The Identification of Specific Expertise (4.3.1)

Project output 4.3.1. Identification of Specific Expertise
FINAL version, 11.02.2014
Information collected from Project Partners by WP4 Leader - PNEC (PP9)

VIS NOVA project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF

Application Form Requirements:

4.3.1	Identification of Specific Expertise	Based on the Transnational Sustainable Energy Strategy, expertise is identified that is relevant to mutually assist other regions' project partners in the preparation of their pilot investments and feasibility studies.	approx. 10 competences identified

„This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF.”

Concept of the Identification of Specific Expertise

Each region recommended his two strongest competences, related to the theme of VIS NOVA project. Expertise can be used by other regions in the preparation of their pilot investments and feasibility studies. Competences were based on the Transnational Sustainable Energy Strategy (TSES) and other relevant documents (like pilot investment concepts, feasibility studies, SWOT analysis). Each competence consists of:

1. Title of the competence.
2. Brief expertise introduction.
3. Competence description:
   3.1. Concept / background.
   3.2. Stage of implementation: project, ongoing or finalized.
   3.3. Aims and activities.
   3.4. Barriers, risks, problems occurred.
   3.5. Main results.
4. Competence conclusion.
5. Short region introduction and contact details (to the person/institution responsible for the issue presented, if any future questions appear).

Identification of Specific Expertise was prepared to show strengths of regions implementing VIS NOVA project. Other regions can use these experiences while implementing similar activities.

Concrete investments or projects were showed as examples of something more - regional policies carried out through such activities. Thanks to such approach, each specific expertise shows the most important, pro-energy oriented advantages of described regions.

This study includes descriptions of competences from:

Gorlice District

- ✓ Thermal efficiency improvement and renovation of public buildings.
- ✓ Recognition of geothermal water resources and the estimation of costs of the investment relating to the acquisition of geothermal energy for heating and recreational purposes in the area of Gorlice.

Northern Saxony District

- ✓ Use of photovoltaic. Photovoltaic use on waste land and photovoltaic use for self usage.
- ✓ Virtual Power Plant. Integration of cogeneration plant in a virtual power plant.

Schwäbisch Hall District

- ✓ Consulting Competence of photovoltaic systems.
- ✓ Consulting Competence of energy efficient rehabilitation and construction.

South Transdanubian Region

- ✓ KEOP programme – 4.7.0. Geothermal energy exploitation and utilization system in the industry park (with the neighbourhood) of Town of Dombóvár and Town of Kaposszekcső.
- ✓ Energetic modernization of a public institution.

Tulln District

- ✓ Use of thermal solar energy for heating and hot water supply on sport clubs.
- ✓ Energy efficient refitting of residential buildings.

1. Title of the competence.

Thermal efficiency improvement and renovation of public buildings.

2. Brief expertise introduction

Gorlice District (GD) is an administrator of numerous public buildings. Among them about 20 buildings have public functions - schools, hospital, offices, etc. As a local government body, GD has a demonstration role as an economic manager and as a trendsetter in energy saving actions. Moreover, GD through such activities answers the National Energy Efficiency Action Plan (11% final energy savings) and the Energy Efficiency Directive.

3. Competence description

3.1. Concept / background.

Poor structural condition of the buildings is resulting in both: significant heat loss and high energy costs. To prevent this situation several activities are recommended: insulation of roof and walls, replacement of doors and windows, old heat and water installations replacement or insulation, old heat boilers replacement. The refurbishment has to be forwarded by appropriate measures - an energy audit.

3.2. Stage of implementation: project, ongoing or finalized.

Retrofitting of almost all public buildings, managed by Gorlice District, has been finalized.

3.3. Aims and activities.

One of examples of activities in thermo renovation of buildings is project *Retrofitting of public buildings in Gorlice District (No POIS.09.03.00-00-021/09)*, which was realized with financial support of EU Cohesion Found under the Operational Programme Infrastructure and Environment (OPI&E), Priority 9: Environment-friendly energy infrastructure and energy efficiency.

For 9 public buildings there were made:

- walls insulation (18 752,40 m²);
- flat roofs insulation (11 173,85 m²);
- doors and windows replacement (3 529,88 m²);
- heat installation replacement (1193 of new heaters);
- 2 hot water installation were replaced;
- coil heating system replaced with gas boiler;
- 1 new heat exchanger room;
- documentation, construction supervision and promotion.

Total costs: 14 194 657,62 zł (≈ 3,4 mln €). OPI&E contribution: 10 442 991,82 zł (≈ 2,5 mln €).

3.4. Barriers, risks, problems occurred.

Retrofitting of already existing buildings usually carries some risks - from documentation phase (energy audits), until a construction finalization. Gorlice District cares about detailed supervision in every single aspect of process realization.

Some problems can also appear during the procurement: not sufficient tenders, extension of selection time, some protests, etc., which can delay the implementation.

3.5. Main results.

Avoided CO_2 emissions: 7 635,64 t

Energy savings: 5 452,58 MWh/year

In addition to environmental and economical benefits there is also one more positive result - new design of building.

4. Competence conclusion.

Well done buildings modernization gives many benefits. It:

- saves energy = saves cost,

„This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF."

- saves environment (less emissions),
- gives the public buildings "fresh" look,
- encourages inhabitants through positive example,
- shows well maintained buildings management.

5. Short Region introduction and contact details.

Gorlice District is located in south-eastern part of Małopolska Voivodship. The seat of District Authority is in Gorlice City. The district consists of following administrative units:

- City of Gorlice,
- City and Commune : Biecz i Bobowa,
- rural Communities : Gorlice, Lipinki, Łużna, Moszczenica, Ropa, Sękowa, Uście Gorlickie.

Inhabitants (2011 by GUS): 109 225

Total area: 966,46 km^2

Contact details: Marian Janusz – Head of the Department of Development
Gorlice District, Department of Development
Biecka 3 Str., 38-300 Gorlice
phone: +48 18 35 48 790
e-mail: inwestycje@powiat.gorlice.pl

School (ZESPÓŁ SZKÓŁ NR 1), Gorlice

District Employment Office, Gorlice

Both photos from the archives of Gorlice District.

4.3.1. Identification of Specific Expertise from Gorlice District by the AGH University of Science and Technology

1. Title of the competence

Recognition of geothermal water resources and the estimation of costs of the investment relating to the acquisition of geothermal energy for heating and recreational purposes in the area of Gorlice.

2. Brief expertise introduction

The subject of geothermal waters recognition in the area of Gorlice was developed both in the "Economic profitability study for the capital project relating to the acquisition of geothermal energy for heating and recreational purposes from boreholes existing on the territory of Gorlice Town and the following communities: Ropa, Biecz, Moszczenica and Sękowa" and in a part of "The atlas of water and geothermal energy resources in Western Carpathians." The studies include recognition of the geological structure of the study area, drilling reconnaissance, thermal characteristics, characteristics of hydrogeological conditions, recognition of geothermal water resources in the area of Gorlice. Within the frameworks of the "Study" potential thermal water reservoirs in the selected boreholes were identified, together with the specific expected capacities of thermal water intakes and possibilities of using removed boreholes for geothermal purposes (heating, balneological and the like), as well as the investment costs relating to the borehole reconstruction were estimated.

3. Competence description

3.1. Concept / background

The presence of old boreholes remaining after prospecting works and hydrocarbons exploitation, which provided research and documentary material regarding recognising of the geological structure and general knowledge about potentially good thermal parameters of the Gorlice area – the value of the heat stream at the level of 75–80 mW/m^2 [Szewczyk J., Gientka D., 2009] – have given premises for making an attempt at evaluating geothermal water resources and the ways of using and estimating the costs of such capital projects.

3.2. Stage of implementation: project, ongoing or finalized

There is no project/capital project applying the knowledge or conclusions resulting from the Study being developed.

3.3. Aims and activities

The main goal was to determine the profitability of the investment in an installation using geothermal waters in the Gorlice area. To do that, it was necessary to conduct a number of analyses and cost estimations. Out of 22 available boreholes, remaining after the exploitation or hydrocarbons prospecting works, on the basis of technical documentation and the location, in total 8 boreholes were selected on the area of Gorlice town and commune as well as the following municipalities: Biecz, Sękowa and Ropa. A detailed geological, hydrogeological and thermal analysis was prepared, together with the analysis of the costs of reconstructing and adapting those boreholes for geothermal purposes.

3.4. Barriers, risks, problems occurred

A crucial barrier to the performance of a potential capital project (i.e. reconstruction of a borehole, a ground part of the installation for the collection of geothermal heat) is a financial barrier, as the lowest cost of reconstructing a borehole, from among 8 selected boreholes, amounts to ca. PLN 4.3 million for a borehole performed in 1990's at the depth of 1100 m below the area surface.

There is a risk, although a low one, that after the borehole reconstruction, the intake efficiency and water temperature will not achieve the expected values.

„This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF."

Another barrier can be the current level of prices of thermal energy generated in a geothermal power plant (it is cheaper than based on fuel oil, a slightly more expensive or comparable to natural gas and more expensive than coal). If a geothermal power plant has constant load during a year and the more customers are connected to the network, the more profitable geothermal heat. When comparing the price to the price of energy produced from coal, it is also necessary to take into account environmental costs, i.e. the impact of coal-based installations on the local natural environment. The utilisation of geothermal energy for heating purposes is characterised with almost zero emission of dust and gases to the atmosphere, which is translated into the reduction of costs of eliminating the effects of atmospheric pollution.

3.5. Main results

As a result of the conducted studies, reservoir levels of the Upper Cretaceous - Palaeocene and Oligocene were determined. The first level is constituted by the lower and upper Istebna sandstones with the sealing of Istebna Shale and Ciężkowice sandstones. The second one is composed of mid-Menilite (Magdalena) sandstones and Krosno sandstones, whereas Krosno sandstones are characterised by low permeability coefficient (2 mD below 500 m below the area surface). Reservoir levels of the Magura Formation may create thill parts of inoceram layers (the Upper Cretaceous - Paleocene) and Magura sandstones (the Upper Eocene – Oligocene). From the regional point of view, the separated reservoirs of thermal waters occur at different depths from ca. 500 to over 4000 m under the area surface [Górecki et al., 2009].

Within the frameworks of the analysis, the following basic geothermal parameters have been determined:

- depth: 55 to 170 m,
- expected temperature: 20 to 109^{o}C at depths from ca. 500 m to 4100 m (for the selected geothermal water reservoirs in the selected boreholes),
- expected capacities of geothermal water intakes: from 8.4 to 76 m^3/h (for aquifer horizons with optimum efficiency and temperature parameters) [Górecki et al., 2009].

Eight boreholes made in 1980's and later were selected for further analysis. The adopted criterion of the date of boreholes performance suggested that their approximated technical condition is satisfactory and that they will be fit for reconstruction, however, a detailed analysis of borehole documentation (technical parameters) proved that out of 8 boreholes, only 5 have sufficient technical documentation, which permits the evaluation of the boreholes reconstruction costs. It was assumed that the reconstruction costs are the exponential function of the borehole depth, which allowed their estimation at the level of PLN 8.1 million for a borehole with the depth of ca. 5100 m [Górecki et al., 2009].

"The atlas of water and geothermal energy resources in Western Carpathians" presents particular stages of a borehole reconstruction in Sękowa Commune in greater detail.

4. Competence conclusion

At the final stage of the competence-related documentation, the results of all analyses were synthesised and the most optimum direction of thermal water management was selected, taking into account the local market in the area of particular communities.

In Gorlice Town, the proposed heat and geothermal water management, taking into account geothermal waters exploited by means of the reconstructed borehole with the anticipated geothermal water temperature at the outflow being +46°C will cover mainly heat supplies for the needs of central heating (with the application of a peak water-heating boiler house) in the domestic and municipal sector, preparation of hot utility water and heating of the existing facilities as well as sports and recreational pools. Medium-mineralized geothermal waters of the acid-carbonate-chloride-sodium type that we have to do in the area of Gorlice may, once treatment properties are confirmed, be additionally used for balneological and rehabilitation purposes, however, it requires additional physico-chemical analyses of samples. However, it should be taken into consideration that geothermal water management in the Town of Gorlice brings profit, provided that the borehole reconstruction will be financed from non-refundable resources (e.g. subsidies).

On the area of Moszczenica Commune there was no deep borehole based on which an analysis could be made or a capital project performed. Therefore, a potential location of a new borehole was specified. If the assumed drilling effects (performance, temperature) were achieved, it would be possible to manage waters similarly to other municipalities. However, it should be pointed out that an investment in case of drilling a new borehole would be barely profitable (at the depth of 4000 m, the cost would be over PLN 30 million, while reconstruction of a borehole of the same depth would cost ca. PLN 7.3 million).

The management of thermal waters on the area of Biecz Commune, with expected geothermal water temperature at the outflow being +26°C is not profitable irrespective of the way of borehole financing, since expenses for heating water in a peak water-heating boiler house to the required parameters increase the energy price considerably. On the other hand, thermal water management on the area of Ropa Commune, with the expected geothermal water temperature at the outflow being +54°C, may include mainly heat supplies for the needs of central heating (with the application of a peak water-heating boiler house), preparation of hot utility water, heating of sports and recreational pools, e.g. in a new Recreational Thermal Centre, and also water use directly for balneological and rehabilitation purposes in case of obtaining positive results of geothermal water sample analyses.

The management of energy coming from geothermal waters exploited through a reconstructed borehole with the expected temperature of +98°C in Sękowa Commune may cover mainly heat supplies for the needs of central heating, preparation of hot utility water, and heating of sports and recreational pools in a new Recreational Thermal Centre. The capital project in Sękowa Commune is profitable irrespective of the kind of financial resources allocated for the borehole reconstruction (own contribution/subsidies) [Górecki at al., 2009].

5. Short region introduction and contact details.

Gorlice District is located in Małopolskie Region. The population density is 112.94 persons/sq.km and the district is characterised by low urbanisation rate (31.29%).

In the northern part of Gorlice District there are good soils in terms of bonitation. Ca. 66% is arable land, most of it designated for farming. On the other hand, in the southern part a forest and farming type of land prevails: 65% is forests and 31% is arable land.

In Gorlice District, the beginnings of crude oil use date back to the 16th century. In the 19th century the Gorlice area became the cradle of the oil industry. One of the world's oldest refineries, established in 1884, is located in Gorlice. Currently, the town is the centre of the oil, engineering and wood industries. An industrial area included in the Special Economic Zone called EURO-PARK MIELEC is located there.

„This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF."

4.3.1. Identification of Specific Expertise from Gorlice District by the AGH University of Science and Technology

Industrial plants can be found mainly in the north-eastern part of Gorlice, i.e. Glinik Mariampolski: Fabryka Maszyn "GLINIK" S.A., Przedsiębiorstwo Materiałów Izolacyjnych "MATIZOL" S.A., Gorlickie Przedsiębiorstwo Przemysłu Drzewnego "FOREST" Sp. z o.o., "POLMOCON" Sp. z o.o., "VELIMAT Saint-Gobain Polska", "GÓR - STAL" Sp. z o.o., "SEVERT POLSKA" Sp. z o.o., Saint-Gobain VELIMAT Polska Sp. z o.o.

The supplier of electric energy and heat in the Gorlice area is Elektrociepłownia Gorlice Sp. z o.o., with the installed thermal power of 87.21 MW_t and electric power of 7 MW_e. Coal dust is the fuel used. A heating system in Gorlice Town operates owing to the energy obtained from the heat power plant; it is managed by MPGK Gorlice Sp. z o.o. 75% of customers connected to the network are 5 housing cooperatives in Gorlice, which in cover total ca. 4885 flats as well as 15 public utility buildings and 113 municipal buildings. Recipients of heat from the heat power plant include also Fabryka Maszyn „Glinik" S.A. (25%) and Miejski Zarząd Budynków – „Pasiak" (0.03%).

Thermal energy is also supplied by scattered local boiler houses located directly at heat recipients' premises (they are owned by the entities and institution directly using that energy) and individual heat sources satisfying own houses or flats needs. [Gorlice, 2011]

Daniel Markowicz dm@powiatgorlicki.pl +48-18-354-87-93
Magda Wojdyła mwojdyla@agh.edu.pl +48-12-617-23-47

Bibliography:

Study of the economic viability of investment in the obtaining of geothermal energy for heating purposes and recreation of existing boreholes in the city Gorlice and municipalities: Ropa, Biecz, Moszczenica and Sękowa, ZSTG "GEOS", Krakow 2009;

Atlas of geothermal waters and energy resources in the Western Carpathians, Scientific Editor: W. GÓRECKI [et al.], AGH University of Science and Technology, 631-636, Krakow 2011;

Geothermal atlas of the Eastern Carpathians, Scientific Editor: W. GÓRECKI [et al.], AGH University of Science and Technology, 601-602, Krakow 2013;

The draft guidelines for plan on supply of heat, electricity and fuel gas for the city of Gorlice - developed for the years 2012-2027, Gorlice 2011;

Terrestrial heat flow density in Poland — a new approach, J. SZEWCZYK, D. GIENTKA, Geological Quarterly, 53(1): 125-140, Warsaw 2009.

4.3.1. Identification of Specific Expertise from District of Northern Saxony by the Economic Development Corporation of the District of Northern Saxony

1. Title of the competence.

Use of photovoltaic. Photovoltaic use on waste land and photovoltaic use for self usage.

2. Brief expertise introduction

In January 2013 a feasibility study was finished that found waste land areas and scored them for the use of photovoltaic. In the process of compiling the study the following competences were build.

- Knowledge in potential of waste land for photovoltaic usage
- Knowledge of scoring waste land for the usage
- Knowledge of potential partners
- Knowledge of conditions of market and politics
- Knowledge of self usage of photovoltaic and storing possibilities
- Knowledge of potential partners

After the changes in the market and political conditions, which will be explained later we build competences in self usage of photovoltaic. The competences are:

- Advising competence for companies (22 consultations since October 2013)
- Competence in promoting benefits of self usage of PV
- An existing network of contacts of companies that provide this service

3. Competence description

3.1. Concept / background.

As already said a feasibility study for the usage of waste land for photovoltaic was finished in January 2013. Mainly in the year 2012 photovoltaic plants were installed on about 145 ha. Nearly all of them on planned business areas, which were planned to develop jobs. Now these areas can't be used for companies. So it was necessary to look for alternative areas for photovoltaic

3.2. Stage of implementation: project, ongoing or finalized.

Stopped - The study will not be implemented, mainly because the market and political conditions have changed. The very attractive financial aid for installing photovoltaic was adapted and abridged.
Ongoing - Self usage of photovoltaic is now more interesting. Companies that provide the service are invented, to present the possibilities to other companies from Northern Saxony at the Energy Symposia.

3.3. Aims and activities.

As a conclusion of the developments, which were already explained the chapters above, the Economic Development Corporation tries to promote self usage of photovoltaic to stabilise energy costs in companies. Possibilities of self usage were presented on the 1st Energy Symposia for companies.

3.4. Barriers, risks, problems occurred.

The market and political conditions have changed, so big photovoltaic parks that feed in the energy in the grid are not that much interesting now.
Promoting the benefits of self usage of photovoltaic needs a lot of communication work to rebut reservations.

3.5. Main results.

There are no results, of the feasibility study because we changed the focus on self usage of photovoltaic. At least the knowledge is available; in case of a political turnaround we already have the experience and potential areas.

„This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF."

The result of this project, is that we presented the possibilities on our Energy Symposia and after that we advised companies that called us to technical possibilities and companies that provide this service.

4. Competence conclusion.

In the field of using photovoltaic there are two main competences. The first competence is finding and scoring possible areas for the installation of photovoltaic for investors.

The second competence is an advising competence for self usage of photovoltaic energy. At the moment this competence is more important and sought after.

5. Short Region introduction and contact details.

The District of Northern Saxony boarders at the city of Leipzig, which is about 200km south of the City of Berlin. The area of the district is 2020 km² and about 200,000 citizens live in the district. To the VIS NOVA Region also belong four further municipalities in the Districts of Anhalt-Bitterfeld and Wittenberg which have altogether 44,000 citizens.

Contact:
Economic Development Corporation of the District of Northern Saxony
Richard-Wagner-Straße 7a
04509 Delitzsch
Germany
http://www.wfg-nordsachsen.de
E-Mail: jan.becker@lra-nordsachsen.de
Tel: +49(0)34202-9881086

„This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF.”

4.3.1. Identification of Specific Expertise from District of Northern Saxony by the Economic Development Corporation of the District of Northern Saxony

1. Title of the competence.

Virtual Power Plant. Integration of cogeneration plant in a virtual power plant.

2. Brief expertise introduction

As part of the EU Project VIS NOVA the pilot project will be the integration of a cogeneration plant and power-to-heat system in virtual power plant. In the process of making a feasibility study and looking for potential partners the following competences were build:

- Knowledge of function of a virtual power plant
- Existence of usable power generation facilities in the region
- Possibilities of integration of energy facilities in the energy grid and energy market
- Prospective Partners
- Knowledge of functionality of German energy markets
- Knowlegde of scoring the applicability of energy facilities

3. Competence description

3.1. Concept / background.

In January 2013 a feasibility study for the realization of a virtual power plant in the District of Northern Saxony was finished. In this feasibility study the district was examined for possible energy facilities for use in a virtual power plant. Also energy demand and production in the municipalities was examined to locate a possible location for the virtual power plant.

In the following consultations with the local energy suppliers the result was not to establish a complete new virtual power plant. This would have been to much work to do. So the decision was to integrate cogeneration plants in an existing virtual power plant - in a first step. In a second step - to install and integrate a power to heat system. In this way it is possible to store/use energy in the form of heat.

3.2. Stage of implementation: project, ongoing or finalized.

Ongoing - The tender for the pilot project was successfully finished in December 2013. The integration of the cogeneration plants in the virtual power plant is already done. The installation of power to heat components will star in March 2014. The whole project will be finished in September 2014.

3.3. Aims and activities.

The aim of a virtual power plant is to stabilize the energy grid and to avoid ups and downs caused by renewable energies. By integrate a cogeneration plant in a virtual power plant the production of electric energy can be run down and store the energy in the form of thermal energy. The integration of the second step, a power to heat system will use electric energy when it is too much in the grid. It also stores energy in the form of heat.

3.4. Barriers, risks, problems occurred.

The main risk is the volatility of renewable energies, caused by the weather. Although the aim is to reduce the volatility of energy by use electric energy, when there is too much energy in the grid, it not that effective when there is not enough electric energy in the grid. The only way is to increase the electric energy production of the CHP generator. That mode of operation may curse a higher attrition.

3.5. Main results.

The knowledge of scoring possible energy facilities for the use in virtual power plant can be applied in a future expansion. Its possible to score the applicability of energy facilities for the integration in a virtual power plant.

The first step - the integration of CHP in a virtual power plant is already finished and working but it is too early to have results.

„This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF."

4. Competence conclusion.

As a conclusion of the feasibility study and the process of implementation there are two main competences. First – the knowledge of how to find partners and applicable energy facilities. Second – the scoring of technical requirements of energy facilities for the integration in a virtual power plant.

5. Short Region introduction and contact details.

The District of Northern Saxony boarders at the city of Leipzig, which is about 200km south of the City of Berlin. The area of the district is 2020 km² and about 200,000 citizens live in the district. To the VIS NOVA Region also belong four further municipalities in the Districts of Anhalt-Bitterfeld and Wittenberg which have altogether 44,000 citizens

Contact:
Economic Development Corporation of the District of Northern Saxony
Richard-Wagner-Straße 7a
04509 Delitzsch
Germany
http://www.wfg-nordsachsen.de
E-Mail: jan.becker@lra-nordsachsen.de
Tel: +49(0)34202-9881086

„This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF."

4.3.1. Identification of Specific Expertise from District of Schwäbisch Hall by the Economic development corporation of the Schwäbisch Hall district

1. Title of the competence.

Consulting Competence of photovoltaic systems.

2. Brief expertise introduction

In the past 8 years the energieZENTRUM gained broad knowledge in photovoltaic. Citizens and businesses can get information on any matter of PV in the energieZENTRUM. It helps those who seek advice about technical possibilities to financial and compensation questions.

3. Competence description

3.1. Concept / background.

Through the installation of 62 proper PV systems with a total operating performance of 2,04 MWp the employees of the energieZENTRUM gained highly competences in this area. Besides the photovoltaic systems a Website launched additional in order to supervise and compare the systems.

3.2. Stage of implementation: project, ongoing or finalized.

Finalized

3.3. Aims and activities.

The aim of the installed systems is the funding of the energieZENTRUM by compensation for electricity fed into the grid. The energieZENTRUM relies on public resources in order to enable free consulting services. A more sustainable funding than with renewable energy is not possible in a facility like this.

3.4. Barriers, risks, problems occurred.

The main barrier of this installation were the highly investments. Over 8 Million € were invested to install the photovoltaic systems. With a pledge of the county cheap credits received. The risk was reduced through the compensations for electricity fed into the grid, which is saved for over 20 years. The second difficulty was the search of the roofs for the systems. Only the most appropriate roofs should be used (southwards/angle between 20° und 30°). Furthermore, it is up to develop an appropriate compensation system, which pleases the owners of the roofs and which is affordable.

3.5. Main results.

The main results of the PV project are the fed into the grid with round about 2 GWh/year of renewable energy of electricity, the gained compensations for electricity fed into the grid to fund the energieZENTRUM and savings of 1.300 t. CO_2.

4. Competence conclusion.

Due to the constant preoccupation with the installation, billing and payment of PV systems a very high level of expertise has been acquired in this field. This is also supported by the partnership relationships with installers who have supported us in our endeavor.
These skills can now be used for advising private clients and businesses to continue the success story of the PV.

5. Short Region introduction and contact details.

The district of Schwäbisch Hall is located in the north-east of Baden-Württemberg in the Federal Republic of Germany. With 1400 km ² and a population of approximately 189,000 residents of the county is part of the rural areas. The energy center is the regional energy agency of the county and advice to private clients, businesses and agriculture to all the questions about energy efficiency and renewable energy.

Contact:
Heinz Kastenholz
Tel.: 0049 7904 94599-13
Fax: 0049 7904 94599-29
E-Mail: kastenholz@wfgsha.de

„This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF."

4.3.1. Identification of Specific Expertise from District of Schwäbisch Hall by the Economic development corporation of the Schwäbisch Hall district

1. Title of the competence.

Consulting Competence of energy efficient rehabilitation and construction.

2. Brief expertise introduction

For 10 years the energieZENTRUM advices constructors in energy-efficient rehabilitation and construction, as well as the possible appropriation of funds. So the the energieZENTRUM gained broad knowledge to increase the number of buildings being renovated.

3. Competence description

3.1. Concept / background.

The leadership of the energieZENTRUM is generally manned with persons who are able to consult. Besides an appropriate education background they have often the qualification of building energy consultant. Thereby professional competence is guaranteed, which is also accepted by the funding institute in Germany.

3.2. Stage of implementation: project, ongoing or finalized.

On-going

3.3. Aims and activities.

The aim is the increase of the renovation rate and an energy efficient reconstruction of private residential building and non-residential buildings. The increase of the renovation rate is a part of the reduction of the greenhouse gases of 90 % in 2050. The energieZENTRUM offers free initial consultings in which discussions about energy efficiency for new and existing buildings and funding possibilities are held.

3.4. Barriers, risks, problems occurred.

The only barrier is the funding of the free consultings. This barrier was solved by the installation of 62 photovoltaic systems. By the gained compensations for electricity fed into the grid the consulting is offered free in next 20 years.

3.5. Main results.

The main result is that the county and citizens lead the ranking of installed solar power plants. Additional, the county holds a share of 44,3 % renewable energy of the total energy consumption.

4. Competence conclusion.

By dedication to the issue of energetic renovation and energy efficient construction and by on-going training and the visit of fairs and congresses highly competences were gained, which could be used by citizens, enterprises and municipalities. The county of Schwäbisch Hall benefits from the continuously decreasing greenhouse gas emissions and the reduced energy consumption. In addition, the creation of value increases in the county.

5. Short Region introduction and contact details.

The district of Schwäbisch Hall is located in the north-east of Baden-Württemberg in the Federal Republic of Germany. With 1400 km ² and a population of approximately 189,000 residents of the county is part of the rural areas. The energy center is the regional energy agency of the county and advice to private clients, businesses and agriculture to all the questions about energy efficiency and renewable energy.

Contact:
Heinz Kastenholz
Tel.: 0049 7904 94599-13
Fax: 0049 7904 94599-29
E-Mail: kastenholz@wfgsha.de

„This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF."

4.3.1. **Identification of Specific Expertise** from South Transdanubian Region by the South Transdanubian Area and Economic Development Nonprofit Ltd.

1. Title of the competence.

KEOP programme – 4.7.0. Geothermal energy exploitation and utilization system in the industry park (with the neighbourhood) of Town of Dombóvár and Town of Kaposszekcső.

2. Brief expertise introduction

Geothermal energy exploitation and utilization system
Heating of the institutions of local governments and housing estates with this system in the administrative area.

3. Competence description

3.1. Concept / background.

Hungary has a huge potential of geothermal energy. As for the geothermal energy the Hungarian geothermal gradient is approximately one and a half times higher than the world average, which is one of the country's valuable natural resources. In Hungary the average thermal power is 90 mW/m2, while in Europe this data is 60 mW/m2. According to the above fact in 1km depth the temperature of water is 60ºC, in 2 km depth this temperature is 110ºC. The geothermal gradient is significant in the Southern-Transdanubian and in the Plain. Now in Hungary there are more than thermal wells. However, in the case of several existing wells, an approach ensuring the rational and optimal utilization is missing. In the South Transdanubian Region 169 thermal wells have been identified and are used for building heating, domestic hot water supply, and spas' water and heat supply.

Good examples for using geothermal energy are: town Szentlőrinc and Municipality of Bóly.

Town of Szentlőrinc
The heating plant that utilizes geothermal energy was installed at the end of 2010. It is able to fully replace the district heating for the 7500 residents of Szentlőrinc. Thanks to the investment since January 1st, 2011 900 homes and several public institutions are heated with geothermal energy. The water extracted from the well is of 87ºC, in closed system it can reach 900C, its maximum discharge is 25 litres per second. By the investment 1,9 million kg CO_2 emission can be saved compared to the existing gas-based district heating. With additional district heating network expansions further cc.1 million kg CO_2 emission can be saved, not to mention the saveable carbon dioxide quantity by greenhouse utilization.

Municipality of Bóly
In the outskirts of Bóly, a town with a population of 3500, thermal water was discovered in the 1980s; they found it while seeking uranium in the depth of 1300-1400 meters. The town leadership decided in the early 2000s that by utilizing geothermal energy it restructures the heating of some public institutions. After successfully applying for the SAPARD Programme‟s funds they drilled a new thermal well on which the new heating system was based that supplied the heating of the school, the community house and the library. The task was complicated by the well‟s low water discharge of 40 °C. Therefore underfloor heating was chosen. In the library building the system has already been developed, in the school and community house it was implemented in the frame of the project. Since the composition of the thermal water could cause sediments that would inhibit the operation of the pipe network, heat exchanger was installed. The system is supplied from a 700-meter-deep water providing system. After its primary utilization the water is used in the school swimming pool of the town. The premises of enterprises operating in the town's industrial park are also heated by the system.

CENTRAL EUROPE COOPERATING FOR SUCCESS. EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND „This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF."

The places of the drills are in the town of Kaposszekcső, North Zselic, which located in the area of County of Baranya and Tolna. The planned investment doesn't accompany with air pollution and CO emission, further more it substitutes for the traditional energy source, and it can decrease the air pollution. The local governments want to solve the heating with this system. For the sake of the cause it will be created 2 piece of thermal spring wells, 1 producer element and 1 back-press element near the place of Industry Park. These are the basic elements of the project.

3.2. Stage of implementation: project, ongoing or finalized.

The project is under planning and preparing.

3.3. Aims and activities.

Create a system according to the Geothermal energy exploitation and utilization. It has two main steps:

- exploratory drill and create a thermal spring well with KEOP4.7.0. program
- building the system with KEOP-4.2.0/B.

The aim of the project is to increase the proportion of renewable energy sources in the energy supply.

If it belongs to an Energy Park, it will be more effective. The investment maybe complete with a utilization renewable energy.

3.4. Barriers, risks, problems occurred.

The problem is, that the emission data are worse and worse in the town and in Hungary also. The two most important climate protection tasks are as follows: conservation of energy and utilization of the local renewable energy.

The other problem is the Hungarian behavior. The first reason is, that this technology is very expensive for Hungarian people and business sector and the time of the return is long. The Hungarian state try to help on it, but sometimes the tenders are very complex, which needs external experts. Otherwise the project has to wait the next budgetary year, because the tender will be financed by the EU. The most important and purposeful support instruments are the programs of EU and Hungarian state aid, which contains EEOP - structural fund - programs. Appeared Green Investment system and credit facilities.

The utilization of renewable energy involves an energy policy question, competitiveness question, environmental question, rural development question, so during the increase of utilization it must comply with the efficiency, technical/technology, sustainability and social concerns.

3.5. Main results.

They haven't provided main results yet.

4. Competence conclusion.

The project will be a good practice for others town, settlements (in Hungary the utilization of renewable energy is in child shoes),

A well identified plan was created including facilities of the town.

According to the EU and state aid in Hungary the regional plans are uncharacteristic, but during the application the renewable energy gives for the applicant flying start. According to the national level, there is an Environment and Energy Operational Program, which is the base of the HU RES programs. Its fourth priority deals and supports with the RES. The aim of the EEOP is to reach till 2020 the 13% according to the symmetry of all energy source. But Hungary targets the 14,65%.

5. Short Region introduction and contact details.

The South Transdanubian region is located in the Southwest part of Hungary, in the South part of the Transdanubia. Its territory is 14 169 km2 that is 15% of the country's territory. Its natural borders are the River Danube in the east, the River Dráva in the west and south and mainly the Lake Balaton in the north. These natural borders separate the territory from the South Plain Region and the neighboring country of Croatia in an economically unfavorable way. Among the producer licensees there are 16 power plants with more than 50 MW performance and 324 small power plants are among the registered single permit licensees that ensure the country's energy production, whose value was 36,6 TWh in 2010. That is supplemented by the energy purchased from the electricity systems of the neighboring CENTREL and UCPTE53 member countries. From our region two power plants participate in the system-wide coordination, the MVM Paks Nuclear Power Plant Ltd. and the Pécs Pannonpower.

Contact:
MNP Mérnökiroda Kft. – MNP Engineer Office Ltd.
Petrich Csaba ügyvezető, director
Address: 7626 Pécs, Felsővámház u. 30.
Mobil: +36304115435

4.3.1. Identification of Specific Expertise from South Transdanubian Region by the City of Szekszárd

1. Title of the competence.

Energetic modernization of a public institution.

2. Brief expertise introduction

In the last few years the management of the municipality of Szekszárd has decided to take advantage of every possible chance in order to modernize the whole public institution building system. Everything has started with the VIS NOVA project followed by a complex social-energetic project. The municipality has won a EU tender through which a kindergarten and a nursery home beside each other could been completely and energetically modernized combined with renewable energy solutions.

3. Competence description

3.1. Concept / background.

- The main concept was to completely insulate both buildings first and after than install solar panels and collectors for covering the hot water supply and the electricity demand by renewable energy. In Hungary, and in our region the sun hours per day are very high so the PV usage is more than current.
- 20 solar collectors on the nursery home with the capacity of 4,2 kWp
- 132 solar panels on the kindergarten; 36 covers the demand of the kindergarten with the capacity of 9kWp and 96 the nursery home with 21 kWp

3.2. Stage of implementation: project, ongoing or finalized.

Finalized.

3.3. Aims and activities.

Both buildings were modernized; all the old windows and doors were replaced, the outdated furnaces have been changed, the heat insulation has been solved. In addition to these to cover the significant hot water need of the nursery home solar collectors were placed onto the roof of the building. Also solar panels have been installed to the roof of the kindergarten for fulfilling the demand of the electricity by reneables.

3.4. Barriers, risks, problems occurred.

EU subsidy has helped with the financing problems.

3.5. Main results.

- Significant decrease of expenses
- More rational usage of environmental resources

4. Competence conclusion

The municipality's aim is to produce more and more good practices, and continue the same procedure on every institution in order to have a green energy supply and more efficient economy which can generate more savings that can be spend on further investments.

5. Short Region introduction and contact details.

The South Transdanubian region is located in the south-west part of Hungary with the center of Pécs. On 14.169 m2 there can be found 952.982 inhabitants. Szekszárd is the county seat of Tolna county with approximately 34 thousands of inhabitants on the north-east corner of the region.

Contact: Szabó Veronika H-7100 Szekszárd, Béla király tér 8.,
E-mail: szabo.veronika@szekszard.hu

„This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF."

4.3.1. Identification of Specific Expertise from Tulln District by the Micro Region Development Association Tullnerfeld West

1. Title of the competence.

Use of thermal solar energy for heating and hot water supply on sport clubs.

2. Brief expertise introduction

To produce hot water with the power of the sun is state of the art. Solar energy is always available for free, and thus price stable over many years.
Solar thermal systems can be used for water heating, assistance for heating, or simultaneously for all two applications.

3. Competence description

3.1. Concept / background.

On Sports grounds (football fields) a large amount of water for the shower is needed due to the many hours of training and championship games. Originally, hot water for the shower was often heated by an electric heater or heating oil boiler. Energy costs are rising. Gas and oil are transported over long distances, until they are in the domestic heating systems. But there are vast amounts of energy in front of our own doorstep.

Example:

Originally, the hot water was heated by a heating oil boiler, the amount used for hot water was roughly 1.300 liters of heating oil. The collector area is 25,7 m^2, in sum it can be heated 2 x 1.000 l of water.
The solar panels have a slope of 30 degrees and are geared towards south.
According to the operator the 7 showers are used by 80 people per week,
3 times weekly. The water flow of the installed shower heads is 8 l / min.
Calculation of the theoretical savings in heating energy: 3 shower events per week x 36 weeks use result in 108 showers per person and year. At a flow rate of 8 liters / min (energy saving shower head) and 5 min shower duration, 4320 liters of water at 35 degrees Celsius are consumed per person and year (108 x 8 x 5).
With a fresh water temperature of 9 degrees Celsius, the following amount of heat would be consumed.
Q = 1.161 m3 x 4.32 x (35-9)
Q = 130,4 kWh
the utilization rate is assumed at 85%
Q = 111 kWh / person
For 80 people a heat of 8.880 kWh must be provided.
According to the literature 350 kWh solar thermal energy can be used per year and per m^2 flat collector.
In this case of 25,7 m^2 installed collector area and a sufficient buffer capacity of 2.000 l the result would be 8.995 kWh / year.
The result is an avoidance of 2,7 tons of CO_2 per year. The replacement of one liter of heating oil avoids 0,3 kg CO_2. (8.995 kWh x 0,3 kg/kWh).

3.2. Stage of implementation: project, ongoing or finalized.

Many projects are finalized and some are ongoing

3.3. Aims and activities.

The solar collectors for this purpose will become a show case with a huge effect of raising awareness.

3.4. Barriers, risks, problems occurred.

Sometimes the literature data on thermal solar systems and the savings according to the information by the operators do not coincide.
Sometimes the savings cannot be calculated, because there is only one meter for the total power consumption.
Without subsidies, it is difficult to implement

3.5. Main results.

In the best case the whole consumption for hot water can be covered by the solar plant.

4. Competence conclusion.

By the good matching of production of solar energy and consumption through sports field operation it results in an additional benefit.

5. Short Region introduction and contact details.

The so called “Kleinregion Tullnerfeld-West” comprises 12 of a total 21 communities of the Tulln district (in alphabetic order: Atzenbrugg, Judenau-Baumgarten, Königstetten, Langenrohr, Michelhausen, Muckendorf-Wipfing, Sieghartskirchen, Sitzenberg-Reidling, Tulbing, Tulln, Würmla, and Zwentendorf) located in central Lower Austria, to the northwest of Vienna.
Covering an area of approximately 360 km2, and inhabited by about 45.000 people, it is the smallest of geographic units participating as a region in the VIS NOVA-project. The region is still largely characterized through features typically associated with rural areas.

Contact:
Thomas Hackl, thomas.hackl@tulln.gv.at

„This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF.”

4.3.1. Identification of Specific Expertise from Tulln District
by the Micro Region Development Association Tullnerfeld West

1. Title of the competence.

Energy efficient refitting of residential buildings.

2. Brief expertise introduction

Particularly older buildings show – due to the use of conventional building materials and construction methods – remarkable energy and costs saving potential. The largest energy losses occur through the building envelope. Thermal insulation is the most effective way to reduce the energy consumption of existing buildings.

3. Competence description

3.1. Concept / background.

As the micro-region Tullnerfeld West is a rural area, there is a large amount of old residential buildings which are not insulated yet. About three quarters of the household energy are used for heating. With harmonized and interdependent insulation measurements about 30-70 % of energy can be saved.

3.2. Stage of implementation: project, ongoing or finalized.

Many projects are finalized and many still are ongoing.

3.3. Aims and activities.

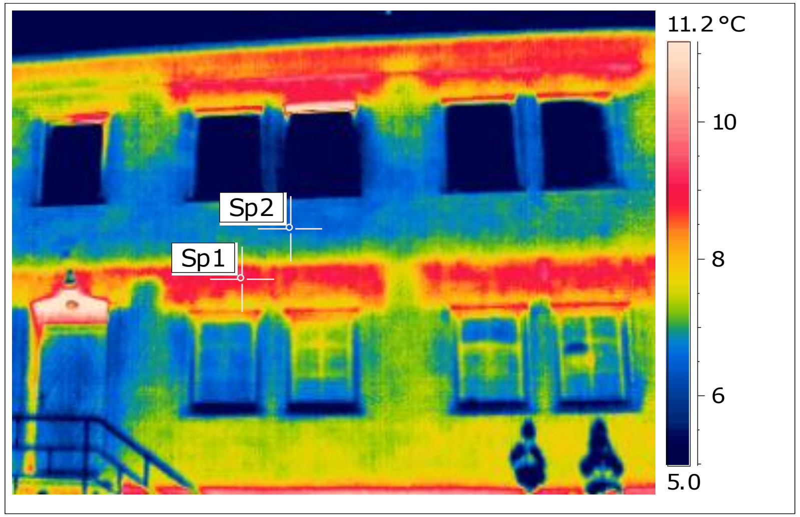
The overall aim of energy efficient refitting of residential building is energy saving and related positive environmental impact (saving of CO_2 etc). Important is that a lot of people implement insulation measurements. The provincial government of Lower Austria for example helps people with energy-related advisory service, but also energy suppliers provide such services.

The heat transfer coefficient (U-value) is relevant to the evaluation of the energy standard of a single component, such as the façade. The larger the U-value is, the worse the insulating effect.

Attention should be paid to the fact that, in addition to the insulation of walls and ceilings, also windows and doors should not be forgotten. In older homes these parts account for up to 25% of heat losses from the buildings. Windows and doors are used regularly and become worn over the time. Further leakage problems are also possible. The installation of glazed windows is recommended. Even in winter, temperatures inside the room will remain at 16 degrees Celsius.

All taken measurements shall be harmonized, to reach the best results. So, awareness raising and providing of information for the house owners is an important point to promote energy-efficient insulation measurements. One way to identify weak points in the building envelope is thermography:

Picture of the infrared camera



The red areas show a larger heat conductivity, because of the static element above the window. The temperature difference at the surface is 2.7 ° C.

„This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF."

3.4. Barriers, risks, problems occurred.

One problem concerning refitting of old buildings is, that often the house owners of old buildings are elder people, who do not want to invest a lot. The subsidies often are supported credits, but elder people often do not want to apply for a credit any more.

Often only single measures in refitting are taken (e.g. renewal of the windows; renewal of the heating before thermal insulation), but not overall concepts are implemented. The results and energy savings are much better, when holistic concepts are elaborated.

3.5. Main results.

The main results of energy efficient refitting of residential buildings are: energy and costs saving and related positive environmental impact (saving of CO_2 emission etc). Additional benefits and advantages of improving the thermal insulation include:

- Better quality of life is achieved in both winter and summer, through the creation of a better indoor climate.
- Because of reduced emissions, thermal insulation makes a valuable contribution to environmental protection.
- Experiencing thermal insulation firsthand increases our need for better comfort over the years, so that older buildings often cannot compete.
- If the façade is embellished, the house itself is also visually and aesthetically improved.
- If the building is maintained in the long term, the pension is secured.
- A well insulated building has a higher market value than a comparable non-insulated construction.
- Lower energy consumption preserves fossil fuel resources such as oil, coal and gas and saves them for future generations.
- If many refitting measures are done at the same time, additional costs can be lowered.
- The additional costs of saved energy and ever-increasing energy prices can be amortized.
- Independence from future energy prices increases.

4. Competence conclusion.

Thermal insulation ameliorates energy-efficiency and therefore shows remarkable energy saving potential. In the micro-region Tullnerfeld West the knowledge and expertise, how to successfully implement projects is absolutely available and a lot of projects have been implemented so far.

5. Short Region introduction and contact details.

The so called “Kleinregion Tullnerfeld-West” comprises 12 of a total of 21 communities of the Tulln district (in alphabetic order: Atzenbrugg, Judenau-Baumgarten, Königstetten, Langenrohr, Michelhausen, Muckendorf-Wipfing, Sieghartskirchen, Sitzenberg-Reidling, Tulbing, Tulln, Würmla, and Zwentendorf) located in central Lower Austria, to the northwest of Vienna.

Covering an area of approximately 360 km2, and inhabited by about 45.000 people, it is the smallest of geographic units participating as a region in the VIS NOVA-project. The region is still largely characterized through features typically associated with rural areas.

Contact:
Thomas Hackl, thomas.hackl@tulln.gv.at
Ingrid Scharf, Ingrid.scharf@tulln.gv.at

„This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF.”