

Executive Summary

Context



- The bill on energy transition for the “green” growth includes the recovery of unavoidable energies in order to fight against energy waste.
- The AVENIA cluster aims at promoting the **use of subsoil**.
- Geoscience activities such as oil fields and deep geothermal installations, generate hot water. In France, this **waste heat is still undervalued**.
- **37 heat reservoirs** are now identified in the Paris Basin, the Aquitaine Basin and in Alsace, with water heated **up to 85 °C and 7,800 m³/day**, of which 15 with flow rates above 900 m³/day or an available heat potential higher than 100 TOE*/day (with 1 Ton of Oil Equivalent = 11,630 kWh).

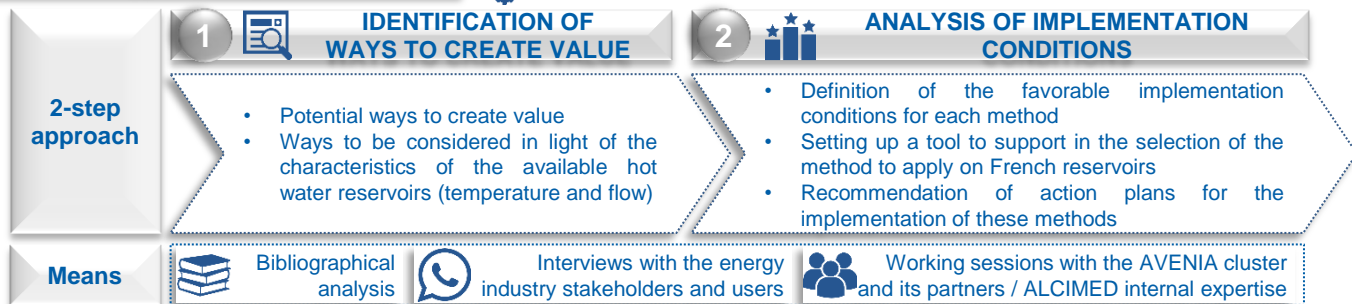
Objective



- The goal is to **find ways to create value** in order to use the available unused heat, near the production sources.
- The study gathers **8 funding partners** representing the different steps in the value chain (institutional players, oil and gas companies, field operators, users or representatives of waste heat users):



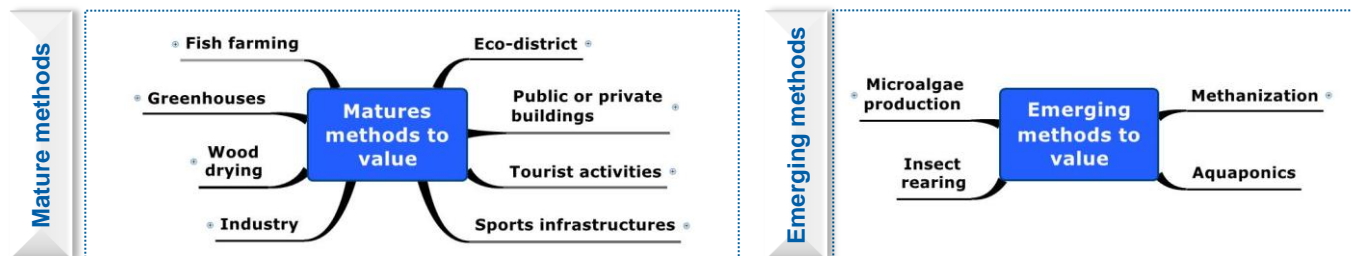
Methodology Description



Results Summary



- Geoscience activity-related waste heat can be used with better efficiency in order to produce positive cold or heat up to 100 °C.
- On this basis, 12 recycling methods have been identified and characterized:
 - **8 mature methods**, where the players are structured and technologies are mature. Waste heat is one of the renewable energies used by these activities.
 - **4 emerging methods**, still in development, which are relevant given their significant market potential in the mid-term. The use of waste heat can promote their technological and economical maturity.



- All these methods can potentially be implemented on all the French waste heat reservoirs.
- The establishment of these methods will be possible when local opportunities arise and favorable conditions are fulfilled.

Take Home Messages



- This approach has helped **bring together** the waste heat holders and **involve potential users** such as the Fibres cluster, Euralis and the Lasalle Beauvais institute.
- New methods, such as insect rearing, unidentified yet to date, have been brought forward.
- All the identified ways are **well accepted** by end-users.
- A **simple tool** for supporting decision-making was developed and will be made available by AVENIA. The waste heat holders will be able to use it for **operational guidance** on value-creation ways to favor in priority, depending on the characteristics of their reservoirs.
- **The key success factor to enable the implementation of a new method to value the waste heat** is based on a **proactive approach** of reservoir holders towards local stakeholders.

Value Creation



- Definition of preferred value-creation ways, specific for each reservoir, and approach for project leaders research
- Feasibility study and project structuring, with public financial support if needed (renewable heat funds, AMI “Industrie et Agriculture Eco-Efficientes”, ...)

Bottom-line



- Joint communication of project partners over the approach
- Go on with value-creation of subsoil (gas, metals, ...) in geoscience activities