



Better regulation for climate neutrality

6th DECEMBER 2023 ROYAL MUSEUMS OF FINE ARTS OF BELGIUM Place du Musée/Museumplein, 1000 Brussels





SESSION THE NEW EU URBAN WASTEWATER TREATMENT DIRECTIVE: POTENTIAL IMPLICATIONS FOR WATER CUSTOMERS AND INDUSTRY IN THE EU SESSION 2 THE EU VISION FOR CLIMATE NEUTRALITY AND THE WATER-TO-ENERGY NEXUS SESSION 3 CLIMATE RESILIENCE AND ADAPTION OF WATER SERVICES IN THE EU AND EU NEIGHBOURING COUNTRIES





6th DECEMBER 2023



MARIA SALVETTI

Director of the Water Area European University Institute-Florence School of Regulation

From energy neutrality to climate neutrality: stakes, requirements & current practices at EU, national and local levels





From energy efficiency to climate neutrality





EFRWS

6th DECEMBER 2023

Energy efficiency in WWTP

•WWTP energy consumption in EU = 24,747GWh per year (≈0.8% of total EU electricity generation)

•Small plants use 42% and large plants 58% (JRC, 2019).

•Energy costs can represent 25% to 56% of WWTP opex







Defining energy and climate neutrality targets

EU - general

EU - sectoral

National - general

National - sectoral

Local

Utility

Green Deal (climat neutrality 2050), Fit For 55 (55% emission reduction by 2030)

Urban Wastewater Treatment Directive (energy neutrality by 2045 @ national level; max. 30% purchased from external source; energy audits)

Obligatory National energy and climate plans, dimensions: decarbonisation, energy efficiency, energy security, internal energy market, research, innovation and competitiveness - for 2020 - 2030

up to national government for specific sector eg. water, waste, transport

up to municipality

up to individual water utilities





Review of National energy and climate plans (WAREG Countries)

- no specific target for wastewater sector in national plans
- <u>direct emission from WWTP included into the direct emission from Waste sector,</u> in most countries no significant reduction of WW emissions expected by 2030







Denmark example

National energy and climate plans

Climate plan for a green waste sector and circular economy- Danish Ministry of Environment

Copenhagen Climate Plan

BIOFOS wastewater utility in the Copenhagen

Reducing Danish greenhouse gas emissions by 70 % by 2030. Denmark to become climate neutral by 2050 – an objective the government wants to bring forward to 2045. In addition, the government will propose a new target of 110 % reduction of greenhouse gas emissions by 2050

Waste sector should be climate-neutral by 2030 (Wastewater sector included in Waste sector) Water utility should report their ambitions regarding energy consumption, energy production, CO2 emissions, nitrous oxide emissions, and methane emissions up to 2030 to the Environmental Protection Agency

Copenhagen aims to be the world's first carbon-neutral capital city by 2025

Become climate positive by 2025, which means that the company will generally remove more carbon dioxide than it emits





Current Regulatory Practices

•<u>KPIs used by some regulators (no target per se)</u>: energy consumption, energy efficiency, GHG emission, energy source

Location	Regulator	Indicator on energy self-production	Unit
Brussels region	BRUGEL	On-site energy production in UWWTPs	kWh
Hungary	ERRA	Energy production (own energy)	%
Portugal	ERSAR	Self-produced energy	%

Energy self-production for wastewater (2021) Portugal: retail 3,8% & bulk 10,3% Brussels region: 34%

•<u>Introduction of new KPIs</u> regarding circular economy practices, energy selfproduction, GHG emissions



Current Regulatory Practices

•<u>Tariff components</u>: energy efficiency taken into account to set efficient tariff (opex); incentive on energy efficiency compared to overall cost

<u>BRUGEL</u>: incentive to increase energy efficiency to beat the controllable costs taken into account in the budget (tunnel approach w/5% difference between forecast and actual costs)

<u>ARERA</u>: energy cost in the equalizing component w/3 elements => 1) mitigate risks of supply choices (benchmark); 2) incentivize electricity self-production; 3) encourage energy savings through sharing factor

$$VRG^{a} = Capex^{a} + FoNI^{a} + Opex^{a} + ERC^{a} + Rc_{TOT}^{a}$$

$$Rc_{TOT}^{a} = (Rc_{VOL}^{a} + Rc_{EE}^{a} + Rc_{eRC}^{a} + Rc_{ALTRO}^{a}) * \prod_{t=a-1}^{a} (1+I^{t})$$

$$Rc_{EE}^{a} = \left\{ min[CO_{EE}^{effettiva,a-2}; (\overline{CO_{EE}^{medio,a-2}} * kWh^{a-2}) * 1, 1] + (\gamma_{EE} * \Delta_{Risparmio}^{a}) \right\}$$

$$CO_{EE}^{a} = \left[CO_{EE}^{effettiva,a-2} + \left(\frac{CO_{EE}^{effettiva,a-2}}{kWh^{a-2}} * kWh^{a-2} \right) + (\gamma_{EE}^{new,a} + \Delta_{Risparmio}^{new,a}) \right] * \prod_{t=a-1}^{a} (1+I^{t})$$

$$CO_{EE}^{a} = \left[CO_{EE}^{effettiva,a-2} + \left(\frac{CO_{EE}^{effettiva,a-2}}{kWh^{a-2}} * kWh^{a-2} \right) + \left(\gamma_{EE}^{new,a} + \Delta_{Risparmio}^{new,a} \right) \right] * \prod_{t=a-1}^{a} (1+I^{t})$$





Current Regulatory Practices

•Innovation fund to support investment in energy efficiency & neutrality

<u>ARERA</u>: Strengthening of incentives through the Innovation Fund => reduction of at least 5% in the quantity of electricity purchased

$$Pr e mio_{ENE,i} = min\left\{\frac{Incentivo_{ENE}}{N_{ENE}}; (0,5 * Capex_i^{2025})\right\}$$

<u>CRU</u>: biogas and biomethane innovation projects are eligible to the fund which currently has an overall budget of 4M€

'...explore technological advances and other innovations in areas such as effective customer engagement, energy reduction, treatment processes, infrastructure rehabilitation, increased understanding of customer behaviours, climate change adaptation and environmental compliance, which could ultimately benefit customers.'





Utilities Practices and Strategies 1/2

•<u>Aguas de Portugal</u> => biggest energy consumer in Portugal

Strategy prosumer & selling to the grid (400M€ investment, return in 3 years) with mix of energy efficiency + wind + solar + biogas + hydropower => energy neutrality by 2031

•<u>Uisce Éireann (Irish Water)</u> => biggest energy consumer in Ireland

Lower energy consumption & improve energy efficiency

Purchase of green energy on the market (hedging 2 or 3 years ahead)

•<u>Veolia France</u>: self-sufficient energy services within 5 years, with energy produced 100% locally (80% biogas/biomethane and 20% solar)





Utilities Practices and Strategies 2/2

- •<u>Hydria & Vivaqua</u>: 30% prosumption, rest is bought on market (pooled with other big consumers)
- •<u>Métropole Nice Côte d'Azur</u>: => 50 GWh/year with biomethane + solar + heat recovery => Positive energy WWTP

•<u>Cagnes s/Mer:</u> WWTP (160kPE) with 223m² of thermal solar panels, heat pumps for riothermy, biomethane injected into the network. In 2022 => production 582,000 kWh for consumption 477,000 kWh.





Reaching energy - climate neutrality







Reaching energy - climate neutrality

STRENGHTS

- Clear sectoral targets set by UWWTD
- Regulatory mandate and tools for energy efficiency and neutrality
- Many utilities are already investing to achieve energy/climate neutrality

WEAKNESSES

- No clear mandate for WSS regulators with regard to climate neutrality
- Including WSS in National energy and climate plans is not mandatory

OPPORTUNITIES

- Adjust, redefine, better coordinate the roles of regulation and policy-making with regard to climate neutrality
- Strengthen policy coherence on climate neutrality between levels of governance in the WSS sector (national, local, utility)
- Multi-level and fragmented governance in the WSS sector can hamper the uptake of climate neutral targets (national, utility)
- Difficulty and complexity to align cross-sectoral policies with WSS policy which is transversal per essence => risk of voids and/or conflicting policies

THREATS







