

Case study : FORTUM (Poland)

Name of the project:	FORTUM POWER AND HEAT POLSKA Sp. z o.o.
Adress of the project:	Fortum assets in Wroclaw (Poland)
Name and type of the owner:	Fortum, Heat Division Emilii Plater 53 00-113 Warsaw, Poland
Owner contact person:	Lukasz Lech, lukasz.lech@fortum.com

Context of the study

The study was prepared for Fortum Power and Heat Polska and concerns possibility of application large-scale solar thermal installations for preparing hot water. The target group are customers connected to the heat network in Worclaw city, namely Krzywoustego estate. Key elements determining economic viability of installing such installations are CAPEX, OPEX and energy balance.

The purpose of the study is presenting the relationship between interdependent parameters of Solat Theremal installations, namely: the capital expenditures, heat production volumes and operational costs.

The applied approach follows that no certain object (e.g. block of flats) with specific demand and description was indicated. Thus using described hereinafter methodology we have assessed relationship between CAPEX, OPEX and productivity in the form of graphs. Such results are supposed to preliminary evaluate economical justification of installing solar thermal installations when demand and conventional heat costs are known. As seasonal variation of heat costs from conventional system is an important factor determining profitability of ST the detailed knowledge about dynamic characterization of production costs, particularly beyond the heating season, is a must.

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

Due to general character of the study, results do not refer to certain object or objects, and are focused on research on economical and technical relationships.

The methodology:

1. Identification of basic parameters of realized ST projects with similar heat demand volume and use profile
2. Development of relationship between CAPEX and productivity for all identified installations
3. Development of total incomes from selling heat taking into account changeable part of heat tariffs
4. Evaluation of results
5. Interpretation of results

In this case:

Ad.1. There were used information from finished tenders (table below). Gathered data were supplemented by the results of simulations in Polysun – annual heat production.

Ad.2. Using collected data the relationship between CAPEX and production was evaluated in the form of quadratic polynomial

Ad.3. The incomes were assessed on the base of the FORTUM heat tariffs and evaluated in the form of continuous function (relationship between volumes and incomes).

Ad.4. The final results were presented in the form of graph depicting CAPEX and productivity. Parameters are varied and we get several functions of costs and incomes.

Ad.5. The graphs present both: cost functions and income functions. The intersection points allow to identify break even points. If there are available lower costs (e.g. due to having grants) then decision makers can select appropriate curve from cost functions, as well as considering seasonal variations of heat production costs.

SDH technical data

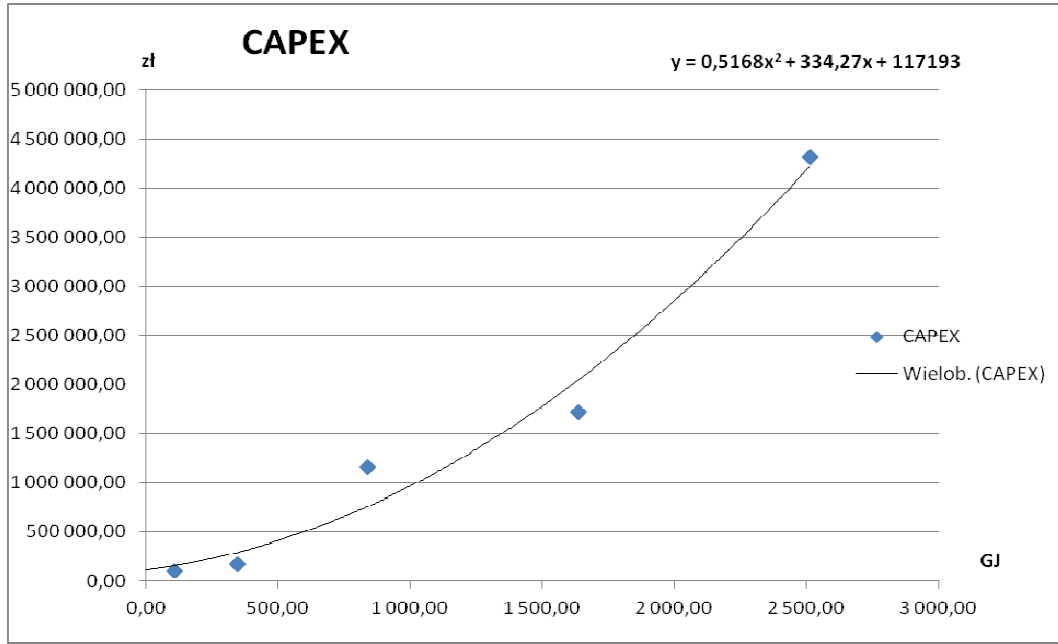
Information from tenders are in the table below.

No	Investor	location	Collectors area	CAPEX	Comment
			m ²	zł (net)	
1	Social welfare home	Kwidzyn	37	103232	2011
2	Social welfare Home	Lipsk	121	171596	2011
3	Sport complex	Chorzow	315	1163295	2013
4	Housing Association Grunwald	Olsztynek	710	1721326	
5	Hospital	Czestochowa	1500	4315144	2007

No	Collectors area	Annual heat production	Annual heat production
	m ²	kWh	GJ
1	37	29 146	104,93
2	121	95 671	344,42
3	315	263 225	836,01
4	710	454 018	1 634,46
5	1500	698 094	2 513,14

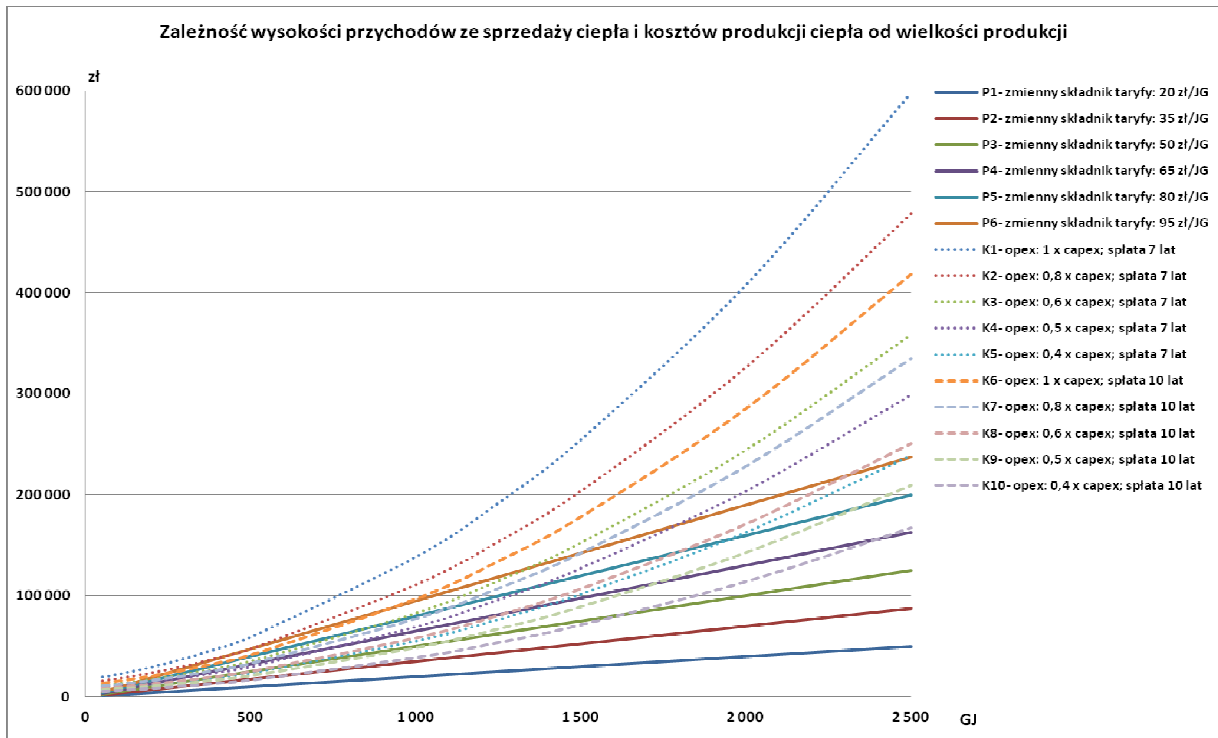
SDH energy balance (MWh)

The graph below presents relationship between capital expenditures (CAPEX) and productivity of ST installations. The CAPEX values were collected from tenders and relevant productivity values were calculated using Polysun software.



SDH economics

The graph below presents relationships incomes and costs. The production is proportional to the ST installation size.



SDH plant opportunities & threats, benefits & limits

Installation of ST in housing associations on their own is more and more popular. There is also possible active participation of DH companies in a so called formula "investment at the customer's site".

The study allows preselection of suitable sites where ST installations are economically justified.

Applied methodology is extendable and additional costs and incomes categories can be added, e.g. CO2 emission claims.

Photos / Graph / Scheme



Authors

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