

# Biocircularcities Trilogy – Ep. 3: The journey of the three pilot territories



## BIO CIRCULAR CITIES

### How to tackle issues with biowaste management in rural regions

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 Bio-based Industries  
Consortium

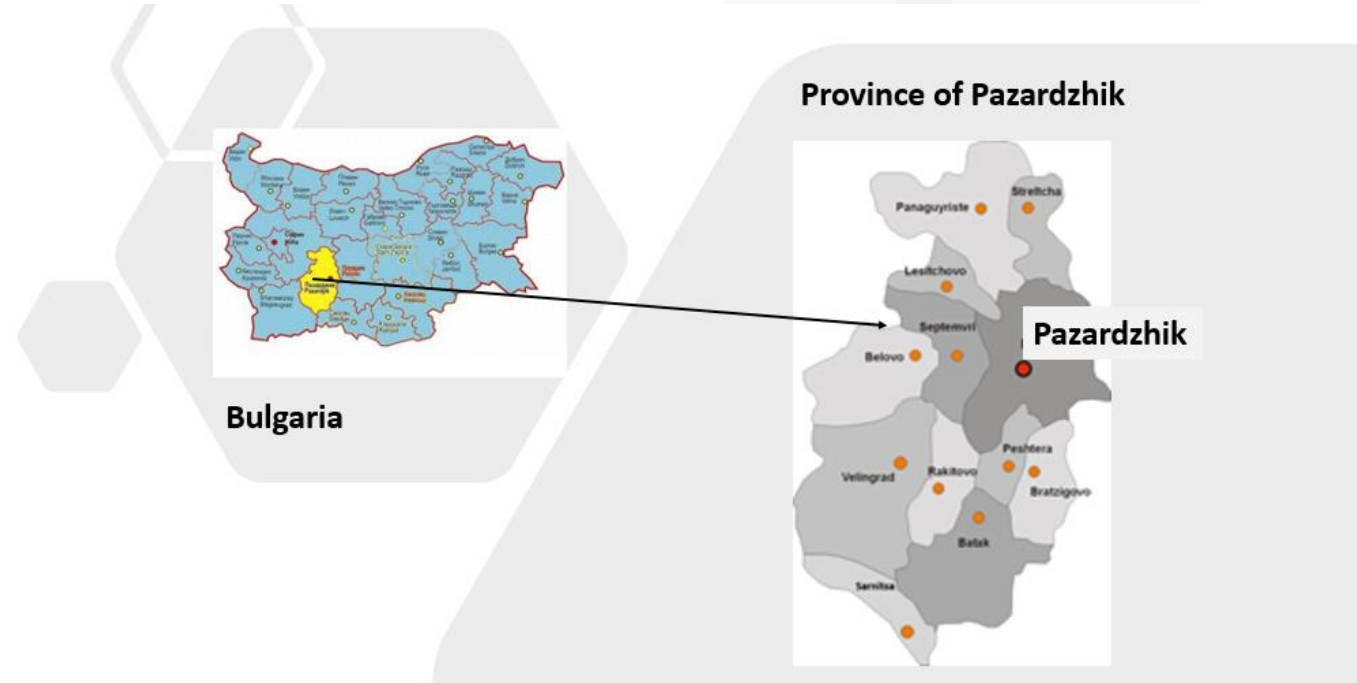


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# Province of Pazardzhik – short intro



The Province of Pazardzhik is located in the South Central part of Bulgaria and comprises 12 self-governing municipalities, which include 117 settlements and 96 mayoralities situated on 4,458 sq. km. (4% of the total country surface), with a population of about 270,000 inhabitants, The Province has a low population density (65 inhabitants/km<sup>2</sup>). The greater part of the territory (56%) is forested areas and 36% is agricultural lands.

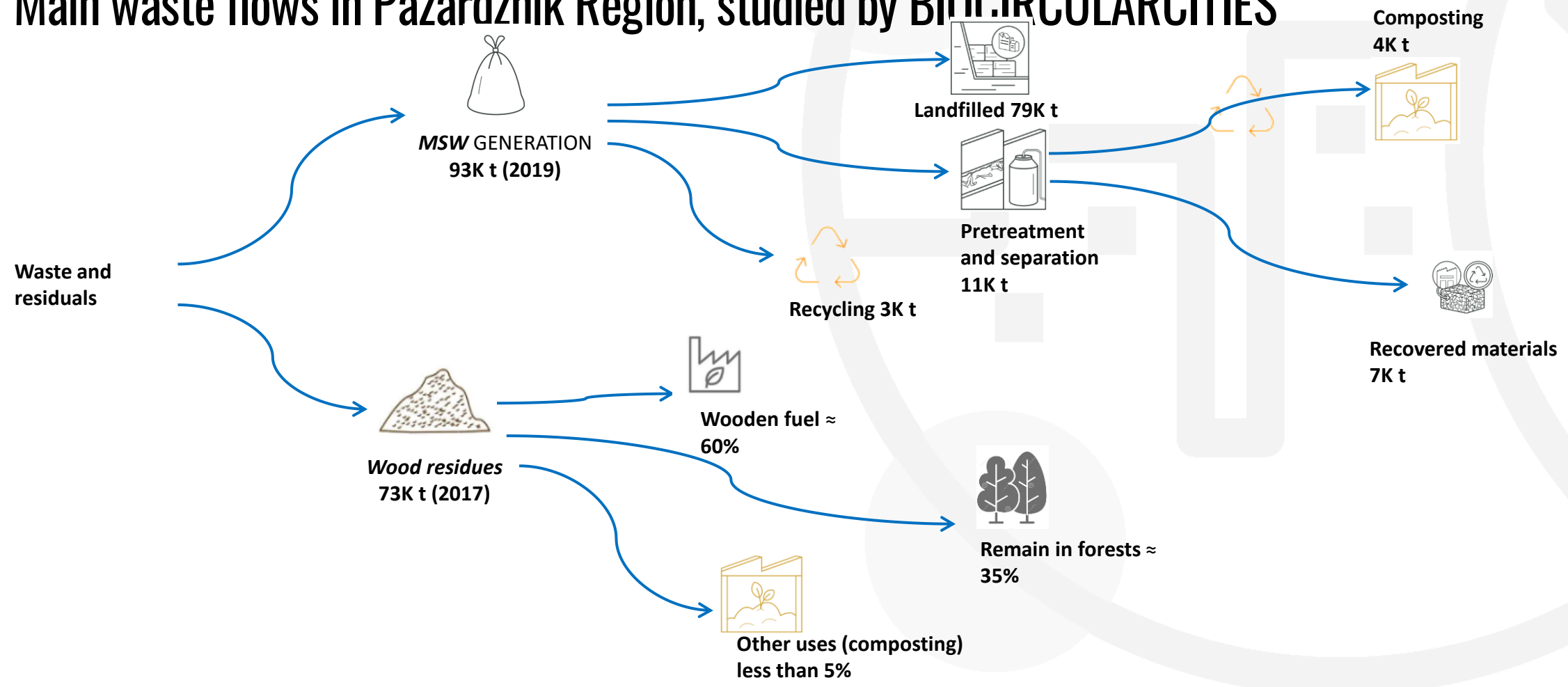
# Province of Pazardzhik – short intro

Key elements related to biowaste and waste management in the region:

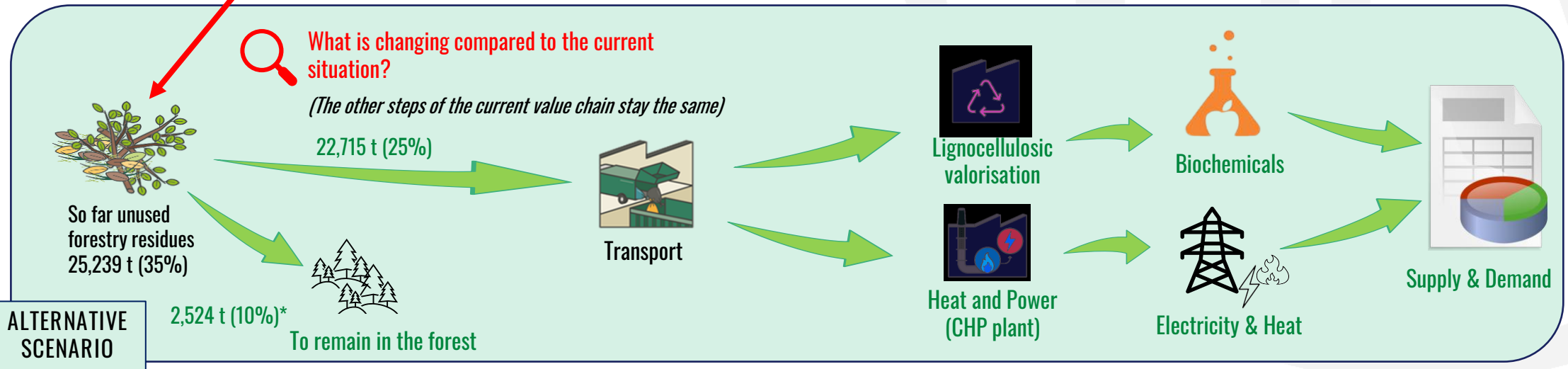
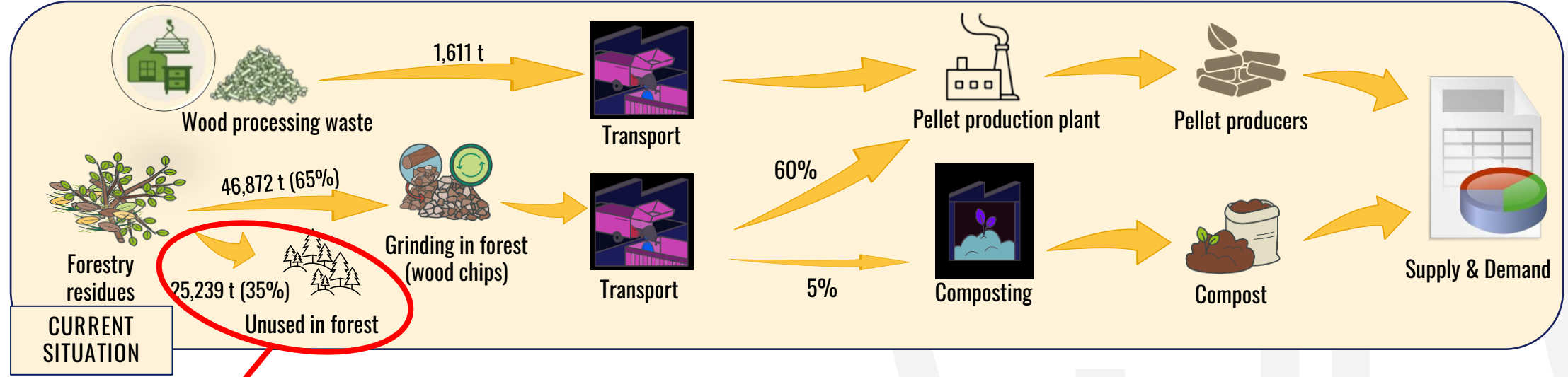
- **Typical rural region** with a large share of unexploited bio-waste from agriculture and forestry sectors.
- Separate collection of bio-waste in the region of Pazardzhik, as well as in Bulgaria in general, is in its very **infant stage** and only few pilot projects are in place.
- Few months ago – a contemporary **regional depot** for composting and pre-treatment of household waste was opened near the city of Pazardzhik, servicing 7 municipalities from the region (Pazardzhik, Peshtera, Bratsigovo, Belovo, Batak, Lesichovo and Septemvri).
- Very good opportunities for the development of **sustainable agro energy** chains based on local agricultural residues, and local agri-industrial wastes

# Waste diagram – main flows

- Main waste flows in Pazardzhik Region, studied by BIO CIRCULAR CITIES



# The selected chain in Pazardzhik Province



Current/ not changing situation
 Alternative scenario changes

\* Recommended amount to be left on the forest floor in order not to disturb the nutrient balance of the soil (Pergola et al., 2020)

# Conclusions from LCA & LCC in PP chain

- The **Biorefinery scenario** turns out to be the most sustainable, thanks to the benefits deriving from the production of bio-based chemicals.
- The greatest environmental **advantages** come from the **avoided production of fossil BDO (1,4-Butanediol)**.
- The **highest impact** (hotspot) is due to **electricity** consumption.
- The valorization of 25% of currently unused forest waste, through its conversion into biochemicals (Alternative scenario - Biorefinery), would **allow to quadruple the economic benefits**, considering both the earnings from all the valorization activities and the **savings of environmental remediation costs**.

## These results suggest:

- Increasing the production of bio-based BDO.
- Increasing the use of renewable energy and/or of low energy consumption machinery.

# Stakeholder involvement

**Stakeholders involved: 3 LLs + one Final Stakeholder event in Pazardzhik**

- Local administrations (municipalities from our region)
- Forestry managers from municipal administrations
- Environmental organizations and Energy agencies
- SMEs associations
- Regional administration of Pazardzhik
- Educational authorities and representatives
- Regional Environmental and Water Inspection

**Stakeholders were providing valuable feedback on main project outputs such as LCA/LCC of the forestry biomass value-chain, identification of good practices, BCC web-tool, policy recommendations, etc.**

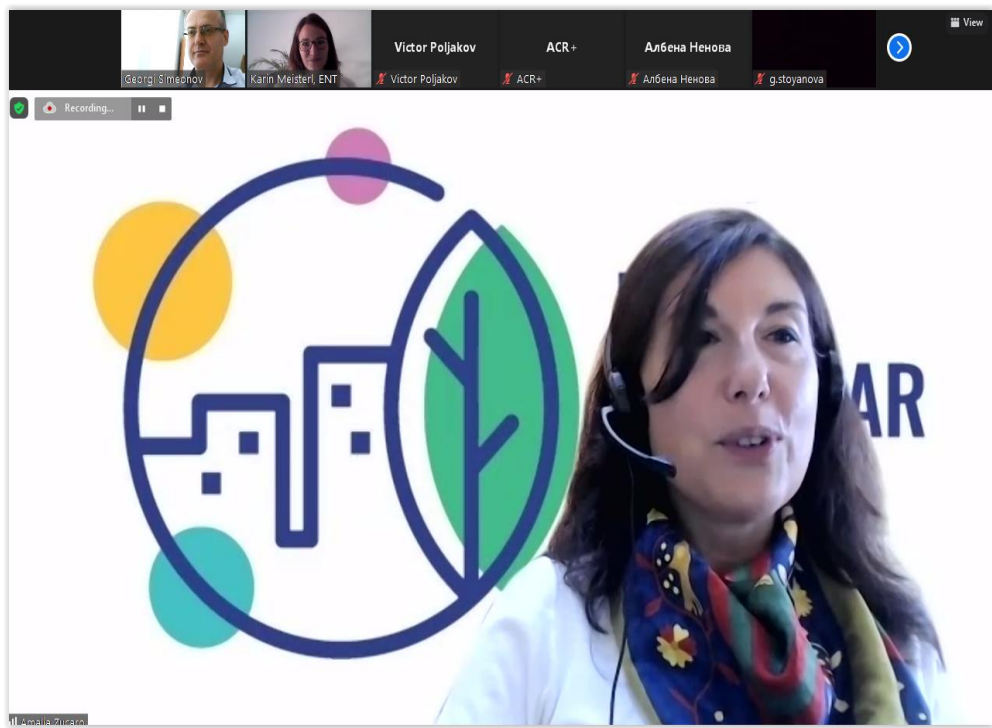
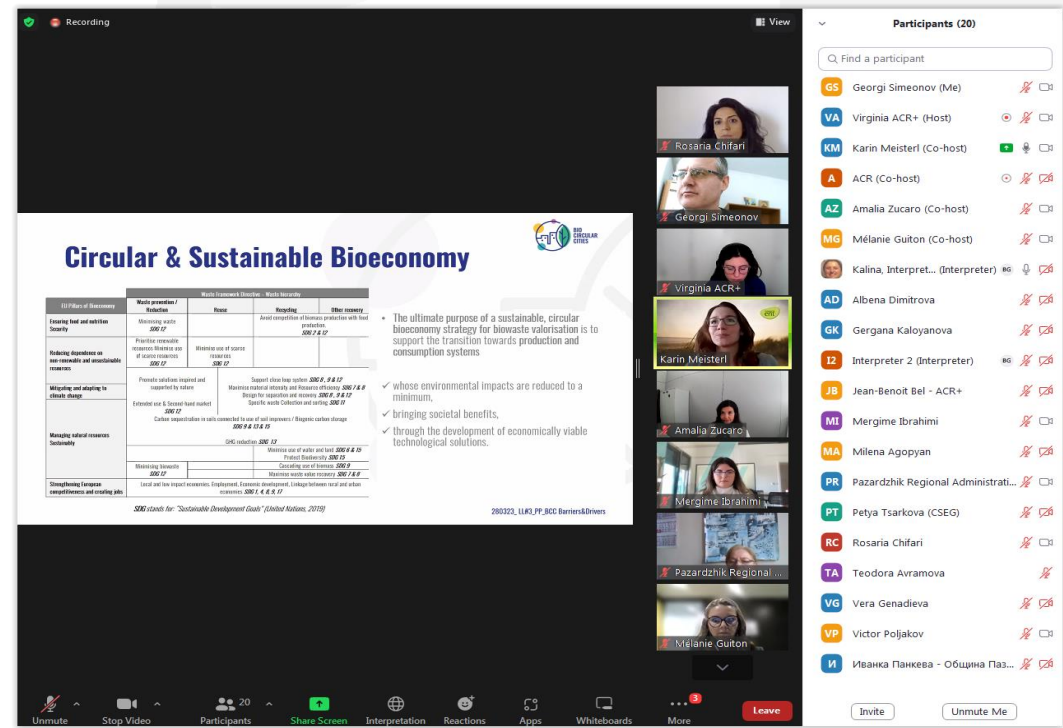
# Stakeholder involvement

## First LL of Pazardzhik Province



# Stakeholder involvement

## Second and Third LLs of Pazardzhik Province

**Circular & Sustainable Bioeconomy**

| SDG Pillars of Bioeconomy   | Policy priorities / Objectives                      | How                                | Enabling                              | Other enablers   |
|---|---|------------------------------------|---------------------------------------|--|
| <b>Ensuring food and nutrition security</b><br>SDG 2                              | Minimizing waste                                    |                                    |                                       | Avoid competition of biomass production with food production<br>SDG 2.4.1  |
| <b>Reducing dependence on non-renewable and unsustainable resources</b><br>SDG 12 | Providing renewable resources                       | Minimizing use of scarce resources |                                       |  |
| <b>Mitigating and adapting to climate change</b><br>SDG 13                        | Providing services required and supported by nature |                                    | Support clean blue carbon<br>SDG 14.2 | Maintain natural diversity and Resilience enhancing<br>SDG 14.5<br>Design for adaptation and recovery<br>SDG 14.7<br>Sustainable water collection and use<br>SDG 17  |
| <b>Managing natural resources sustainably</b><br>SDG 15                           | Enhancing soil & Sustain land market                |                                    |                                       | Carbon sequestration in soils connected to use of soil improvers / Biogenic carbon storage<br>SDG 13.1.1.1<br>SDG 15.1.1.1   |
| <b>Strengthening European competitiveness and creating jobs</b><br>SDG 8          | Monitoring benefits                                 |                                    |                                       | Minimize use of water and land<br>SDG 6.4.1<br>Protect Ecosystems<br>SDG 15<br>Circularity use of biomass<br>SDG 12<br>Maximize waste value recovery<br>SDG 12.2<br>Land use and the impact resources, Employment, Economic development, Collaborative innovation and open science ecosystems<br>SDG 1.4.4.8.1 |

- The ultimate purpose of a sustainable, circular bioeconomy strategy for biowaste valorisation is to support the transition towards production and consumption systems
- whose environmental impacts are reduced to a minimum,
- bringing societal benefits,
- through the development of economically viable technological solutions.

SDG stands for: "Sustainable Development Goals" (United Nations, 2015)

280323\_LUK\_PP\_BCC\_Barriers&Drivers

**Participants (20)**

- GS Georgi Simeonov (Me)
- VA Virginia ACR+ (Host)
- KM Karin Meisterl (Co-host)
- A ACR (Co-host)
- AZ Amalia Zucaro (Co-host)
- MG Mélanie Guiton (Co-host)
- Kalina, Interpret... (Interpreter)
- AD Albena Dimitrova
- GK Gergana Kaloyanova
- I2 Interpreter 2 (Interpreter)
- JB Jean-Benoit Bel - ACR+
- MI Mergime Ibrahim
- MA Milena Agopyan
- PR Pazardzhik Regional Administrati...
- PT Petya Tsarkova (CSEG)
- RC Rosaria Chifari
- TA Teodora Avramova
- VG Vera Genadieva
- VP Victor Poljakov
- I Ивanka Панчева - Община Паз...

# Stakeholder involvement

Final Stakeholder event in Pazardzhik Province



# Status of the implementation

**A BCC stakeholder group in PP was already established**

- Key stakeholders identifies and involved**
- What should be done next: policy improvement based on BCC policy recommendations and project outcomes; further analysis obtained during the project peer reviews by the external experts.**
- Meetings with stakeholders to adopt strategy on implementation of the project outcomes related to Pazardzhik Province**

# Main conclusions and lessons learnt

- There was a variety of experts from Bulgaria participating in the project events. Many public administrations joined the events (Peshtera, Pazardzhik, Bratsigovo, the Regional administration of PP, and the Regional Environmental Inspectorate), as well as energy agencies, NGOs with environmental profile, SMEs association, and educational authorities.
- Majority of stakeholders acknowledged that the LCA/LCC analyses of the selected value chain in PP can play a significant role in the process of policy development of local and regional administrations, especially when policies are in the area of environment protection and waste management. Some considerations and also interesting proposals have been given by experts in regards to municipal biowaste management.
- The Biocircularcities webtool created also a large interest, and some experts pointed out that future updates will be needed, i.e. the maintenance of this interesting tool would be important, so as to update the technical database with most actual and contemporary technologies. Most of the public administration representatives acknowledged they can use it within the decision-making process of waste management at local and regional level.

# Main conclusions and lessons learnt

- As according to some experts from the region pointed out the technology barriers as a major challenge towards the larger utilization of biowaste, which is again to prove the need of tools like the Biocircularcities webtool and usefulness of analyses which are undertaken by project activities.
- LCC and LCA analyses should be initiated before the start of a large environmental and/or biowaste management project. After we presented the BCC LCC/LCA analyses, some experts showed interest in it and asked for the detailed analysis performed by BCC project of the selected biowaste chain in order to use it in their future works.
- Educational authority representatives pointed out the importance of starting to address the topic of recycling and separate collection of waste and biowaste at an early age. They mentioned that teachers are already working hard in order to address the topic in schools, and provided some examples – project “Save 4 Waste” which brings the topic of food waste management in primary schools in Pazardzhik Province.
- The participants in the roundtable acknowledged that both analysis of LCA and LCC can play a very important role in the decision making process of municipalities and regions which have large forest stocks, similarly to Pazardzhik Province, which is at the second position in Bulgaria from all Bulgarian provinces, considering this indicator (available forest stock).



# BIO CIRCULAR CITIES

Exploring the circular  
bioeconomy potential  
in cities

**Thank you**  
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[simeonov@reap-bg.eu](mailto:simeonov@reap-bg.eu)