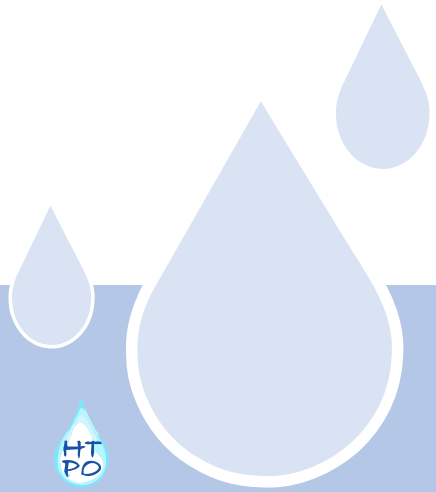
Interreg
Österreich-Tschechische Republik
Europäischer Fonds für regionale Entwicklung

HTPO

ATCZ167

T2.1 CATALOG OF JOINT MANAGEMENT STRATEGIES AND MEASURES DERIVED FOR AN SUSTAINABLE AND EFFICIENT USE OF THERMAL WATER RESOURCES



Co-financed by the European Regional Development Fund

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CONTENT

1. INTRODUCTION

This report was written in the course of the project "HTPO - Hydrothermal Area Potential" in Laa an der Thaya-Pasohlávky ". The report forms the core output of work package 2 "Strategic measures for the sustainable and efficient management and use of cross-border thermal water resources". The report intents to serve as a guideline for a future joint management and joint measures for the near-border and cross-border thermal water resources in the study area. The aim is to use resources efficiently and sustainably in order to preserve the economic potential (tourism and energy supply) for future generations.

As “Catalogue of joint management strategies and derived measures for the sustainable and efficient use of thermal water resources”, the report represents a summary of the outputs from work package 2 - “Strategic measures for the sustainable and efficient management and use of cross-border thermal water resources”. The contents of this work package are divided into the following subject groups:

- Perception of the technology - prepared as SWOT analyses and surveys on the advantages and disadvantages of using thermal water for bathing and healing purposes and for energy generation (work package T2.2.1)
- Elaboration of the legal and administrative framework conditions in the project area (work package T2.1)
- Overview of types of use of thermal water and possible areas of application (work package T2.2.2)
- Socio-economic study of the investigated area and economic consideration of uses (work package T2.2.2)
- Quantitative risk assessment of risks with environmental impacts (work package T2.2.3)

The following elaboration of the strategies and measures is based on the results of these outputs in combination with the results from work package 1 - "Geoscientific model of thermal water resources", which reflect the geological and hydrogeological conditions in the project area.

For a better understanding or for further information, all outputs can be viewed or downloaded at https://www.at-cz.eu/at/ibox/pa-2-umwelt-und-ressourcen/atcz167_htpo/dokumente.

2. MANAGEMENT STRATEGIES AND MEASURES

2.1 BASELINE

This catalogue presents a management strategy based on an adaptive management strategy adapted to the current usage situation in the study area.

The thermal waters in the HTPO project area are already used for bathing and healing purposes, but also offer the possibility of a local heat supply using hydrogeothermal energy (deep geothermal energy). From the point of view of the availability of the resource, there is nothing to prevent the expansion of uses of any kind. While use for bathing and healing purposes is viewed positively in this regard, stakeholder surveys clearly show that use for energy generation, more from an economic than from a scientific point of view, is sometimes viewed by the respondents as not promising. The current situation, with regard to climate protection, the strong fluctuation in energy prices in the hydrocarbon sector with a continuously increasing tendency, or developments in the state of the art, may change the economic and technical conditions for the use of deep geothermal energy in the future.

From an economic point of view, the region, albeit sparsely populated and characterized by agriculture, has good prerequisites for further uses, especially in the energy sector. On the Austrian side in particular, the proximity to Vienna, the well-developed infrastructure and a general trend towards population growth speak in favour of this. The water management consideration of an expansion of uses cannot be specified now. The thermal water uses on both sides of the border draw their water from the same geological body, but a connection could not be confirmed within the framework of the project.

For the development of a management strategy, it is therefore important to consider future developments and new findings about the subsurface. Adaptive management strategies can serve as a basis for the development and management of thermal groundwater bodies. This strategy is not a one-off linear process, but rather a combination of principles defined and monitored over the entire management period, adapted to the current situation. The individual focal points are closely linked and can only be worked out and defined for a management area when viewed together. The compilation of adaptive management strategies develops through knowledge, which is expanded through research and the establishment of uses. Adaptive management strategies look different at the beginning of the management compared to an increased use of the resource. In principle, goals, criteria and measures can therefore also change after area expansions and be supplemented, tightened or mitigated for the entire area or individual sections of the management area

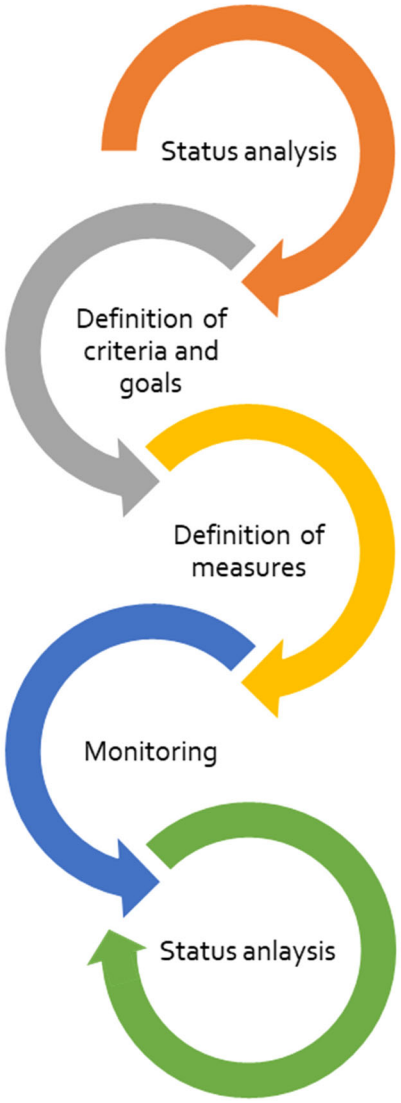

Figure 1: Principle of an adaptive management strategy

The most important instrument for the preparation and implementation of common management strategies and thus their basis is information and exchange. In relation to the current management situation in the study area, the key words information and visibility of the technology are of particular importance. The presentation of measures in the HTPO study area is therefore based on three mutually building-up cornerstones:

- **Exchange and communication** between those responsible in both countries to enable future uses and to ensure sustainability;
- **Information** - Provision of existing information to force the topic;
- Increasing the **visibility** of the technology, especially in the field of energy generation.

2.2 MANAGEMENT STRATEGY

IMPLEMENTATION, INFORMATION AND FIRST MEASURES FOR THE HTPO REGION

(1) STATUS ANALYSIS

➔ Implementation

The status analysis is at the beginning of every strategy development and has an extensive data collection as the first goal. Questions to be clarified are “Can the resource be used and to what extent?” and “What do I have to pay attention to in order to use this resource?”. In doing so, both data relating to the subsoil and the thermal water are recorded as well as data that are decisive when used in the region. The more comprehensive and precise these data are, the more precisely a possible management of the area can be planned. Based on this data, initial hydraulic evaluations and an approximate estimate of the energy content should be made, to define criteria and goals for use. The inventory analysis is at the beginning of an adaptive management strategy, but at the same time forms a process that runs through the entire management period. Each new use brings new knowledge and possible changes in the state that lead to a new starting position and require new evaluations of criteria, goals and measures.

➔ Information from HTPO

T1.1.1 Structural-geological-hydrogeological map series of thermal water resources - zoning, relief and thickness of relevant hydrostratigraphic systems

T1.1.2 Geothermal map series of thermal water resources - reservoir temperature, heat flow and thermal circulation paths

T1.2.1 Acquisition of historical earthquakes - assessment of seismic activity based on archive data

T1.3.1 Joint earthquake catalogue - with special attention to the vicinity of the study area

T1.4.1 Cross-border database of thermal water uses in the Laa-Pasohlávky region - historical and current production data as well as periodic monitoring data

T1.4.2 Technical description of the existing uses Laa-Pasohlávky

T1.4.3 Balance of thermal water resources Laa-Pasohlávky - hydraulic and thermal balance of thermal water resources based on the hydrogeological model

T2.1.1 Inventory of current management and administration practice

T2.1.2 Inventory of relevant transnational agreements and mechanisms

T2.2.2 Assessment of the available resources and the economic potential - Part 2: Socio-economic study of the HTPO region including an economic analysis and presentation of the energy content

Measures: Proposal for the HTPO region

- Establishment of a common administrative tool for both countries to create communication channels and responsibilities at the official level
- Involvement of the existing Austrian-Czech border water commission
- Establishment of a common data model

(2) DEFINITION OF CRITERIA AND GOALS

➔ Implementation

Quality and quantity of the resource - the hydraulic assessment created from the as-built analysis and the assessment of the content should be combined with possible applications in the next step. The focus is on “Where and for what can I use the resource?”. Usage goals are set as a usage strategy and can subsequently also be linked to energy and area development goals to manage areas systematically and put new individual plants in a larger context. In this way, common interests are put first. Another advantage arises here for the formulation of measures and the adherence to goals. In this sense, critical changes in status are also determined at the same time, which are understood as framework conditions for the extent of management.

➔ Information from HTPO

T2.2.1 Integrative survey and assessment of opportunities and risks for the use of thermal water - surveys of the general public and experts on the use of thermal water, advantages and disadvantages as well as opportunities and risks

T2.2.2 Assessment of the available resources and the economic potential - Part 1: Uses of thermal water in general and in the HTPO project area

Measures: Proposal for the HTPO region

- Definition of criteria for use - establishment of a common state of art including the hydraulic balance
- Consideration of hydrogeothermal energy in area and energy planning
- Exploring possibilities and determining potential usage locations
- Establishment of a usage strategy with the involvement of stakeholders from science, business and industry

(3) DEFINITION OF MEASURES

➔ Implementation

For the definition of measures, the question arises “How should the construction and operation of systems for the use of the resource be designed?”. A common database and the associated creation of a common resource model serve as the basis for this. Both must be designed dynamically and expanded to include this information / data in the event of new findings. In detail, this point also includes the elaboration of operating parameters (delivery rates, delivery and reinjection temperatures, pressures, etc.) for the protection of existing systems and the resource in general and the instruments with which they are monitored (monitoring of operating parameters, passive environmental monitoring, seismic monitoring). As a further step, joint legal and administrative measures, such as the procedure for submitting and monitoring systems and responsibilities, are to be defined in the respective country and for cross-border communication.

➔ Information from HTPO

T1.1 Integrative geoscientific model of the Laa-Pasohlávky thermal water resources - issued as an inclusive map series and explanations

T1.4.4 Dynamic forecast model for future uses - scenario analysis for future uses

T1.3.2 Assessment of the seismic potential - based on the available earthquake data, the seismic potential is examined with regard to future uses

T2.2.3 Assessment of possible risks and environmental impacts from the use of thermal water - First risk assessment of selected risks

T2.3.1 Catalogue of technical and institutional measures for joint use in the border area - technical infrastructures and institutional proposals for joint use

T2.3.2 Catalogue of the administrative and legal measures for the joint use of thermal waters in the border area - proposal for the elaboration of a legal framework for joint management based on the current legal situation in Austria and the Czech Republic

Measures: Proposal for the HTPO region → Enabling and supporting the management of thermal waters in the HTPO area

- Promotion of the application through socio-political incentives such as promotion of research in the study area
- Investment models and financial support
- Energy price adjustments for renewable energies
- Increasing visibility - advertising and information

(4) MONITORING

→ Implementation

The monitoring of all defined requirements and measures in the operation of plants serves on the one hand for control and on the other hand monitoring reports provide a new data basis to expand the inventory analysis. By monitoring, the system and the subsurface, undesired effects such as impairment of neighbouring systems or a drop in the reservoir temperature can be detected early and counteracted before a problematic situation arises.

2.3 MEASURES

PROPOSAL FOR A ROADMAP 2021-2030 FOR THE HTPO AREA