



# Revision of the Urban Wastewater Treatment Directive



# UWWTD Evaluation

## The Directive

**Collection**

**Treatment**

**Monitoring &  
Reporting**

## Lessons learnt

Effective tool –  
Tangible impacts

Simple instrument

Carrot and stick

Late but high  
implementation

Benefits >>> costs

## Room for improvement

Remaining pollution

Eutrophication

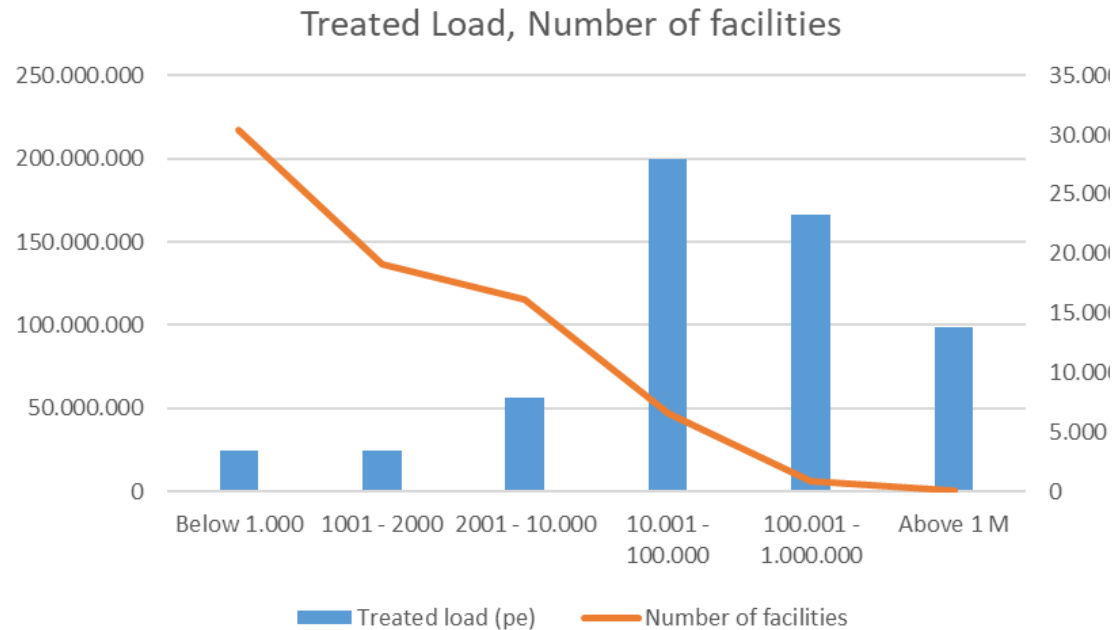
Energy use, sludge  
management

Governance –  
transparency/reporting

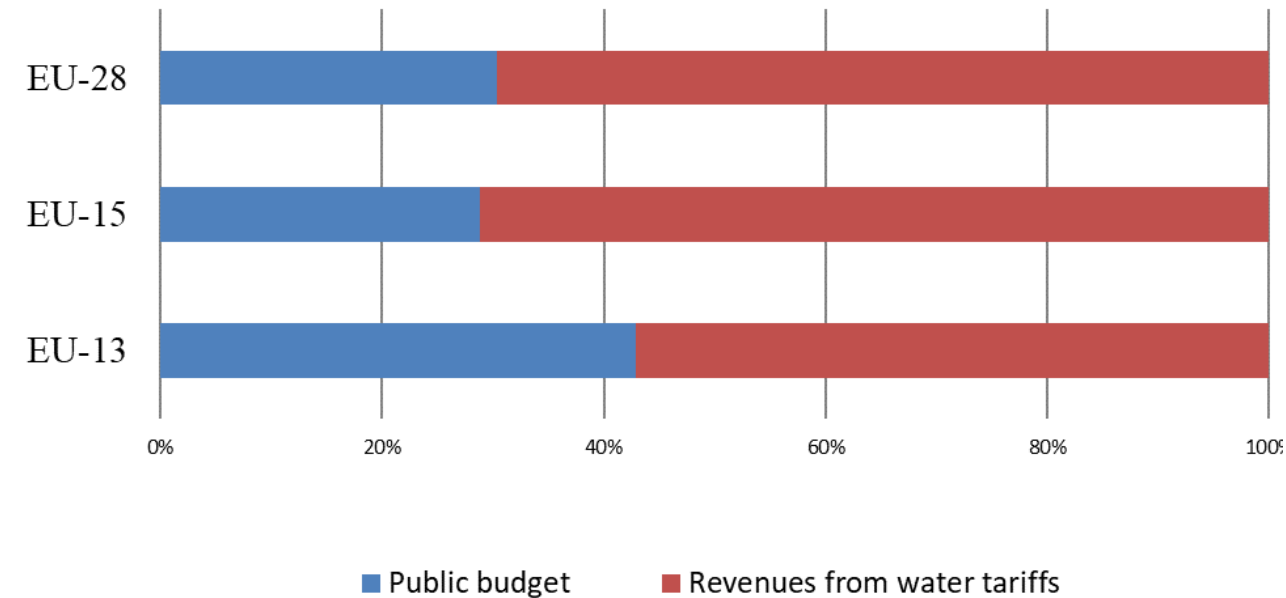
Coherence with other  
legislation

# EU wastewater sector

**Wastewater = public competence + “captive market”  
Mainly reactive to legal requirements**



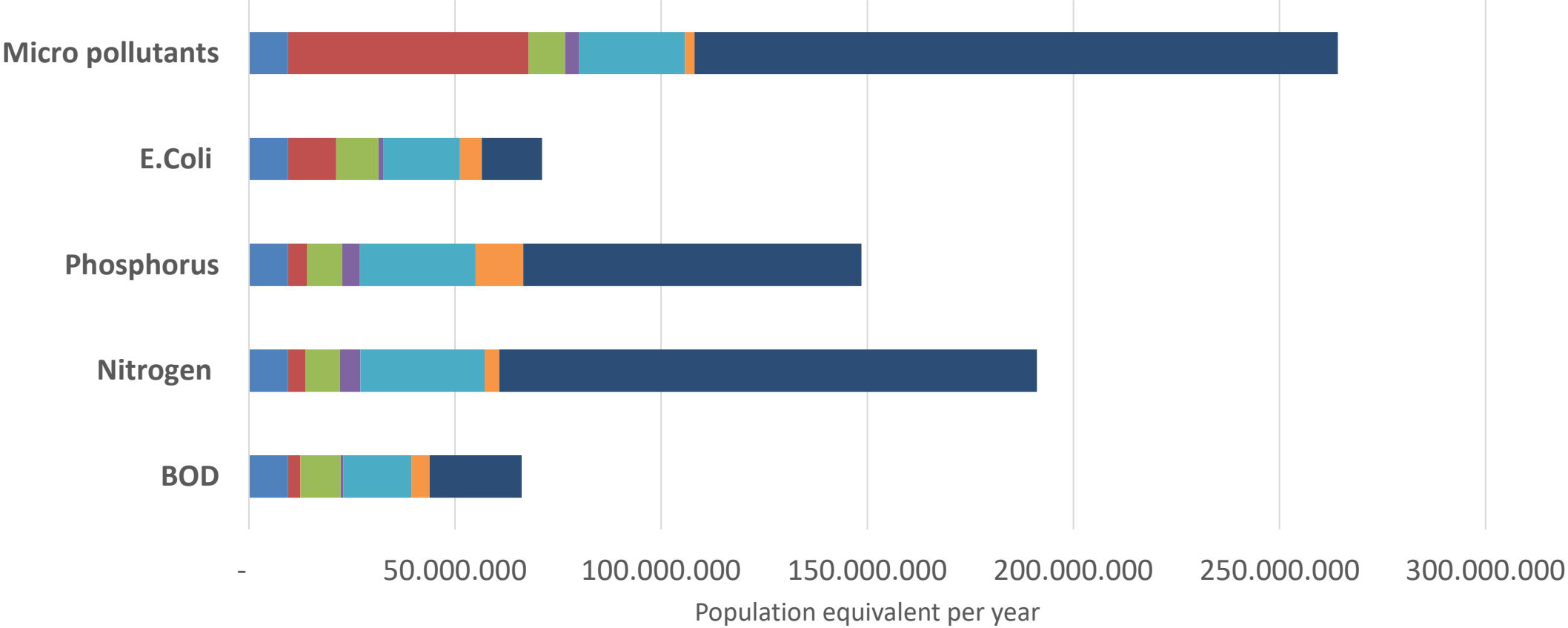
**81% of the pollution facilities above 10.000 inhabitants  
46% above 100.000 inh.**



**Costs covered by mix of water tariffs (70%) and public budgets (30%)**

SWO = storm water overflow  
 IAS = Individual system

# Problem definition – remaining loads

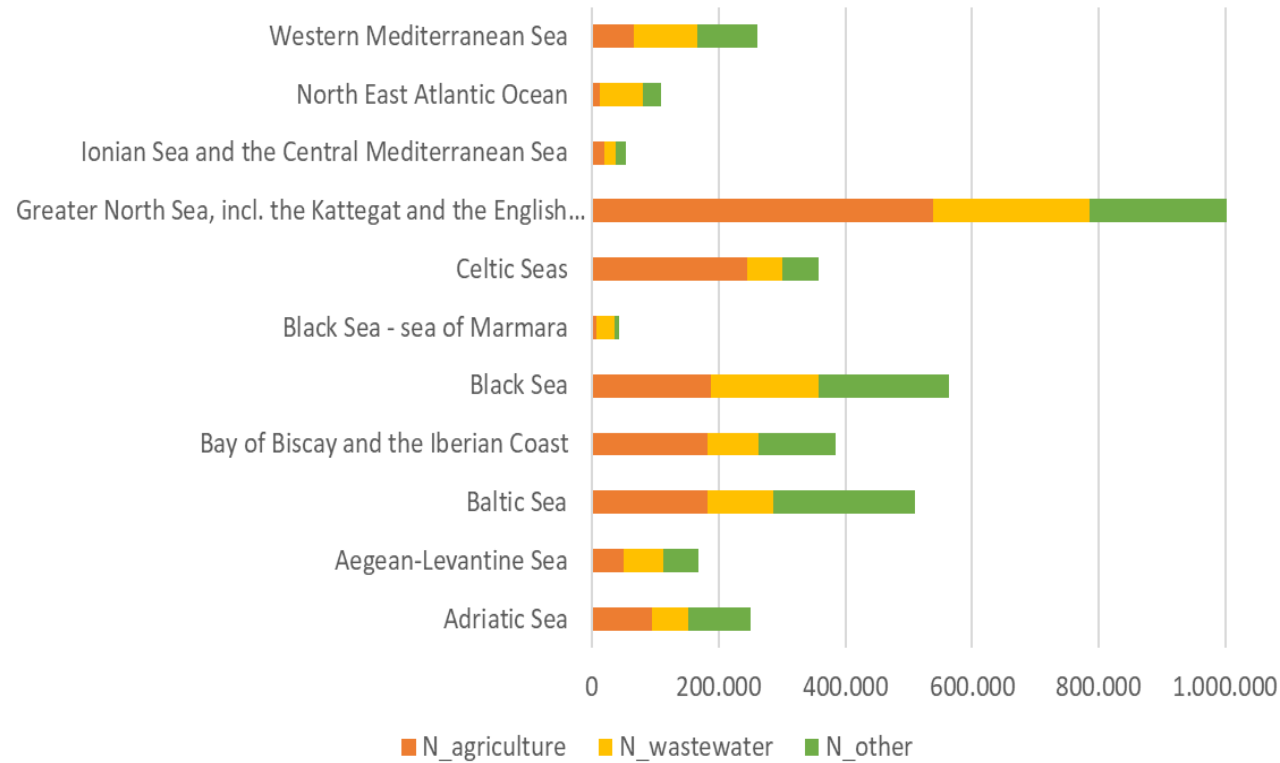


- SWO
- Urban run off
- Non Compliant IAS
- Compliant IAS
- Small Agglo
- Non compliant load
- Remaining compliant treated load



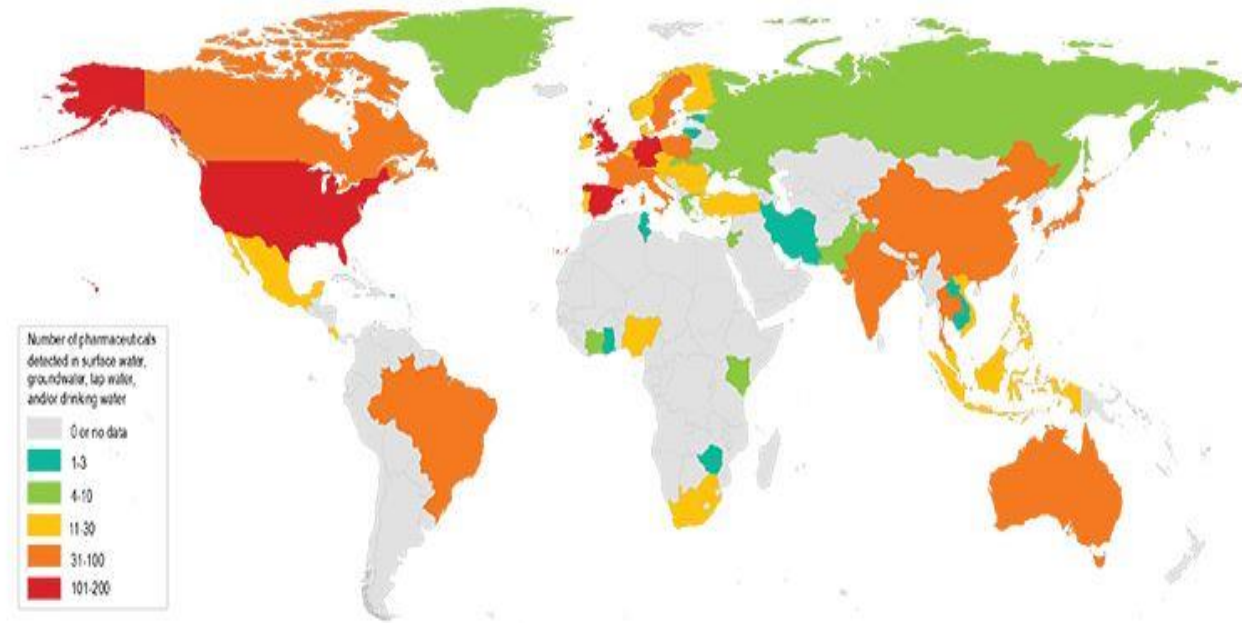
Source: European Commission (JRC), 2022, [UWWTD IA](#)

# Problem definition – nutrients and micropollutants



**Loads of N (tonnes/year) to EU regional seas by source**

Source: European Commission (JRC), 2019, [The effects of the UWWTD](#)



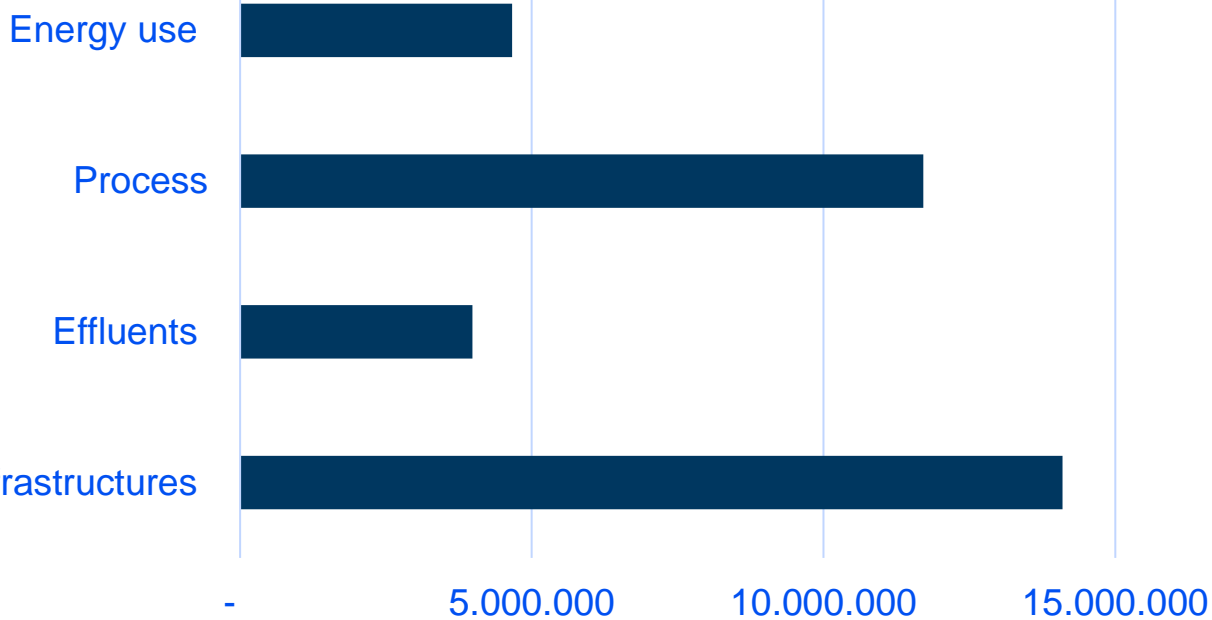
**Number of pharmaceuticals detected in surface, ground or drinking water**

Source: Aus der Beek et al., 2015, [Pharmaceuticals in the environment – Global occurrences and perspectives. Critical Review in Environmental Toxicology and Chemistry.](#)



# EU Green Deal

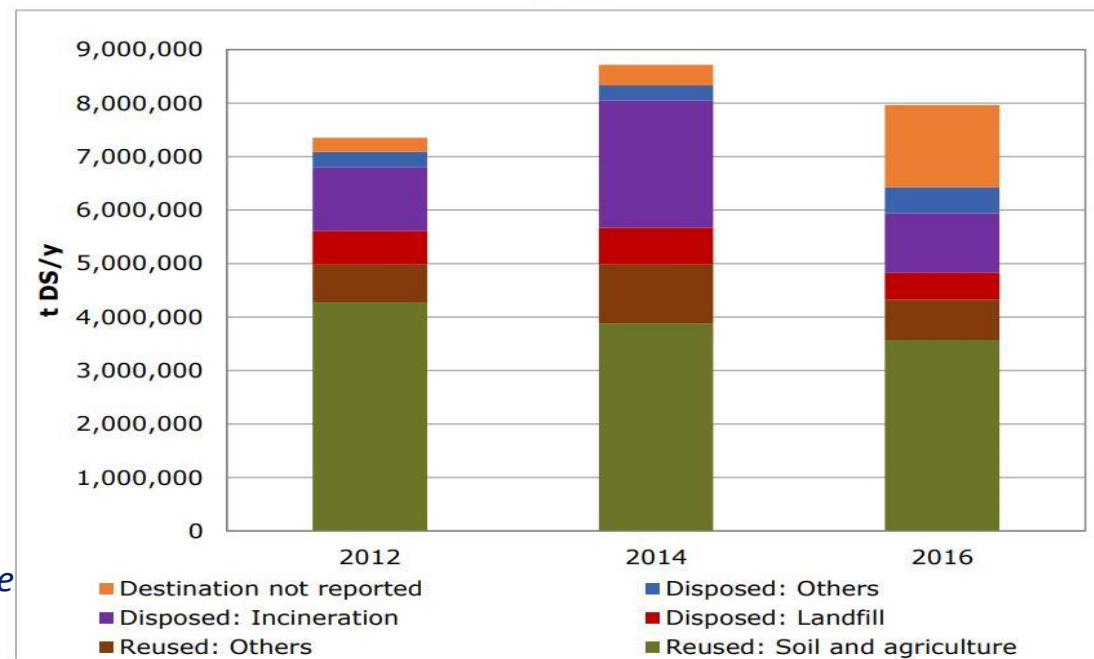
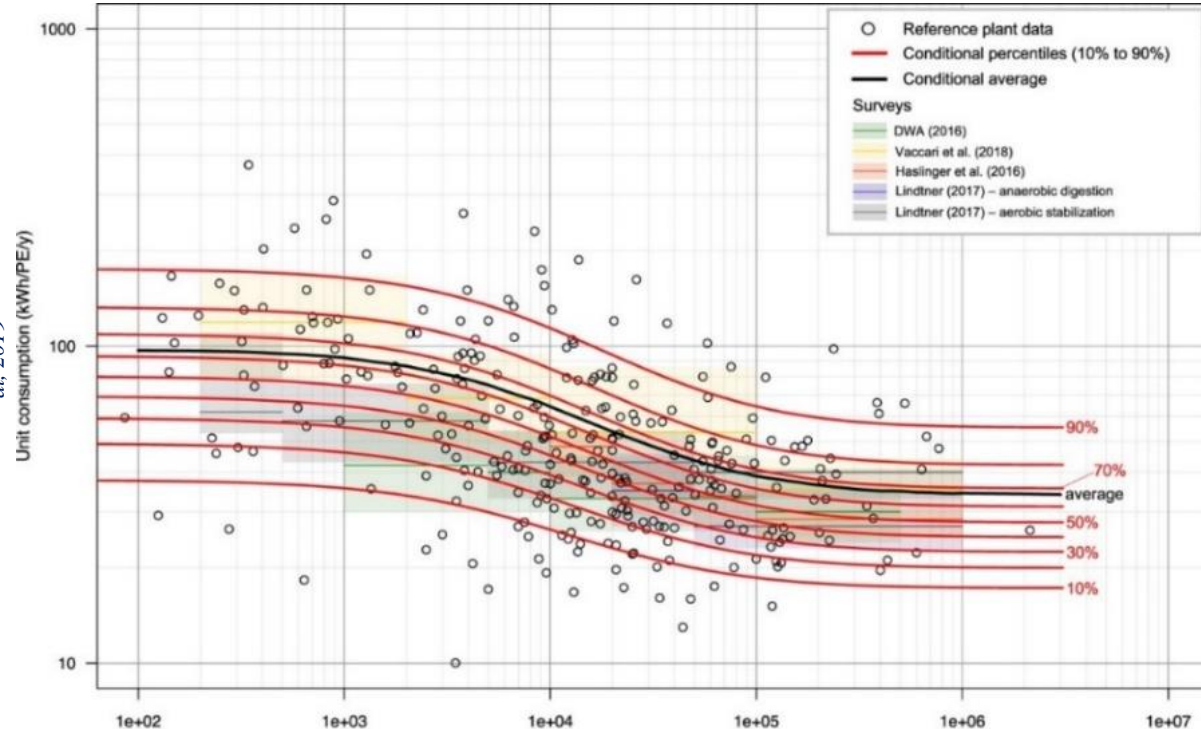
## GHG emissions - Waste Water (EU 27, tons CO2e/year)



Source JRC 2022

Sewage sludge reuse in EU-28 in the period 2012-2016 (% of sewage sludge reused in soil and agriculture)

Annual electricity used vs size of treatment plants, source: Ganora et al, 2019



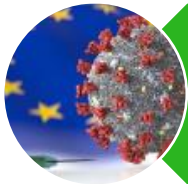
# Problem definition – Governance



Transparency,  
Performances



Polluters pays



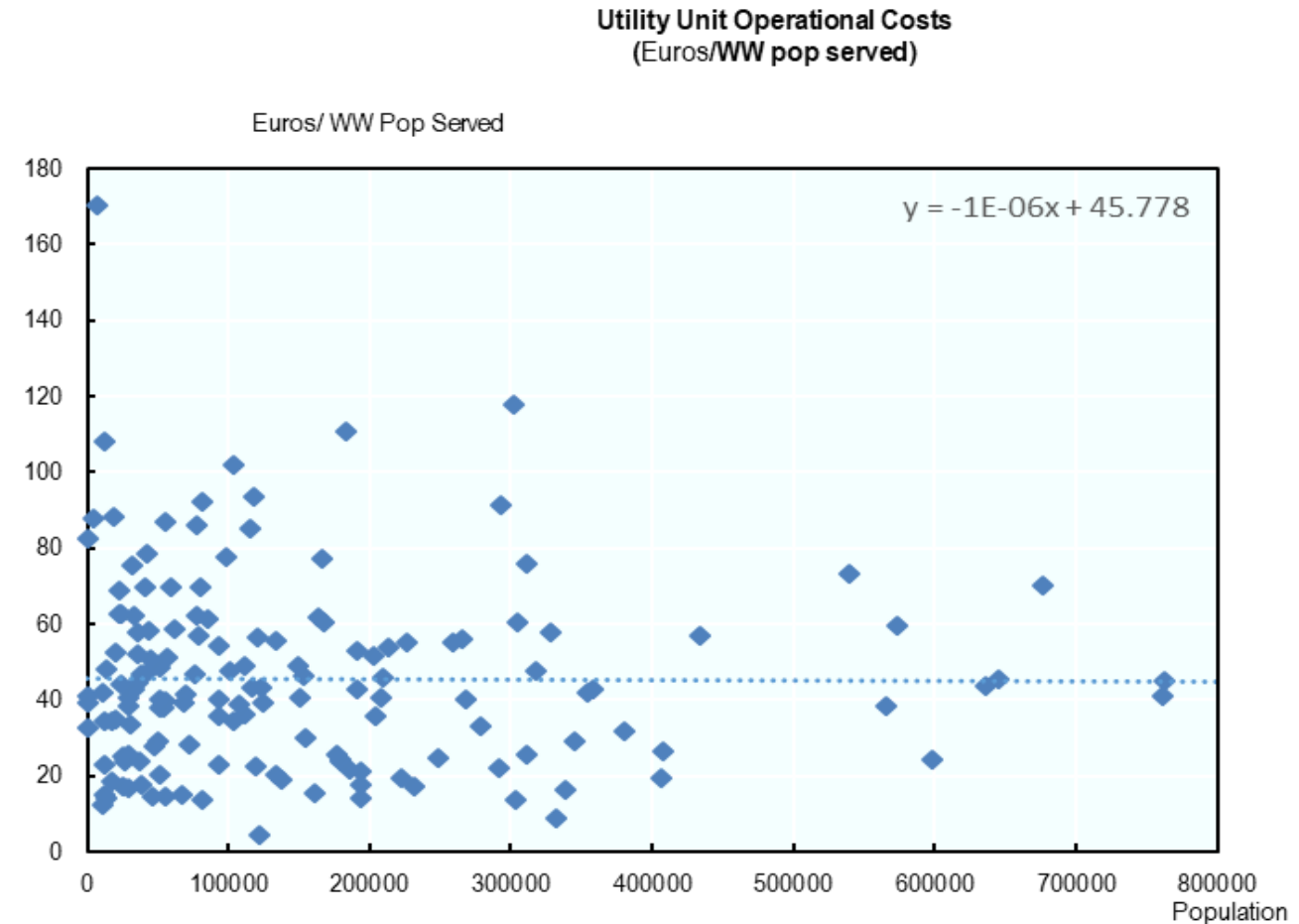
Health, access to  
sanitation



Monitoring &  
Reporting



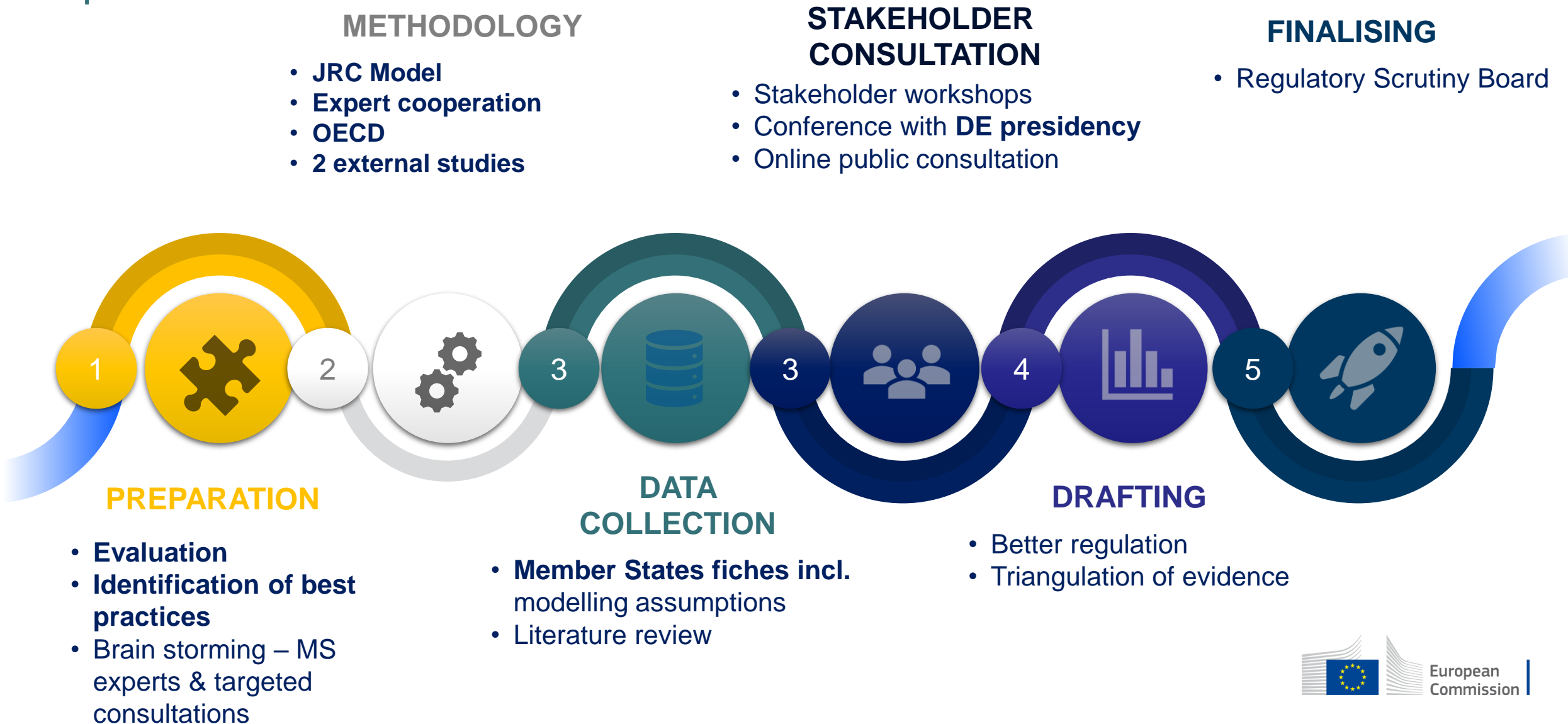
Coherence



## Operational costs – EU wastewater operators

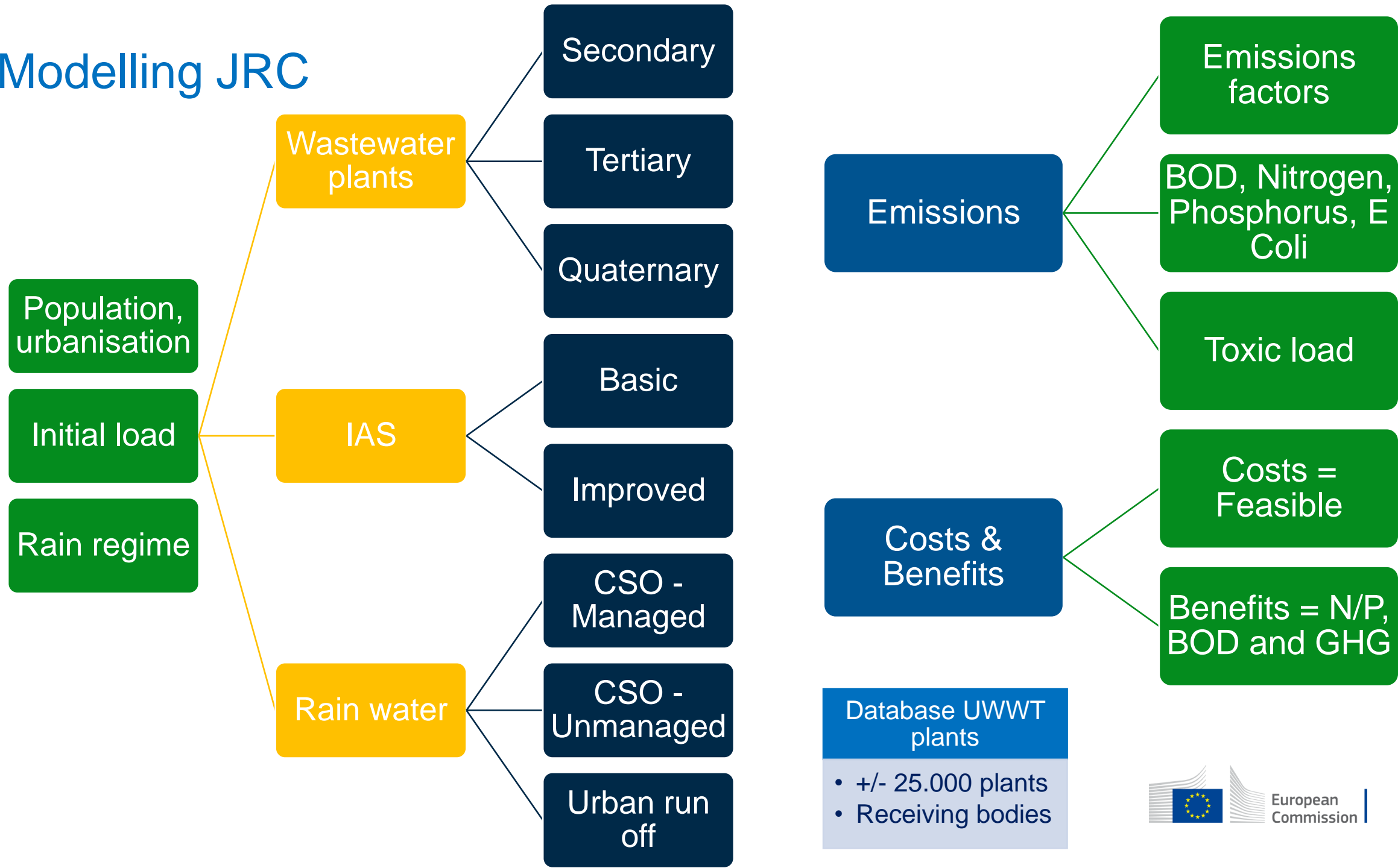
Source: OECD, 2022, (forthcoming 2022) Transparency and the performance of wastewater collection and treatment services

# Approach to the impact assessment

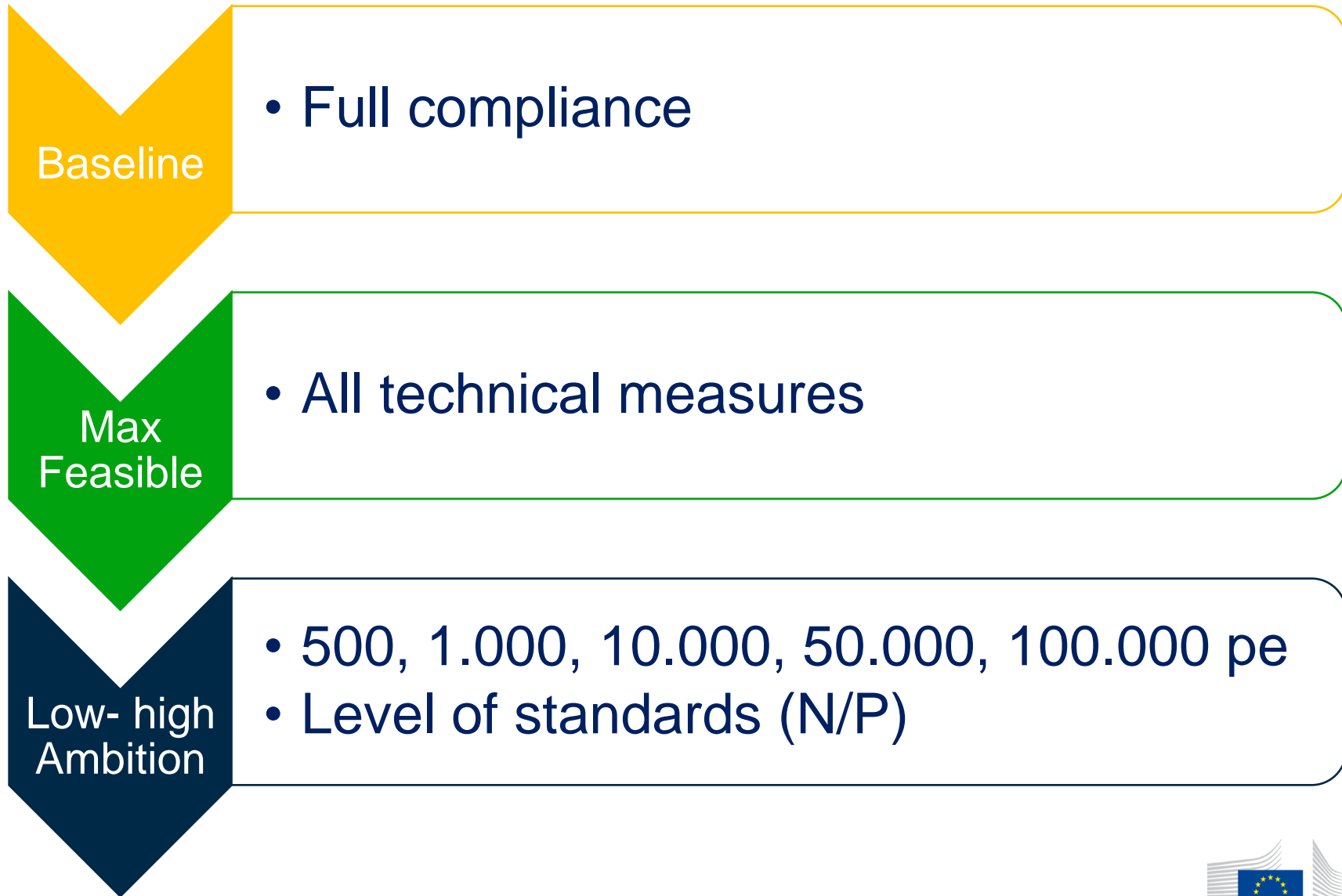




# Modelling JRC



# Modelling JRC



# Towards the preferred option

Best practices,  
Stakeholders,  
other EU laws

Possible  
Options IA -  
levels of  
ambition

Costs &  
Benefits or  
Cost  
effectiveness

Contribution to  
Green Deal,  
Enforceability  
&  
Administrative  
burden

**Preferred  
Option =  
legal  
proposal**

# Main objectives

## Water quality

- Tackling remaining sources of urban wastewater pollution

## Green Deal

- Towards climate neutrality, improving energy balance
- Enhance circular economy

## Governance

- Improve governance of this 'captive' sector

# What is new? IAS & Small Agglo – Articles 3 and 4

## Small agglomerations

- 2.000 p.e. to 1.000 p.e. (2030)
- Obligation of connection

## Individual systems

- Exception
- MS to ensure control
- EU based minimum requirements
- Reporting if more than 2% of load

# What is new? Rain waters – Article 5, Annex V

## Integrated Management plan

- Based on in depth analysis/monitoring
- Local objectives, indicative EU objective
- Measures based on hierarchy of action (prevention/green)

## Risk based approach

- Plans in all Agglo > 100.000 p.e. (2030)
- Plans in Agglo at risk > 10.000 p.e. (2035) - 30% in the IA

## Areas at risk

- Agglo between 10 and 10.000 p.e.
- List by 2025
- Criteria in Art. 5

# What is new? Nutrients – Article 7

## Risk based approach

- N/P treatment > 100.000 p.e. (2035)
- N/P treatment > 10.000 p.e. in designated areas (2040)
- In the IA, 50% of facilities > 10.000 pe not yet equipped will have to be equipped

## Areas sensitive to eutrophication

- Revised list by 2025
- Revised criteria in Annex II
- Better connection with WFD and MSFD

## Revised standards

- New standards for N/P (2035 > 100.000 pe, 2040 > 10.000 pe)
- % reduction still possible

# What is new? Micro-pollutants – Article 8

## Risk based approach

- All facilities > 100.000 p.e. (2035)
- Facilities > 10.000 p.e. in areas at risk (2040)

## Areas at risk

- List of areas by 2030
- Clear criteria
- In the IA: 70% of areas at risk

## Standards

- 80% removal of 6 substances of a list of 12



# What is new? - Energy & Climate, Circular Economy



## ENERGY, CLIMATE

- Audits >100.000 p.e. (2025), > 10.000 p.e. (2030) (Art. 11)
- Energy neutrality by 2040
- Interim targets
- Monitoring GHG emissions

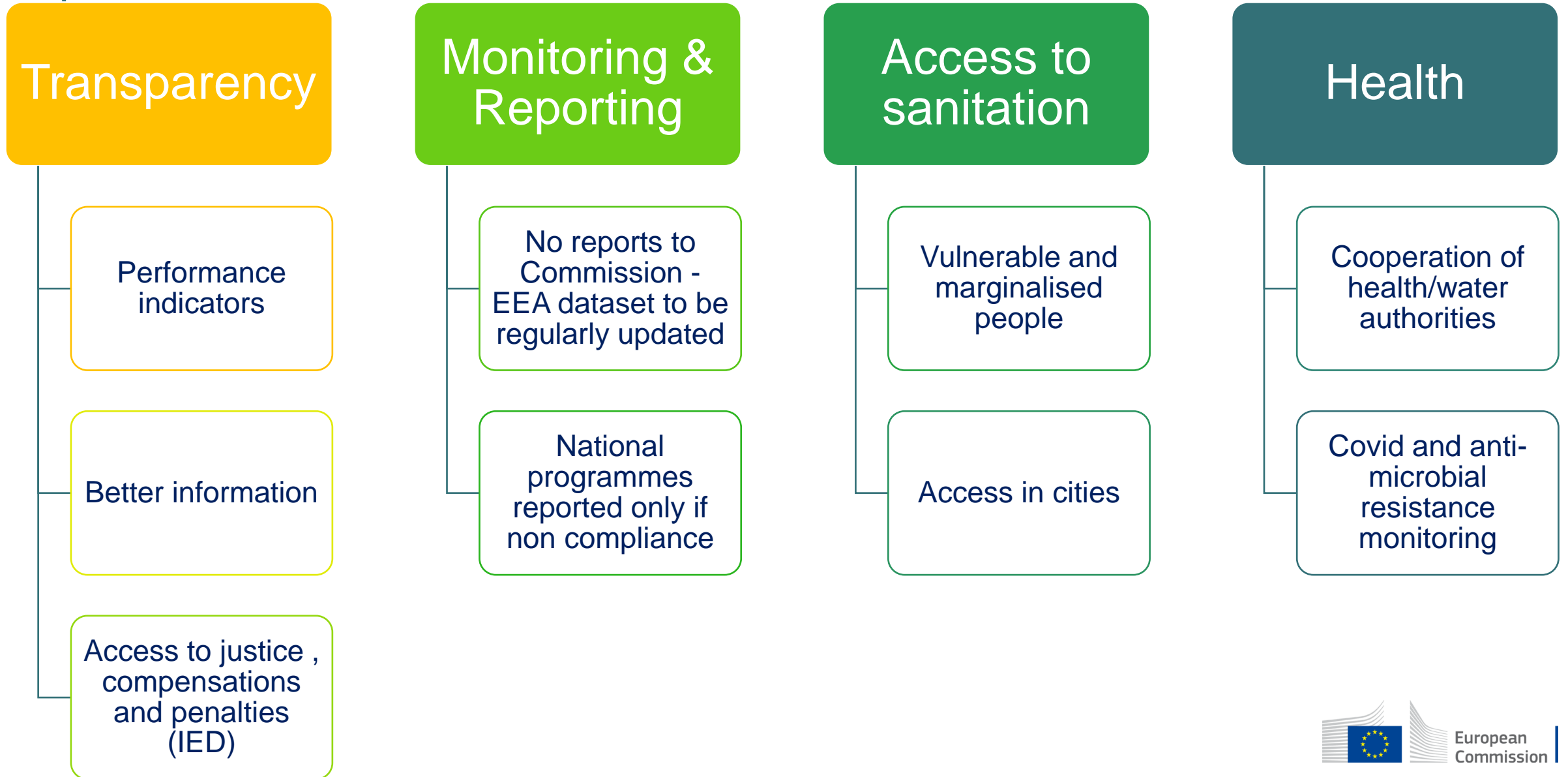


## CIRCULAR ECONOMY

- Track at source (Art. 14)
- Systematically consider water re-use (Art. 15)
- Sludge in line with waste hierarchy + DA on recycling re-use for N/P (Art. 20)

DA = Delegated Act

# What is new? - Governance



# Preferred Option = legal proposal

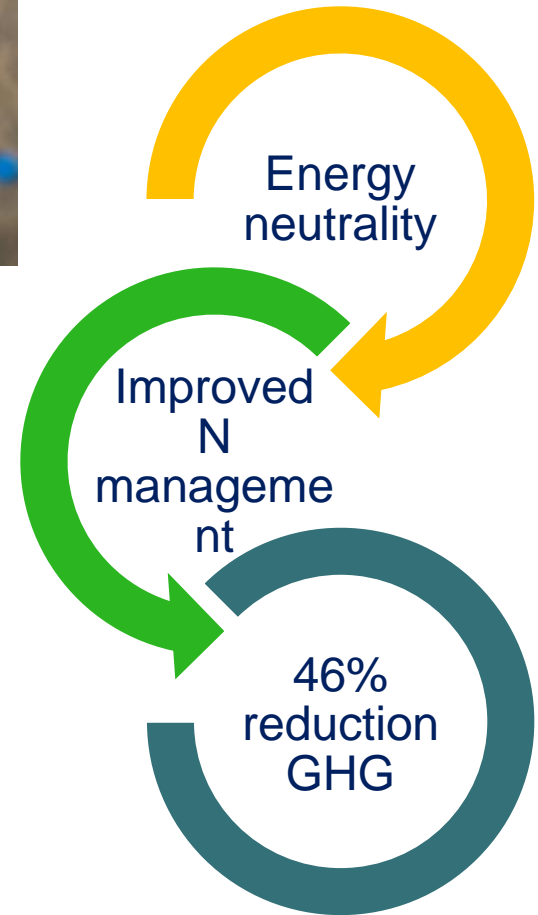
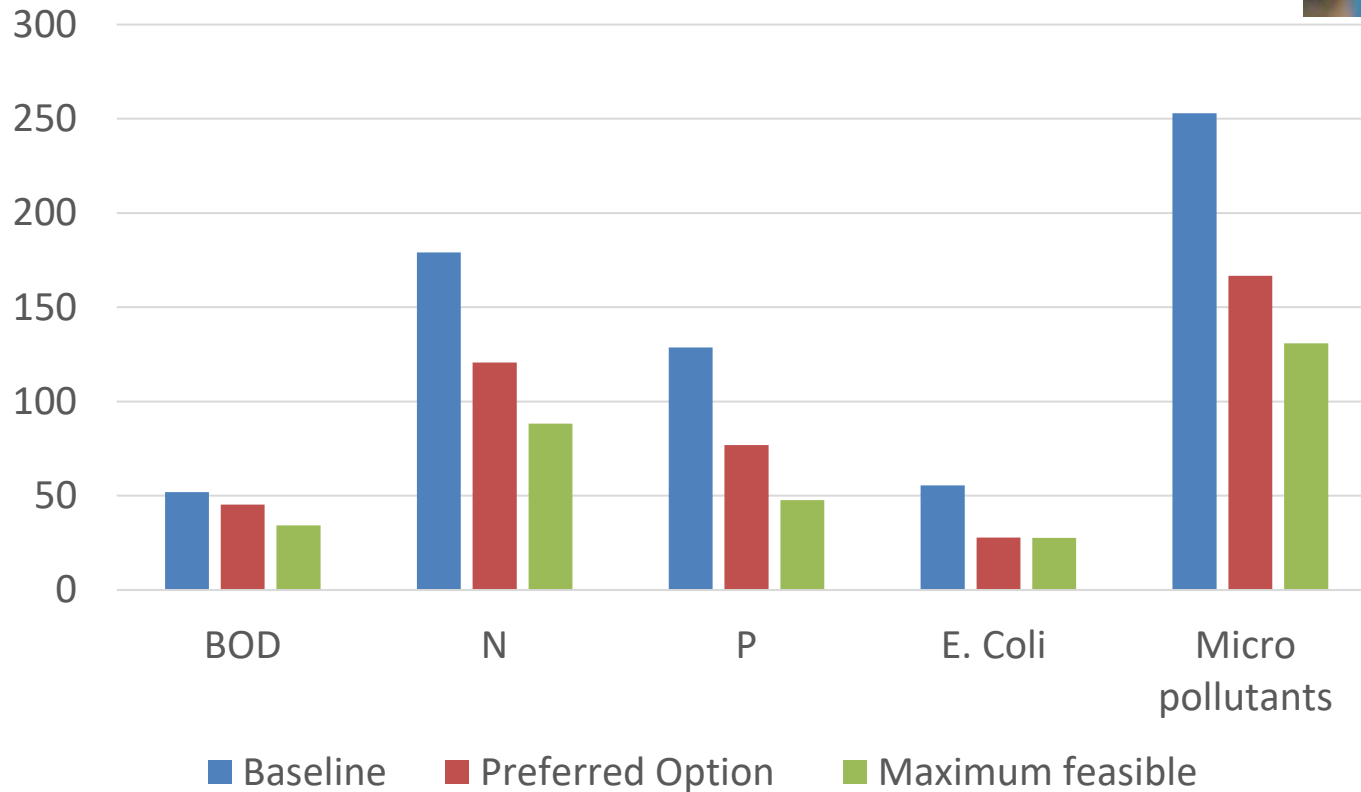
	<b>Costs (€/year)</b>	<b>Administrative costs (€/year)</b>	<b>Total costs (€/year)</b>	<b>Monetised benefits (€/year)</b>	<b>Proportionality (Benefits/ Costs)</b>
<b>Storm water and urban runoff</b>	372.472.648	57.600.000	430.072.648	785.687.648	2,11
<b>Small agglomerations</b>	140.406.278	472.000	140.878.278	224.242.435	1,6
<b>Nutrients management</b>	2.008.825.659	0	2.008.825.659	5.285.693.790	2,63
<b>Micro-pollutants treatment</b>	1.185.512.586	27.600.000	1.213.112.586	0	Reduction of the toxic load of 68.198 p.e.
<b>Energy and GHG</b>		Note		347.221.754	Energy neutrality
<b>Others</b>		55.700.000			
<b>Total</b>	3.707.217.171	141.372.000	3.848.589.171	6.642.845.627	1,726

# Impacts



**- 9 %  
micro  
plastics**

Pollution reduction (million pe)



# Costs coverage, Affordability

**Now:** 70% water tariffs and 30% public budget  
**Proposal:** 3 sources of financing

Total Costs: EUR 3,8 billion/year in 2040

Total monetized benefits: EUR 6,6 bn/year in 2040

## Water tariffs (1,8 bn/year by 2040)

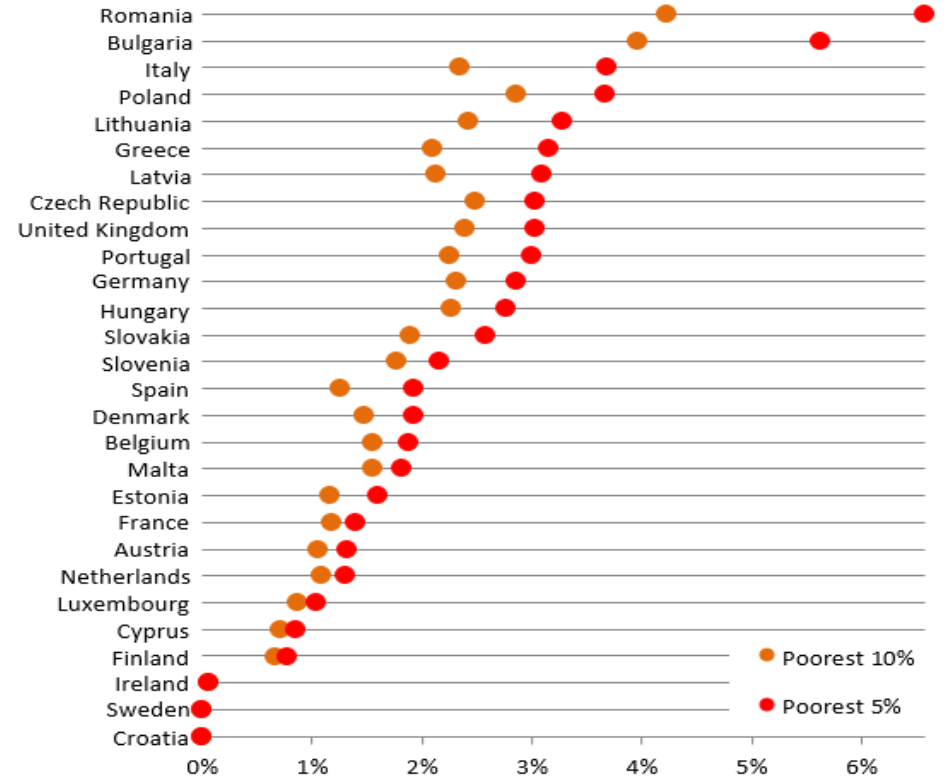
- Average increase **2,3% in 2040**
- **Affordability not endangered**

## Public Budget - (0,8 bn/year by 2040)

- EU funds for water: EUR 2 bn/year
- Average public budget for water: EUR 30 bn/year

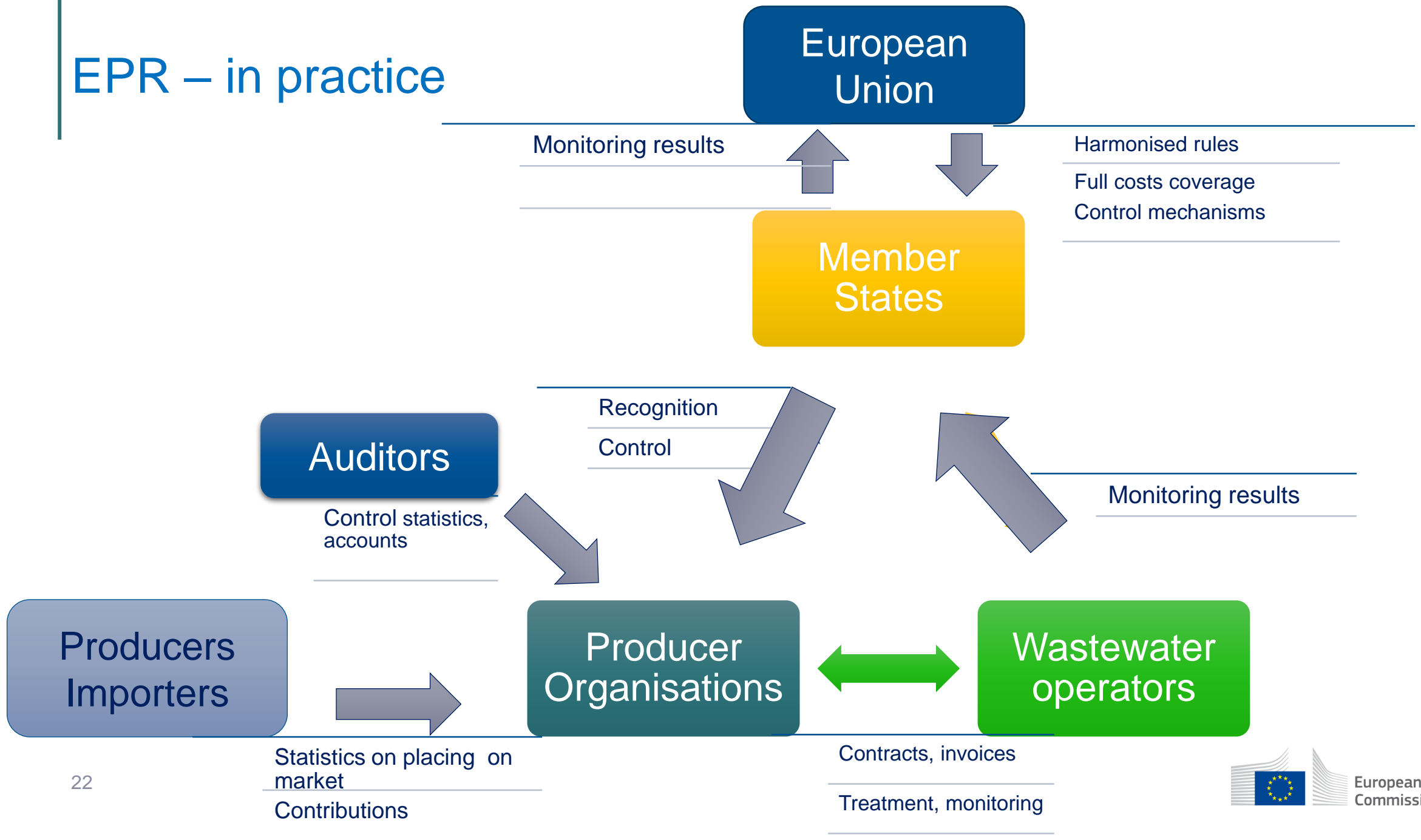
## Producer responsibility (1,2 bn/year by 2040)

- 0,5 to 0,9% max reduction of profit margins
- Or 0,6% max of annual expenses (**2,7 € year/person max**)

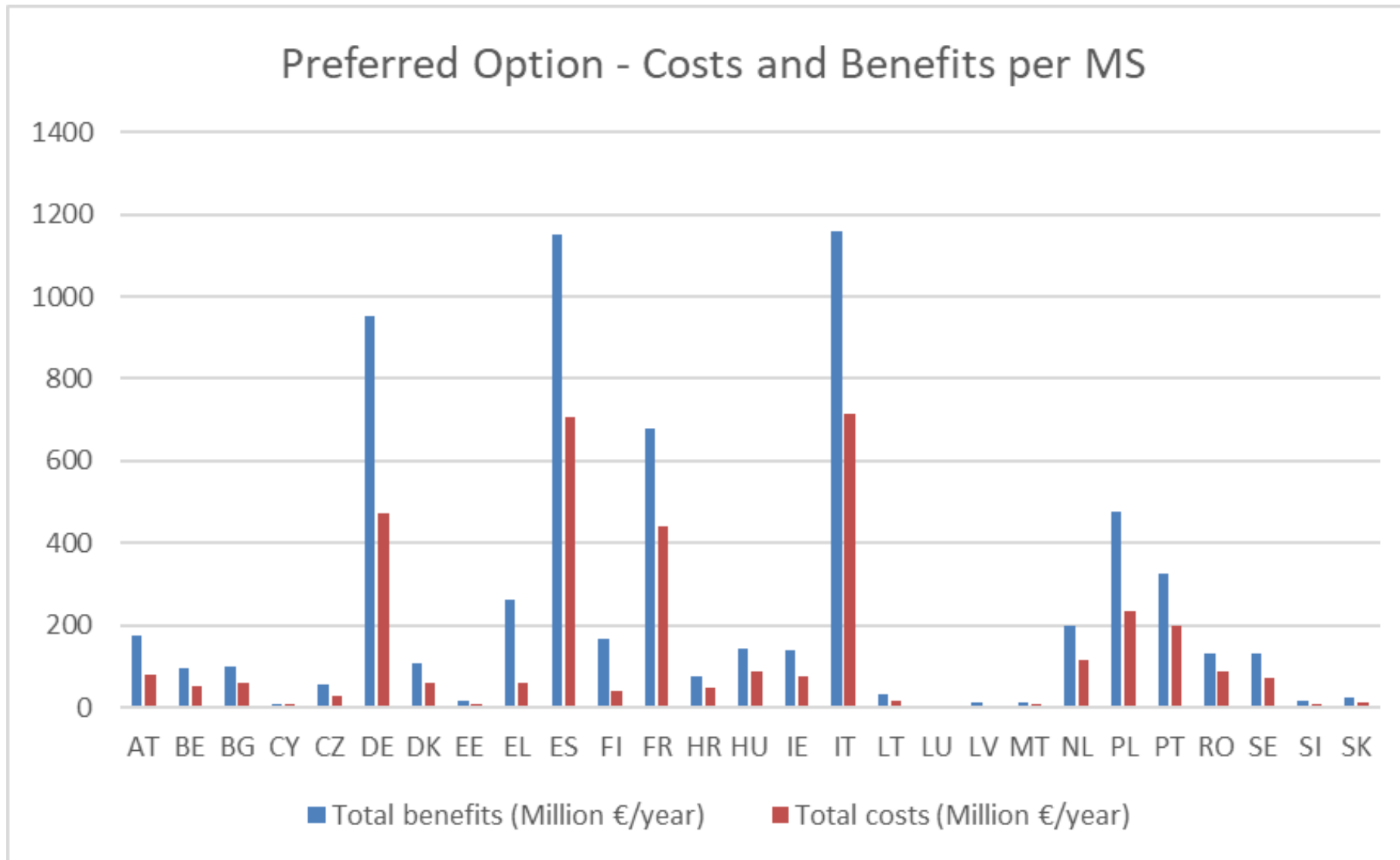


Share of water expenditures in households' disposable income (2011-2015 average) Source: OECD based on Eurostat

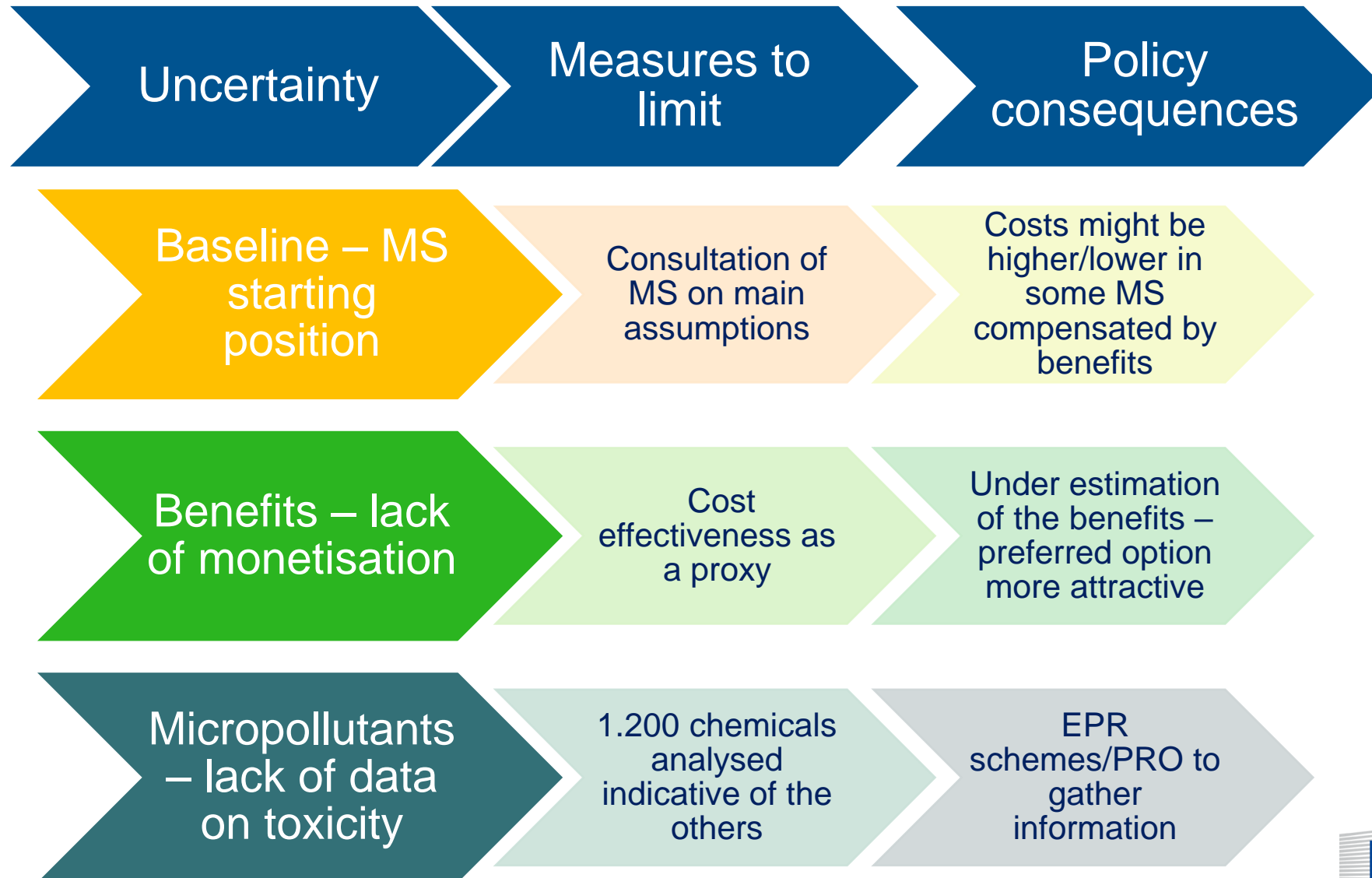
# EPR – in practice



# Costs and benefits per Member State



# Uncertainties

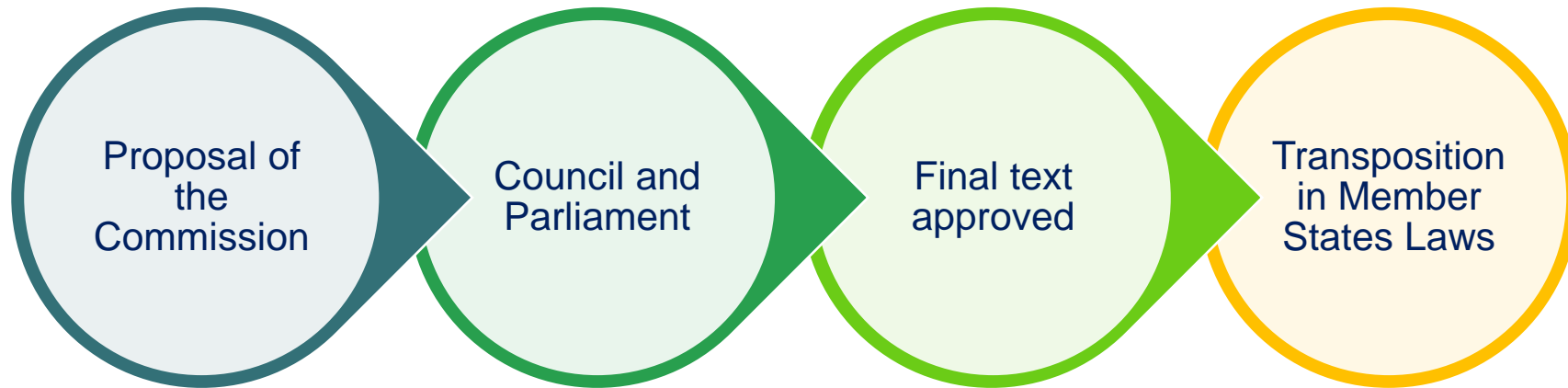




# Publications

1. **Obermaier, N., Pistocchi, A.,** (2022) *Plastics in European Wastewater Treatment Plants*. Joint Research Centre, European Commission.
2. **Parravicini, V., et al.,** (2022) *Present greenhouse gas emissions from the European urban wastewater sector, and options for their reduction*. Joint Research Centre, European Commission.
3. **Pistocchi, A., Parravicini, V., Langergraber, G.** (2022) *How many small agglomerations exist in the European Union, and how should we treat their wastewater?* Joint Research Centre, European Commission.
4. **Manaia, C.** (2021) *Antibiotic resistance in urban wastewater treatment plants – Drivers, risks and mitigation towards improved environmental and human-health protection*.
5. **Pistocchi, A., et al.** (2022) *Screening of mercury pollution sources to European inland waters using high resolution earth surface data*. Joint Research Centre, European Commission.
6. **Pistocchi, A., et al.** (2022) *Impacts of urban wastewater treatment on aquatic micropollutant emissions in Europe*. Joint Research Centre, European Commission.
7. **Pistocchi, A., et al.** (2022) *Treatment of micropollutants in wastewater : balancing effectiveness, costs and implications*. Joint Research Centre, European Commission.
8. **Pistocchi, A., et al** (2021) *An assessment of options for the removal of excess nutrients from European wastewater*. Joint Research Centre, European Commission.
9. **Psomas, A.** (2021) *Support studies on specific aspects of wastewater management: Individual or other Appropriate Systems (IAS)*. Brilliants Solutions Engineering & Consulting (BRiS).
10. **Quaranta, E., et al.** (2022) *A hydrological model to estimate pollution from combined sewer overflows at the regional scale. Application to Europe*.
11. **Quaranta, E., et al.** (2022) *Assessment of costs and benefits of combined sewer overflow mitigation and treatment strategies at the European scale*

# Next steps



Thank you for your attention