

Small-scale Water Supply and Sanitation in Rural Areas

Webinar presentation of the whitepaper
By Tia Savolainen

Sweco company presentation

Transforming society together



Europe's leading architecture and engineering consultancy

#1

On the European market¹

¹ Based on reported Net sales 2020, annual reports.

17 500

Full-time employees,
with as many different
perspectives



SEK

20.9 bn

Net sales 2020

SEK

1.8 bn

EBITA 2020

14

Markets in Europe

70+

Projects in more than
70 markets worldwide

A local team powered by our collective know-how

Local presence – global expertise

We combine a strong local presence with offering our clients access to the total knowledge at Sweco, to help you solve any challenge at hand.



Our segments and services



Buildings and urban districts

- Architecture
- Sustainable buildings
- City planning
- Climate and environment assessment
- Parametric design



Water, energy and industry

- Renewable energy
- Electrification
- Environmental impact assessment
- Efficient logistics and processes
- Water treatment and water protection



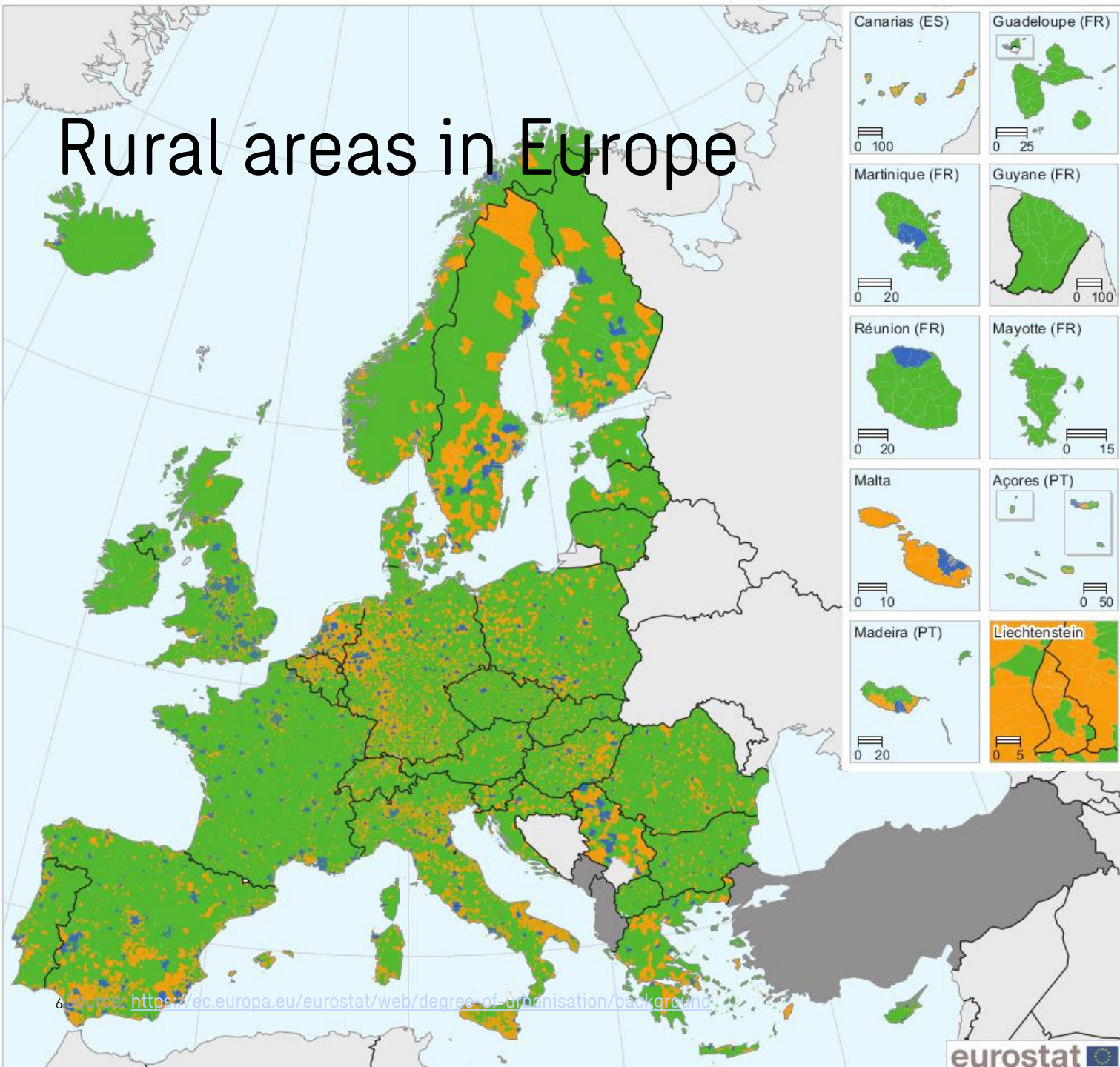
Transport infrastructure

- Railway and rail-bound traffic design
- Public transportation planning
- Cycling in cities
- Traffic and urban planning

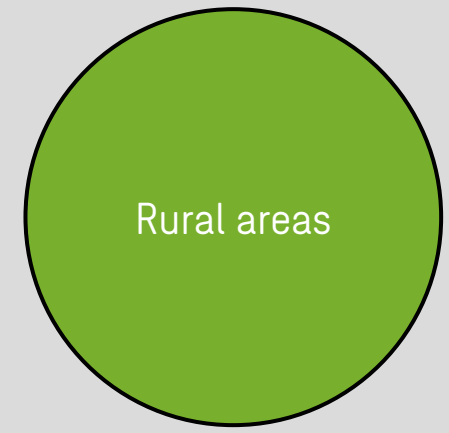
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Rural areas in Europe



Source: <https://ec.europa.eu/eurostat/web/degree-of-urbanisation/background>

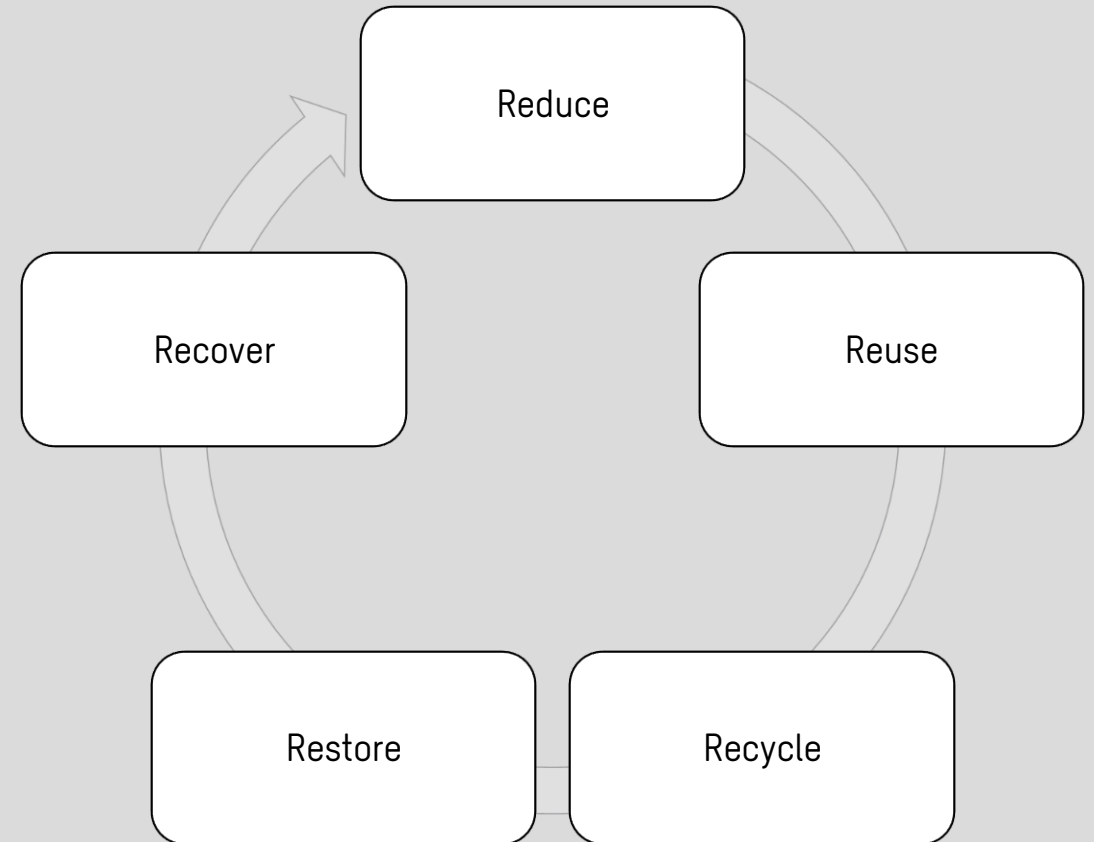


- Cities**
(Densely populated areas: at least 50 % of the population lives in urban centres)
- Towns and suburbs**
(Intermediate density areas: less than 50 % of the population lives in rural grid cells and less than 50 % of the population lives in urban centres)
- Rural areas**
(Thinly populated areas: more than 50 % of the population lives in rural grid cells)
- Data not available**



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat
Cartography: Eurostat — GISCO, 05/2018

Circular Economy in Short



History of the Water Supply in Rural Europe



The beginning of agriculture → the need for water supply



On modern-day Crete and the Indus valley during the Bronze Age

Aqueducts Cisterns Filtering systems Sedimentation basins
Rainwater harvesting systems Terracotta pipes for water supply and sewage
Sewerage systems



Sewage sludge as a fertilizer has been common

In 1998: the EU set limits on the amount of phosphorus applied to fields, which reduced the usage.
From 2006 one should prove the hygiene of the sewage sludge prior to its usage → used increasingly for landscaping and energy production

Drinking Water Supply

In Small-scale In Rural Areas

Small-scale water supplies in the pan-European region



Private or individual wells

- point sources
- boreholes, dug wells, springs or rainwater collection
- piped into the dwelling or yard
- serve a single family or a small number of households (farms, hamlets)
- operated by the users themselves



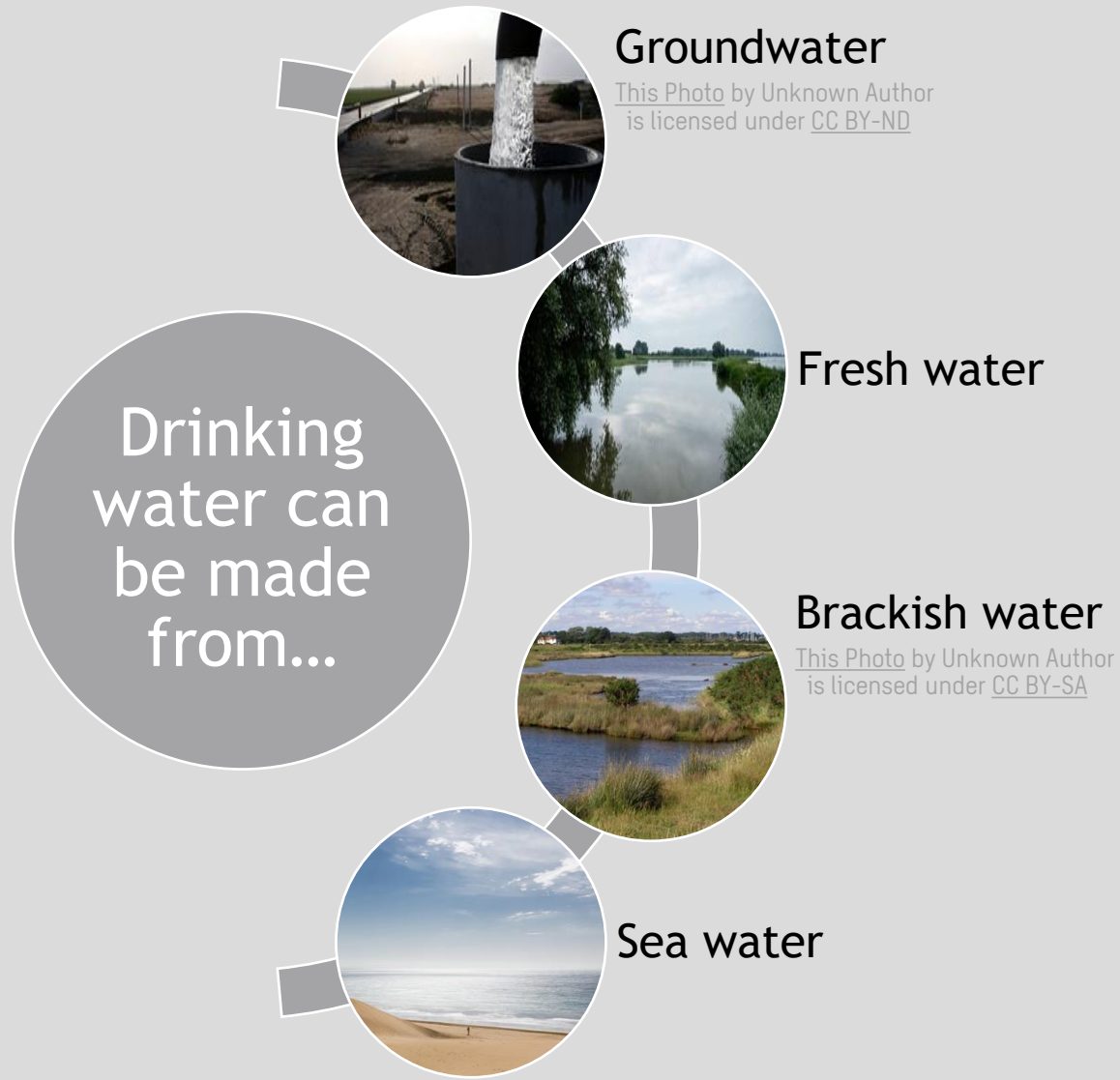
Community-managed supplies

- managed by the community members who are also the users of the water
- from point sources from which community members collect water and carry it home, to systems that may involve treatment, storage and piped distribution into dwellings and yards



Public supplies

- managed by distinct public entity (municipality or water board association)
- spatially limited area (a small municipality or town)



The treatment method chosen depends on how the water quality needs to be improved

Drinking water production

Treatment technologies in use in Europe

Treatment method	Purpose/factor to be deleted
Sand Filtration	Solids, organisms (together with oxidation also Fe and Mn)
Oxidation	Rn, H ₂ S (together with sand filtration Fe and Mn)
Coagulation	Suspended solids, gravel, sand, algae, clay, Fe, protozoa
Active Carbon Adsorption	Rn, colour, pesticides, smell and taste
Ozonization	Bacteria, algae, biofilms, micro-organisms
Chlorination	Microbes
Alkalisiation	Raising the pH / capturing free carbon dioxide
UV disinfection	Microbes

Sanitation

In Small-scale In Rural Areas

The sewage
can be
separated to
grey and
black waters.



Grey water is domestic wastewater which is produced from the recycling of laundry, shower, and hand basin water



Black water is sewage which also contains the discharge from the toilets.

Black water contains more organic loading than greywater.

Small-scale Sewage Treatment Technologies in Use in Europe

Grey water

Seepage pit

Greywater filter

Grey and black water

Ground absorption
(+ dephosphorization for
black water)

Ground filtration
(+ dephosphorization for
black water)

Black water (sewage)

Small-scale
treatment plant

Reed fields/
wetlands

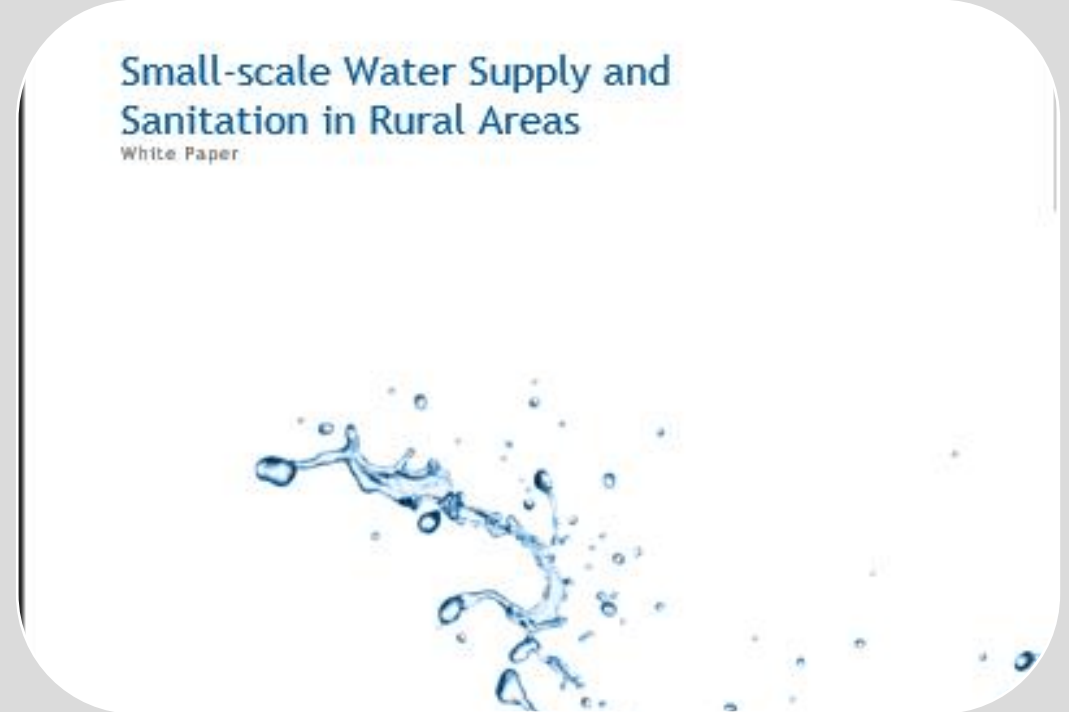
Reed fields or wetlands



Summary



Circular economy is the principle in the effective green water supply and sanitation in rural areas.



The whitepaper will be published on the CEWP site later.

Transforming society together

Thank you!

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