



Project proposal RECROS – Renewable Energy CROSSborder Strategy

Programme:	EU Danube Region Strategy
	Priority Area 02 "To encourage more sustainable energy"
Project status	Planning phase
Schedule:	2016 - 2019
Planned project budget:	1.8 mil. €
	Contact person: Lukáš Páček (pacek@af.czu.cz), Life Sciences University in Prague, Faculty of Agrobiolgy, Food and Natural Resources

Preface

Renewable energy sources (RES) are becoming increasingly important to the environment and economy in the new EU member states. RES contribute to the climate protection and energy self-sufficiency on one side, but they also burden power grids and ecosystems on the other side. Besides the installation technology itself, which always leaves its marks in landscapes and affects local biotopes, it is mainly an issue of a negative impact on ecosystems and soil as a consequence of the biomass utilization. In our view, in case of agronomical biomass, the conversion of biomass into energy should take into account soil sustainability production. In case of forest or residual biomass, it is also necessary to keep in mind that excessive reduction of biomass in ecosystem could result in soil degradation.

RES play a significant role mainly in two types of environment represented by nature reserves (or similar valuable localities) and city spaces in the Danube region. Many of those nature reserves are often located in close-to-border or cross-border areas. There, mainly small-scale RES technologies integrated into households or other types of constructions represent a beneficial mean for reduction of negative environmental impact from fossil fuels and for strengthening the energy self-sufficiency and independent energy supply. Yet, it is crucial to carefully consider a size of an installation, its location and a way of energy production. In case of biomass-based sources also an amount and type of biomass feedstock needs to be considered. At this stage conflicts with soil and biodiversity protection could emerge.

Due to this reason, it is beneficial for administrations of protected areas and local municipalities to design and follow a long-term strategy of RES development, which would include all limits given by the local environment. These limits consist of biodiversity protection, soil and forest management and processing residual and waste biomass. Apart from that, such a strategy should comprise sizes and types of recommended/allowed RES with respect to local energy demand among others. It should be supported by concrete measures, motivation tools and model solutions, which could be applied in the respective region. The strategy is strongly recommended for approval by local authorities responsible for nature reserves and by representatives of citizens, municipalities and entrepreneurs in concerned areas. One of the main impacts will be better energy safety, protection



of environment and comfort for living. The strategy therefore could also become an important part of a plan for prevention of depopulation, which is often an important issue in the aforementioned regions. The **Renewable Energy CROSSborder Strategy** (RECROS) project offers application of know-how in the form of verified principles, which are able to evaluate all tied conditions and limits for RES utilization in a particular region. RECROS projects leaders assume that close-to-border regions should apply the same approach to RES utilization on both sides of the border. If this condition is not fulfilled and neighbouring regions have different priorities, the strategy, regardless its quality and complexity could remain idle. The project therefore aims at mediation of an agreement based on principles of the strategy development and its final outcomes among main stakeholders (municipalities, administrative bodies of nature reserves, alternatively also various associations or entrepreneurs). Only such approach will subsequently guarantee a long-term local direction of development in the RES development and use.

Alternatively (according to the final composition of a project consortium and stakeholders' interests) the project offers a possibility to elaborate these strategies for cities, which often also face various conflicts while applying RES. Demands on soil are rather high in cities' surroundings and consequently it is necessary to protect bio-centres and bio-corridors, preserved ecosystems and refuges of wildlife in these areas. Biomass sources have to be structured in a different way (with the aim to waste production from lawns and other green areas), resp. it is necessary to import biomass. Furthermore as cities show enormous energy consumption, RES could represent a significant element, which could facilitate decrease in emission impacts and related effects on public health. Therefore, also for cities and their buffer zones it is necessary to have clear, long-term concept in the area of RES represented by concrete measures, steps with focus on suitable win-win solutions. Due to these reasons, participation of municipalities in the RECROS project is sought as highly beneficial as it would offer them a platform for win-win development considering both economic and environmental aspects of sustainability.

Main objective:

To create a tool and a joint strategy for development of renewable energy sources (RES) using principles formed in RESTEP (described below) and Regional Sources Assessment for cross-border regions / cities in selected Danube countries with an emphasis to the environmental importance.

Project background:

The Regional Sources Assessment methodology and the interactive map IS RESTEP has been created under the project support of the European program Life+ (www.restep.eu/en/user-instruction, <http://restep.vumop.cz/>). Within the three-years project period (XI/2011 – X/2014) the unique complex information system has been developed. The created tool enables users to evaluate local and regional conditions for sustainable use of RES, including energy and material utilization of biomass as well as the local infrastructure.

More than 110 data layers connected to the locality are analysed in IS RESTEP:



- land use (up-to-date data for land plots (incl. arable land) , forest areas, structure of produced crops, quantification of farm animal production) – 10 layers
- potential yield of 25 crops (food producing, cereals, fodder plants, energy crops) – 25 layers
- potential yield of perennial grass lands (PGS) and short rotation coppice (SRC) – 4 layers
- availability of the other biomass types (forest harvesting residuals, black liquors) – 5 layers
- production of biologically degradable and combustible wastes including their processing – 9 layers
- local potentials of solar, wind, water and geothermal energy – 10 layers
- biodiversity, nature protected areas – 5 layers
- soil degradation, legislative limits for soil utilization and other soil characteristics including production ability deterioration – 18 layers
- air pollution – 8 layers
- socio-economic parameters (number of inhabitants, energy and fuel consumption, infrastructure) transport routes – 13 layers
- current RES installations – 6 layers

Project description

The know-how and lessons learnt acquired during the RESTEP project implementation is going to be utilized in the proposed project RECROS. Such approach aims to develop spatial decision support systems (SDSS) and common policies for sustainable development of RES in cross-border nature reserves within specific areas of the Danube region.

The main project motive consists of a pilot application of Regional Sources Assessment principles in these valuable areas and subsequent creation of analogical complex assessment systems, which will form interconnected, international knowledge base.

The following areas could be targeted with the strategies based on RESTEP in cross-border regions:

- 1) CZ – Bavaria (Šumava, Bayerischer Wald)
- 2) CZ – Austria (Šumava, Bayerischer Wald, Podyjí/Thayatal)
- 3) CZ – Slovakia – AT (Morava river)
- 4) Slovakia – Hungary (Slovenský kras / Aggteleki)
- 5) Hungary – Austria (Neusiedler See)
- 6) Austria – Bavaria (Šumava, Bayerischer Wald)

Alternatively, particular cities and/or towns in the Danube region could be considered for project implementation.

For each area available data will be analysed/acquired and data layers analogical to IS RESTEP will be produced in order to evaluate renewable natural resources (RES) potential for selected areas. .



Based on the evaluated RES potential, limits and current utilization a dedicated strategy will be designed and then submitted to respective spatial authorities with the request of approval. Strategies are planned to be supplemented by detailed analytical and map-based evidence.

Project tasks:

WP1 – Data sources

The WP1 covers the activities related to the relevant and reliable data collection and analysis. Project team will be divided according to particular areas.

Tasks:

- **Analysis of the availability of relevant and reliable data and their parameters** – Survey of possible data sources, providers (statistical offices, databases of research institutions, data sources of the affected territories, management organizations of the nature reserves, etc.), eventually price for purchasing data sets from their owners (if data sets utilization is not free of charge) and legislative restrictions (limited group of users, licence conditions for using data). Parameters of data sets needed to be clarified for next steps: extent (local/regional/national, parameters listed), scale (region/urban area/cadastre), quality (completeness, technical characteristics), accuracy etc.
- **Collection of relevant and reliable data** – in structure (data layers) analogical to IS RESTEP (population, infrastructure, RES potential, biodiversity, culture, countryside and nature protection limits, etc.), focus will be on gathering the spatial data
- **Data processing** - Elaboration of individual data layers in order to obtain unified data structure covering all selected territories (nature reserves), data manipulation (conversions, adjustments, modifications, etc.)

WP2 – Design and development of SW tool

The WP2 focuses on design and development of SDSS (Spatial Decision Support System) tool. In this step data from WP1 and consequently feed-back from WP3 and WP4 will be integrated into the interactive computer-based software system for decision making process. Due to identified challenges to predict data availability, SW tool is going to be built as model-driven DSS. Absence of data will be substituted by user-specified parameters (for example missing total surface of roofs suitable for photovoltaics could be substituted by model calculation or input from mayor).

Tasks:

- **Building database** – From collected data with utilization of internal relations and processes among data layers a knowledge base (KB) will be built. Complexity will be determined by quantity and quality of collected data (WP1).
- **Modelling** – Based on results from the previous step a model for decision making process will be designed. Models are expected to contain results-oriented conditions for decision, possible alternative actions for solution, and selection rules for proper actions
- **User interface** – Developed tools are going to strive for “user-friendly” principles in order to ensure wide accessibility for the target group. Great efforts will be devoted to design this kind of



graphical user interface. Application is also going to include an interactive map window for displaying data and results in the form of thematic maps.

WP3 – Spatial analysis

Detailed analyses for each territory focused on RES potential, limits and sustainability will be elaborated within the WP3. The methodology assessment will be formed with the assistance of the responsible authorities (managing bodies of the selected territories).

Tasks:

- **Complex analysis** of the area based on acquired data layers and their mutual connections. Dominating limitation will be represented by the conservation and biodiversity protection requirements and their influence on utilization of different RES.
- Joint **assessment workshops** for methodology assessment and interpretation for project team and authorities representatives
- Analysis of potential **RES sustainability** – evaluation of particular RES types, future development and their role in the created strategies (WP4)

WP4 – Strategy and its application

Next group of tasks will result in creation of common strategies for future RES utilization in all selected territories. The emphasis will be put on quality measures for efficient RES utilization, recommendations for different target groups or plans for increased RES production in particular areas. The strategic documents will be adopted and implemented by the management bodies of the territories.

Tasks:

- Elaboration of a **strategy for more effective RES utilization** within the boundaries and biodiversity/resources limits of the selected areas (cross-border regions / cities).
- **Measures for quality and long-term sustainable natural resources management** for energy purposes – concrete investment proposals, support strategy, motivation of the local population, entrepreneurs and administration, communication strategy.
- Diversified strategy (RES decisions and investments) for **individual target groups** (citizens, entrepreneurs, public administration), recommendations of suitable technologies including economy efficiency (investments, operational costs etc.) and evaluation of local conditions.
- Individual strategies for particular **municipalities** including plans for increase of RES share on energy production.

WP5 – Strategy implementation and communication

The WP5 is based on the transfer of developed strategy towards daily practice. The work package therefore includes work with representatives from public administrations, discussions and cooperation with management bodies from the selected territories and information campaign via media.



Tasks:

- **Addressing of public administration** (regions, municipalities) – integration of the strategy into policies of the selected territories via seminars, workshops, individual consulting, presentations for representative, public discussions.
- **Intensive cooperation** with management bodies of the selected protected areas in a synergy with their management strategies - seminars, workshops, individual consulting, implementation into the communication strategies of the protected areas.
- **Expert discussions** – involvement of the expert sector, discussions, cooperation.
- **Communication/Information campaign** – expert/public level, direct or via media – 1 common conference and in every region / city:
 - o 2 workshops (for authorities and experts/public)
 - o web presentation and e-learning course
 - o local press releases
 - o leaflet

Deliverables

- 6x complex natural resources evaluations of cross-border regions for individual RES
- 6x cross-border regional strategies for development of sustainable energy production
- Number of employees of the relevant local authorities, agencies and other relevant public bodies with increased awareness on RES potential and suitable technologies in their area) – 100 (evidence: presence lists)
- Number of local or regional administrations regularly using RECROS for decision making since 2018 – 12 (evidence: LoI)

Duration: 36 months (2016 – 2019)

Potential and Identified Partners (10 max)

CZ – Czech University of Life Sciences in Prague (lead partner), Research Institute for Soil and Water Conservation, ECO trend Research centre

SK – Soil Science and Conservation Research Institute

SK, HU, AT, Bavaria – preferably cities/regional authorities/management bodies of nature reserves and owners of data sources are welcome