PILOT ACTION COMMUNITY USTKA

SECTOR

POMERANIA
POLAND

TYPE OF ENERGY CONSUMPTION
- **HEAT ENERGY**
- **HOT DOMESTIC WATER**
- ELECTRICITY
- WATER

USE OF RENEWABLE ENERGY RESOURCES (POTENTIAL OR ACTUAL)
- **BIOMASS**
- WIND ENERGY
- GEOTHERMAL ENERGY
- **SOLAR ENERGY**
- HYDROELECTRIC POWER STATIONS

RATIONAL USE OF ENERGY
- SUSTAINABLE BUILDING SYSTEMS, LOW ENERGY HOUSING
- **BUILDING THERMAL MODERNISATION**
- **MODERNISATION AND UPGRADING OF THE HEATING SYSTEMS**
- MODERNISATION OF LIGHTING
- BALANCED/SUSTAINABLE TRANSPORT

As a seaside health resort Ustka realizes its spatial policy in accordance with the principle of sustainable development. The major objectives of this policy are the following:
- minimization of space and natural resources use
- economical, rational and effective management of energy.

COMMUNITY

Geographical position: 54°35' N, 16°51' E
Main profile of activity in the region: health resort, tourist industry, sea harbour.
Number of inhabitants: 16 955 (2006)
Important institutions: District Heating Company EMPEC Ustka Ltd., Ustka Municipality, Housing Association UTBS

Energy data:
Energy supply (number of households): 6 437
Energy consumption (GJ): 192 549 (households only)
Total heated flat area (m^2): 401 144 (flats) + 18 291 (summer houses)
Energy source (for heating &htw): DH (55,3%-coal), coal (12,3%), wood (4,7%), oil (12,3%), gas (10,7%), electricity (4,5%), solar energy (0,2%).

Climatic data:

Hours of sunshine per year:	1639
Degree-days:	3 958
Average yearly temperature:	7,38°C
Mean wind speed:	5,5 m/s
Average of heating days per year:	238

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COST AND BENEFITS

Economical

The cost of reducing CO_2 emission generated by district heating system, obtained as a result of both stages of the modernization will amount to 12 €/1 t CO_2.

Environmental

The considerable reduction of emission generated by the heating systems is significant due to the spa character of Ustka.

Present situation		2015	2025	Emission [t/year]	Change [%]	Emission [t/year]	Change [%]
	a	b	b1	c =a-b	d=c/a *100	c1=a-b1	d=c1/a *100
SO_2	141,56	116,5	13,1	25,03	17,7	128,51	90,8
NO_2	29,38	27,1	23,9	2,33	7,9	5,50	18,7
CO	459,49	395,5	41,4	64,04	13,9	418,11	91,0
Dust	275,24	231,9	17,4	43,38	15,8	257,85	93,7
CO_2	30 854,45	25 947,8	18 652,7	4 906,64	15,9	12 201,71	39,5

EVALUATION AND OUTLOOK

The project is at the phase of planning with regard to the modernization of the district heating system. The other activities such as the thermal retrofitting of the multi-family buildings are nearing completion - about 30 buildings in total are undergoing this process. The concept of revitalization is also under realization. Old fisherman's houses are being reconstructed and the Chopin street, Zaruski street and Beniowski street in the revitalized part of the town are being modernized (not only the surface layer but the underground installations, such as the sewage system, water conduit and electric mains, as well the lighting). The municipality obtained the funds for the modernization of the infrastructure. The buildings revitalized by Ustka Public Building Society are being sold on the free market and the revenues obtained in this way are used to finance housing for citizens with lower income. This solution has proved to be successful. The town enhances its image and the quality of the air in the town will improve.

FURTHER INFORMATION

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Przedsiębiorstwo Energetyki Cieplnej "EMPEC" Sp. z o.o w Ustce

Miasto Ustka

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CONTEXT

The concept of sustainable energy policy is being implemented in Ustka in all sectors: starting from the place of energy production, through the distribution network, to the actions on fuels market and at the end consumer. At present the main energy carrier for Ustka is coal, with the 38% share in the energy consumption. The other energy carriers are: gas, oil, wood and electricity. Well developed central heat distribution network supplies over 35% of energy needed for heating purposes and hot usable water preparation. Thermomodernisation works are being conducted in residential housing and public buildings. Heat supply network is re-developed and enlarged as a part of the old town revitalization. Scenarios have been prepared for the heat source consecutive modernization, and for the exchange of coal for renewable energy carriers and gas or biogas (whenever it is available).

EXPERIENCE OF THE CITY

Partnership process

The district heating company EMPEC Ustka Ltd. is owned by the Municipality (major shareowner) and the company E.ON Sverige. Therefore it cooperates both with the representatives of the municipality and the Swedish partner. It also has good relations with the energy end-users and its activity is aimed at the acquisition of new heat end-users. The municipality carries out its primary duties within the scope of heat supply and municipal housing.

(photo by: Fundacja e-MEDIA

Technical data

Modernization of the district heating system

Stage I – installation of the boiler fired with wood chips of 2 MW of capacity for the production of hot tap water for the district heating system.
Stage II – installation of combined district heating units of total capacity 4 MW_e and 5,6 MW_{th}, which altogether with the installation of the biomass fed boiler and the peak-load boilers of total capacity 11,4 MW, fired with natural gas or biogas, depending on the current prices of these energy carries, will cover about 75% of heat demand.

Photo by: Fundacja e-MEDIA

Thermal retrofitting and revitalization of buildings

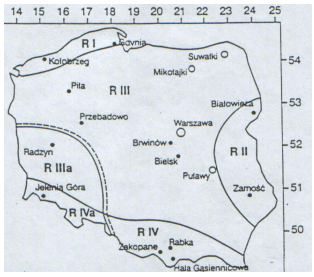
Most of the multi-family buildings have been already thermomodernized. The completion of thermal retrofitting of multi-family residential buildings and the revitalization of old fisherman's houses are ongoing.

Photos by Public Building Society –UTBS: Old fisherman's house in Ustka before and after modernization

RES POTENTIAL

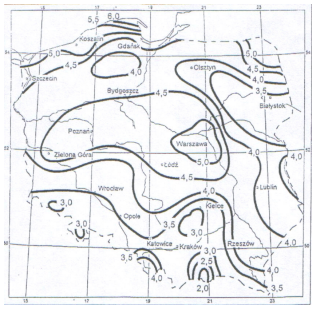
Availability of the following RES has been determined for Ustka municipality:

- Solar energy
- Wind energy
- Energy from biomass and biogas.



Solar energy

Ustka in placed in the most sunny region, where the potential energy from sun equals 1012 kWh/(m^2·year. The average number of sunny hours in the year time equals 1639, 4.



Wind energy

Ustka is characterized by good wind conditions. Small installations for households shall be considered there. Large wind parks are not planned there due to municipal development.

Biomass energy

Straw and wood for energy purposes may be collected from the rural community, which lies in neighbourhood of Ustka. Also biogas may be produced there and supply the gas network in biogas.

The town has a potential to satisfy **14%** of the heat demand with local renewable resources.

Type of fuel	Calorific value [GJ/unit]	Energy potential [GJ/year]
straw	14,5	36 500
wood	7	34 000
energy willow	8	8 400
Total		**78 900**

Tab.1. Potential of bioenergy for Ustka

MOBILISING END-USERS

Pilot actions were addressed to the energy end-consumers. The following activities were arranged:

- questionnaire – examining the social awareness in respect to sustainable energy, energy use efficiency and available RES.
- Project presentations,
- Education materials, guidelines
- Website information
- Video on Ustka
- Series of seminars around Poland
- Development of good practices in thermomodernization
- Development of toolbox for communities

Pict.1 SEC Toolbox by BAPE