



**SRIP CIRCULAR  
ECONOMY**



REPUBLIC OF SLOVENIA  
**MINISTRY OF ECONOMIC DEVELOPMENT  
AND TECHNOLOGY**



EUROPEAN UNION  
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Strategic research and innovation partnership (SRIP) –  
Networks for the transition to circular economy

## **S3P - Bioenergy partnership**

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Investment is co-financed by the Republic Slovenia and the EU under the European Regional Development Fund.



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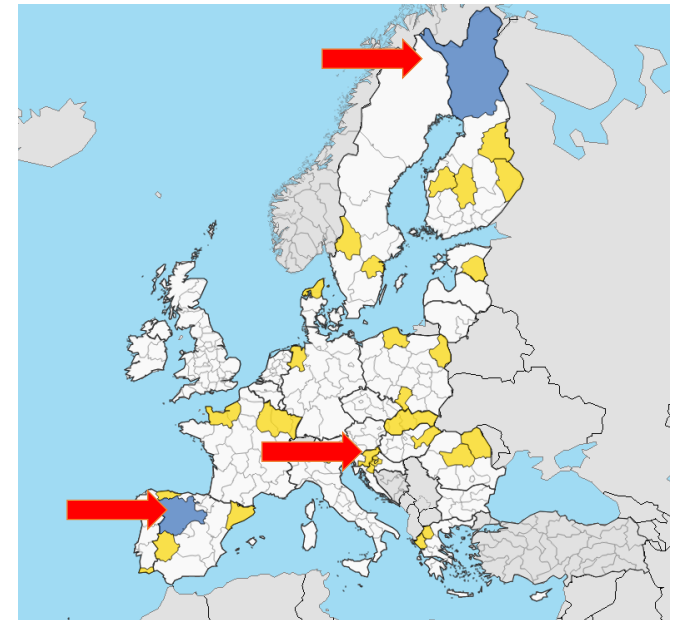
## S3P Bioenergy - interregional partnership for bioenergy and smart specialization

Leading regions: Region of Lapland, Region Castilla y León

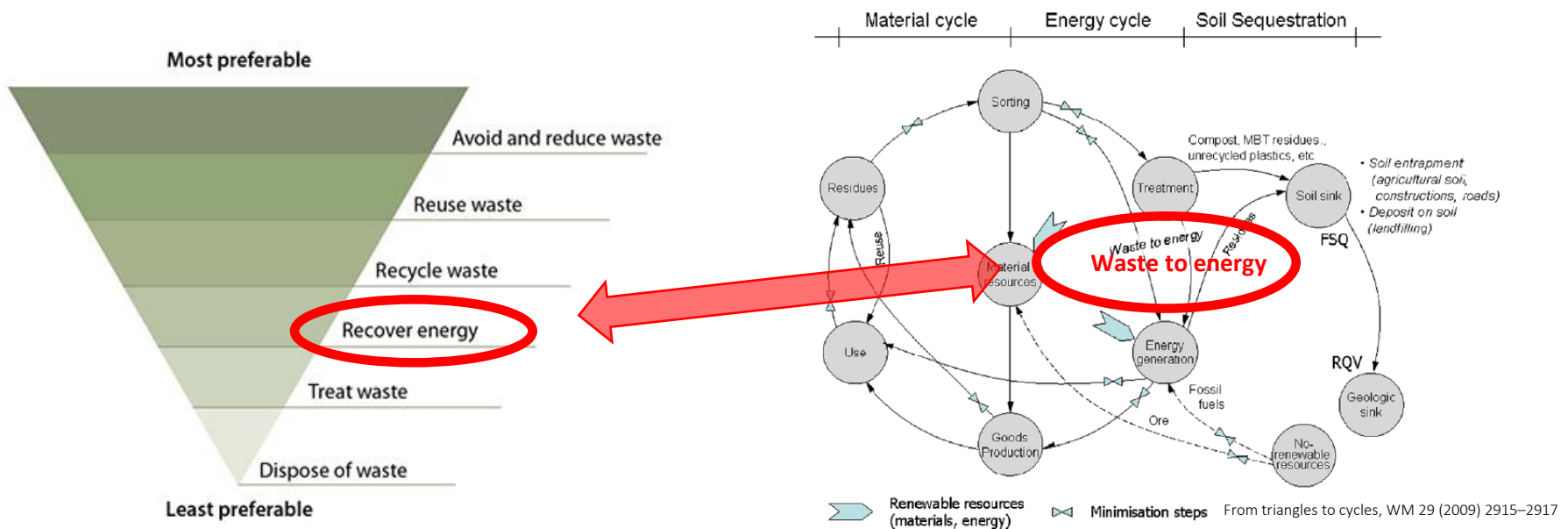
Involvement of Slovenia via SRIP – circular economy:

development  
dissemination  
implementation

of novel decentralized technologies for energy recovery of bio-based and waste-based residuals.



## Position of energy recovery within circular economy



Cascaded use might result in less favorable physical and chemical properties of fuels under consideration of economic constraints.

## Benefits of decentralized technologies for treatment of residuals

Opportunity to implement small to medium capacity plants.

- Subsystems and technologies already marketable, coupling to autonomous plants increases added value.

Attractive also in markets with limited investment potential.

- In comparison to large centralized technologies, initial investment is orders of magnitude lower.

Coupled treatment of residual streams with on-site power generation/consumption.

- True closed-loop resource management, maximizing the system efficiency and reducing logistic challenges.

Increased public acceptance that promotes responsible waste management.

- Local treatment of locally generated residuals – communities are responsible for their own waste, promoting its minimization.

Predictable business cases due to autonomous treatment process.

- Installations are largely independent from highly volatile market of residuals and waste streams.
- Further optimization is possible according to specifics of each region/municipality – fit for purpose.

## Opportunities, identified through S3P Bioenergy and SRIP

### TRL 6

- CHP fueled by liquefied biomass residuals to support first zero-waste process for nanocellulose production. **(SME level)**
- CHP fueled by waste tire oil to support environmentally acceptable and economically viable alternative to incineration. **(Regional level)**

### TRL 6+

- Energy recovery from dried sewage sludge for local self-sustainable wastewater treatment plants. Features integral solution for wide interval of PE. **(Municipal level)**

### TRL <6

- CHP fueled by textile and polymer residual streams – based on ReSynTex





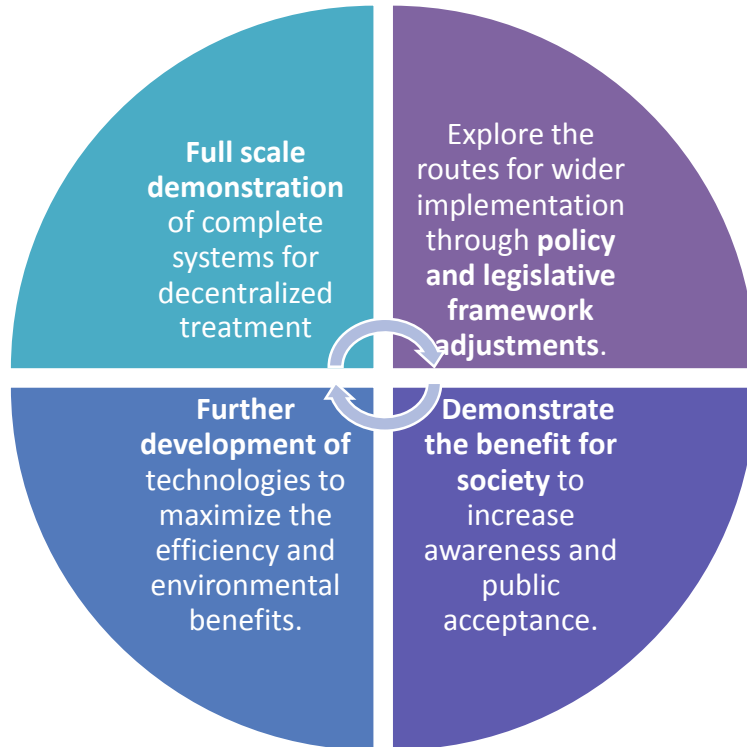
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## What is underway

- **Full scale demonstration** of complete systems for decentralized treatment to confirm marketability, reliability .
- Explore the routes for wider implementation through **policy and legislative framework adjustments**.
- **Demonstrate the benefit for society** to increase awareness and public acceptance.
- **Further development of technologies** to maximize the efficiency and environmental benefits.

## What is underway



- Addressing the gaps through existent partnerships and platforms.
- Involvement of Business, Government, Academia and Community.
- Exchanging key information to gradually implement circular business models to local public and private companies.





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Thank you for your attention!

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