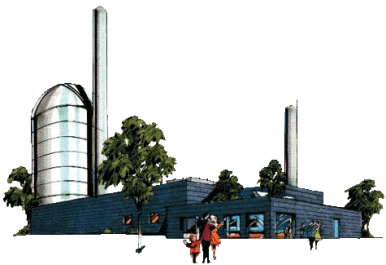


24-05-2024



Elkedel

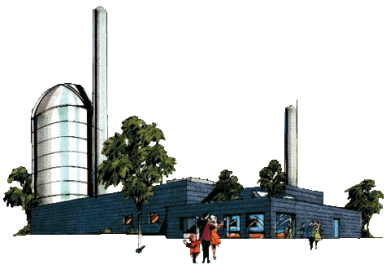




Akkutank tilføjet



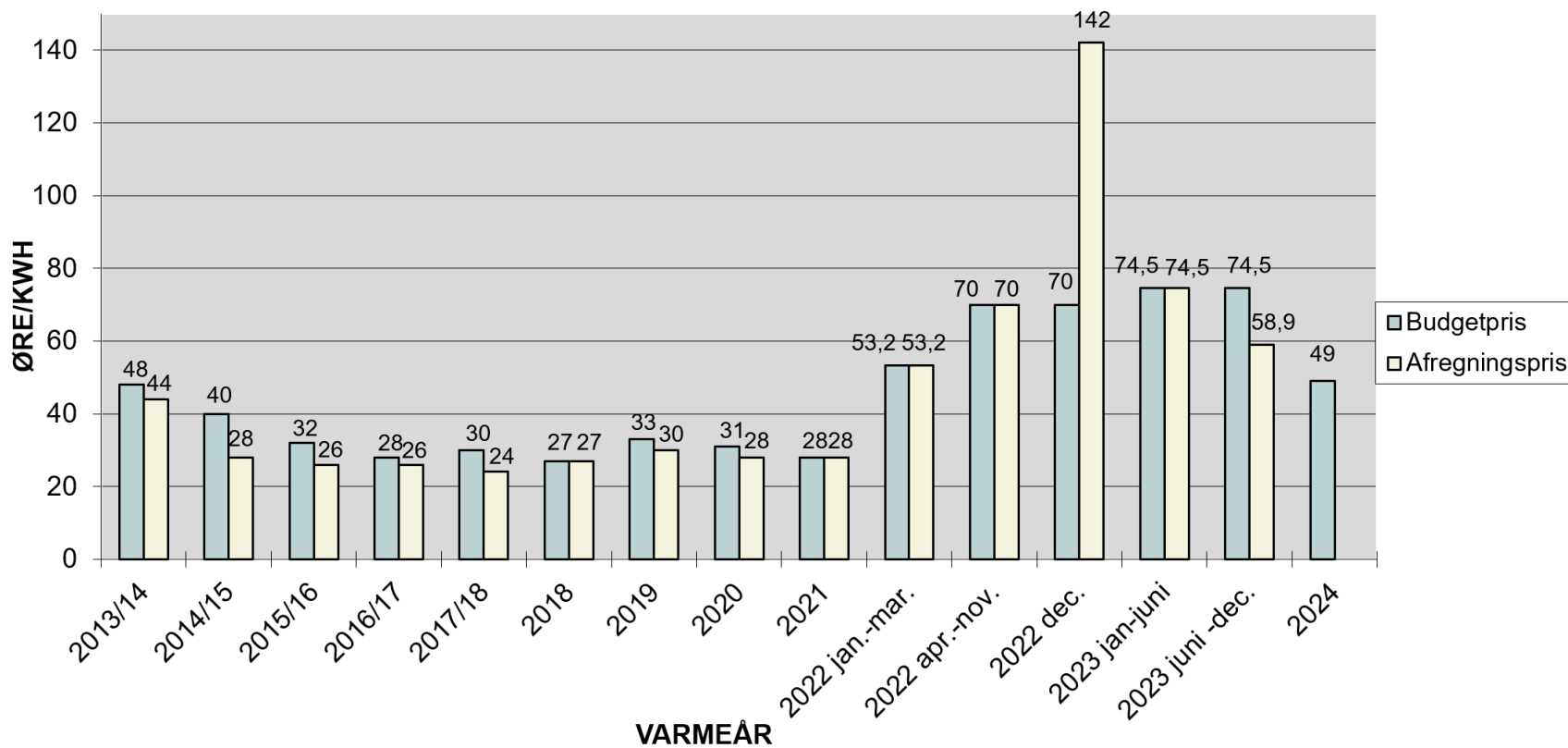
24-05-2024

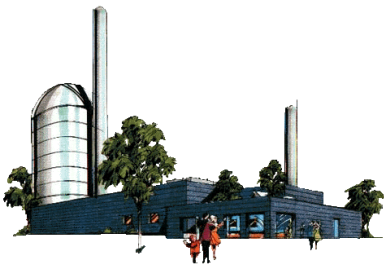


Priser



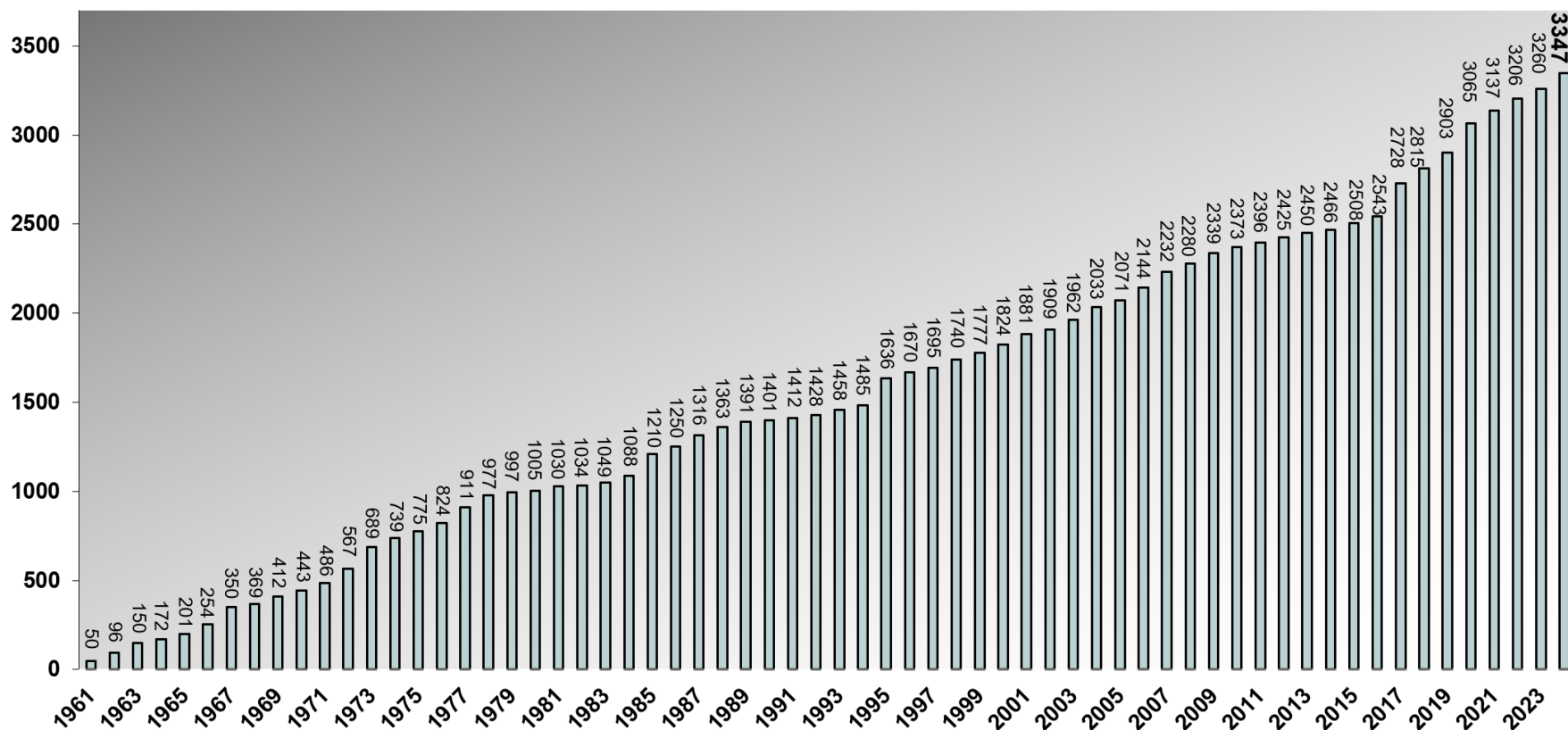
UDVIKLING I VARMEPRISEN - ØRE/KWH ekskl. moms

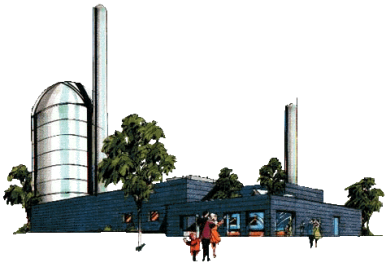




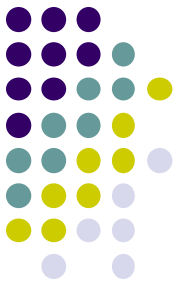
Udbygningen tager fart

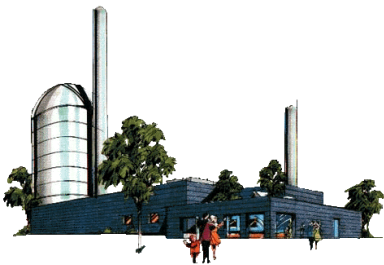
Udvikling i antal målertilslutninger



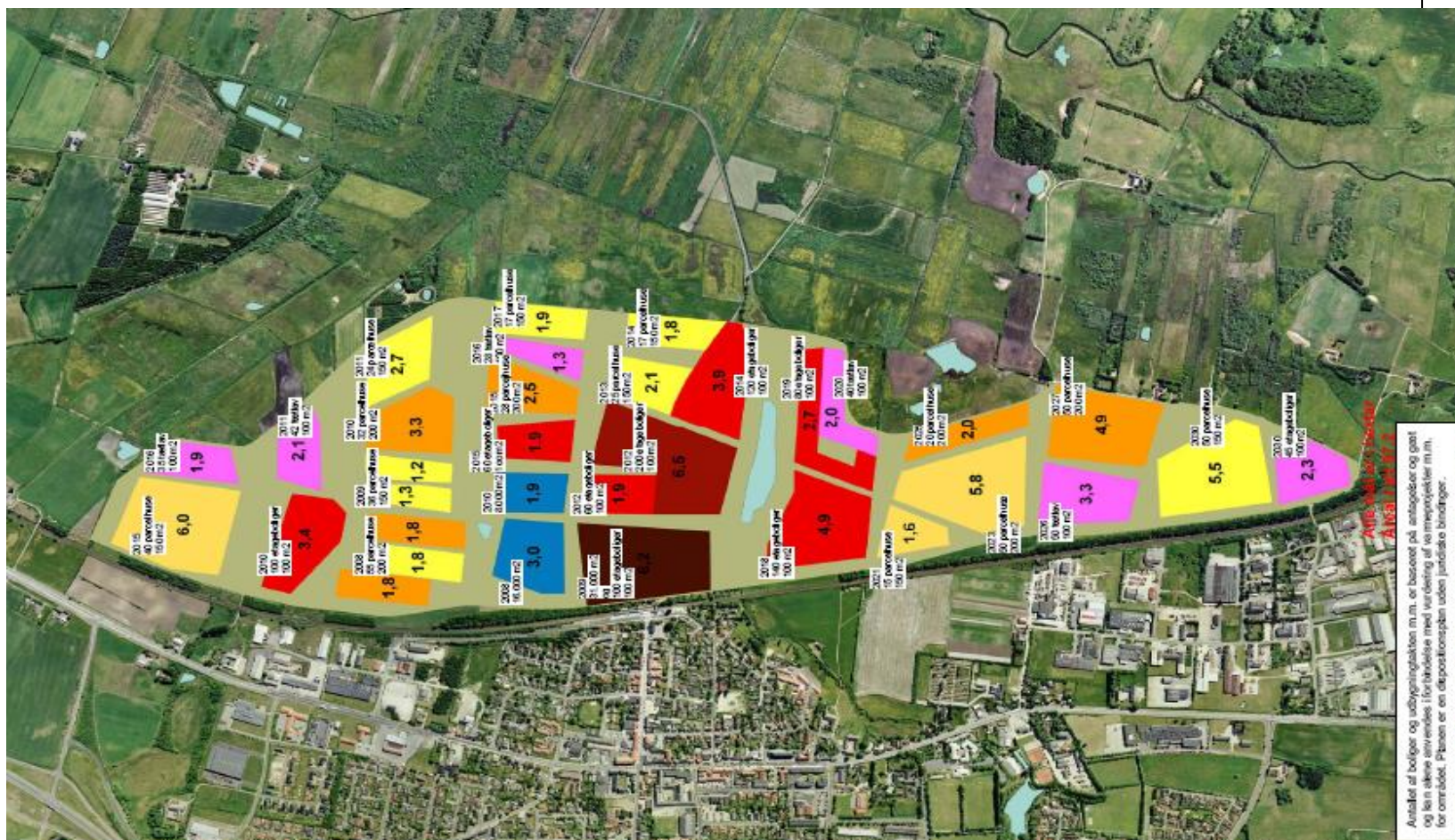


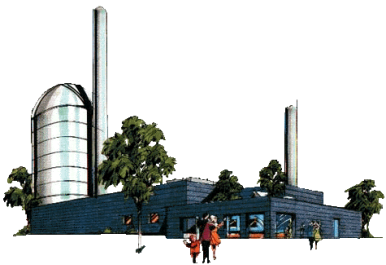
Udbygningen tager fart





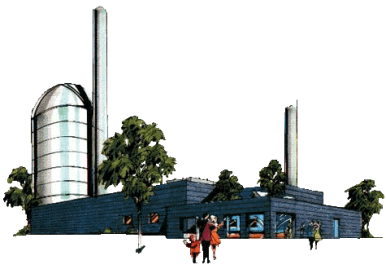
Udbygningen tager fart





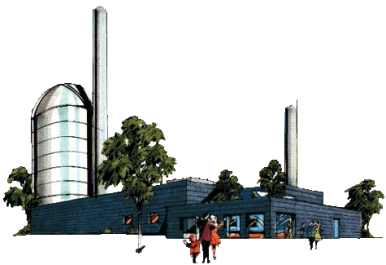
Udbygningen tager fart





Udbygningen tager fart

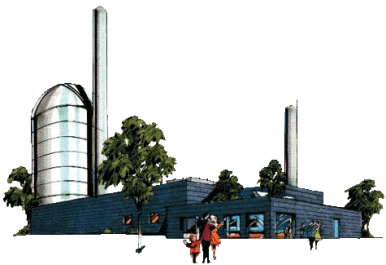




Udbygningen tager fart



24-05-2024

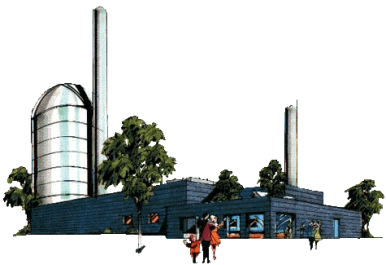


Udbygningen tager fart

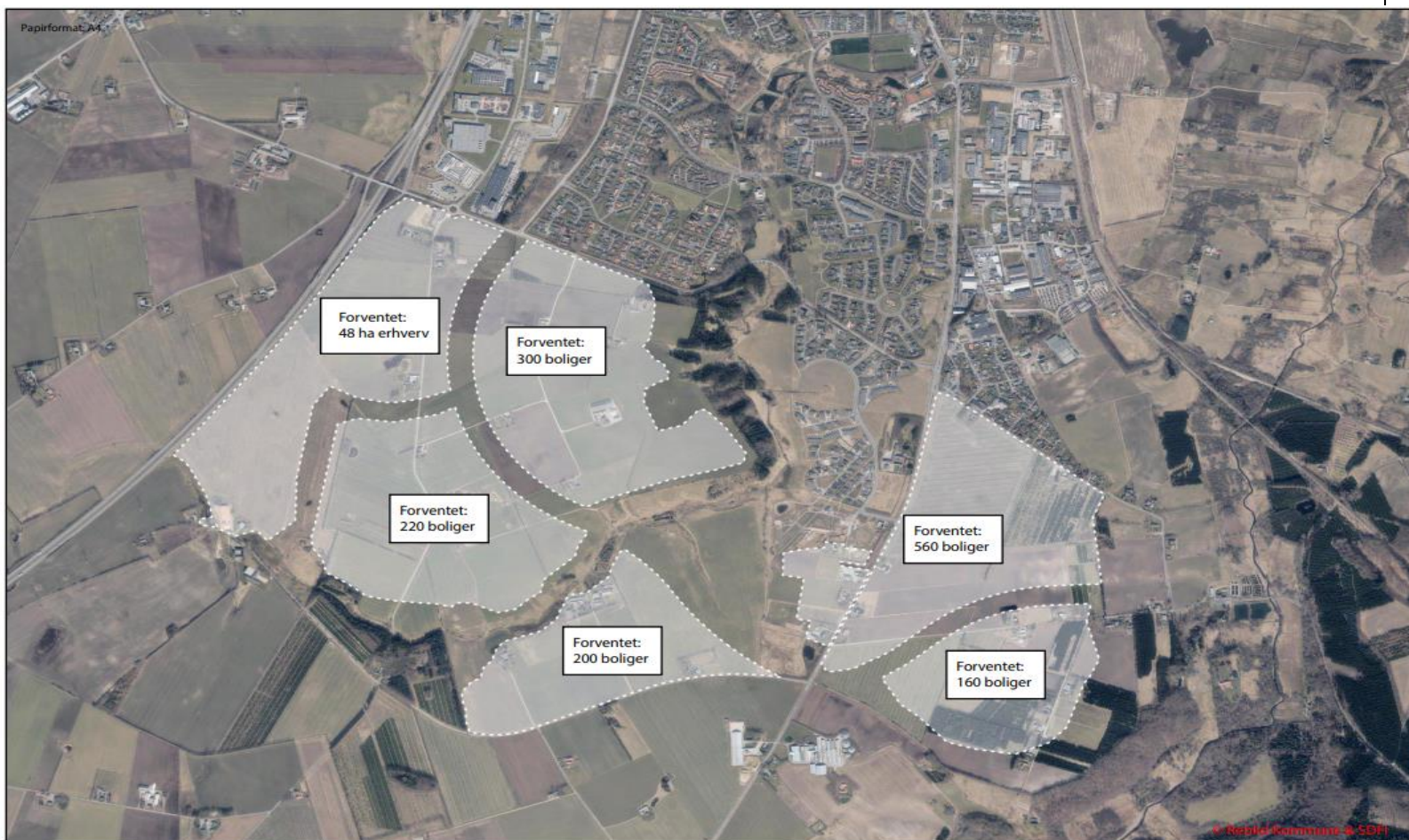


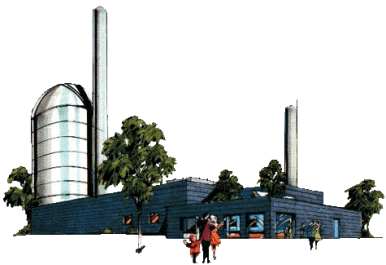
24-05-2024

16



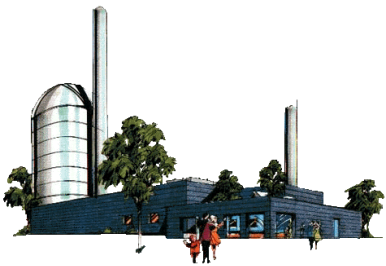
Udbygningen tager fart





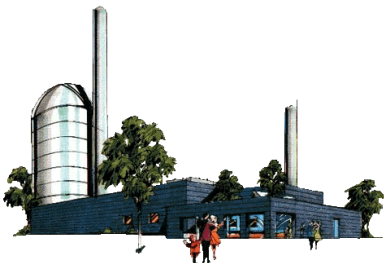
Udbygningen tager fart





Udbygningen tager fart





Udbygningen tager fart



Byrådet har godkendt købet af svinefarmen. *Foto: Lars Pauli*



Lasse Damsgaard

Journalist



Lars Pauli

Fotograf

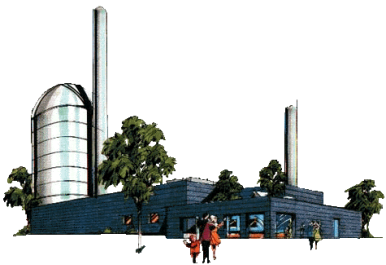
Det er Nordjyllands hurtigst voksende by. Tilflytterne strømmer til i hobetal.

Og den ene store millionvilla efter den anden skyder op.

Det betyder nu, at byen skal have en helt ny bydel.

Samt en ekstra skole.

Derfor er en kæmpe svinefarm blevet købt op af kommunen.

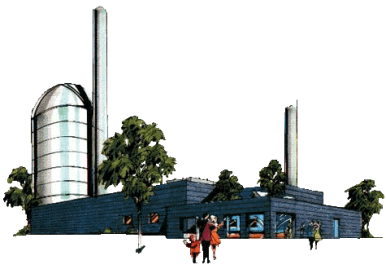


Støvring Kraftvarmeværk



Dagsorden:

- **Varmepumpe 2019 – 7,3 MW**



Støvring Kraftvarmeværk

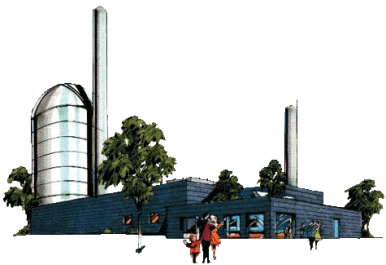


- **Ophør af grundbeløb
10 – 12 mio. årligt**



Den grønne omstilling

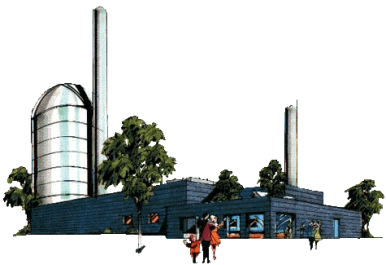




Vi skal alle denne vej!

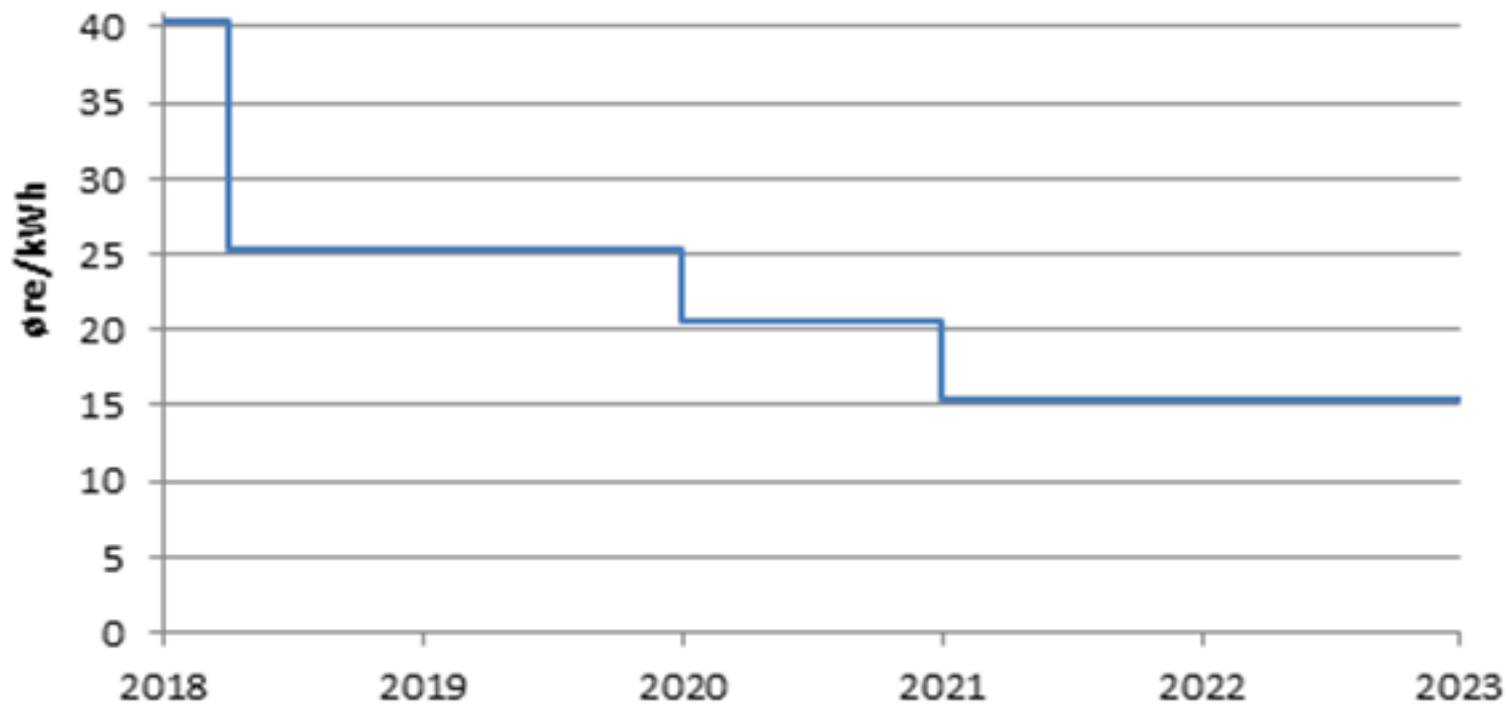


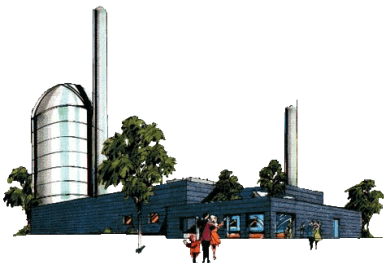
**CO₂ reduktion fra
21.674 ton til 4.324 ton**



Elvarmeafgiften

Lempelse af elvarmeafgiften

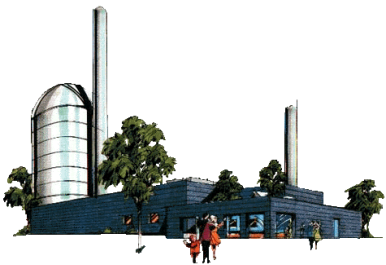




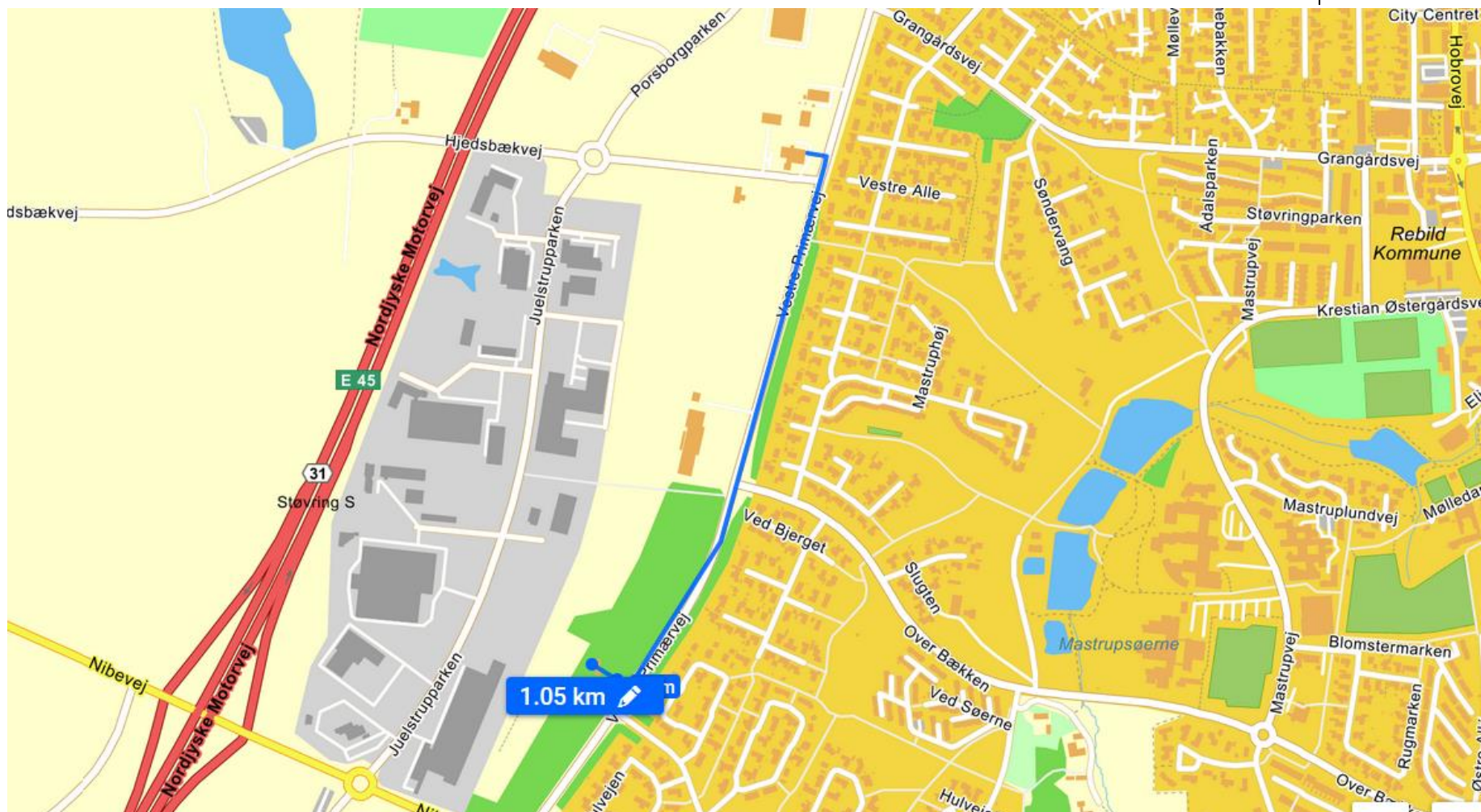
Forventet økonomi

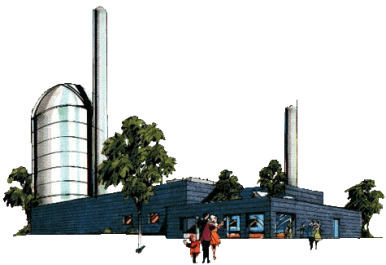
	2019	2020	
ÅRLIGE PRODUKTIONSOMKOSTNINGER			
Produktionspris reference/år	25.310,170		
Produktionspris inkl. gr. beløb/år			
Produktionspris elvarmepumpe/år			
Besparelse ved varmepumpedrift/år			8.254.383 Kr.
Produktionspris - inkl.			
		273,19	273,19 Kr. MWh

7,3 MW eldrevet varmepumpe
Forventer, at denne producerer omkring 80% af årsproduktionen –
Og dermed giver en årlig besparelse ” på ca. 80% af det bortfaldne grundbeløb ”



Eltilslutning



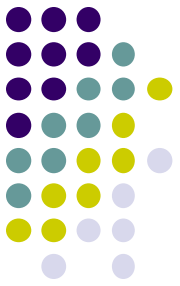


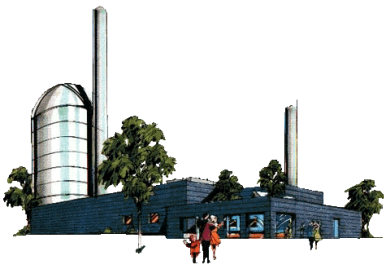
Varmepumpe – Støvring Kraftvarmeværk



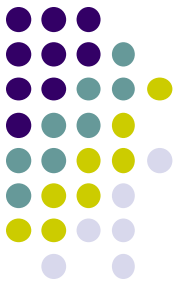


Driftserfaringer



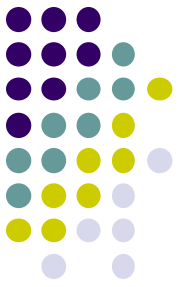


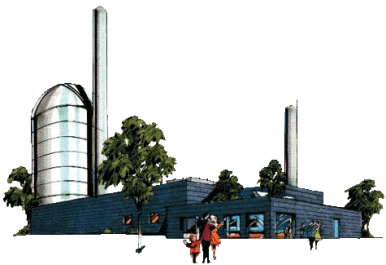
Driftserfaringer





Energiøptagere





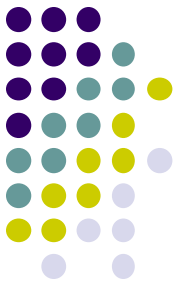
Varmepumpe – Støvring Kraftvarmeværk



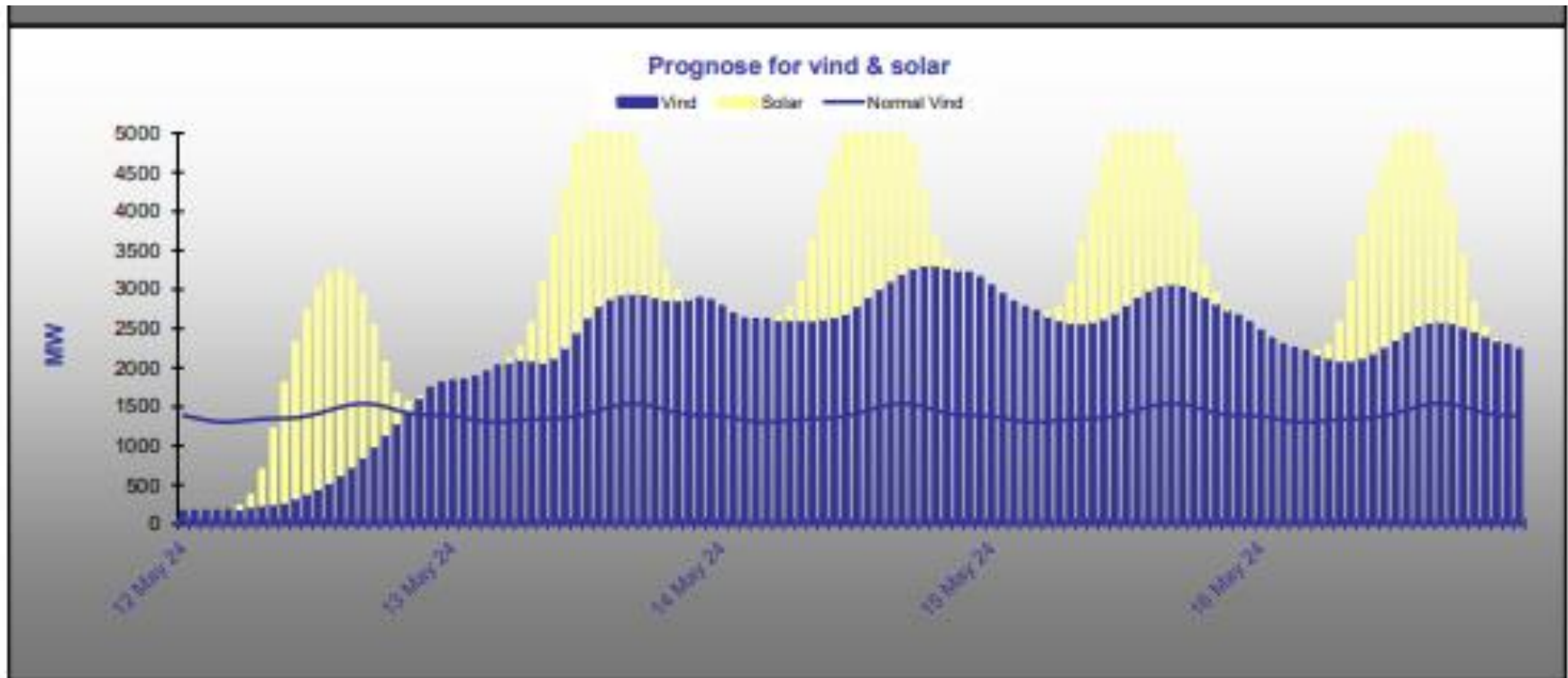


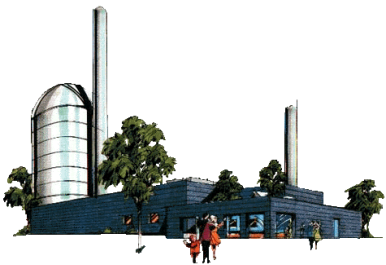
Driftserfaringer

	12/05/2024	13/05/2024	14/05/2024	15/05/2024	16/05/2024
Prognose for: Time	Søndag DKK/MWh	Mandag DKK/MWh	Tirsdag DKK/MWh	Onsdag DKK/MWh	Torsdag DKK/MWh
0-1	493	343	310	179	11
1-2	436	300	295	133	7
2-3	308	295	288	96	7
3-4	273	284	284	82	8
4-5	350	312	281	81	9
5-6	256	315	293	99	70
6-7	339	367	356	322	281
7-8	338	615	373	360	501
8-9	282	368	349	347	293
9-10	117	314	210	345	299
10-11	-37	206	55	344	292
11-12	-273	151	9	338	232
12-13	-397	7	5	191	197
13-14	-483	5	3	189	168
14-15	-475	3	2	190	163
15-16	-355	29	3	317	211
16-17	100	193	78	329	200
17-18	15	307	279	303	105
18-19	139	353	328	321	121
19-20	321	351	312	312	503
20-21	578	354	299	305	248
21-22	563	350	293	299	248
22-23	467	331	294	291	249
23-24	359	321	263	253	232
Base 1-24	155	270	219	251	194
Peak 8-20	-87	191	136	294	232
Off-Peak	397	349	302	208	156



Driftserfaringer

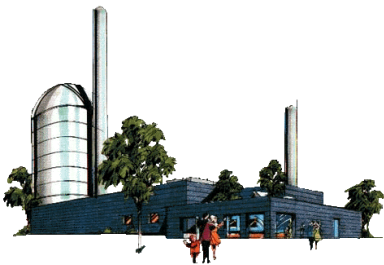




Forventet økonomi



	2019	2020	2021	2022	
ÅRLIGE PRODUKTIONSOMKOSTNINGER					
Produktionspris reference/år	25.310.176	25.310.176	25.310.176	25.310.176	Kr.
Produktionspris inkl. gr. beløb/år	14.459.390	14.459.390	14.459.390	14.459.390	Kr.
Produktionspris elvarmepumpe/år	19.443.906	17.601.301	17.055.793	17.055.793	Kr.
Besparelse ved varmepumpedrift/år	5.866.270	7.708.875	8.254.383	8.254.383	Kr.
Produktionspris - indeholdt 15 års afskrivning, samt service	311,44	281,92	273,19	273,19	Kr. MWh

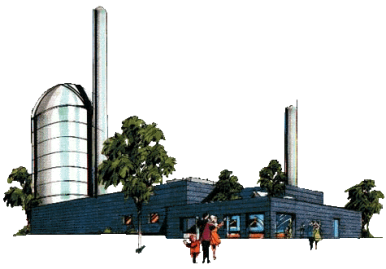


Økonomiske driftserfaringer

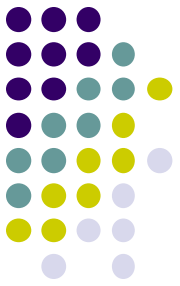


Støvring Kraftvarmeværk a.m.b.a. - Budgetopfølgning

Periode 01-2023 - 12-2023	januar	februar	marts	april	maj	juni	juli	august	september	oktober	november	december	Sum til dato
Varmepr. Gasmotor													
Produktionspris kr./MWh	654	621	570	422	16	(335)	(129)	(1.243)	(180)	478	467	640	501
Varmeproduktion kedler													
Produktionspris kr./MWh	962	809	760	791	(134.202)	1.466	407	866	717	746	777	800	795
Varmeproduktion varmepumpe													
Produktionspris kr./MWh	397	335	312	258	241	235	189	205	217	205	291	264	272
Varmeproduktion elkedel													
Produktionspris kr./MWh	-	-	-	-	-	-	-	-	680	289	416	372	368
Alle enheder/gennemsnit													
Produktionspris kr./MWh	578	496	532	335	193	159	192	19	227	324	510	486	417,6

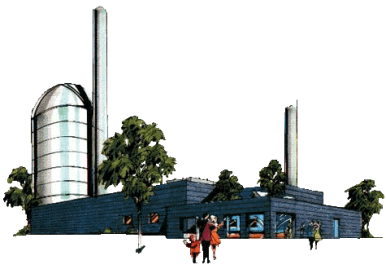


Dagsorden



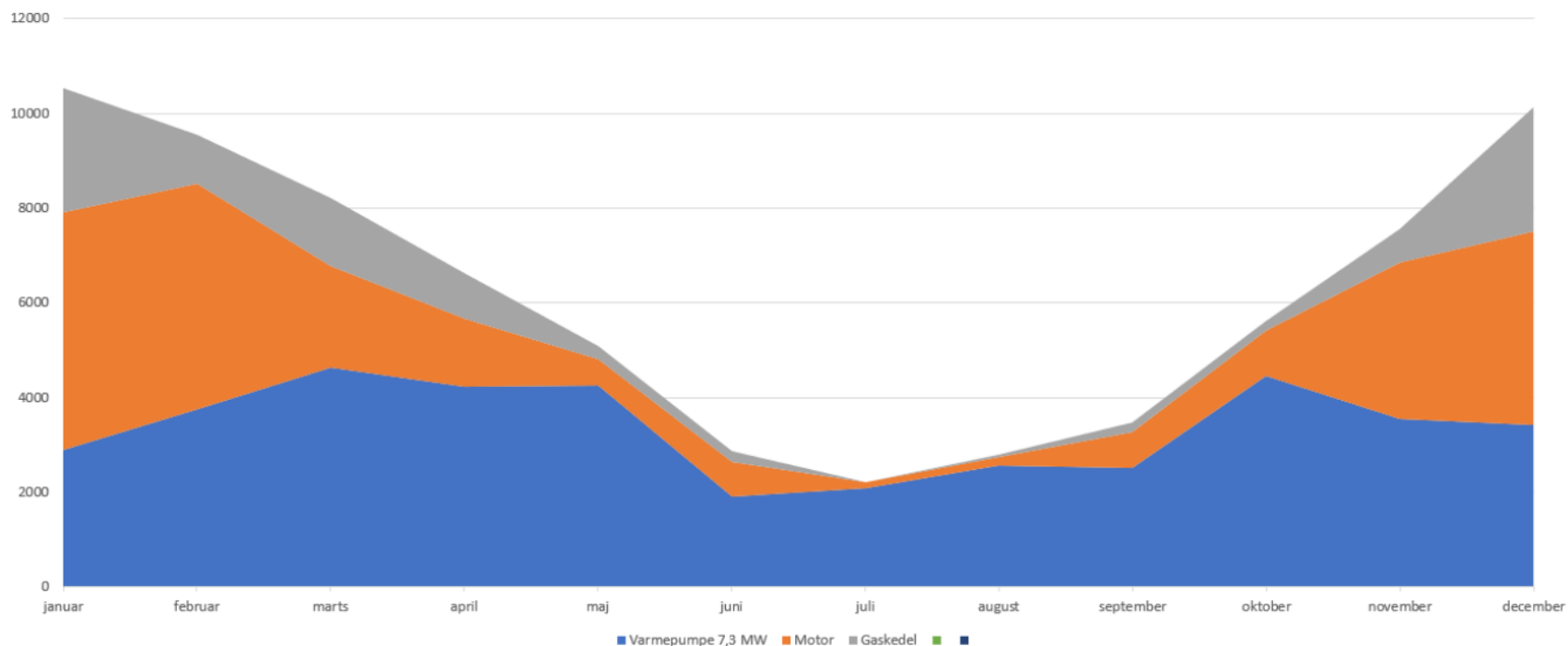
Dagsorden:

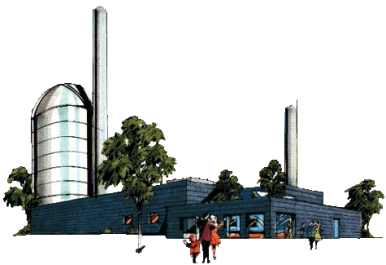
- **Elkedel – 10 MW, samt 3.700 m³ akkutank**



Varighedskurve 2021

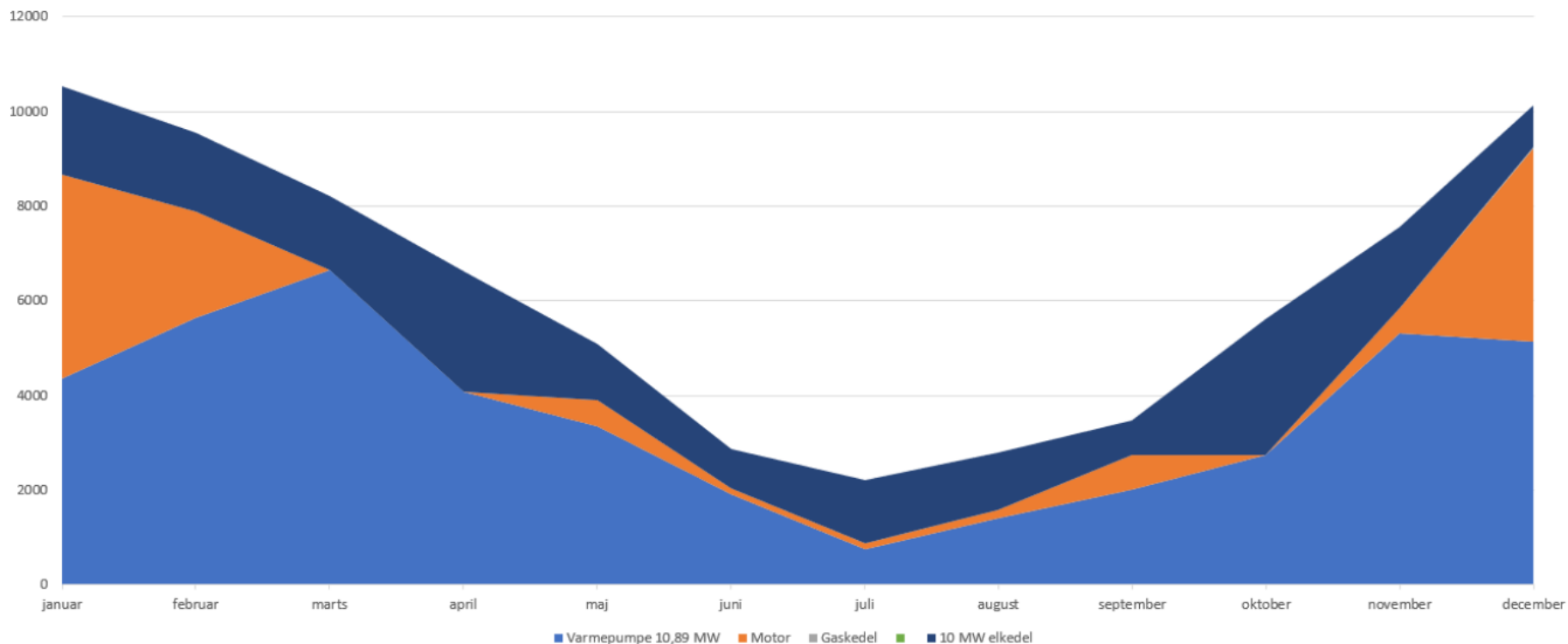
Varighedskurve 2021 - 7,3 MW varmepumpe





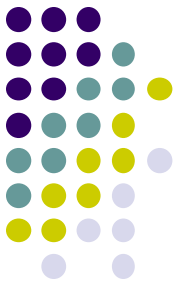
Varighedskurve 2025

Varighedskurve 2021 - 10 MW elkedel + 3. linje varmepumpen

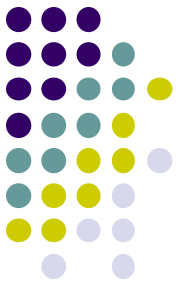
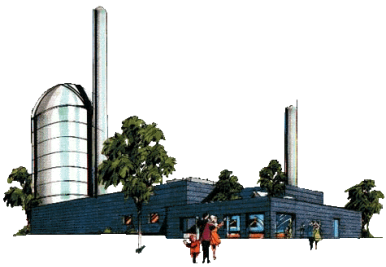




Akkutank

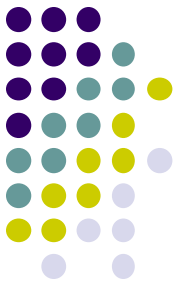


24-05-20

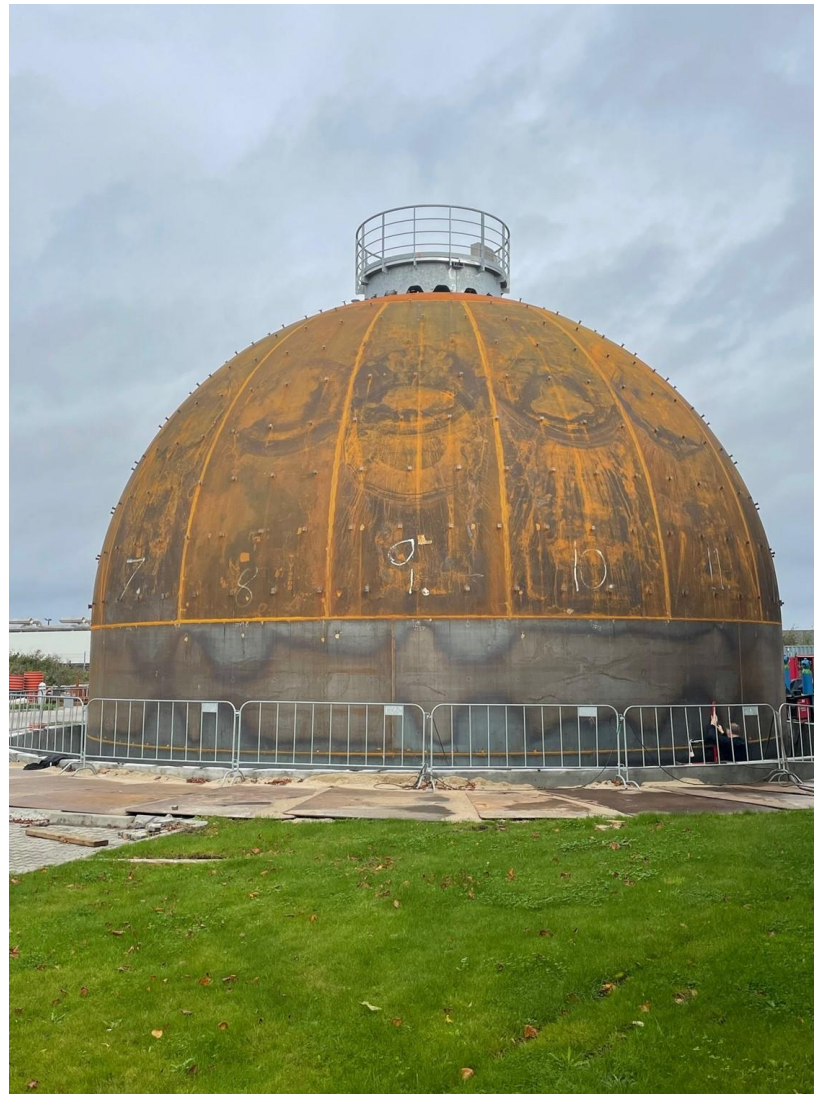


Akkutank



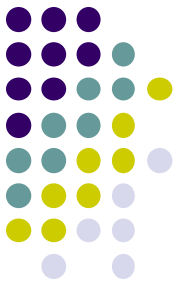


Akkutank

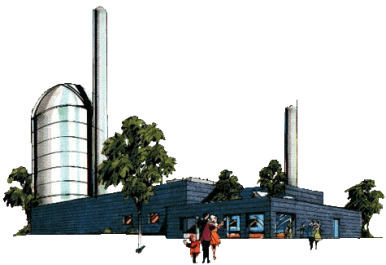




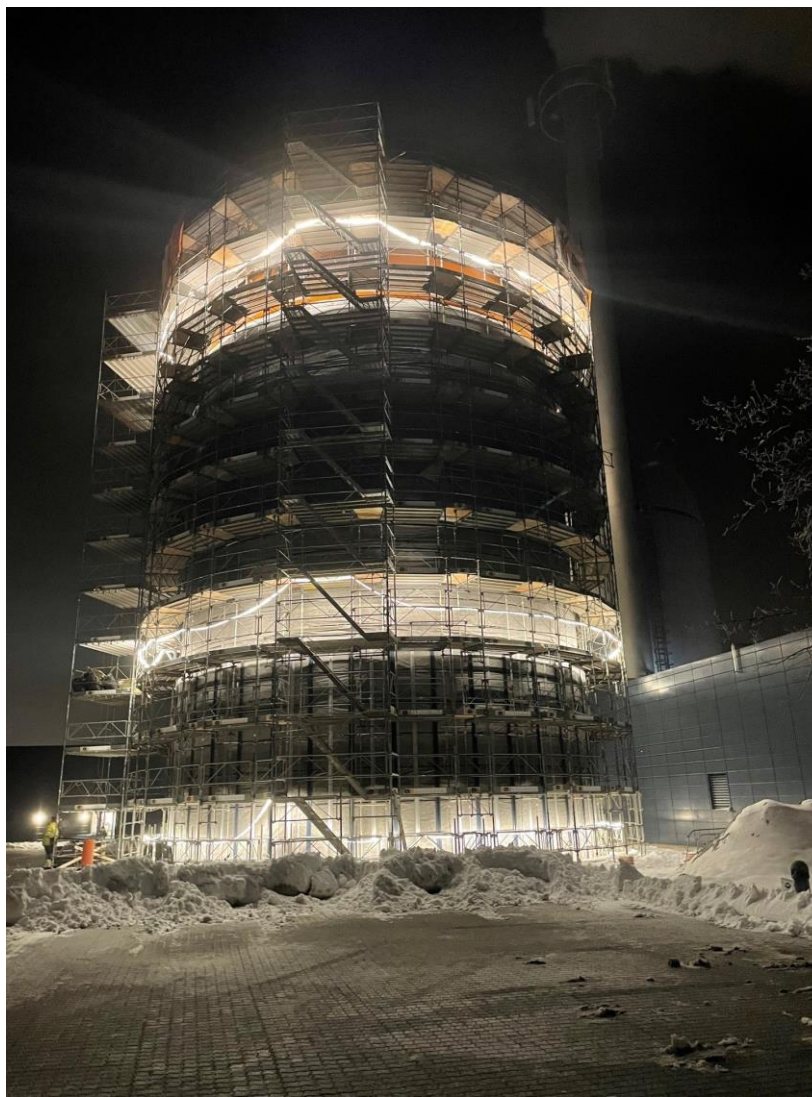
Akkutank



24-05-2024



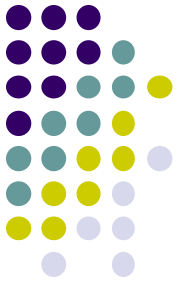
Akkutank



24-05-2024



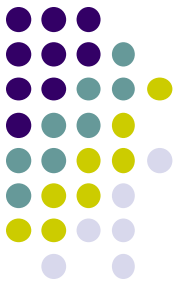
Akkutank



24-05-2024

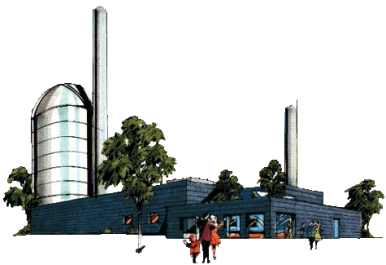


Støvring Kraftvarmeværk



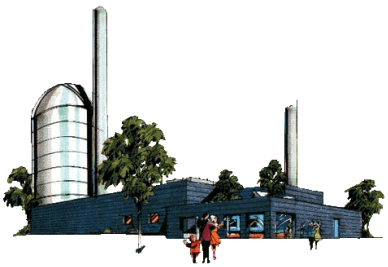
Dagsorden:

- **Nye gasmotorer, 2024**

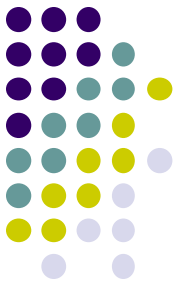


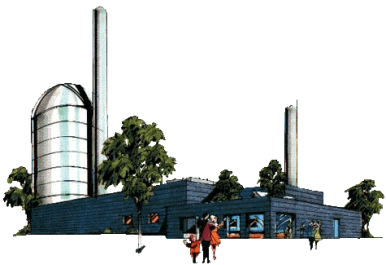
Hvorfor gasmotorer?





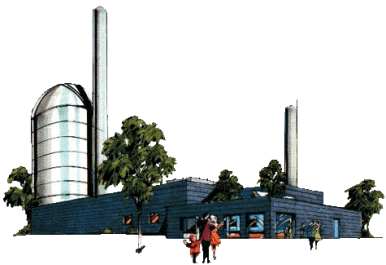
Hvorfor gasmotorer?





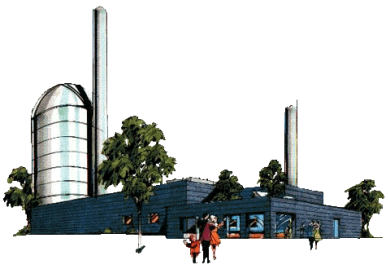
Hvorfor gasmotorer?



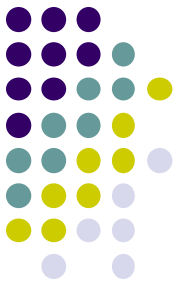


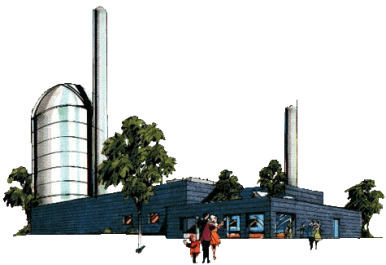
Hvorfor gasmotorer?





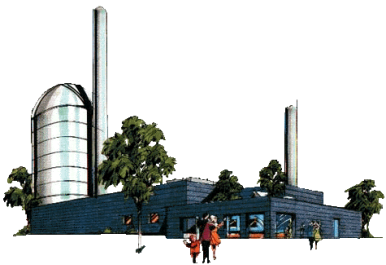
Hvorfor gasmotorer?





Hvorfor gasmotorer?

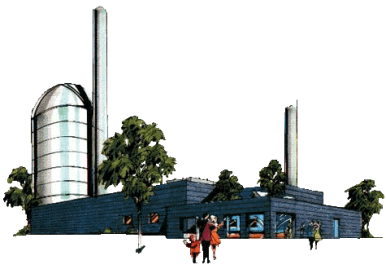




Støvring Kraftvarmeværk



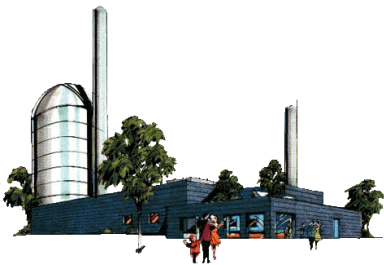
24-05-2024



Støvring Kraftvarmeværk



24-05-2024



Grøn skatterreform

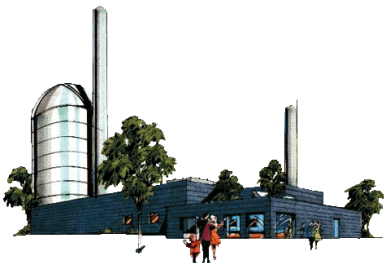
* linje 55 og 56 er efter den Grønne skattereform. Linje 51 og 52 er nuværende reform

Evidens	Gas motor & kedel i m3	Afgiftsfri gas i m3	Gas m. afgift i m3	Nedfors. Afgif. Biog Dist. Afg kr./m3	CO2 afg. kr./m3	Naturg. Af. kr./m3	Nox afg. kr./m3	Methan afg. kr/m3	I alt distr. afgift	I alt CO2 afgift	I alt Naturgas afg	I alt Nox afg.	I alt Methan afg	CO2 fritag	NG fritag	HMN opdelt i kr.	HMN i alt kr./mdr.	Note 1
	657.683	403.392	254.291	0,3924	0,460	2,834	0,030	0,071	258.074,63	302.533,97	1.863.872,35	19.730,48	46.695,46	185.560,32	1.143.212,93	1.162.133,6		
	84.062			0,3924	0,460	2,834	0,009		32.986,04	38.668,65	238.232,50	756,56	-			310.643,75	1.472.777,39	
	657.683	403.392	254.291	0,3924	1,922	1,369	0,030	0,071	258.074,63	1.264.065,86	900.367,41	19.730,48	46.695,46	775.319,42	552.243,65	1.161.370,8		
	84.062			0,3924	1,922	1,369	0,009		32.986,04	161.567,70	115.081,26	756,56	-			310.391,56	1.471.762,33	

Prisforskel i de to regneksempler: kr.: 1.015,06

linje 55 og 56 er efter

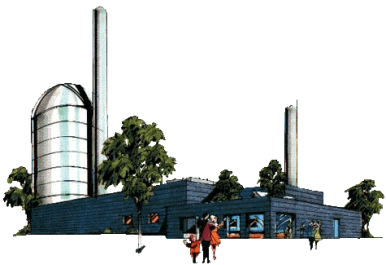
	CO2 afg. kr./m3	Naturg. Af. kr./m3	Nox afg. kr./m3
3924	0,460	2,834	0,030
3924	0,460	2,834	0,009
3924	1,922	1,369	0,030
3924	1,922	1,369	0,009



Grøn skatterreform



Eksempel fra 2023						Gasmotor	Varmeproduk.	Produkti	Produktions	Produktions	Produkti. Efter	Produktions	Merpris total værk
Varmeår	Gasmængde m3	CO2 udledning	Kr./ton (ny afgift)	Årlig udgift	Varmepro./MWh	Merpris pr. MWh	MWh	MWh	omkost i kr.	pris/MWh	ny afgift	pris/MWh	kr. /MWh
2025	2.498.804	5.579	85,0	474.215	24.841	19,09	68.329	68.329	28.542.579	417,72	29.016.794	424,66	6,94
2026	2.498.804	5.579	153,0	853.586	24.841	34,36	68.329	68.329	28.542.579	417,72	29.396.165	430,22	12,49
2027	2.498.804	5.579	221,0	1.232.958	24.841	49,63	68.329	68.329	28.542.579	417,72	29.775.537	435,77	18,04
2028	2.498.804	5.579	290,0	1.617.909	24.841	65,13	68.329	68.329	28.542.579	417,72	30.160.488	441,40	23,68
2029	2.498.804	5.579	358,0	1.997.280	24.841	80,40	68.329	68.329	28.542.579	417,72	30.539.859	446,95	29,23
2030	2.498.804	5.579	426,0	2.376.652	24.841	95,67	68.329	68.329	28.542.579	417,72	30.919.231	452,51	34,78

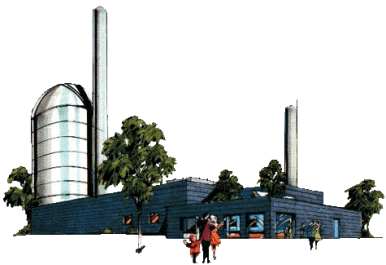


Støvring Kraftvarmeværk

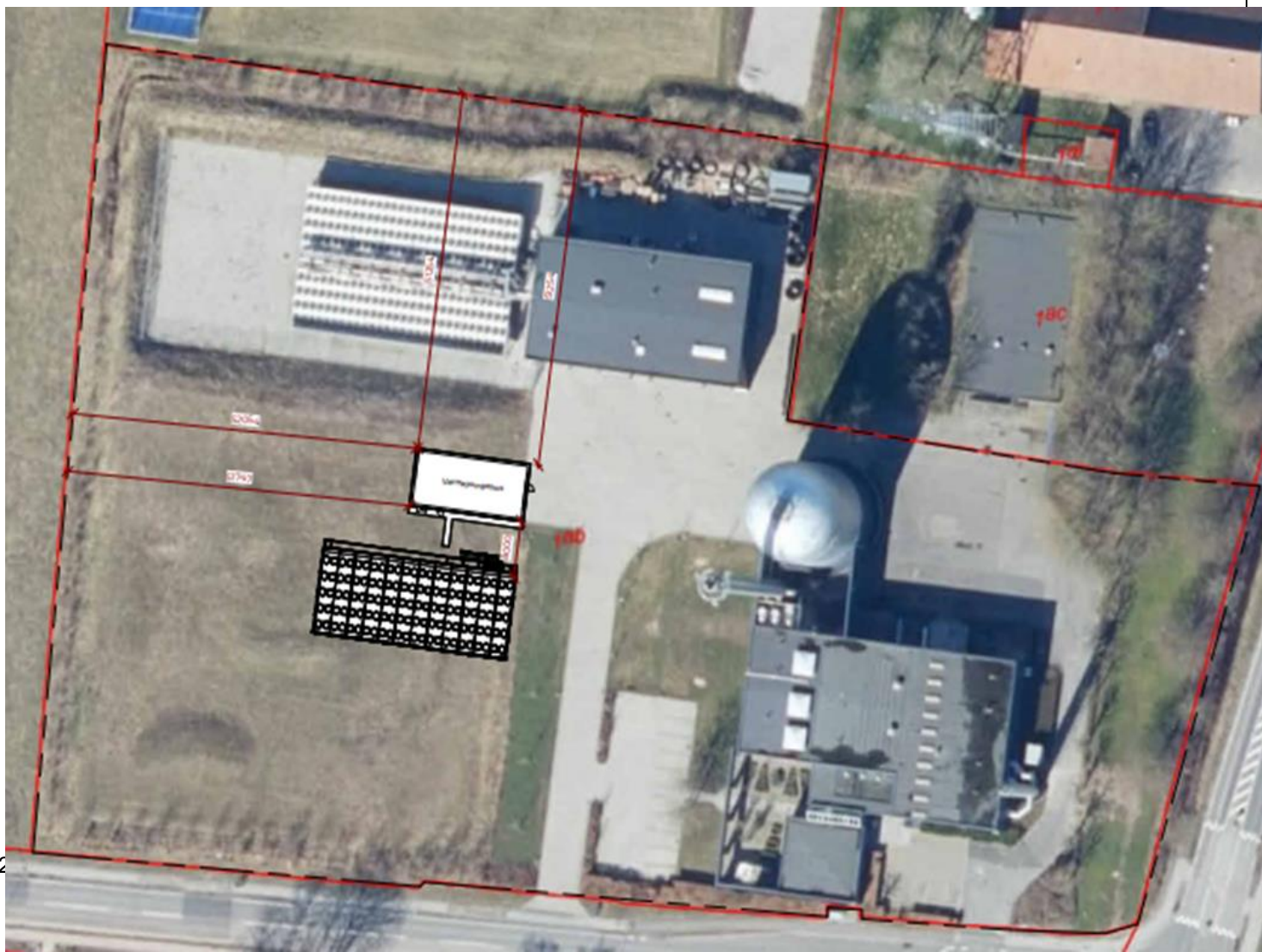


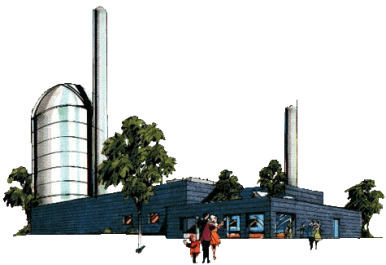
Dagsorden:

- **Varmepumpe 2024 – 3,3 MW**



Udbygning varmepumpe



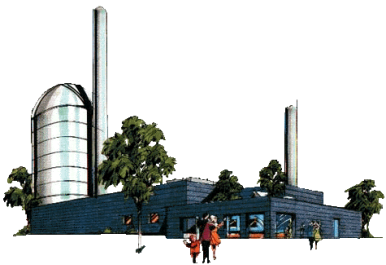


Udbygning varmepumpe



H1200-AW/WW

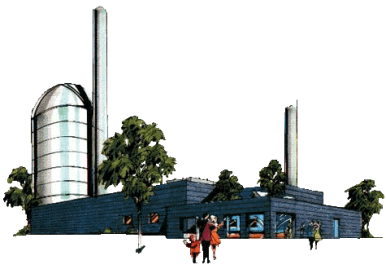
H1800-AW/WW



Udbygning varmepumpe



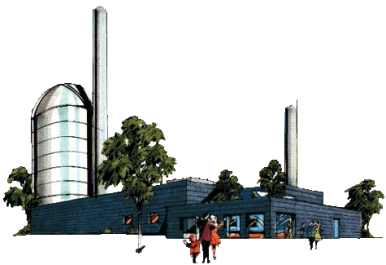
24-05-2024



Udbygning varmepumpe



24-05-2024

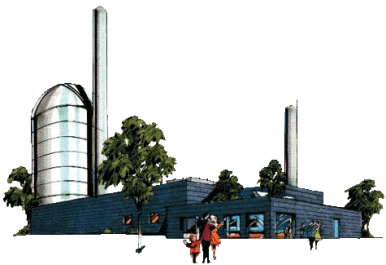


Støvring Kraftvarmeværk



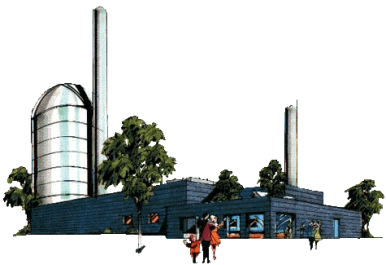
Dagsorden:

- **Solceller & vindmøller, er det noget?**

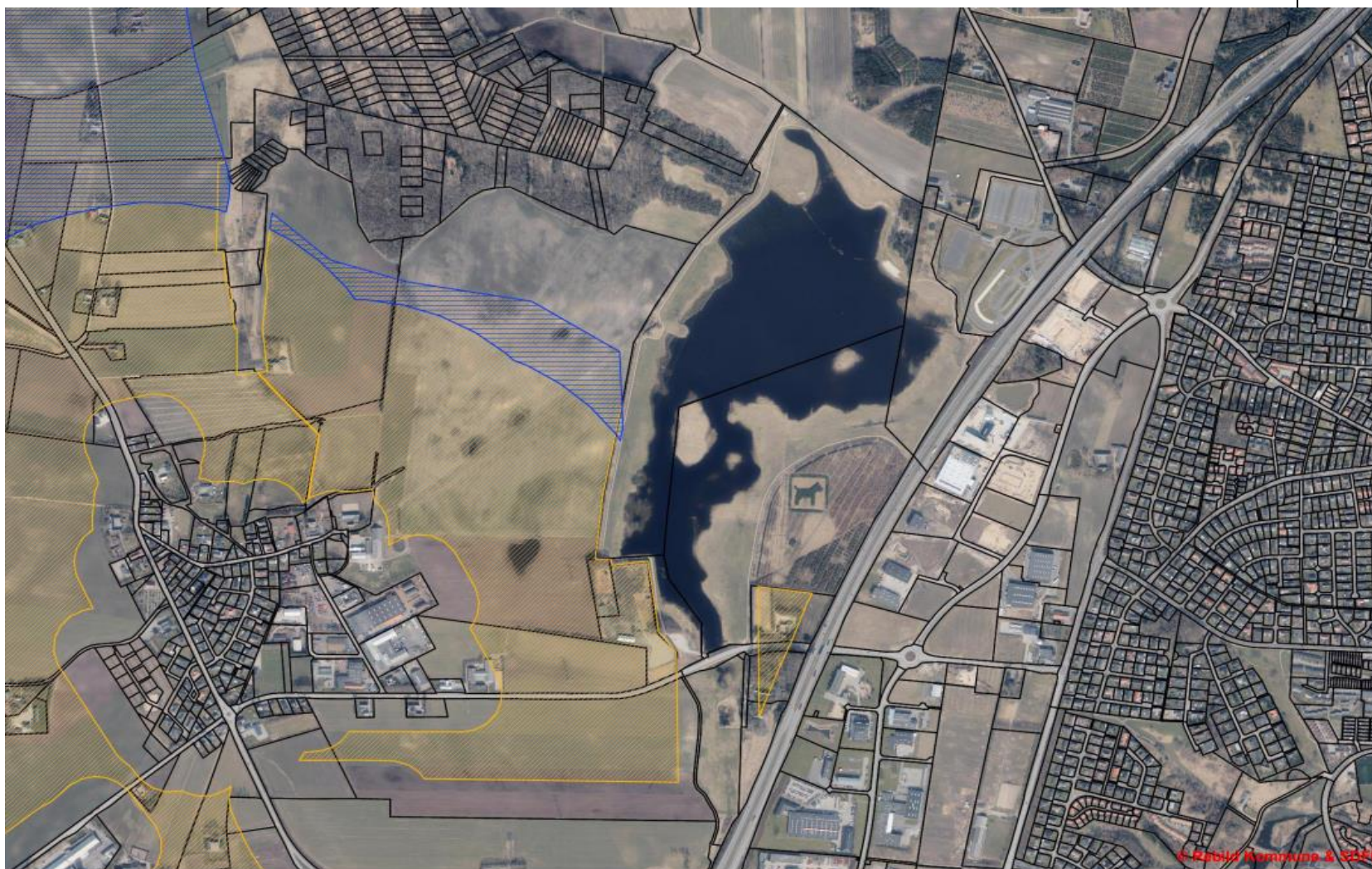


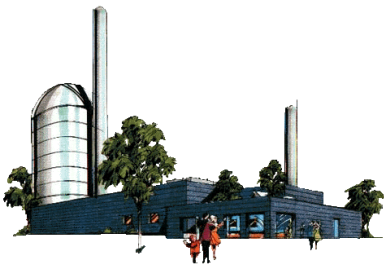
Sol og vind



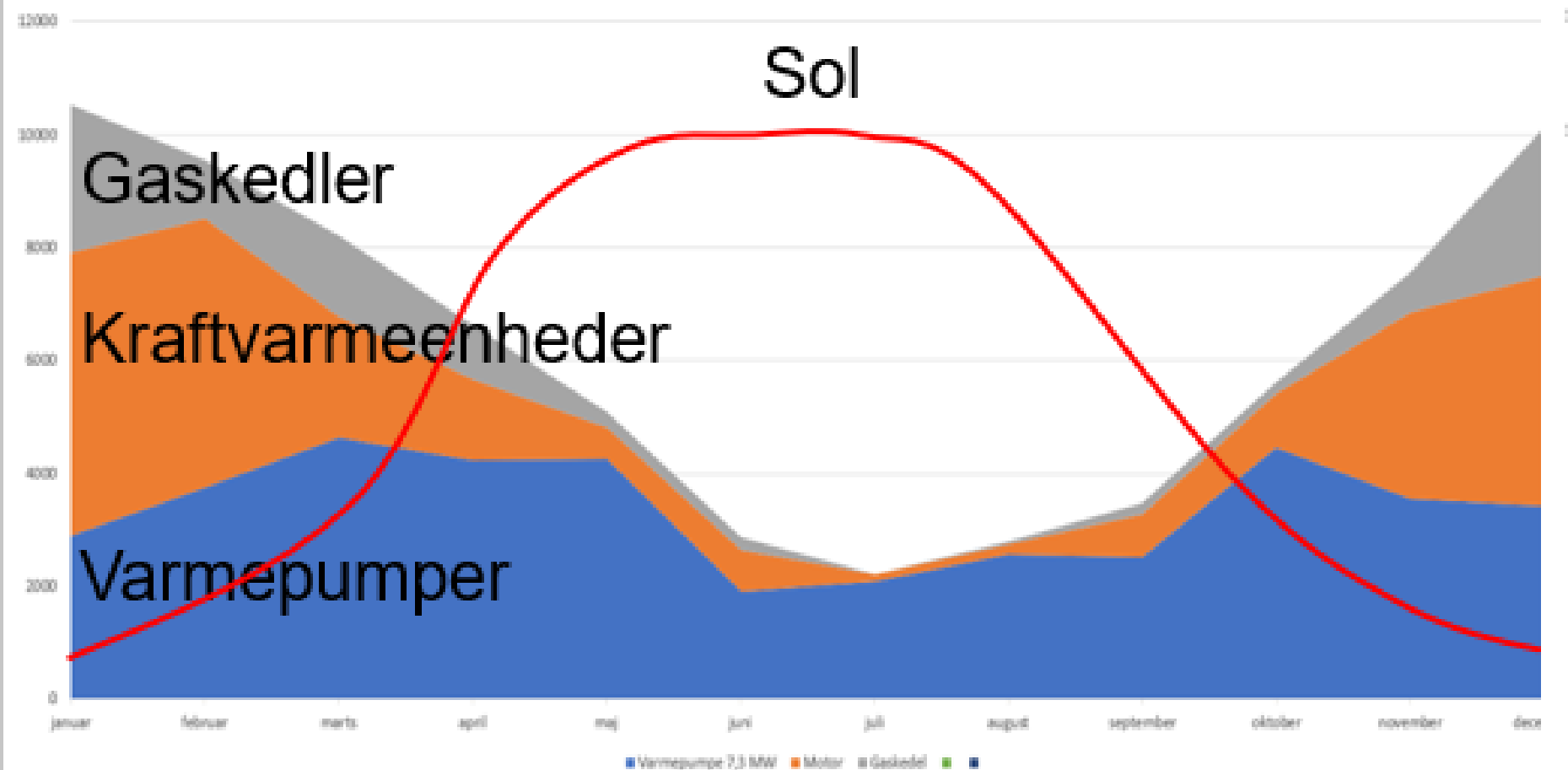


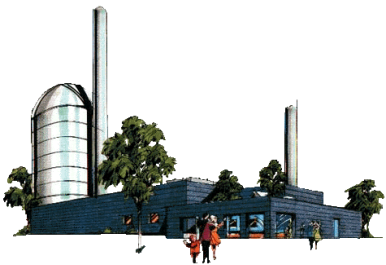
Sol og vind



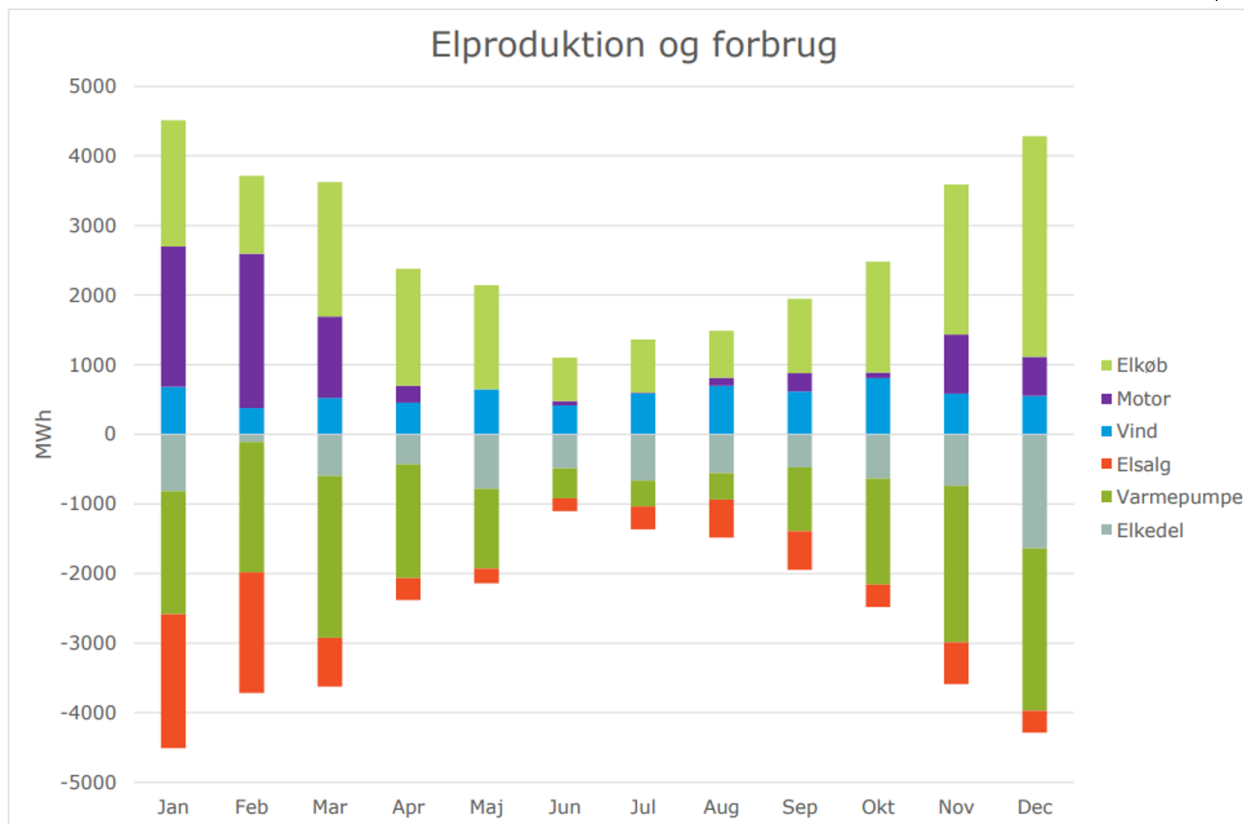


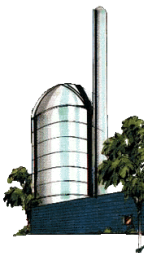
Sol og vind



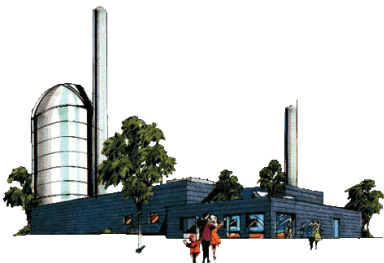


Sol og vind





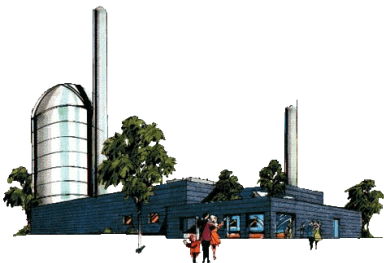
	Scenarie 2	Scenarie 2	Scenarie 2	Scenarie 2	Scenarie 2	Scenarie 2	Scenarie 2
	Vind	Vind	Vind	Vind	Vind	Vind	Vind
Elpris kr./MWh	256	125	225	325	425	650	1.300
N-gaspris kr./m ³	4,25	1,25	1,75	2,25	2,75	4,25	8,50
Solcelleanlæg, vindmølle	Direkte linje	Direkte linje	Direkte linje	Direkte linje	Direkte linje	Direkte linje	Direkte linje
Varmeproduktion - MWh							
Varmepumpe 1_2	54.616	55.819	54.878	53.370	51.437	46.881	35.563
Gasmotor 1_3	16	56	1.656	4.041	6.231	10.379	21.848
Gaskedel 1_2	0	0	0	0	0	0	0
Elkedel	10.369	9.125	8.466	7.590	7.332	7.741	7.590
Sum	65.000	65.000	65.000	65.000	65.000	65.000	65.000
Elproduktion - MWh							
Gasmotor 1_3	12	42	1.230	3.000	4.626	7.706	16.221
Solcelleanlæg	0	0	0	0	0	0	0
Vindmølle	6.956	6.956	6.956	6.956	6.956	6.956	6.956
Egenproduktion, i alt	6.968	6.998	8.186	9.956	11.582	14.662	23.177
Elforbrug - MWh							
Varmepumpe 1_2	19.700	20.124	19.790	19.271	18.587	16.919	12.809
Elkedel	10.580	9.311	8.639	7.744	7.482	7.899	7.745
Forbrug, i alt	30.281	29.435	28.429	27.015	26.069	24.818	20.554
Forbrug af egen elproduktion - MWh							
Gasmotor 1_3	3	42	1.050	1.845	2.098	1.787	1.058
Solcelleanlæg	0	0	0	0	0	0	0
Vindmølle	6.165	6.494	6.246	5.889	5.527	5.017	3.798
Egetforbrug i alt	6.168	6.535	7.296	7.734	7.625	6.803	4.856
Udveksling med elnettet - MWh							
Elkøb	24.113	22.899	21.133	19.281	18.445	18.015	15.698
Elsalg	800	463	890	2.223	3.958	7.859	18.321
Netto	0	0	0	0	0	0	0
Økonomi, 1.000 kr.							
Elsalg	292	74	341	1.348	3.188	9.377	39.297
Elkøb	-9.366	-6.672	-7.286	-7.248	-7.473	-8.619	-9.912
Solcelleanlæg (DV)	0	0	0	0	0	0	0
Vindmølle (DV)	-561	-574	-564	-550	-536	-516	-469
Motoranlæg	-20	-44	-1.420	-3.765	-6.286	-12.959	-42.439
Varmepumpe 1_2 (DV)	-1.256	-1.284	-1.262	-1.228	-1.183	-1.078	-818
Gaskedler	0	0	0	0	0	0	0
Elkedler (DV)	-73	-64	-59	-53	-51	-54	-53
VE-bonusordning 1,5%	-27	-13	-23	-34	-44	-68	-136
Sum	-11.009	-8.577	-10.274	-11.530	-12.386	-13.917	-14.530
Investering	-28.600	-28.600	-28.600	-28.600	-28.600	-28.600	-28.600
Ydelse på lån	-2.067	-2.067	-2.067	-2.067	-2.067	-2.067	-2.067
Samlet, 1000 kr.	-13.077	-10.644	-12.341	-13.597	-14.453	-15.985	-16.597
Difference fra Reference	125	-704	-95	495	1.100	2.501	6.516



Sol og vind

	Scenarie 2	Scenarie 2	Scenarie 2	Scenarie 2	Scenarie 2	Scenarie 2	Scenarie 2
	Vind	Vind	Vind	Vind	Vind	Vind	Vind
Elpris kr./MWh	256	125	225	325	425	650	1.300
N-gaspris kr./m ³	4,25	1,25	1,75	2,25	2,75	4,25	8,50

Udelse på idii	-2.007	-2.007	-2.007	-2.007	-2.007	-2.007	-2.007
Samlet 1000 kr.	-13.077	-10.644	-12.341	-13.597	-14.453	-15.985	-16.597
Difference fra Reference	125	-704	-95	495	1.100	2.501	6.516



Sol og vind



Støvring Kraftvarmeværk - el fra vindmølle, sammenlignet med el fra nettet

22.03.2024

Beregning el fra 2 MW vindmølle

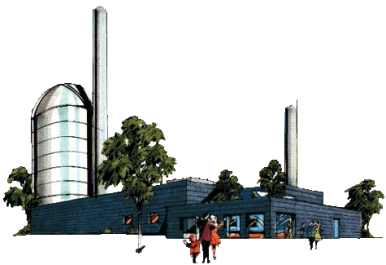
Anlægsinvestering i kr.	Afskrivnings- periode (år)	Årligt afdrag i kr.	Rente i procent	Første års renteudgift i kr.	Udgift første år i kr.	Årsproduktion i MWh (el)	Produktionspris kr./MWh (el)	N1 rådighedsbetaling kr. MWh (el)	Vedligehold kr. MWh (el)	Endelig elpris kr. MWh (el)
28.600.000	15	1.906.667	3,8	1.086.800	2.993.467	7.000	428	39	13	480

Beregning el fra nettet

Elvarmeafgift kr./MWh (el)	Energinet nettarif kr. /MWh (el)	Energinet systemtarif kr. /MWh (el)	Distributionsafgift kr. /MWh (el)	Elpris vind kr. /MWh (el)	Endelig elpris kr. MWh (el)
4	74	51	52	309	490

Tast i gule celler:					Årlig pris vindmøllestrøm	3.357.467	kr./år
Rente	3,8	%			Årlig pris køb elnettet	3.430.000	kr./år
Afskrivningsperiode	15	år					
Pris vindmøllestrøm	309	Kr./MWh el					
Distributionsafgift	52	Kr./MWh el					

Spidslast	94	Kr./MWh
Højlast	47	Kr./MWh
Lavlast	16	Kr./MWh
Gennemsnit *	52	Kr./MWh



Støvring Kraftvarmeværk



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