Case study : PEC Kalisz (Poland)

Name of the project:	SM BLONIE and KALISKA SM
Adress of the project:	Nowe Skalmierzyce, Kaliska street
Name and type of the owner:	PEC KALISZ SA; Przedsiębiorstwo Energetyki Cieplnej S.A. w Kaliszu 62-800 KALISZ, ul. Marii Dąbrowskiej 3
Owner contact person:	Marian Kazienko, +48 62 765 26 22, m.kazienko@pec.kalisz.pl

Context of the study

The study was initiated by PEC Kalisz answering the announcement published by IEO about possibility for preparing pre-feasibility study for large solar-thermal installations integrated with district heating network in the SDHplus project. PEC Kalisz, local district heating company have been already considering such investment on the roofs of residential block of flats belonging to two housing associations SM Blonie and Kaliska SM. PEC Kalisz is supplying those buildings with heat generated in nearby boilers and distributed by local network. Housing associations were interested in such installation assuming that they would lower bills for heating water.
The basic fuel used in the neighborhood boiler is coal, supplemented with biomass burning in the second boiler.

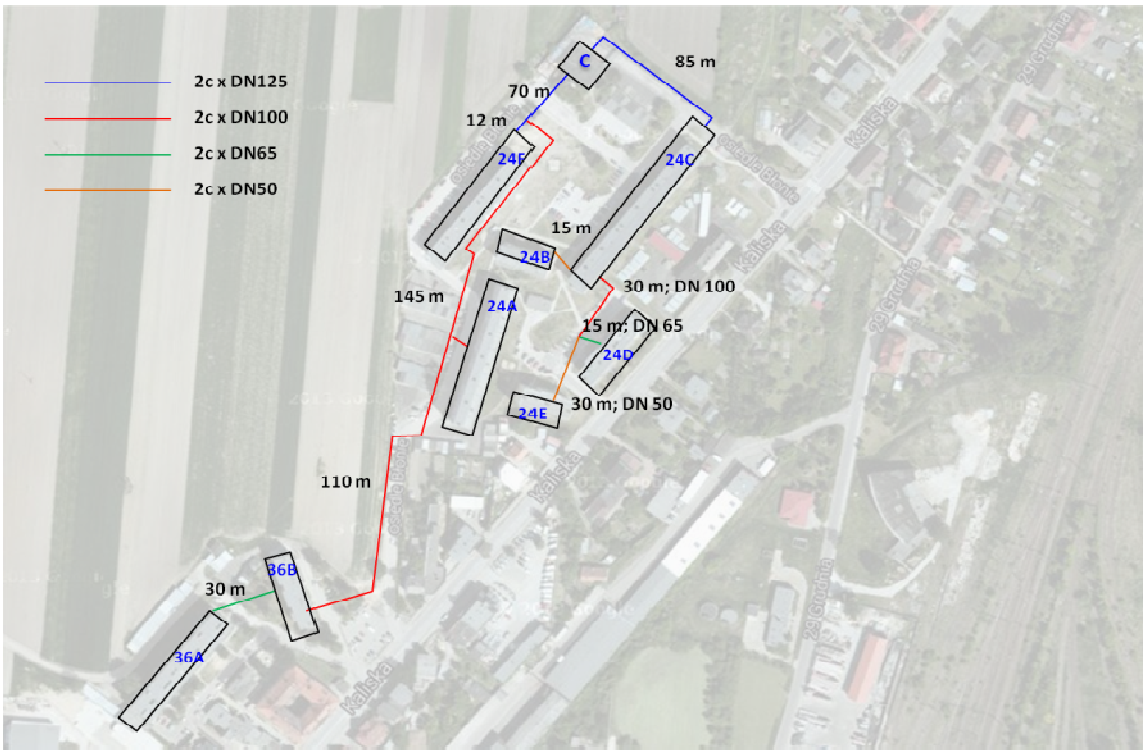
Support

There is no regular standardized supporting system offering financial or other type of support for preparing conceptual studies. Some opportunities are available and it is up to the interested company to seek such support. Usually investors prefer preparing documentations strictly required to get building permits.

SDH plant

SDH system concept

Solar thermal collectors and additional equipment were planned to be located on the roof of respective building (see the picture below). According to the preliminary plans collectors were planned to be located at each roof, elements were located in technical rooms at each building.



SDH technical data

No	Building	Residents	Hot water consumption	Collectors.	Buffer tank	Collectors surface	CAPEX
		Person	m³/a	pcs	l	m²	zł
1	24A	190	1622	29	6 000	63,51	183 237
2	24B	64	575	11	2 000	24,09	67 311
3	24C	200	1880	20	4 000	43,80	128 072
4	24D	84	832	15	3 000	32,85	95 626
5	24E	62	551	13	2 500	28,47	83 301
6	24F	176	1631	22	4 000	48,18	137 666
7	36B	42	384[1]	8	1 500	17,52	49 985
ALL		**818**	**8348**	**106**	**20 000**	**258,00**	**745 198**

SDH energy balance (MWh)

The performance of analysed systems were done in POLYSUN software. Some data were delivered by PEC Kalisz (heat consumption, the number of residents and available space on roofs), some parameters were assumed (e.g. heat consumption profiles). All assumptions as well as results were evaluated by PEC Kalisz.

No	Building	Calculated collectors surface	Calculated energy	Solar fraction	Fuels saving	Avoided fuel costs	Incomes from selling heat	Discounted payback time
		m²	kWh	%	ton	zł/a	zł/a	years
1	24A	63,20	34 225,80	44	7,47	3 742,17	6 845,17	12
2	24B	24,00	12 797,70	34	2,79	1 399,27	2 559,46	11
3	24C	43,60	26 496,60	32	5,78	2 897,06	5 299,32	11
4	24D	32,70	17 797,30	37	3,88	1 945,91	3 559,46	12
5	24E	28,30	14 327,50	39	3,13	1 566,53	2 865,50	13
6	24F	48,00	27 900,10	36	6,09	3 050,52	5 580,03	10
7	36B	17,40	9 122,40	32	1,99	997,43	1 824,49	12
		257,20	**142 667,40**		**31,13**	**15 598,89**	**28 533,43**	**av. 11,57**

SDH economics

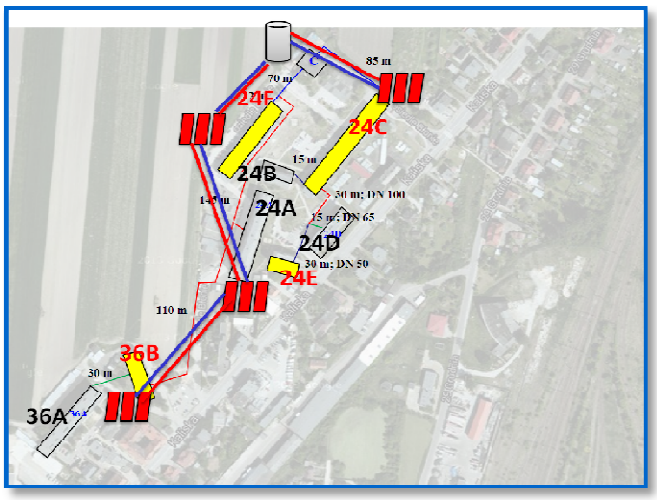
The set of parameters assumed for economical analysis, namely CAPEX, incomes from selling heat and savings due to lower fuel consumption, presents the table above.

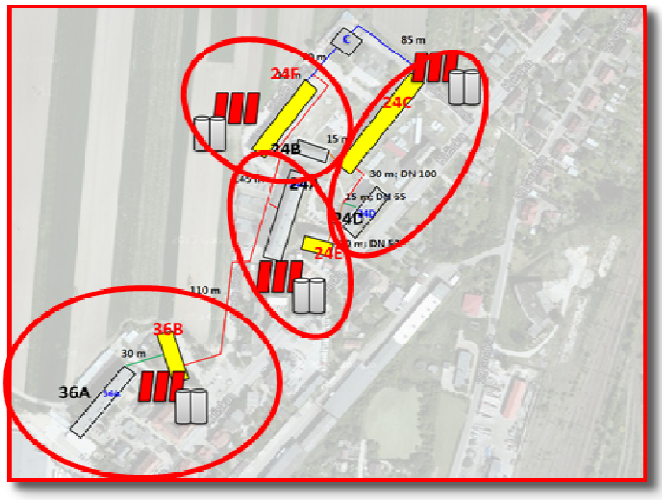
SDH plant opportunities & threats, benefits & limits

Housing associations expressed willingness to install ST installations on the condition that the discounted payback time will no longer than 7 years. To reach such payback time there is necessary to have CAPEX lower either by having funding and benefiting from economies of scale. Finally investors declared that he would refrain from decision up to economic requirement would be reached. There are several options possible including increase of fuel prices, implementing subsidy system etc. From the SDHplus perspective some technical improvements aiming at decreasing CAPEX were proposed. Namely clustering collectors' fields and installing cumulating heat storage receiving heat from collectors through district heating network. In both cases some elements are not necessary as for instance one, bigger equivalent could be used commonly. The economical evaluation were not performed. Respective variants are presented on schemes below.

Photos / Graph / Scheme

The cumulative heat storage; clustering collectors fields in selected buildings.





Authors

This factsheet was prepared in March 2015 by Mr Grzegorz Kunikowski From ECBREC IEO with the help of prof. Jan Olof Dalenback.

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