



### GREENCYCLE:

Introducing circular economy system to Alpine Space to achieve low-carbon targets



## PROJECT OVERVIEW

The GREENCYCLE project aims to develop and promote circular economy in medium-sized cities in the Alpine Space. Its implementation focused on developing several axes: circular economy strategies in partner cities, regional skills to support circular economy projects, and tools such as a knowledge base, a toolbox and a digital marketplace. Financed by the Interreg Alpine Space programme, it includes five partner pilot cities: Freiburg (Germany), Vorau (Austria), Maribor (Slovenia), Vienne Condrieu Agglomération (France) and Trento (Italy).

In France, the project was led by Auvergne-Rhône-Alpes Énergie Environnement (AURA-EE), which accompanied Vienne Condrieu Agglomération during three years in the definition of its circular economy strategy and action plan. This resulted in the creation of a pilot project for a local loop around the municipality's wastewater treatment plant, as well as in a collective approach with the area's economic actors on energy and waste issues



### GOALS IN THE AUVERGNE-RHÔNE-ALPES REGION

- ∞ Develop regional skills to support circular economy projects
- ∞ Enrich the regional resource centre for circular economy (ECLAIRA), by integrating the tools created under the project.
- ∞ Enhance the experience of Vienne Condrieu Agglomération on the development of circular economy



### TARGETS

Local authorities wishing to integrate circular economy into their territorial strategy



### ACTIVITIES

- ∞ A toolbox designed for local authorities
- ∞ Definition of the circular economy strategy of Vienne Condrieu Agglomération
- ∞ Creation of a local loop to enhance the value of the biogas produced by the wastewater treatment plant
- ∞ Involvement of the territory's economic players
- ∞ A study on the territory's bio-waste potential to produce biogas



### INVOLVED ACTORS IN THE REGION

- ∞ Vienne Condrieu Agglomération
- ∞ Isère Chamber of Commerce and Industry
- ∞ Association for the Economic Development of Isère Rhodanienne (ADEIR)
- ∞ An association for waste sorting and management, Tri Rhône-Alpes (TRIRA)

### TOTAL BUDGET

# €1.9 M



out of which €1.6 M ERDF, allocated to the European partners.

### DURATION



## October 2016 – April 2020

### EUROPEAN PARTNERS

10 partners from 6 Alpine countries: Italy, Austria, Germany, Slovenia, Liechtenstein and France.

# ACTIVITIES CARRIED OUT



## ▶ A toolbox designed for local authorities

During the first phase of the project, a toolbox was created in order to help territorial actors to develop circular economy projects.

This toolbox, available online on the [regional platform for circular economy](#), ECLAIRA, and on the [greencycle.si](#) platform developed by project partners, offers questionnaires and methodological guides that can be downloaded. These documents help interested municipalities to start their projects (identification of key players and issues), to develop an action plan and to evaluate their circular economy policies. The tools are classified by theme (energy, mobility, waste, construction, etc.), by type and by project stages (diagnosis, strategy, action plan, design, assessment). They have been tested within the framework of circular economy projects conducted by the local authorities that were partners in the project: Vienne Condrieu Agglomération in France, the City of Freiburg in Germany, the Municipality of Trento in Italy, the City of Vorau in Austria and the City of Maribor in Slovenia.

## ▶ Definition of the circular economy strategy of Vienne Condrieu Agglomération

### *The objectives of the territory*

- Reduce the dependence on fossil fuels, particularly in transport;
- Cut down the energy consumption and develop renewable energies in industry;
- Lower waste production and optimise recovery circuits;
- Raise awareness about circular economy among professionals in all sectors.

### *The circular economy strategy of Vienne Condrieu Agglomération*



The local authority has chosen circular economy actions that complement the existing policies, such as the Sustainable Energy and Climate Action Plan, the "Positive energy territories" approach and the Waste Plan. The focus of the strategy is on innovation, employment and the exemplary nature of the territory.

### *The main lines of action*

In the field of circular economy, Vienne Condrieu Agglomération has chosen to work on several axes. In the field of energy, the objectives are the recovery of waste from biomass and the use of available wood resources (construction, furnishing, energy).

Regarding waste, the actions concern the observation of material flows and the dissemination of recycling technologies. It is also planned to improve sorting performance and to create a network of "resource" centres (voluntary contribution points, fixed or mobile waste collection centres, recovery centres).

Finally, in construction, it is proposed to use materials that are bio-sourced or issued from reuse or recycling, and also to recycle construction waste.

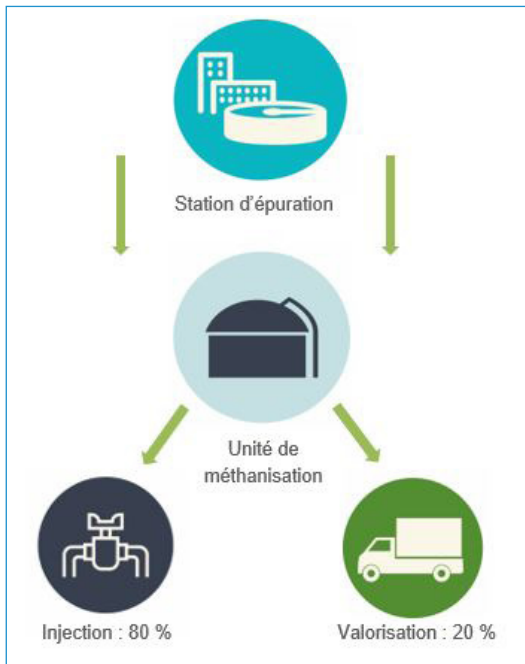
### *The 2018-2020 roadmap*

To get started, Vienne Condrieu Agglomération prioritised three circular economy actions for the 2018-2020 period of the project:

- The creation of a local loop for the recovery of sludge from the municipality's wastewater treatment plant, in the form of "bioNGV" (natural gas for vehicles) fuel, to supply a fleet of vehicles (GREENCYCLE pilot project);
- The development of territorial synergies between economic actors, in the fields of waste, energy and pooling of services;
- The identification of bio-waste flows in the urban area, in order to identify the biogas potential and to build an adapted waste collection strategy.

## ► Creation of a local loop to enhance the value of the biogas produced by the wastewater treatment plant

Vienne Condrieu Agglomération has chosen the biomethane production as a priority because of its strong potential in the area. Therefore, when it came to choosing a pilot project for GREENCYCLE, the local authority, with the help of AURA-EE, decided to create a local loop around a biogas plant managed by the municipality. It was also agreed to use at the local level part of the biomethane produced by the Reventin-Vaugris wastewater treatment plant.



This plant, exemplary in terms of sustainable development, was already recovering biogas from sludge digestion. This was made by cogeneration in order to produce electricity. The remaining biogas was used on site for building heating and was also injected into the gas grid.

The local loop aims to use part of the biomethane produced, by building an NGV service station linked to the mobility platform for urban buses. As of 2020, this service station will supply three urban buses and two gas-powered garbage trucks of the municipality. The objective is that 20% of the biomethane produced to be transformed into bioNGV fuel (40 Nm<sup>3</sup>h in 2018).

ENGIE (purchaser of the biomethane) and Vienne Condrieu Agglomération (operator of the wastewater treatment plant) have joined forces to implement this local loop. In this way, there is the guarantee that part of the biomethane produced will be used to supply the NGV vehicles belonging to the municipality.

## ► Involvement of the territory's economic players

The second initiative of the 2018-2020 roadmap, named "Cap'Synergies", was set up by Vienne Condrieu Agglomération, AURA-EE and a local partner (ADEIR). Its objective was to develop synergies and pooling between economic players through networking at a territorial scale.

The action areas selected for the development of synergies were waste (repair, reuse, recycling, pooling) and energy (energy saving, renewable energies, energy recovery).

About thirty companies in the area were involved in this process, participating in workshops providing information about the following issues:

- On the theme of waste: costs, recyclable waste streams, and existing mechanisms (pre-diagnosis of flows, waste diagnosis, etc.);
- On the theme of energy: contracts, subsidies, existing mechanisms ("Energy Visit") and ways of pooling energy purchase.

More than 180 resources and 50 potential synergies have been identified for the studied themes.

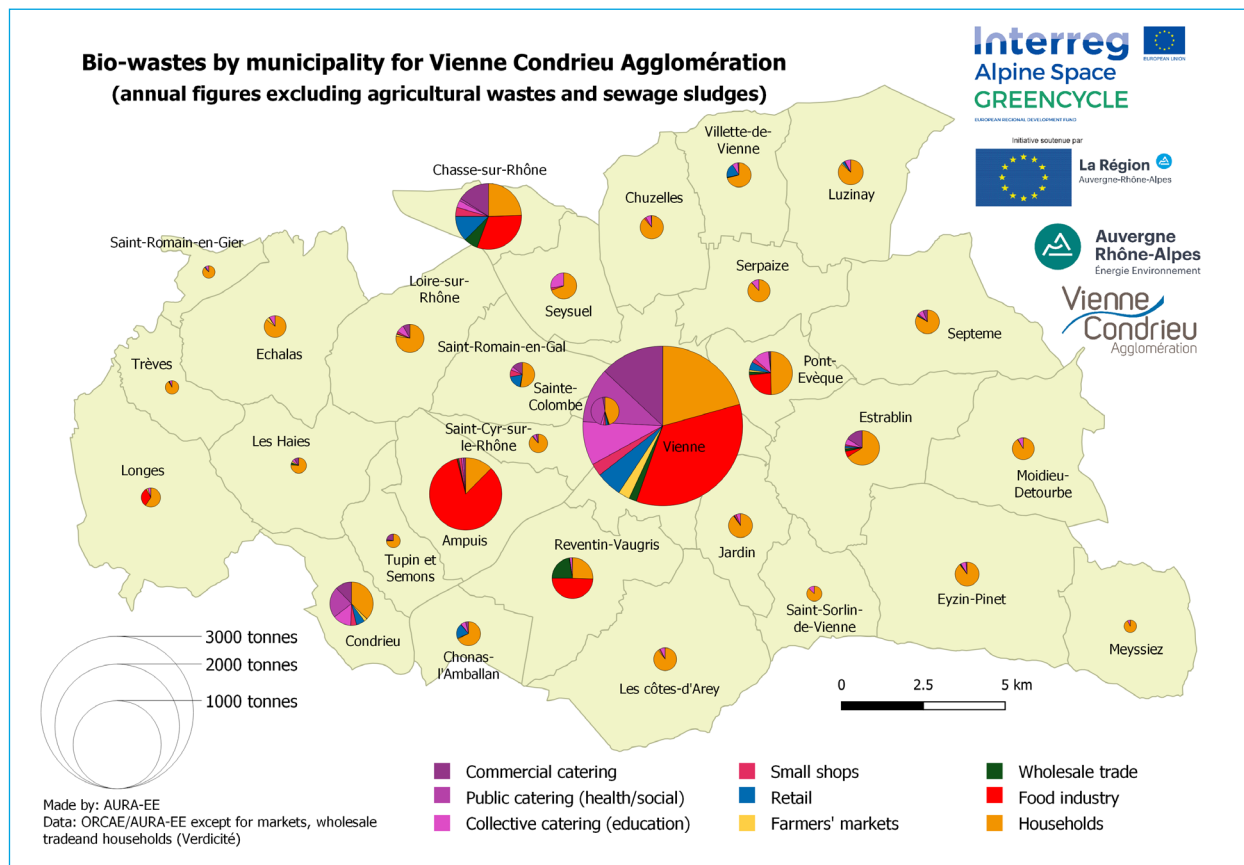
Moreover, a study was carried out on the pooling of recyclable waste collection, such as plastic film and cardboard boxes. It was managed by the Isère Chamber of Commerce and Industry and ADEIR among around fifteen SMEs in the Pont-Evêque/Estrablin area, aiming to identify the potential of this type of initiative. Interviews were conducted with manufacturers such as Ascorel, Querlioz, Descortes and Calor. The results of the study show that, despite the interest of the companies interviewed during the collective sessions, the effective implementation of pooling in waste collection is complex (the identified reasons are presented in the section on the lessons learned from the project).

## ► A study on the territory's bio-waste potential to produce biogas

In line with the strategy for deploying the circular economy actions around biomethane, a study financed by GREENCYCLE was carried out in 2019-2020 by two engineering firms (EREP and Verdicités). Its objectives were to quantify and qualify the area's food bio-waste, identify the biogas potential, and provide scenarios for the collection and treatment of bio-waste by the municipality.

Indeed, the Ecological Transition Law for Green Growth of 2015 and the National Roadmap for Circular Economy of 2018 impose to local authorities new obligations regarding the management of their waste, including sorting bio-waste at the source, to be implemented in 2025.

The purpose of this study was mainly to quantify the tonnages of food bio-waste by sector in the territory (commercial catering, collective catering, food industry, small shops, distribution, household bio-waste, wholesale businesses and food markets). Agricultural waste and sewage sludge were not considered in this study. Based on the figures provided by this study, AURA-EE produced a map of bio-waste at the scale of the urban area and will integrate during 2020 the data collected into the regional decision support tool, TerriSTORY®, and into the Regional Observatory on Climate Air and Energy (ORCAE).



Then, the potential to produce biogas was assessed by identifying biogas plants or composting sites likely to receive bio-waste from the territory.

Finally, two scenarios for the bio-waste collection by the municipality have been imagined and quantified:

- A maximalist scenario regarding the means allocated by the local authority, by favouring door-to-door collection of bio-waste;
- A minimalist scenario favouring the voluntary disposal points and individual composting.

These scenarios were designed in consultation with the waste department of Vienne Condrieu Agglomération, so that the quantified means are realistic.



## PROJECT RESOURCES AVAILABLE



### Circular Economy Toolbox

#### "Develop circular economy in the territories: levers and concrete examples" (in English)

This document guides a territory in defining its circular economy strategy, providing concrete examples of possible actions and listing the challenges that may arise during the process.

Written by AURA-EE in 2018, it compiles information from ARENE Ile-de-France, the City of Paris and OREE.

<https://bit.ly/2Lu1ErK>



#### "Organisation of a world café on circular economy" (in English)

The objective of the world café is to foster collective creativity and the sharing of knowledge and ideas. This process reproduces the atmosphere of a café, with small, friendly tables that encourage spontaneous exchanges. This tool allows to involve all the participants in authentic exchanges on the subject.

This document was produced by Vienne Condrieu Agglomération in 2018, based on the work carried out by TRIRA with the economic actors of the urban area.

<https://bit.ly/2y25ZQ3>



#### "Local use of the biomethane produced by the wastewater treatment plant in Vienne Condrieu Agglomération" (in French)

This initiative sheet presents the ambitious project about the Reventin-Vaugris wastewater treatment plant, aiming to recover the biogas produced by sludge digestion. It also describes the local loop pilot project to supply with bioNGV five vehicles of the agglomeration.

The document was drafted in 2018 by AURA-EE and Vienne Condrieu Agglomération.

<https://bit.ly/2VtGKPM>



#### Video: The pilot project in Vienne Condrieu Agglomération, a model to inspire local stakeholders (subtitled in English)

This video, produced by Vienne Condrieu Agglomération in 2018, shows the visit organised around the local loop in Reventin-Vaugris. The pilot project is regularly presented to the actors of the territory, as a spin-off model.

<https://bit.ly/3dn2seg>





# RESULTS AND LESSONS LEARNED

## **Project results**

- An investment by Vienne Condrieu Agglomération of €450,000 for the construction of the private NGV service station in Pont-Evêque and €1.35 M for three city buses and two gas-powered garbage trucks;
- About thirty companies in the area involved in the process of seeking synergies.

## **Impacts in the region**

### *Ecological impacts*

The pilot project in Vienne Condrieu Agglomération implies the use of bioNGV instead of fossil fuel and will therefore result in the reduction of fossil fuel consumption. This allows to cut down to a significant extent greenhouse gas emissions and atmospheric pollutants.

### *Social impacts*

The transformation of sewage mud into an energy product has a strong impact from a social point of view. It is a way to change mentalities and to encourage the implementation of circular economy principles into other projects. Firstly, by showing that local loops can be implemented around biogas plants and, secondly, by considering waste as a potential resource and a way to obtain a financial value from it, at a local level. This change in mentality concerns the employees of the local authority, and also economic partners and municipalities.

### *Economic impacts*

With operating savings of more than €300,000 per year (the savings on gas that would have been purchased for the vehicles, but will be produced locally), the investments made in the NGV service station will improve the ROI of the project. In addition, the implementation of such a local loop enables the municipality to reduce its operating costs, as the cost price per kilometer is lower in the case of bioNGV compared to diesel.

## **Main lessons learned from the project**

The feedback from the project partner cities shows that the implementation of a circular economy strategy, a very broad subject, has most of the time started with the identification of existing initiatives and often led to analysing the possibility of "closing loops", to make existing projects "circular". Starting from scratch in circular economy is very difficult. Therefore, the solution is to build on existing projects, in the fields of energy and/or waste, for example, as Vienne Condrieu Agglomération did around its wastewater treatment plant.

The involvement of economic players is necessary in circular economy approaches to identify synergies and ways of pooling waste collection and this aspect worked well at the beginning of the "Cap Synergies" initiative. However, when it came to taking action, the local authority was confronted with obstacles that made it difficult to deploy the planned actions:

- the lack of employees in charge of waste management in SMEs does not allow to have a respondent on the subject;
- insufficient sorting instructions (cardboard boxes mixed with other types of waste);
- the unavailability of measuring instruments to quantify the volume of waste produced by businesses makes it difficult, if not impossible, to quantify the benefit of such an action.

Finally, it is by focusing on the players of the sector that the agglomeration managed to achieve promising results. The services of the local authority regularly organise visits to the wastewater treatment plant for farmers, in order to make them aware of the local use of biomethane and to identify future partnership opportunities.

# FUTURE PROSPECTS

At the beginning of 2020, the local loop project supplies five vehicles belonging to the municipality. In the coming years, it is planned to develop another public service station for professionals in the sector and to make other potential users aware of the ecological advantages of NGV vehicles.



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The strategy of Vienne Condrieu Agglomération is to link the territory with agricultural biogas projects, combined with circular economy, on the same model as the one set up in Reventin-Vaugris: using waste from agriculture to produce energy and connecting these initiatives with the bioNGV production, in order to supply the service stations.

The development of renewable energy production operations should allow the urban area to achieve the energy neutrality objectives by 2050.

In this context, the municipality supports a local agricultural biogas project, AGROMETHA, which includes 30 farms. It involves injecting 325 Nm<sup>3</sup>/h of biomethane into the gas grid and employing five people on a full-time basis. This project strengthens the "Positive energy territories" dynamic and represents an important action that contributes to the circular economy approach in the agglomeration.



AGROMETHA, a collective of farmers © Vienne Condrieu Agglomération



## ... TO FIND OUT MORE

- GREENCYCLE project website (in English) : <https://www.alpine-space.eu/projects/greencycle/>
- GREENCYCLE project page (in French) : <https://www.auvergnerhonealpes-ee.fr/projets/projet/greencycle>

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