



InnoRenew CoE

Livade 6, 6310 Izola/Isola, Slovenia, T: +386 40 282 944, E: coe@innorenew.eu, www.innorenew.eu



Forthcoming challenges in the wood processing sector

BioEast Foresight Conference

September 27, 2021



SWST - International
Society of Wood
Science and Technology

Prof. Andreja Kutnar, PhD



InnoRenew CoE

Livade 6, 6310 Izola/Isola, Slovenia, T: +386 40 282 944, E: coe@innorenew.eu, www.innorenew.eu

InnoRenew CoE Renewable Materials and Healthy Environments Research and Innovation Centre of Excellence

Horizon 2020 Framework Programme of the European Union; H2020 WIDESPREAD-2-
Teaming: #739574



Inštitut za celulozo in papir
Pulp and paper Institute
Bogišičeva ul. 8, 1000 Ljubljana
tel.: +386 1 200 28 00
fax.: +386 1 426 56 39
email: info@icp-lj.si



RRA LUR



Nacionalni inštitut
za javno zdravje

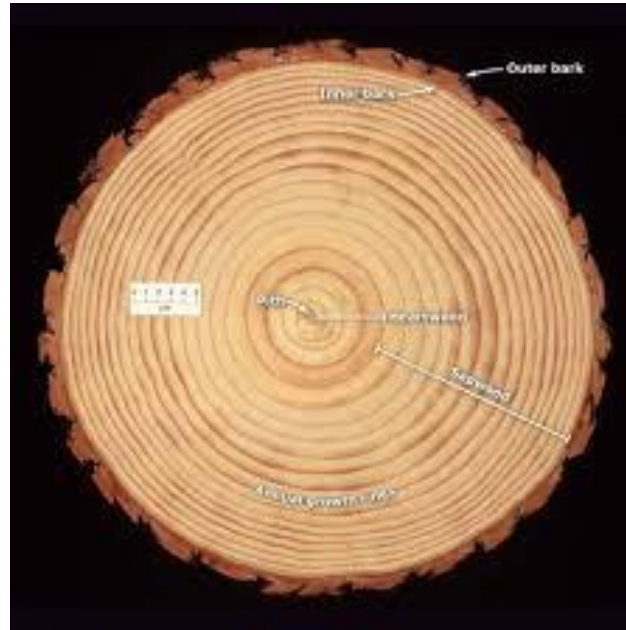


The InnoRenew CoE is tasked with advancing the state-of-the-art and achieve scientific and innovation excellence through interdisciplinary science

Ways the world and work are changing?

Past wood science education

- Chemistry
- Physics
- Engineering
- Material Science
- Wood Preservation
- Manufacturing



Present need

- Sustainability
- Digitalization
- Interdisciplinarity
- Social science
- Creativity

Future - *"The best way to predict your future is to create it!" (Abraham Lincoln)*



**Europe's ambition
to become
the first climate-neutral continent by
2050.**



A European Green Deal *(December 11, 2019)*

A **roadmap** for **making the EU's economy sustainable** by turning climate and environmental challenges into opportunities across all policy areas and making the transition just and inclusive for all.

The European Green Deal will transform the EU into a **modern, resource-efficient and competitive economy**, ensuring:

- no net emissions of greenhouse gases by 2050
- economic growth decoupled from resource use
- no person and no place left behind



European Commission - the New European Bauhaus (January 18, 2021)



"We know that the construction sector can even be turned from a carbon source into a sink, if organic building materials like wood and smart technologies like AI are applied."

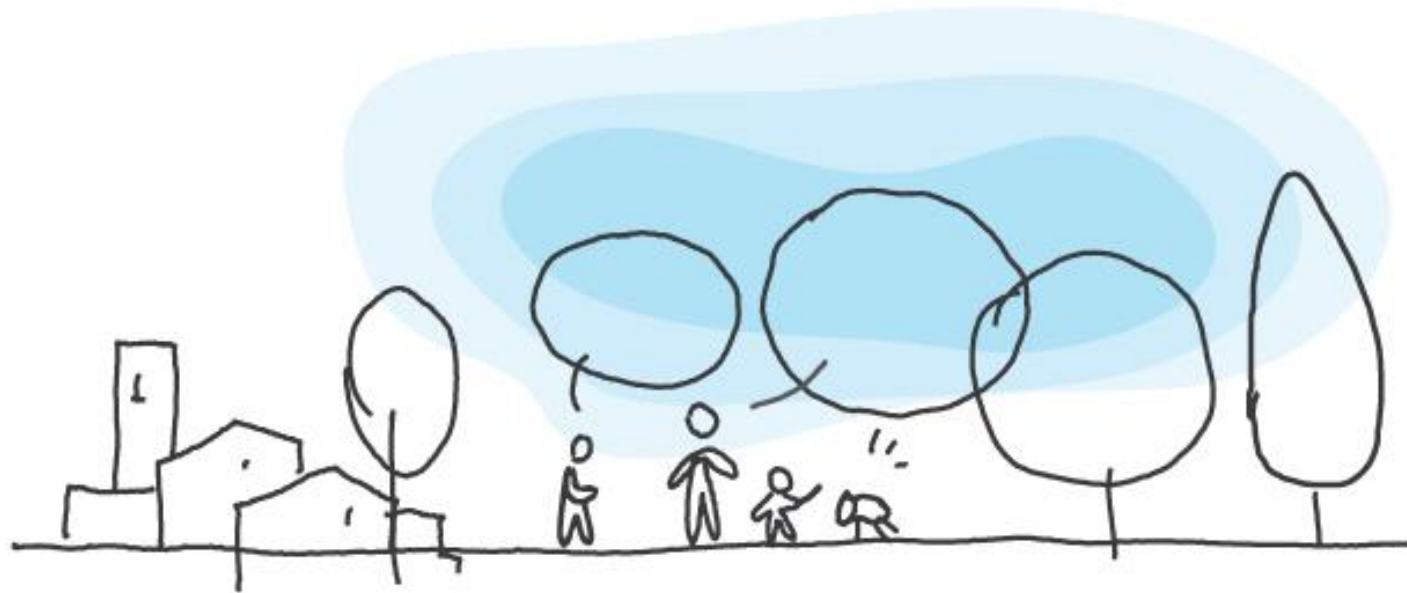
Ursula von der Leyen

President of the European Commission

State of the Union Address, 16/09/2020



InnoRenew CoE partner of the New European Bauhaus



New European Bauhaus
beautiful | sustainable | together



July 14, 2021

The European Commission has released its “[Fit for 55](#)” legislation package, supporting its commitment to **reduce net greenhouse gas emissions by at least 55% by 2030.**

The package presents a **policy action plan** on how to reach Europe’s climate targets, in line with its ambition to become **the first climate-neutral continent by 2050.**



Key opportunities in Fit for 55

The **public sector will be required to renovate 3% of its buildings** each year to drive the renovation wave, create jobs and bring down energy use and costs to the taxpayer.

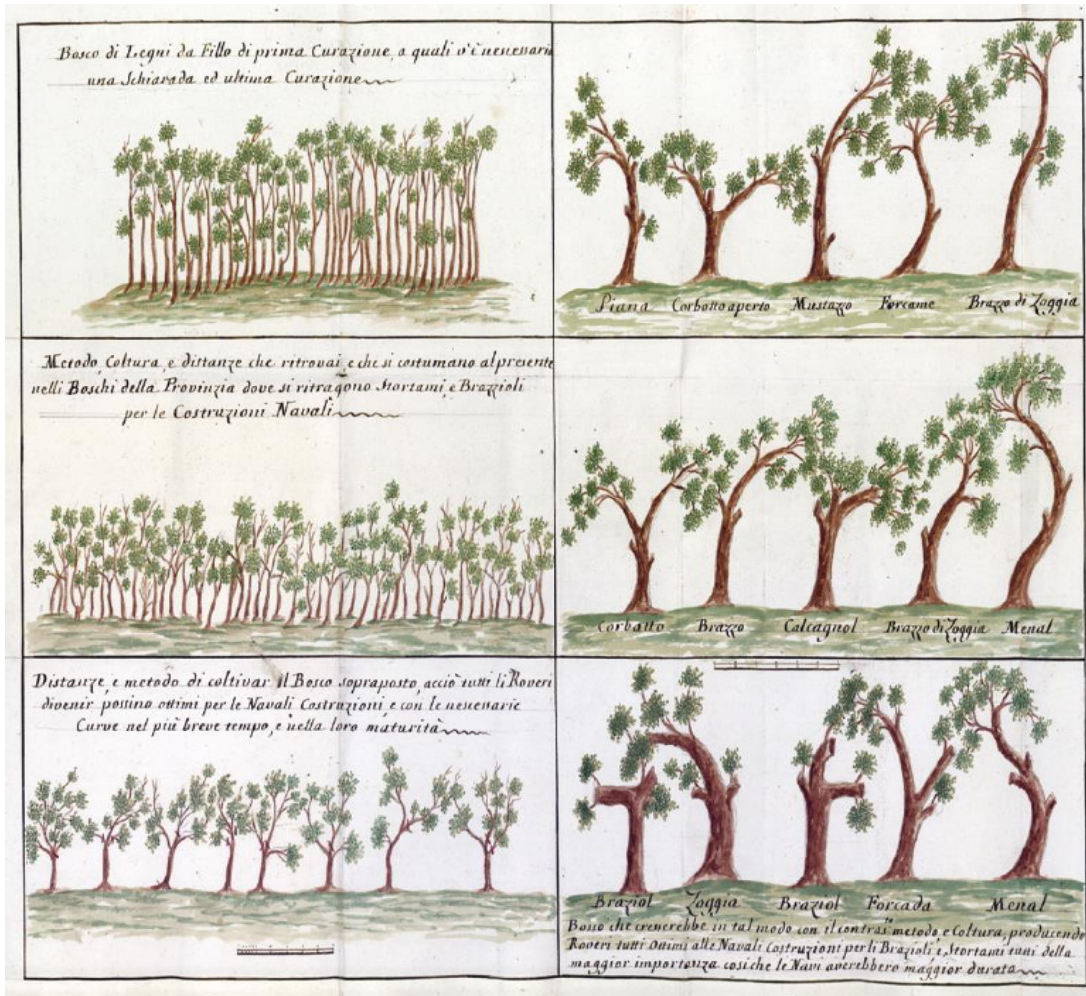
The **EU Forest Strategy** aims to improve the quality, quantity and resilience of EU forests. It supports foresters and the **forest-based bioeconomy** while keeping harvesting and biomass use sustainable, preserving biodiversity, and setting out **a plan to plant three billion trees** across Europe by 2030.

A new **Carbon Border Adjustment Mechanism** will put a carbon price on imports of a targeted selection of products to ensure that ambitious climate action in Europe does not lead to 'carbon leakage'.



Reusing materials is critical to achieving sustainability





Wood products in the past

Illustration of the method of cultivation of oak forest and various forms of pruning of trees for the needs of the Venetian Navy – example from Istria

(G. C. Vittori, 1777, ASV, Senato, Arsenal, 133, 2). From Panjek (2015)

<http://www.hippocampus.si/ISBN/978-961-6963-35-0.pdf>



Wood today

Multi story timber





Is there enough wood?

New timber species

MAIN STOCK



YOUNG TREES



Source: Garman association of sawmilling industry

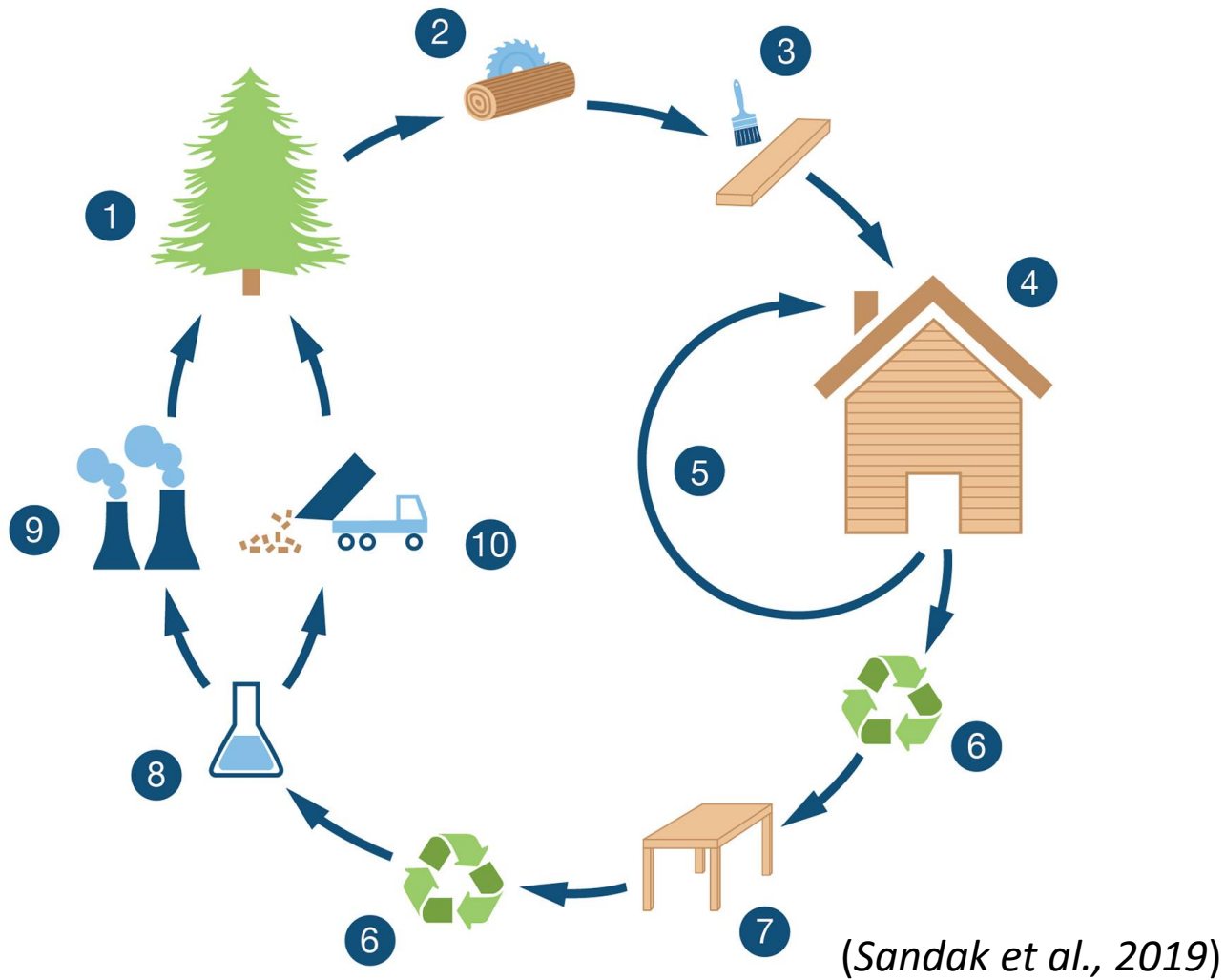


Introduction of new timber species

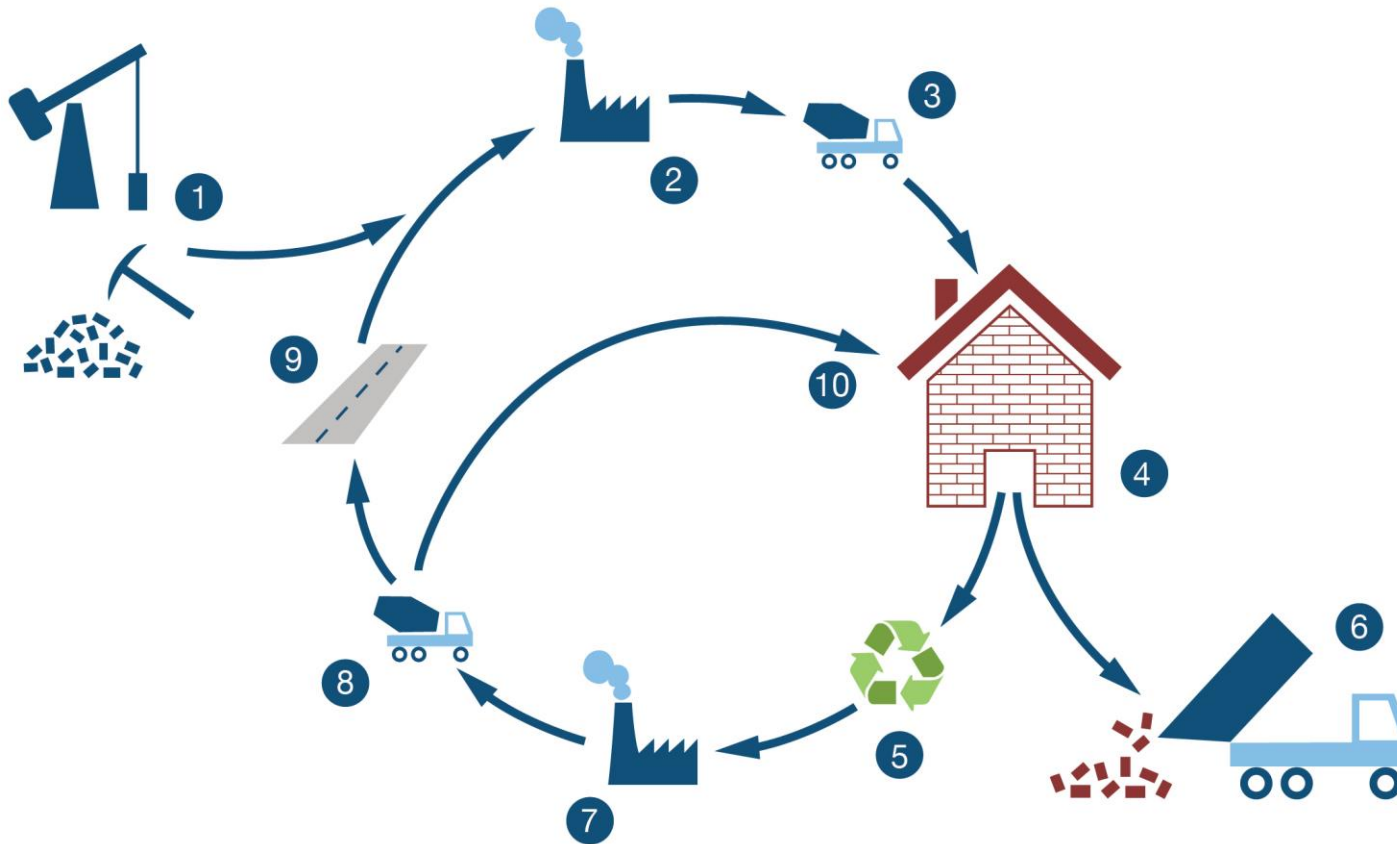
- fast growing plantation species, waste timber



Renewable materials

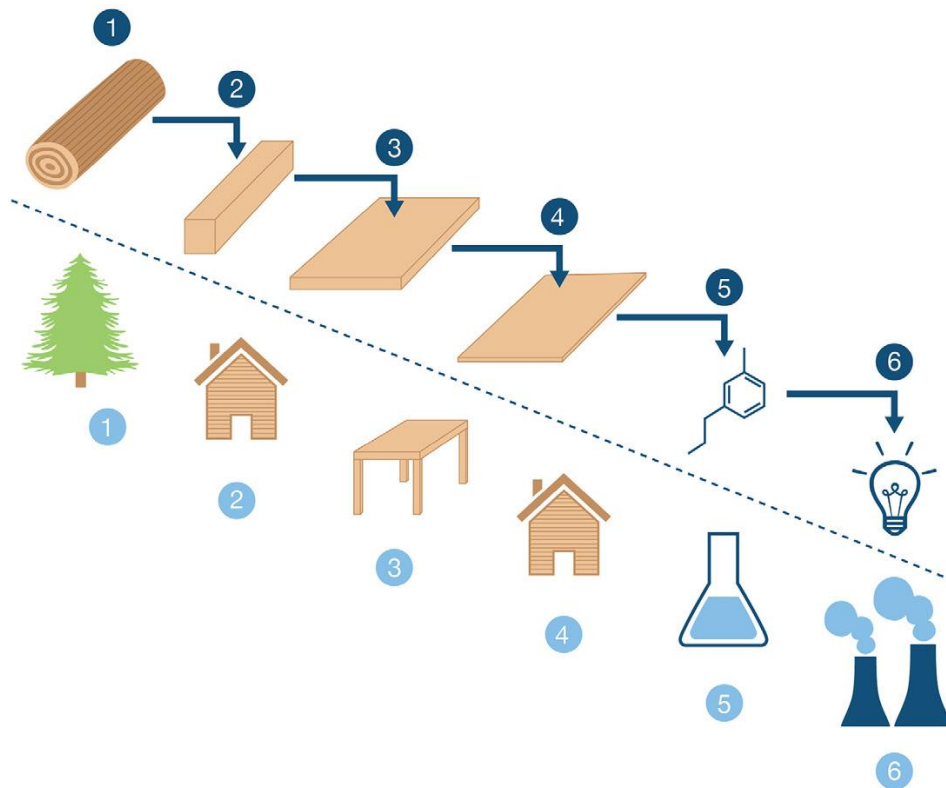


Non-Renewable materials



(Sandak et al., 2019)

Cascade utilisation of wood



- (1) roundwood,
- (2) large-dimension sawn or engineered timber assortments,
- (3) strand- or particle-based composites,
- (4) fibre-based composites,
- (5) chemicals, and
- (6) energy.

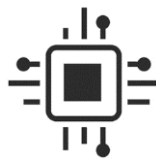
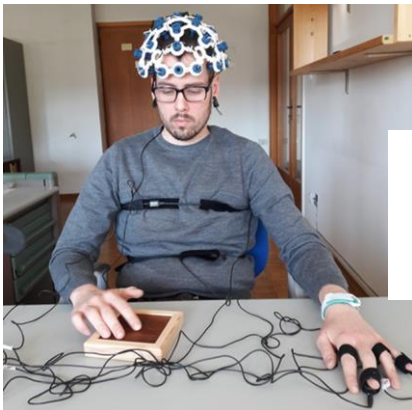
Material cycles: (1) resource extraction, (2) 1st life cycle, (3–4) 2nd life cycle, (5) chemicals processing, (6) energy generation

(adapted after Sandak et al., 2019)

How can we adapt to these changes?

Interdisciplinarity

Bundling modern research fields with concepts of sustainability and sensible use of natural resources. In this case, *wood*.





Novel and advanced uses of wood create new opportunities to replace non-renewable materials in buildings while **creating healthy working environments.**



Do we have enough skills to cope or is there a need to conquer different sets of abilities?

Findings from the Workshop on higher education programs in Europe, lead by **Bob Smith**

Students today

- Raised with environmental awareness.
- More socially conscious.
- More diverse backgrounds.
- More urban.
- More electronic.
- More global
- In tune with sustainability
- Shortened attention span

Educational programs should be in the future:

1. Need to modernize the curriculum;
2. Become more interdisciplinary/multidisciplinary;
3. Increase importance/relevance in society;
4. Must lead the importance of wood to solve environmental problems and climate change;
5. **Become the recognized leader for the circular economy.**



Key to success

Collaboration

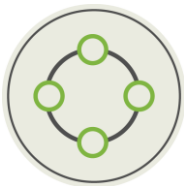
Living Lab InnoRenew - Structured engagement with other researchers, industry, policy makers, and the public



Idea generation & validation



Training & workshops



Collaboration & new value chains



International networking

**116 stakeholders
(56 SMEs)**

28 countries



Key to success – educational programs for digital society

Involve the society – be close to society

Study programs fit to digital society:

Sustainable Built Environments

MSc at UP from 2016/2017

Renewable Materials for Healthy Built Environments

PhD at UP from 2020/2021

Data Science

MSc at UP from 2019/2020





To use more reclaimed timber in construction, three key objectives must be overcome

- 1) Innovation in **design for disassembly** that allows for timber to be easily reclaimed without damaging the material;
- 2) Establishing **reverse logistics systems** that optimising recovering material from many locations and returning it to processing centres;
- 3) **Technological solutions** to clean, reprocess, and reintroduce reclaimed timber to the market efficiently need to be reintroduced.



InnoRenew CoE is hosting Woodrise 2022

WOODRISE 2022 TECHNICAL CONFERENCES AND TOURS



6-7
September 2022

Congress Center
Bernardin Portorož,
Slovenia

<https://woodrise2022.eu/>



Photo credit: Jan Godoc, slovenia.info



InnoRenew CoE

Livade 6, 6310 Izola/Isola, Slovenia, T: +386 40 282 944, E: coe@innorenew.eu, www.innorenew.eu



REPUBLIC OF SLOVENIA
**MINISTRY OF EDUCATION,
SCIENCE AND SPORT**



Občina · Comune di
IZOLA · ISOLA



EUROPEAN UNION
EUROPEAN REGIONAL
DEVELOPMENT FUND



Thank you for your time.