

# Advances in European water reuse

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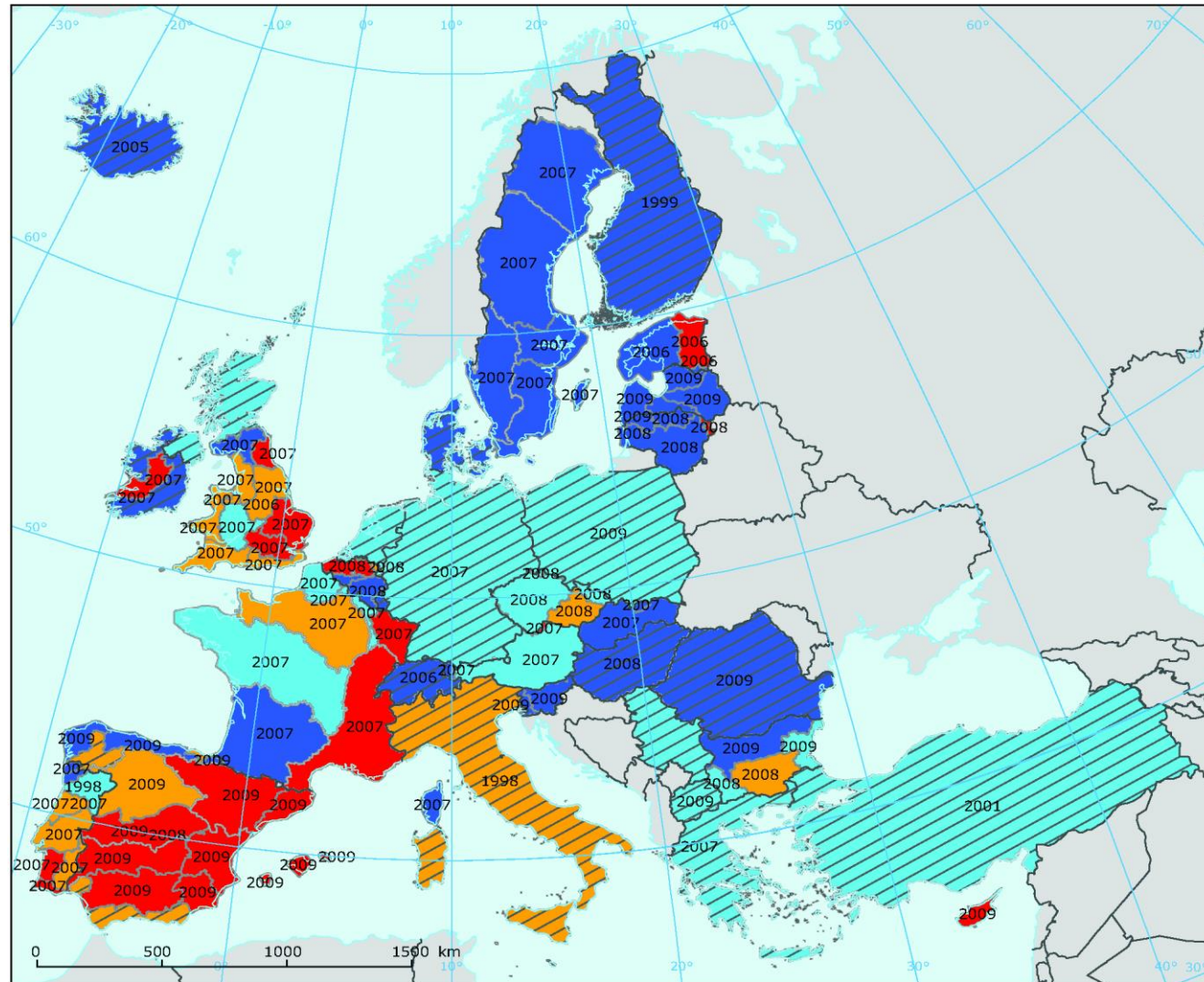
School of Life Sciences – Institute for Ecopreneurship



## Outline

- Introduction to water reuse in Europe
- Legal framework conditions
- European policy developments
- Summary

# Water exploitation index in European basins



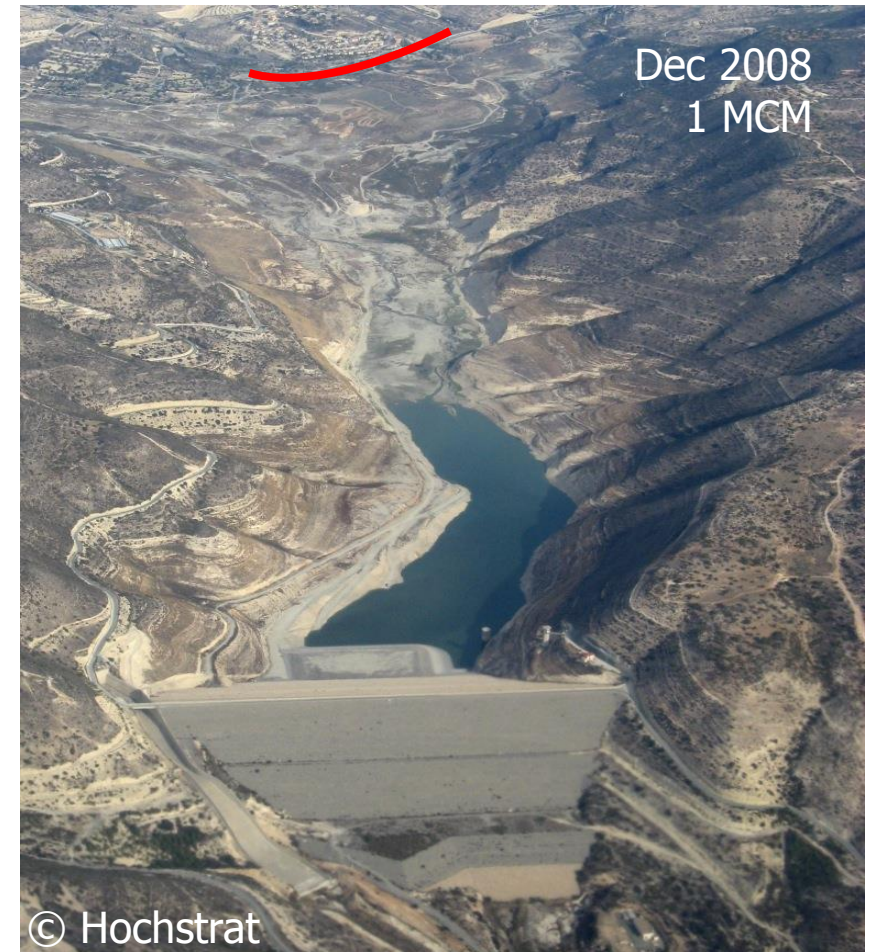
## Water exploitation index (%)



EEA, 2012

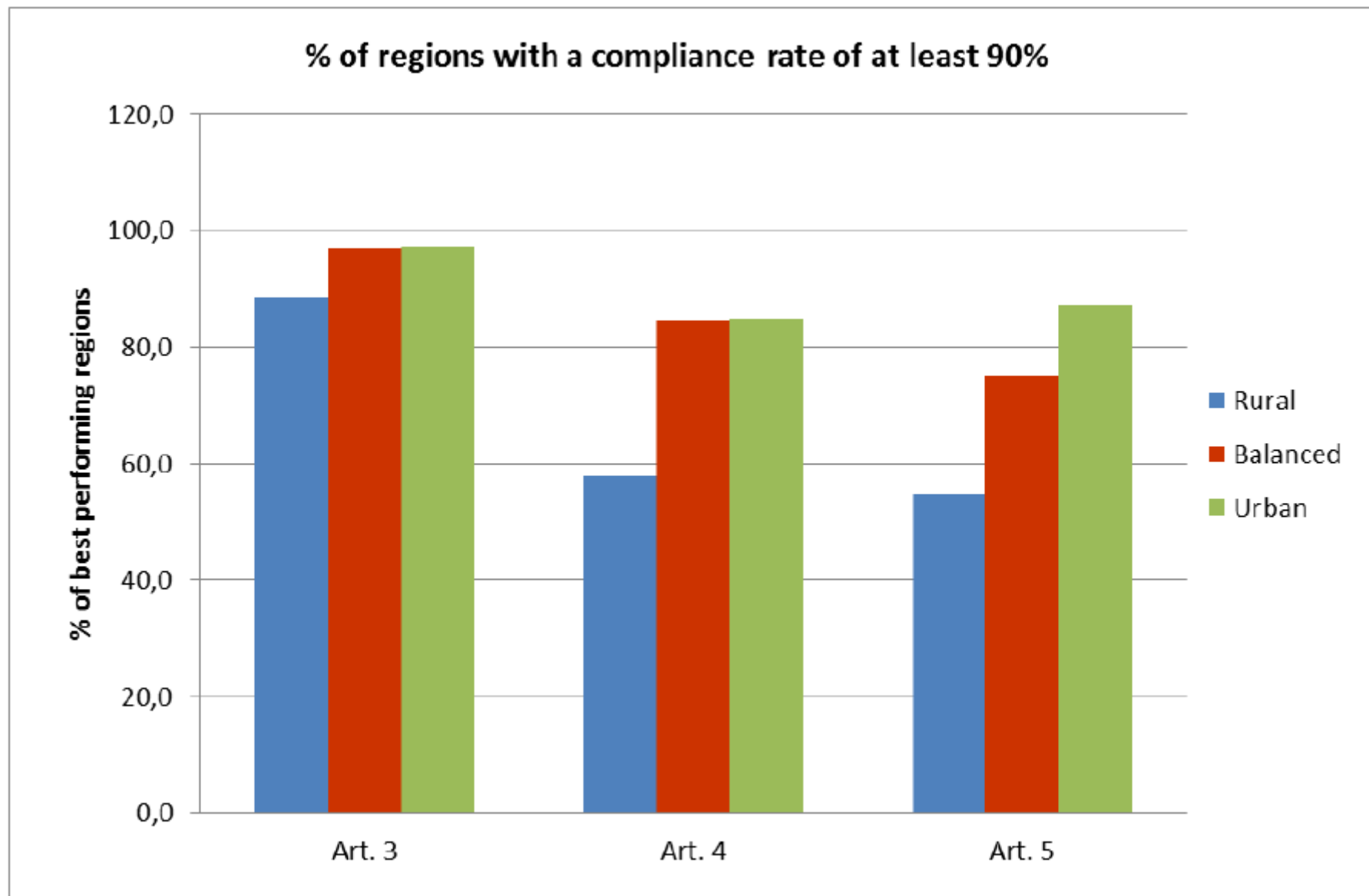


## Drought impact on water resources – the Cyprus case

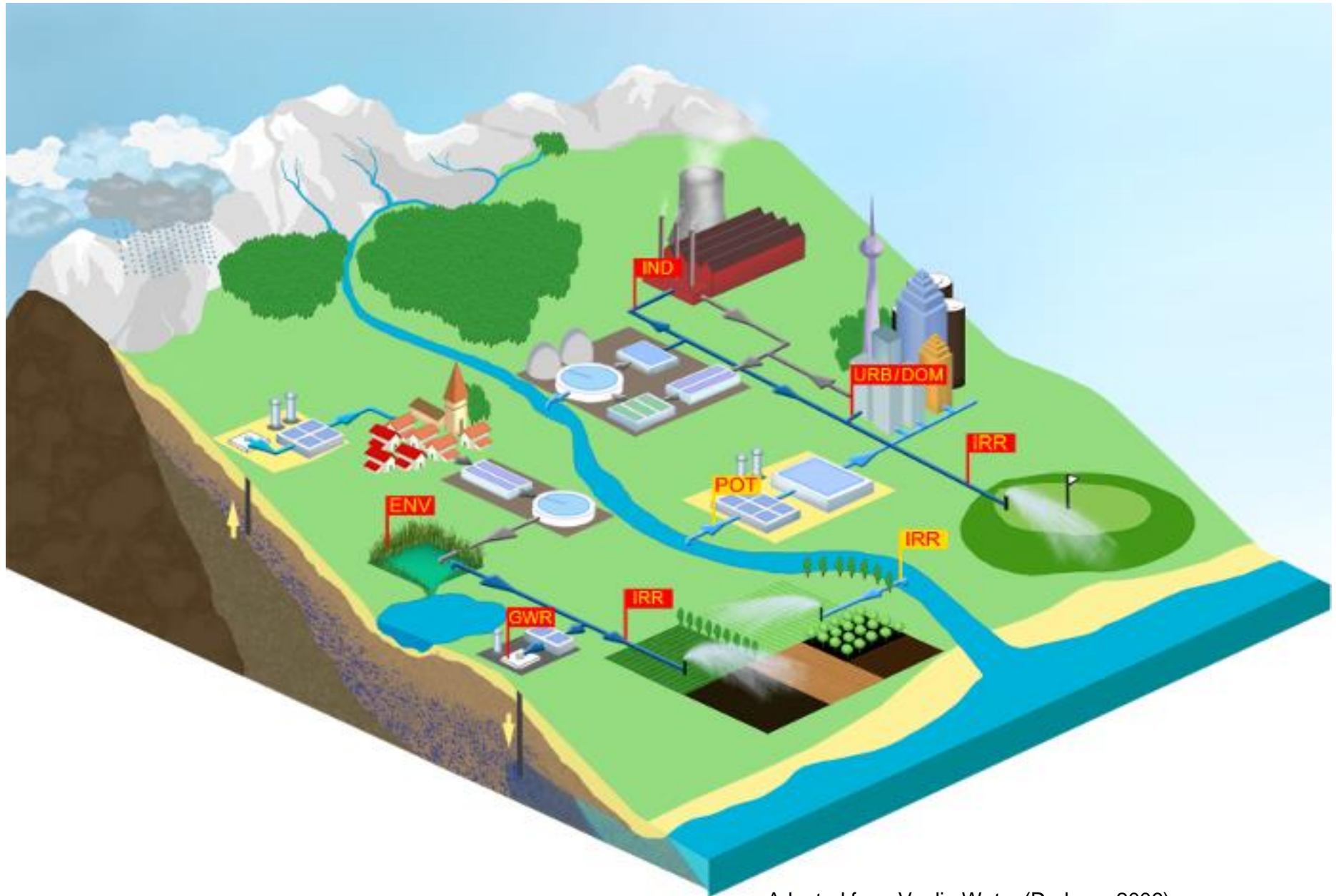


## Compliance with European Urban Wastewater Treatment Directive (EU, 2016)

Art 3. collection, Art 4 secondary treatment, Art 5. advanced treatment

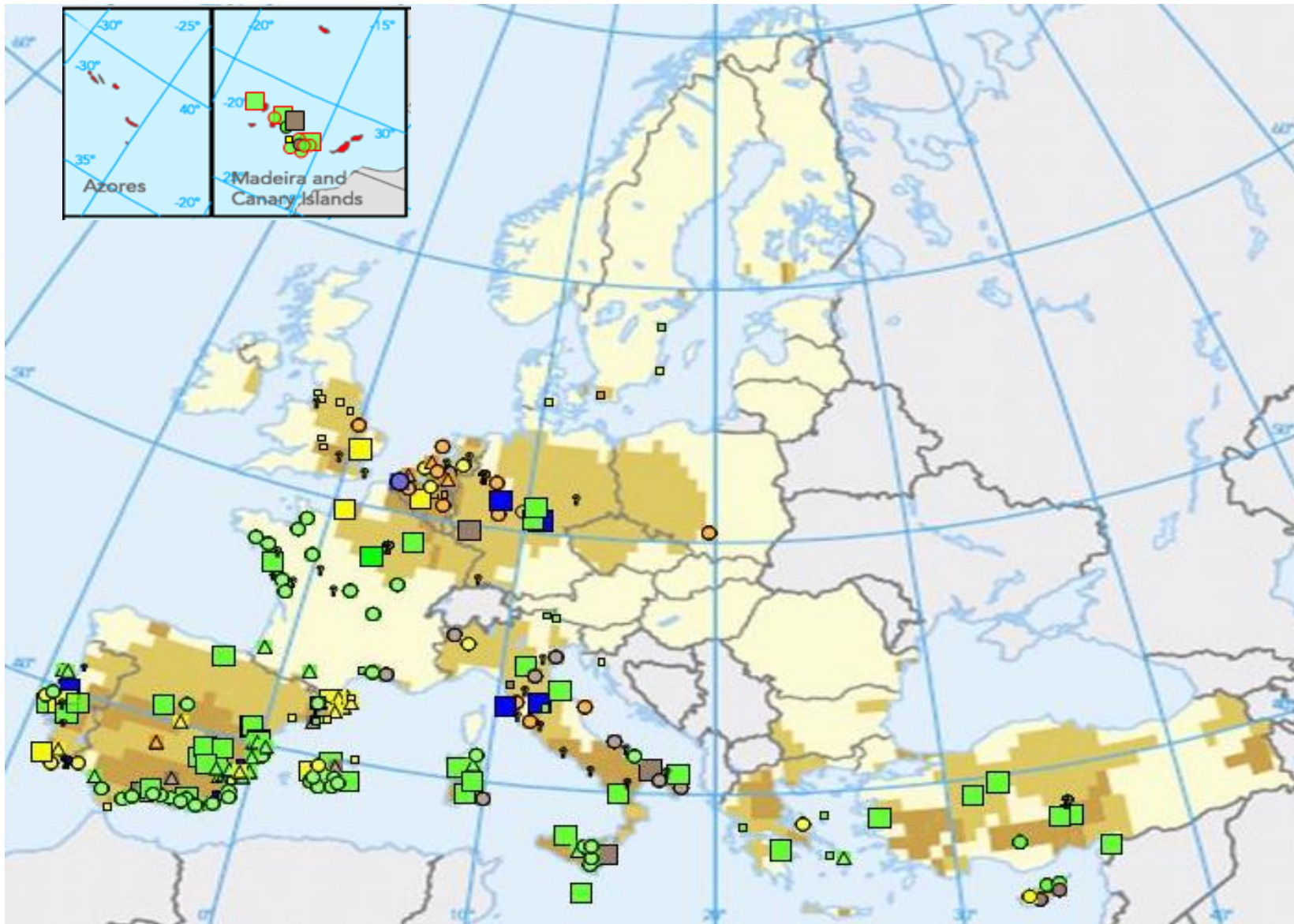


## Wastewater reclamation and reuse applications





## Water reuse in Europe (Aquarec, 2006)



### Water reuse projects

SIZE (million m³/a)	END USE
□ <0.1	■ Agriculture
△ 0.1-0.5	■ Urban
○ 0.5-5	■ Industry
□ >5	■ Multipurpose
? N/A	

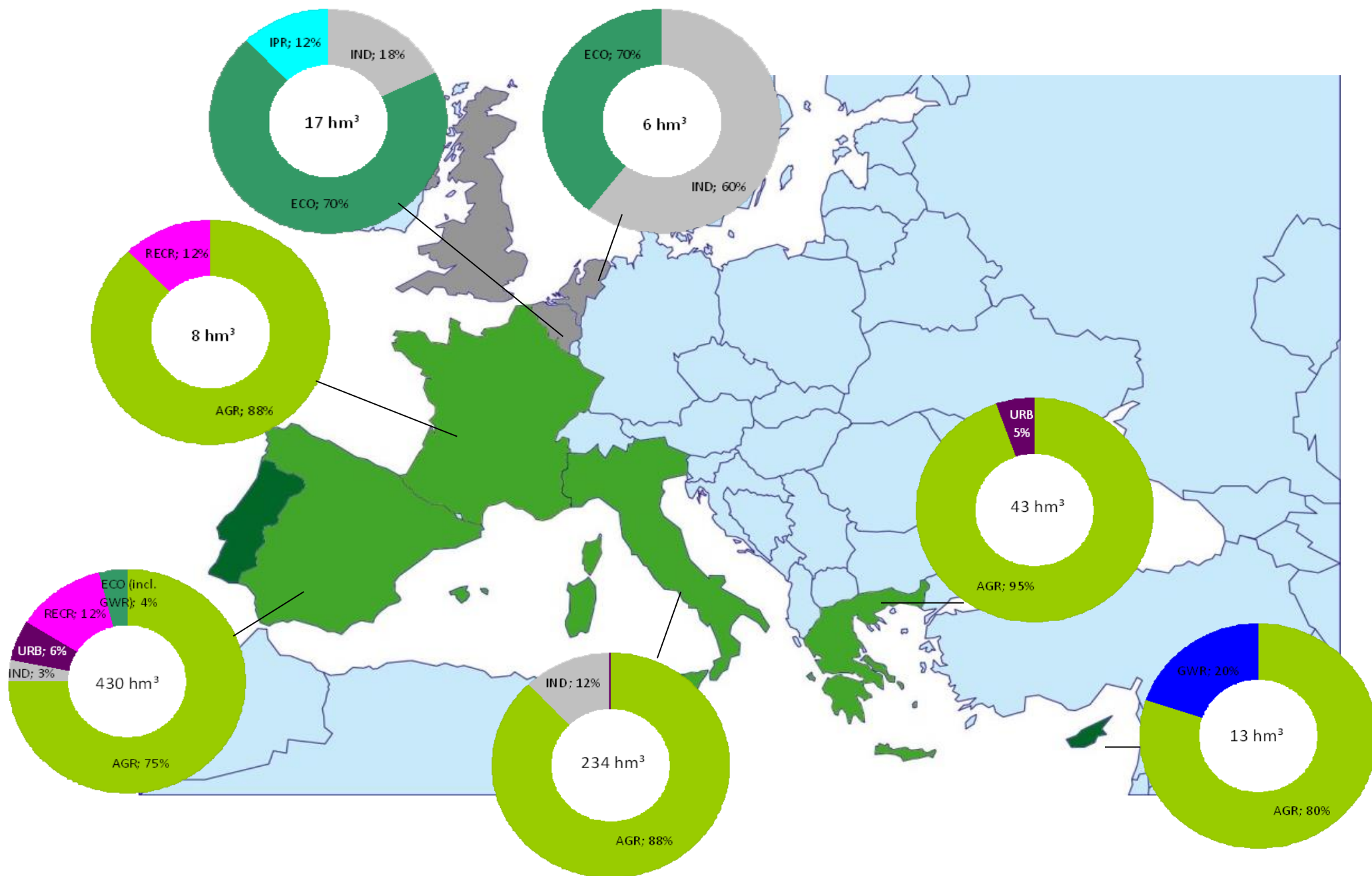
### Water exploitation index (%) around year 2000

■ 0-20 (low water stress)
■ 20-40 (medium water stress)
■ >40 (severe water stress)
■ Outside data coverage

Water Exploitation Index map: EEA (2005)

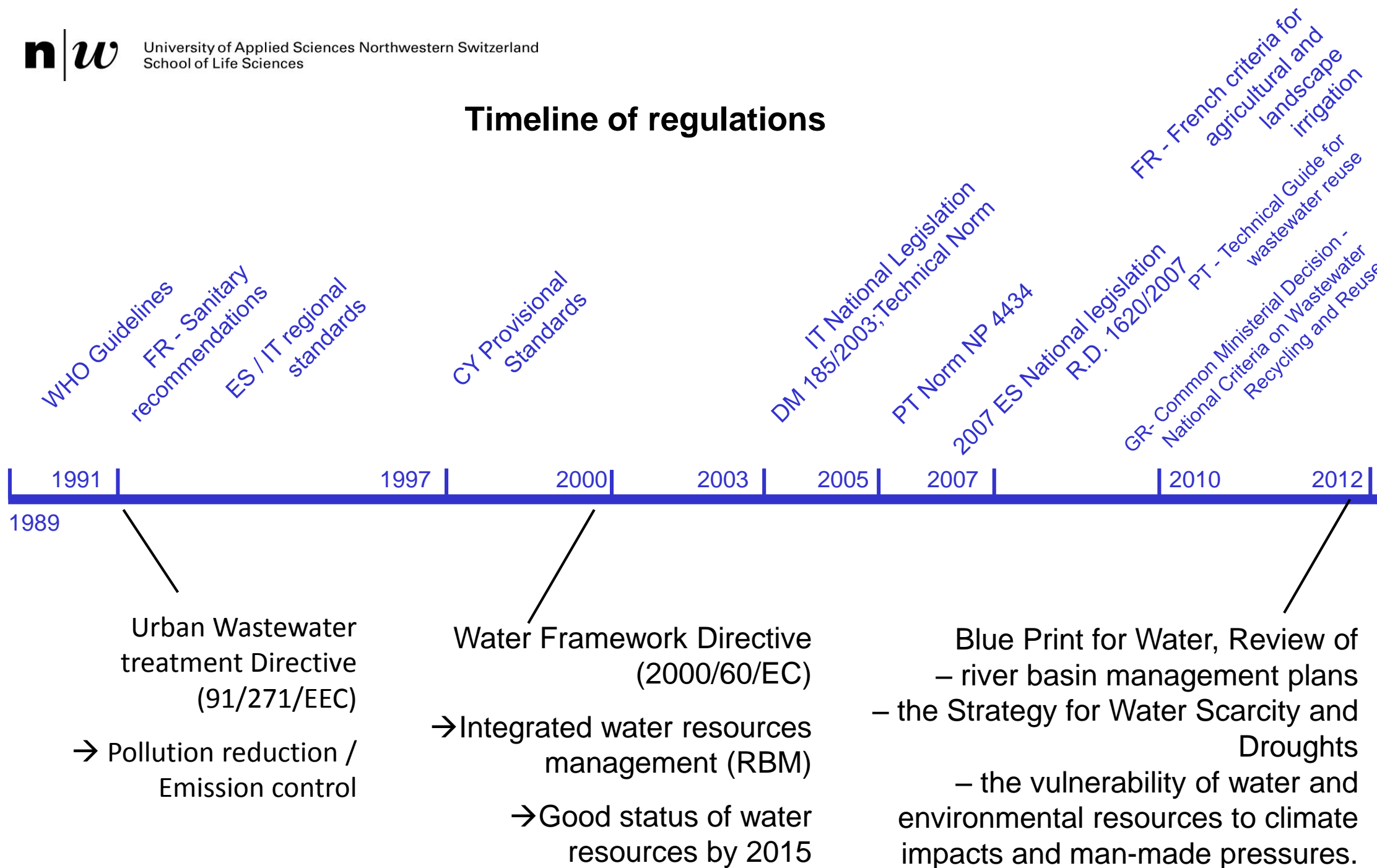
*Bixio et al., 2004*

## Status of water reuse (2012) – about 2.4% of all effluent recycled





## Timeline of regulations



## Series of actions on EU Level

**2007** - Report on Mediterranean wastewater reuse, MED-EUWI Wastewater Reuse Working Group – *key recommendation: guidance framework*

**2012** - Impact assessment for the Blueprint Communication - *identifying knowledge gaps, opportunities (RBMP) and barriers*

**2013** - Wastewater reuse in the European Union, TYPESA (Update)

**2014** - Report "Water Reuse in Europe" JRC

**2014** - Public Consultation on Policy Options to optimise Water Reuse in the EU

**2015** - Report "Optimising water reuse in the EU", BIO - «problem tree, policy options»

**2015** - Action plan Water Reuse as part of Circular Economy

# Potential measures on a European level



Optimising water reuse  
in the EU

Final report – Part I

Prepared for the European Commission – DG ENV

bio  
by Deloitte

In association  
with

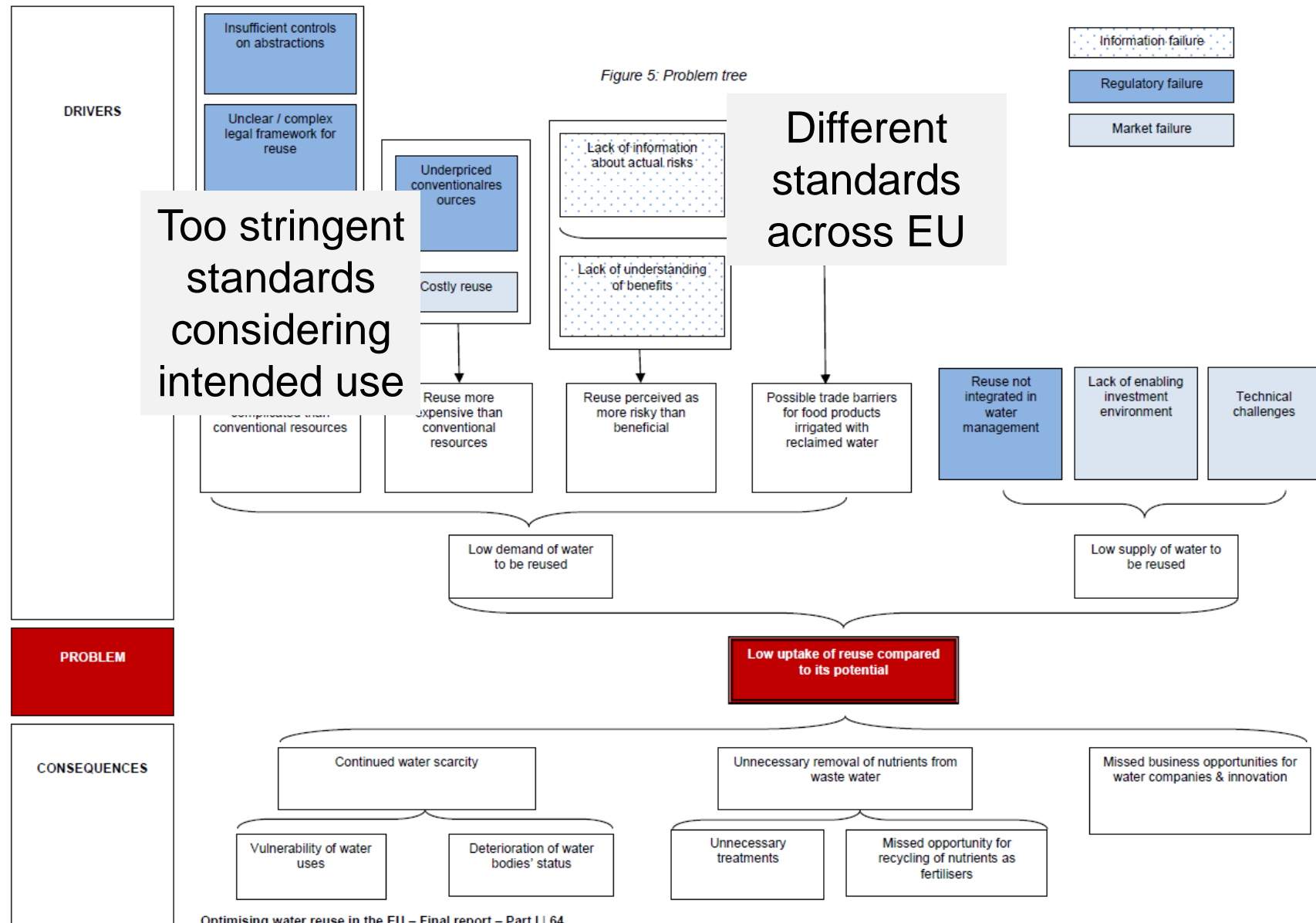
ICF G.H.K.

Cranfield  
UNIVERSITY

- **Non-binding measures aimed at improving:** implementation/enforcement of pricing, controls of abstractions and integrated water management, promotion of ISO/CEN water reuse standards, promotion of risk-based approaches for regulating water reuse.
- **Binding standards on water reuse and/or binding framework for water reuse practices on the basis of a risk-based approach** This could encompass elements such as risk management plans, treatment standards, treatment process controls, application controls and water quality benchmarks
- **Information, communication and knowledge enhancement measures** including EU guidance development, knowledge sharing and awareness raising actions



# Water reuse – „Problem analysis“ (Bio report, 2015)



## **Water Reuse - Action Plan within the European circular economy package 2015**

1) *Guidelines on Integrating Water Reuse* into Water Planning and Management in the context of the WFD.

2) *Minimum quality requirements* for water reuse in irrigation and aquifer recharge

The Commission will propose at the beginning of 2017 legislation on minimum requirements (agricultural irrigation and aquifer recharge).

3) Water reuse in *industrial activities*

Further integration of water reuse in the development and review of Best Available Techniques Reference Documents (BREFs)

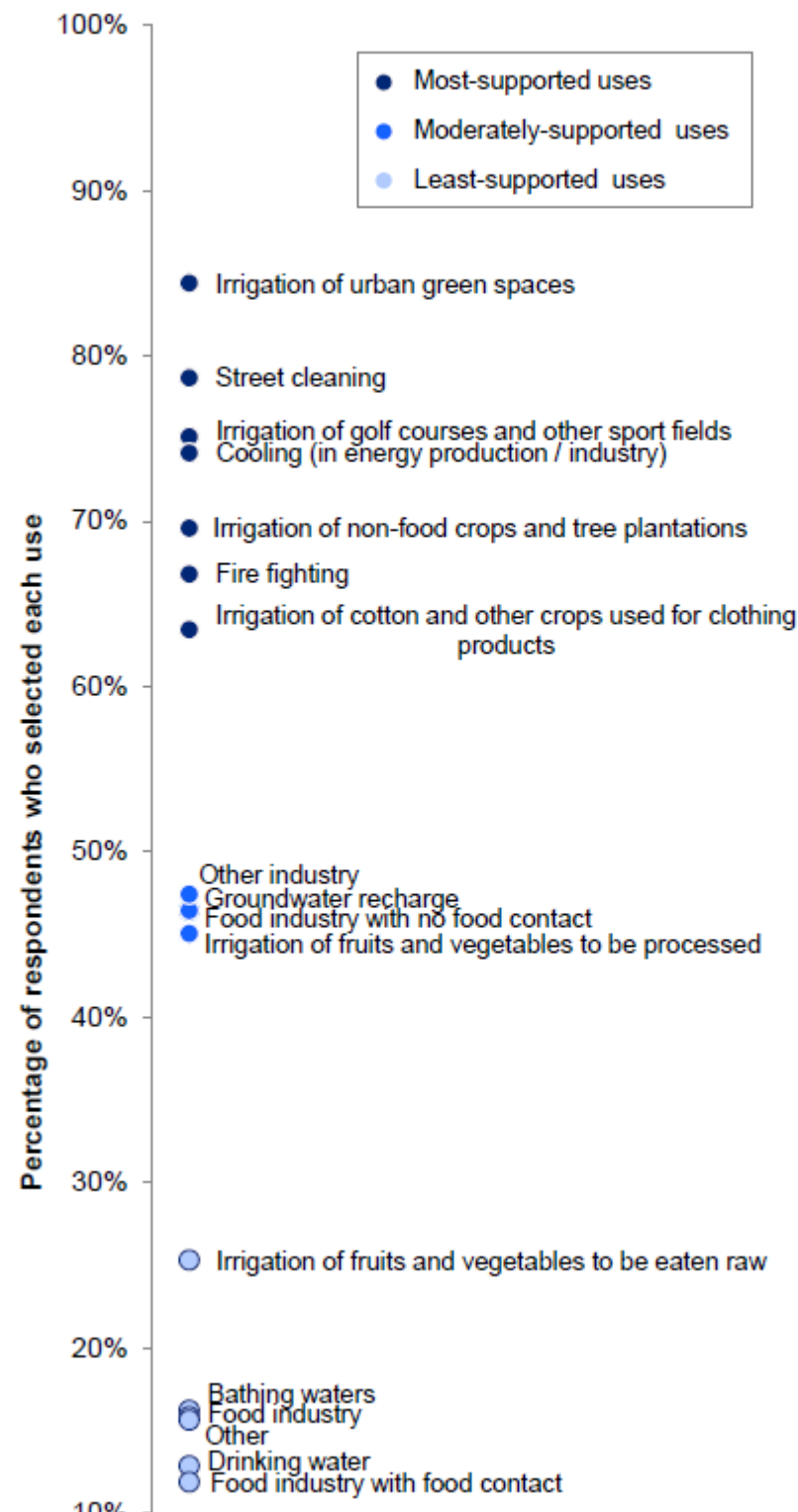
4) Support to *research and innovation* in water reuse - the European Innovation Partnership (EIP) on Water

5) EU *funds for investments* in water reuse

<http://ec.europa.eu/environment/water/reuse-actions.htm>

## EU Public Consultation Analysis Report (by Bio Deloitte, 2015)

Type of respondent	Number
Individual respondents	224
Companies and organisations	222
Public authorities	43
Other	17





# Current regulations on country level



JRC SCIENCE AND POLICY REPORTS

## Water Reuse in Europe

Relevant guidelines, needs for and barriers to innovation

*A synoptic overview*

Laura Alcalde Sanz, Bernd Manfred Gawlik  
2014



Country	Standards reference
<b>Cyprus</b>	Law 106 (I) 2002 Water and Soil pollution control and associated regulations  KDP 772/2003, KDP 269/2005
<b>France</b>	JORF num.0153, 4 July 2014  Order of 2014, related to the use of water from treated urban wastewater for irrigation of crops and green areas
<b>Greece</b>	CMD No 145116  Measures, limits and procedures for reuse of treated wastewater
<b>Italy</b>	DM 185/2003  Technical measures for reuse of wastewater
<b>Portugal</b>	NP 4434 2005  Reuse of reclaimed urban water for irrigation
<b>Spain</b>	RD 1620/2007  The legal framework for the reuse of treated wastewater

## Regulatory values for various intended uses

Analytical parameters	Cyprus	France	Greece	Italy	Portugal	Spain
<b>Microbiological parameters</b>						
- <i>Escherichia coli</i> (cfu/100ml)	5-10 <sup>3</sup>	250-10 <sup>5</sup>	5-200	10		0-10 <sup>4</sup>
- Faecal coliforms (cfu/100ml)					100-10 <sup>4</sup>	
- Total coliforms (cfu/100ml)			2			
- Faecal enterococci (log reduction)		2-4				
- <i>Legionella</i> sp. (cfu/l)						0-10 <sup>3</sup>
- <i>Salmonella</i> sp.				absence		absence
- Sulphate-reducing bacteria (log reduction)		2-4				
- Helminth eggs (Intestinal nematodes) (eggs/l)	0				1	0.1
- F-specific bacteriophages (log reduction)		2-4				

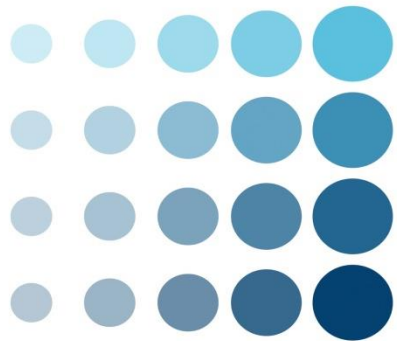
JRC Report, Water Reuse in Europe, 2014

## Summary– Potential water reuse implementation issues

- water resources, water needs and water stress
- human health risks
- environmental impact
- legal framework
- technology and practices
- public and institutional acceptance
- fundability
- permissions and implementation
- monitoring
- knowledge exchange







**Water  
Reuse  
Europe**

The trade association for  
organisations involved in the  
European water reuse sector.

**Stay connected at:**

**<http://www.water-reuse.eu>**

**Many thanks for your invitation and  
attention!**

**Acknowledgement to project  
funding by European framework  
programmes!**

