

**Interreg**



CENTRAL EUROPE

European Union  
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**REEF 2W**

# INCREASED RENEWABLE ENERGY AND ENERGY EFFICIENCY BY INTEGRATING, COMBINING URBAN WASTEWATER AND WASTE MANAGEMENT SYSTEM

TAKING  
**COOPERATION**  
FORWARD



ECOMONDO Rimini 05/11/2019



## REEF 2W objectives and results



Roberto Farina ENEA

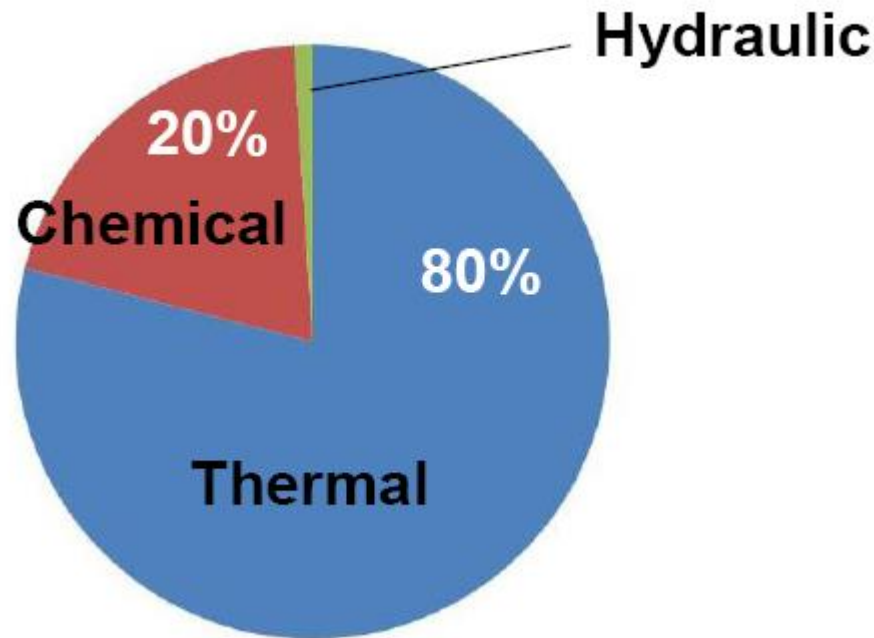
## Energy consumption in the water cycle

In USA the energy consumed to provide drinking water and ensure the treatment of the waste water correspond about the 3% of the total electric energy consumption of the country (US EPA 2006)



## Potential energy recoverable from wastewater

There is more energy in wastewater than is needed for treatment about 5X more

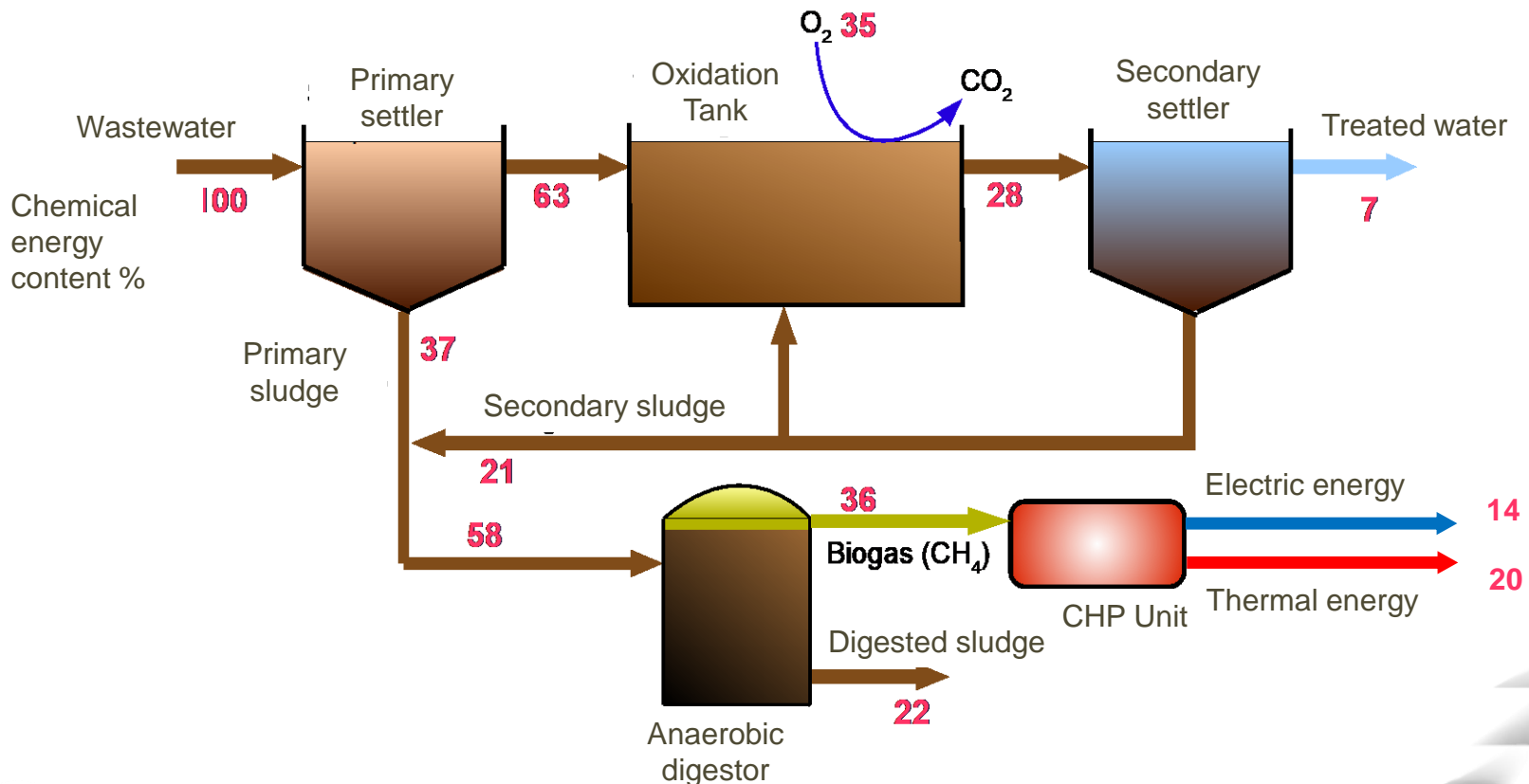


But not only from wastewater. Energies recoverable from solar radiation, hydraulic power, gasification and incineration processes is considered



# WHY THIS PROJECT

## Chemical energy recovery



# REEF 2W PARTNERSHIP

- Research and Academic institution will collaborate with industrial partners to develop new strategies for waste and wastewater treatment in the view of the reduction of energy consumption for the treatments and provide energies at the nearby areas
- 5 pilot sites will be studied to understand which are the best possible solutions and the energetic interactions with the urban areas



Italian National Agency for New Technologies,  
Energy and Sustainable Economic Development



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# REEF 2W PROJECT



- To identify possible critical points for the energy efficiency of the WWTPs
- Help to define strategies and technologies and evaluate possible future scenarios for the waste treatment platforms integrating waste, wastewater and other renewable energy sources
- To provide an assessment, if there is an excess of energy available, where it can be delivered as electricity, heat, biofuel, biomethane to the nearby community to decrease its energetic impact.
- To provide a simple interactive TOOL able to help policy makers and stakeholders to define the health state of the treatment plant



# SCOPE OF THE PROJECT

- To provide an environmental assessment of the actions implemented
- To provide an economic assessment for the implementation of different technologies
- Identify obstacles and barriers for the implementation of more efficient system to recovery energy from organic wastes
- Involve local authorities to test the tool, and use it to contribute at a better design of the energetic planning





- 5 pilot sites have been identified to study and evaluate technical solutions, social and legislative barriers and obstacles
- Are involved :
  - Small and big municipalities are involved
  - Waste and wastewater treatment plants
- Italy: SWTP Novafeltria
- Croatia: WWTP Zabok
- Austria: WWTP RHV Trattnachtal
- Czeck Republic: WWTP Prague
- Germany: WWTP Berlin



- Technologies considered are
  - Anaerobic digestion, biogas upgrading, power to gas, CHP
  - Heat recovery from treated wastewater
  - Gasification, Hydrothermal carbonization, composting, incineration
  - Photovoltaic, thermal and hybrids panels
  - Hydroelectric power
  - Others will be possible to implement in future (effects of nutrients recovery, filtration technologies, wind, etc.)



# INTEGRATED SUSTAINABILITY ASSESSMENT (ISA)

- ISA approach has been used to connect all the different aspects that the project consider:

- Energy assessment
- Spatial assessment
- Environmental assessment
- Economical assessment



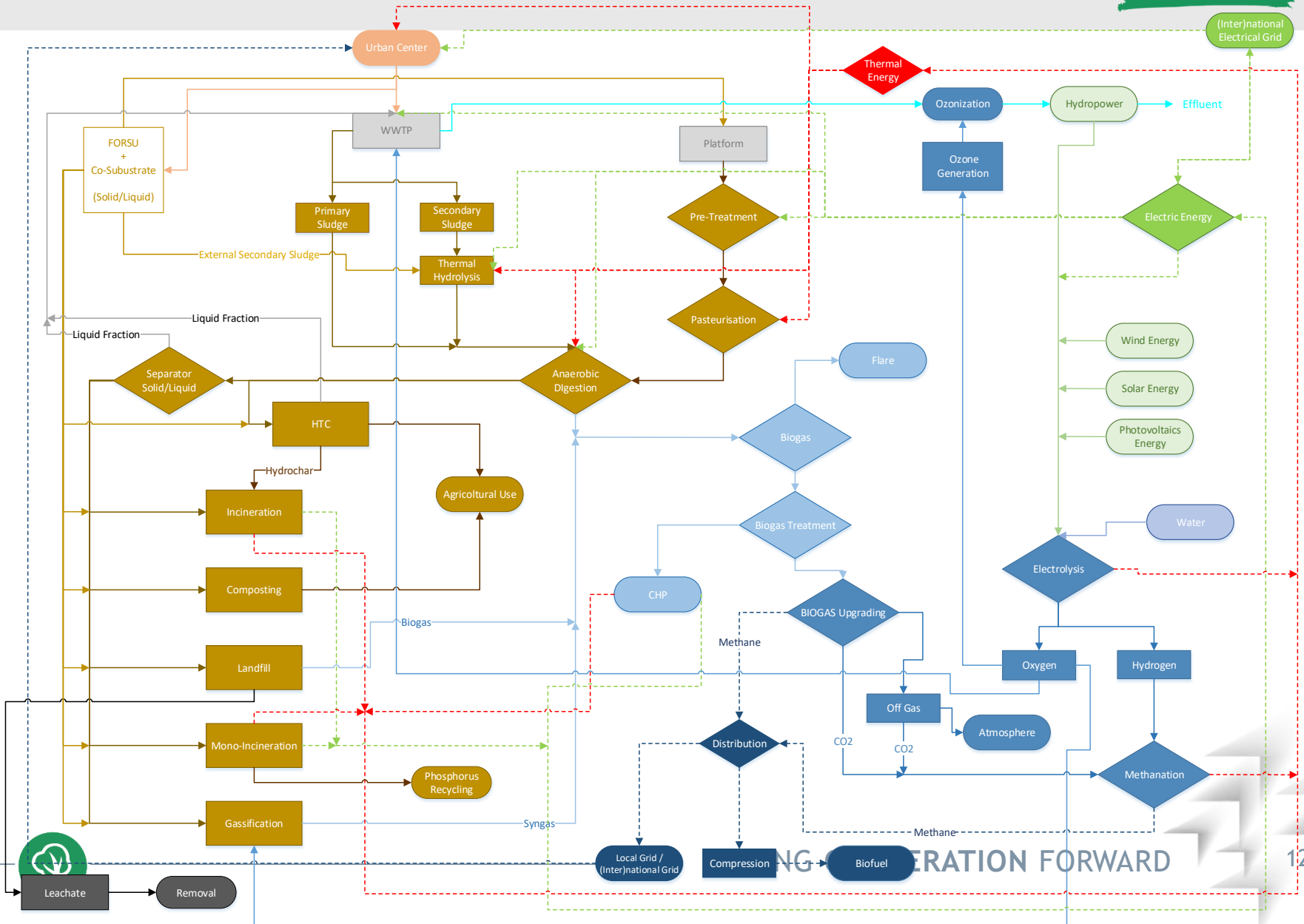
Information about WWTP and Plant type

- Strong involvement of the user in collecting available data and defining future credible scenarios



# LOGICAL SCHEME TO DEVELOP THE TOOL

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NG GENERATION FORWARD

# REEF 2W TOOL

## Tool progress status:

Status quo

Future situation



Energy Assessment



Information about WWTP and Plant type



Spatial Assessment



Environment Assessment



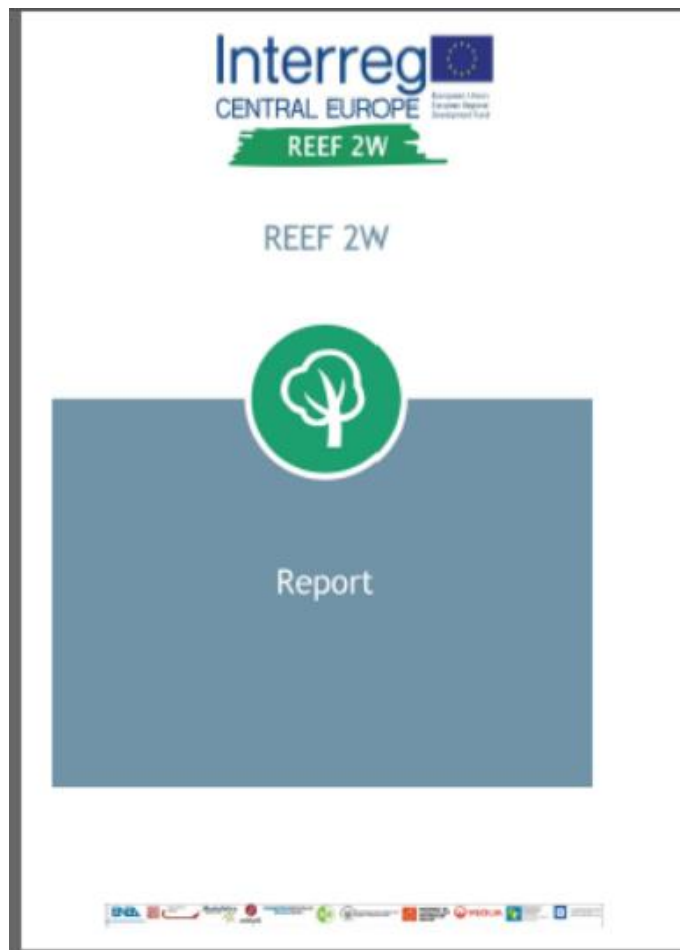
Economic Assessment

Future situation

Report

Reset





## Involvement of Public Administrations and Stakeholders

- Other Public Administrations and Stakeholders than already involved in the project will be contacted to help them in the evaluation of their possibility to decrease the energetic impact of the municipality recovering energy from wastes
- Training courses will be conducted to train advisors ([Reef2w@gmail.com](mailto:Reef2w@gmail.com))
- Final conference in Venice
- Book with the description of the experience developed in the project



# *Thank You for your attention*

## *REEF 2W Team*





# Contact details



Name: Roberto Farina



[www.interreg-central.eu/reef-2w](http://www.interreg-central.eu/reef-2w)



[mailto: reef2w@gmail.com](mailto:reef2w@gmail.com)

[Roberto.farina@enea.it](mailto:Roberto.farina@enea.it)



Off.: +39 0516098580



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