Waste for Energy
Experience of Ljubljana

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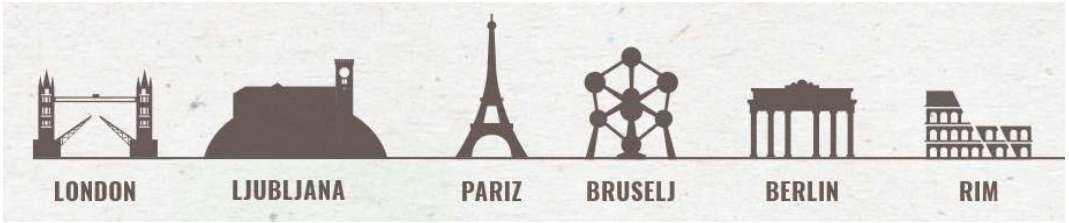
BOSNA I HERCEGOVINA
Ministarstvo vanjske trgovine i ekonomskih odnosa Bosne i Hercegovine

IRENA
International Renewable Energy Agency

Renewable Energy Benefits: Can South East Europe realise the full potential of the Energy Transition?
Swissotel Sarajevo, Bosnia and Herzegovina, 11.-12.6.2019

Ljubljana, the green capital of Europe

- Ljubljana is the EU capital with the highest % of separate collected waste (in front of Talinn and Helsinki)
- 2016: Ljubljana won the European Green Capital title
- The ambitions are high
  - Zero waste
  - Circular economy
  - Green jobs



Waste: an energy source?

- Using plastics as fuel for co-firing sounds appealing
  - Problems with cleaning of the emission gasses
    - Proper cleaning is expensive
  - Vienna waste-to-energy (WTE) plant
    - 250.000 t of waste annually
      - 120,000 MWh of electricity
      - 500,000 MWh of district heating (60.000 households)
      - 6,000 tonnes of scrap iron
      - 60,000 tonnes of clinker, ash and filter cake
    - In 2018, they invested 120 m€ for upgrades

- In 2018, China stopped imports of waste materials
  - Resulting glut of waste in EU
- Slovenia has no WTE plant – strategy was to export waste
  - Energy treatment plant is built for 30 years – national strategy is needed
    - There may be much reduced need for waste heat recovery in the future
  - Reduce, Reuse, Repurpose, Recycle, Recover, Deposit

RCERO Ljubljana

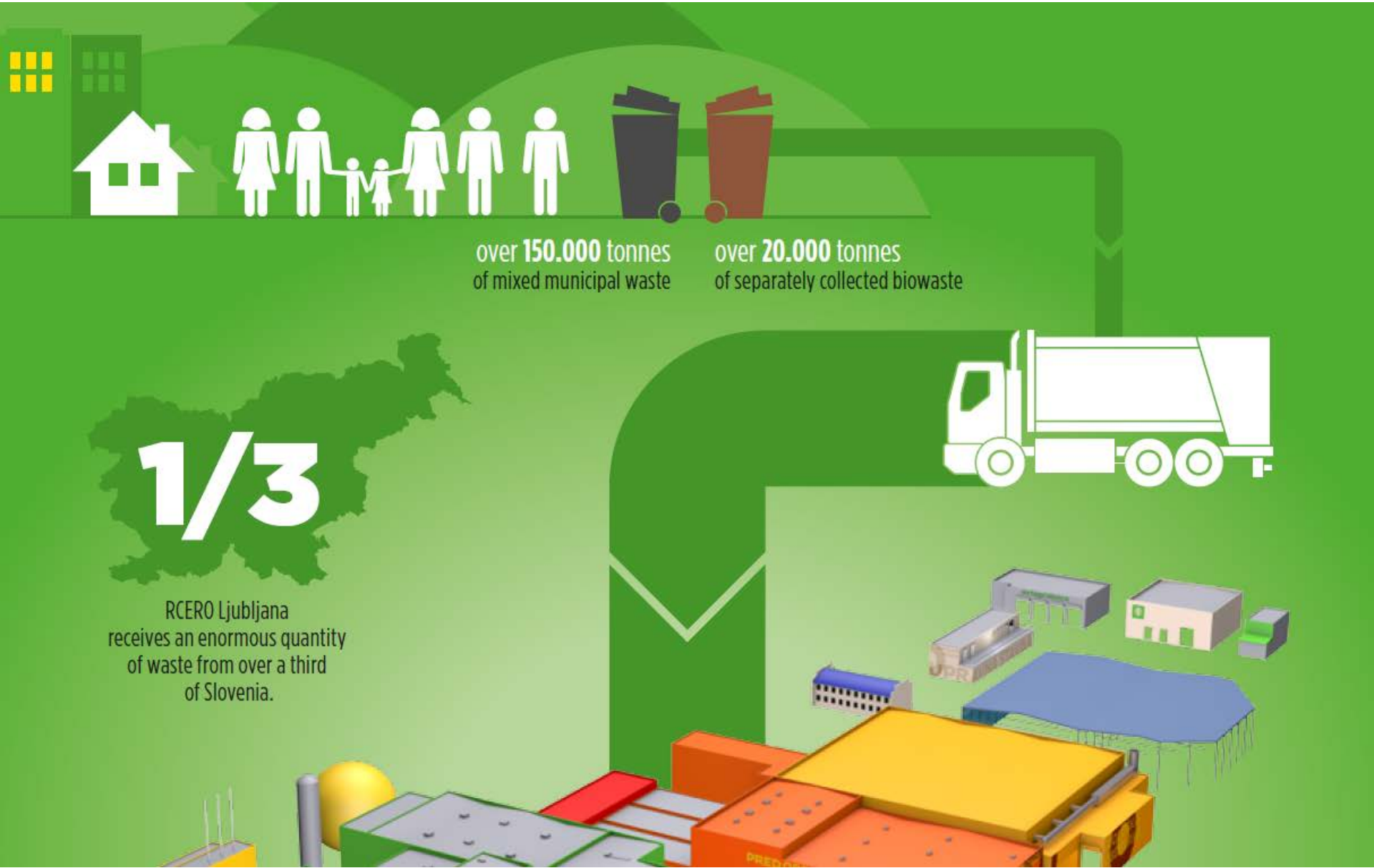
- Regional Centre for Waste Treatment and Recovery
  - The best and the most modern plant of its kind in Slovenia
  - One of the larger ones and the most modern one in Europe,
  - It can process over 170,000 tonnes of waste annually,
  - Serves 700.000 citizens of 43 municipalities (1/3 of Slovenia)
  - The biggest environmental project in Slovenia supported by the Cohesion Fund
- RCERO Ljubljana recovers natural resources, practices re-use, optimises and closes loops.

Investing in your future
Operation part financed by the European Union
European Regional Development Fund
Cohesion Fund
European Social Fund

City of Ljubljana

RCERO LJUBLJANA

RCERO Ljubljana: the facts



RCERO Ljubljana: the facts

Using its innovative and state-of-the art technology, RCERO Ljubljana recovers almost all the waste it receives: less that 5% (7,350 tonnes) ends up at the landfill.

<5 %

Useless waste becomes a major source of other raw materials.

30.000 tonnes of raw, recyclable materials

up to **60.000** tonnes of fuel

7.000 tonnes of compost

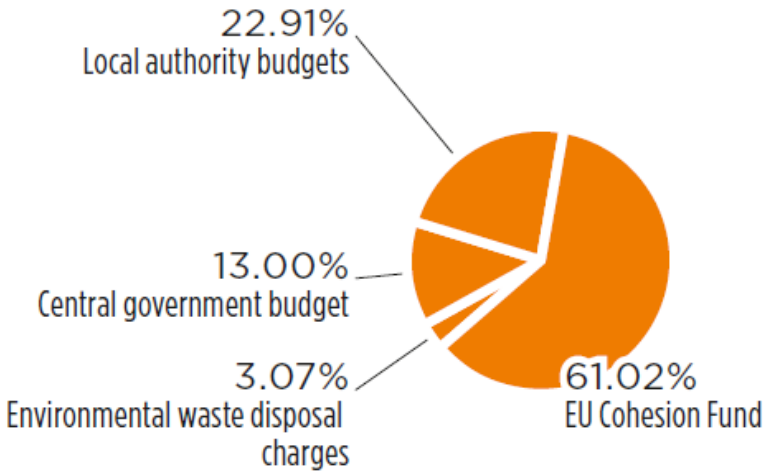
35.000 tonnes of digestate

6.000 tonnes of wood

17.000 MWh of electricity
36.000 MWh of heat

RCERO Ljubljana: the facts

- Total investment: 155 m€
  - 2007–2013 period: the EU's Cohesion Fund contributed 77.5 m€ through its Environment and Infrastructure Operational Programme



South of Ljubljana, the new part of non-toxic waste landfill Barje is in operation since September 2009.

Wastewater treatment plant for trickle waters operates since July 2010.

Constructuon of the main buildings of RCERO started in 2014.

RCERO consists of objects for mechanical-biological treatment of municipal waste.

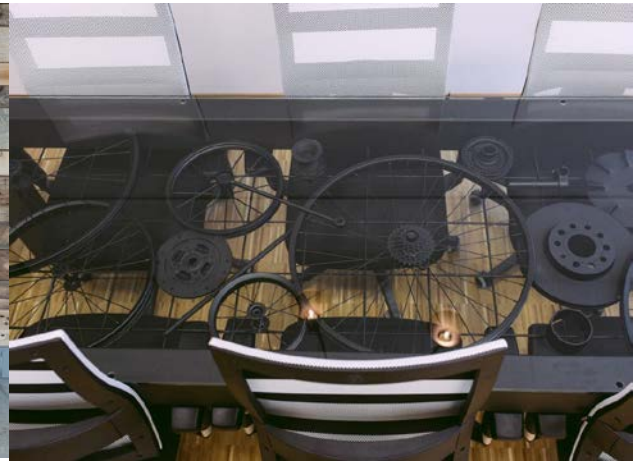
Annual production of **60.000** t of fuel, **35.000** t of digestate, **30.000** t of sorted secondary raw materials, **6.000** t of wood, **7.000** t of compost, **17.000 MWh** electricity and **36.000 MWh** heat from biogas, obtained at biological treatment of waste.

Energy source: biogas

- The biogas produced in the biological processing of waste
  - Generates sufficient electrical and heat energy needed for the operation of the RCERO.
  - Biogas is collected in the yellow balloon (gas tank).
  - wastewater is returned to the technological process
- The facilities of RCERO reduce waste, promote recycling and reuse.
  - A part of the equipment in the administrative building is made of waste objects and reused materials which have been turned into up-cycled furniture.

Upcycling: giving new life to old objects

- Creative reuse, recycling and upcycling extends the life span of the objects
- This supports a sustainable attitude towards the objects and the primary sources



RCERO: technical tour at EEM19

EEM 19

16TH INTERNATIONAL CONFERENCE ON THE EUROPEAN ENERGY MARKET

18-20 September 2019, Ljubljana, Slovenia

- Come and visit RCERO!
- Organized as a technical tour at the conference
- https://www.eem19.eu/

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City of Ljubljana

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RCERO LJUBLJANA

Thank you!

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