



# La revisione della UWWTD e i nuovi obiettivi di neutralità energetica

Alberto Pistocchi

# Outline

L'intervento illustra i contenuti dell'impact assessment della proposta di revisione della Direttiva 91/271/EEC, dalla posizione del problema all'identificazione delle opzioni disponibili per affrontarlo. Vengono richiamati gli studi condotti dalla Commissione Europea per analizzare le alternative di policy disponibili, e si propone una prospettiva che attribuisce al settore della depurazione un ruolo nel contribuire agli obiettivi di sostenibilità e competitività dell'Unione Europea. In particolare si considerano le opportunità di riduzione dei consumi energetici e di sviluppo di energie rinnovabili nel settore, al confronto con il fabbisogno energetico generato dalle nuove esigenze di trattamento (terziario e quaternario) imposte dalla nuova legislazione.

# Problemi aperti che hanno richiesto la revisione della Dir. 91/271/CEE

## Inquinamento residuale

Scarichi di piena

Microinquinanti

Nutrienti

Piccoli agglomerati

## Green Deal

Circular economy

**GHG**

**Energy neutrality**

# Contesto

EU Climate Regulation+Effort Sharing Regulation: national objectives to reduce GHG emissions from the sectors such as the wastewater treatment sector which are not covered by the ETS. Italia: **-43.7%**

Energy Efficiency Directive (EED): reduce overall energy consumption by **11.7%** by 2030 compared to 2020, **1,9%** reduction each year per Enti Pubblici. Energy audits per industria energivora (non WWTPs)

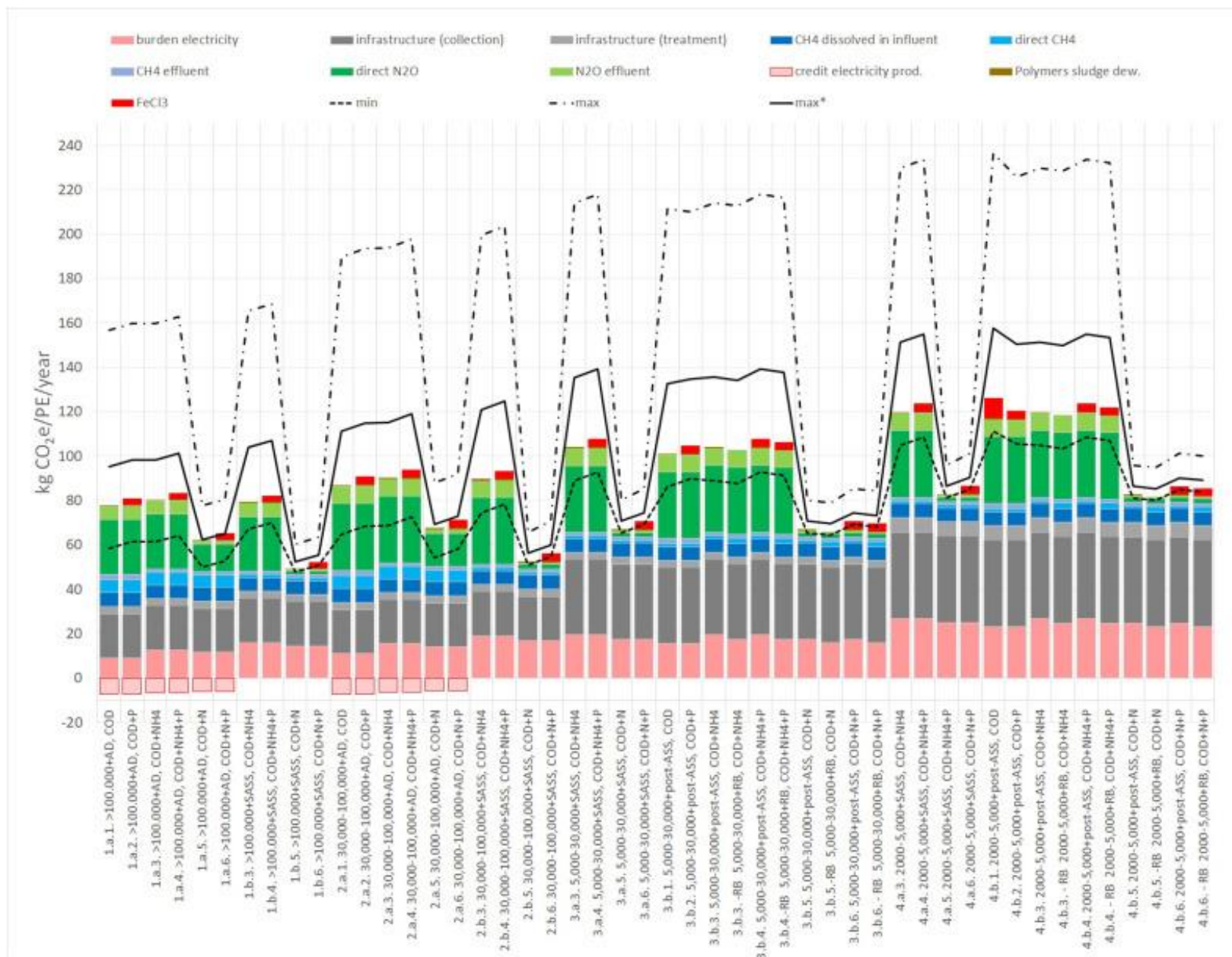
Renewable Energy Directive (RED): **>42.5%** rinnovabili entro 2030.

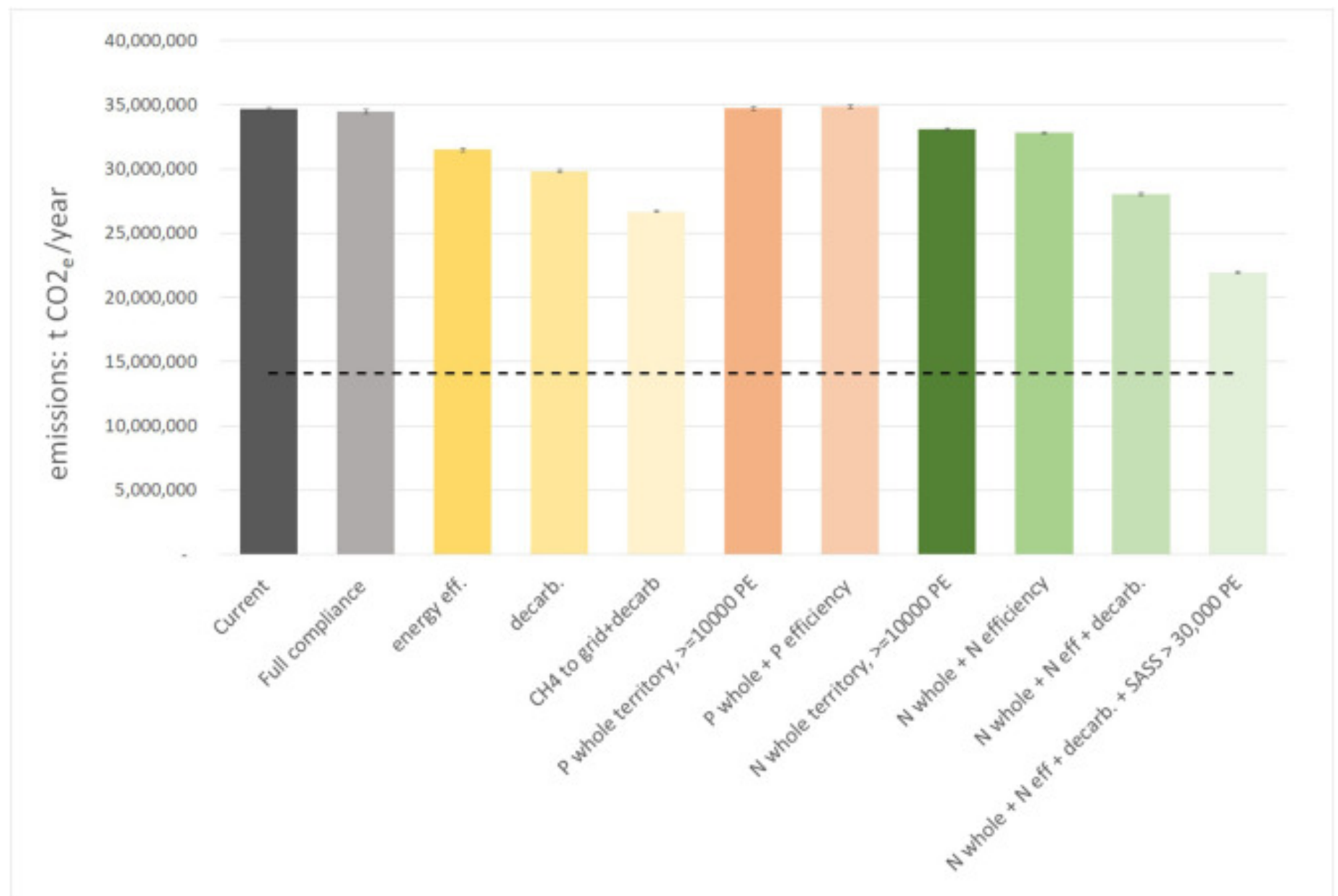
Energia WWTPs: ca. **0.8%** del totale EU, potenziale di generazione da sfruttare

# Energy Consumption and GHG Emissions:

The wastewater sector accounts for 0.8% of the overall energy used in the EU and has the potential to significantly reduce its energy consumption and produce renewable energy. Approximately 46.45% of the sector's GHG emissions are related to energy use.







<https://doi.org/10.1016/j.scitotenv.2022.156322>



# Renewable Energy Production

Wastewater treatment plants can produce renewable energy, notably biogas, which can be used as a substitute for natural gas. They also have the potential to host solar, wind, and hydropower installations

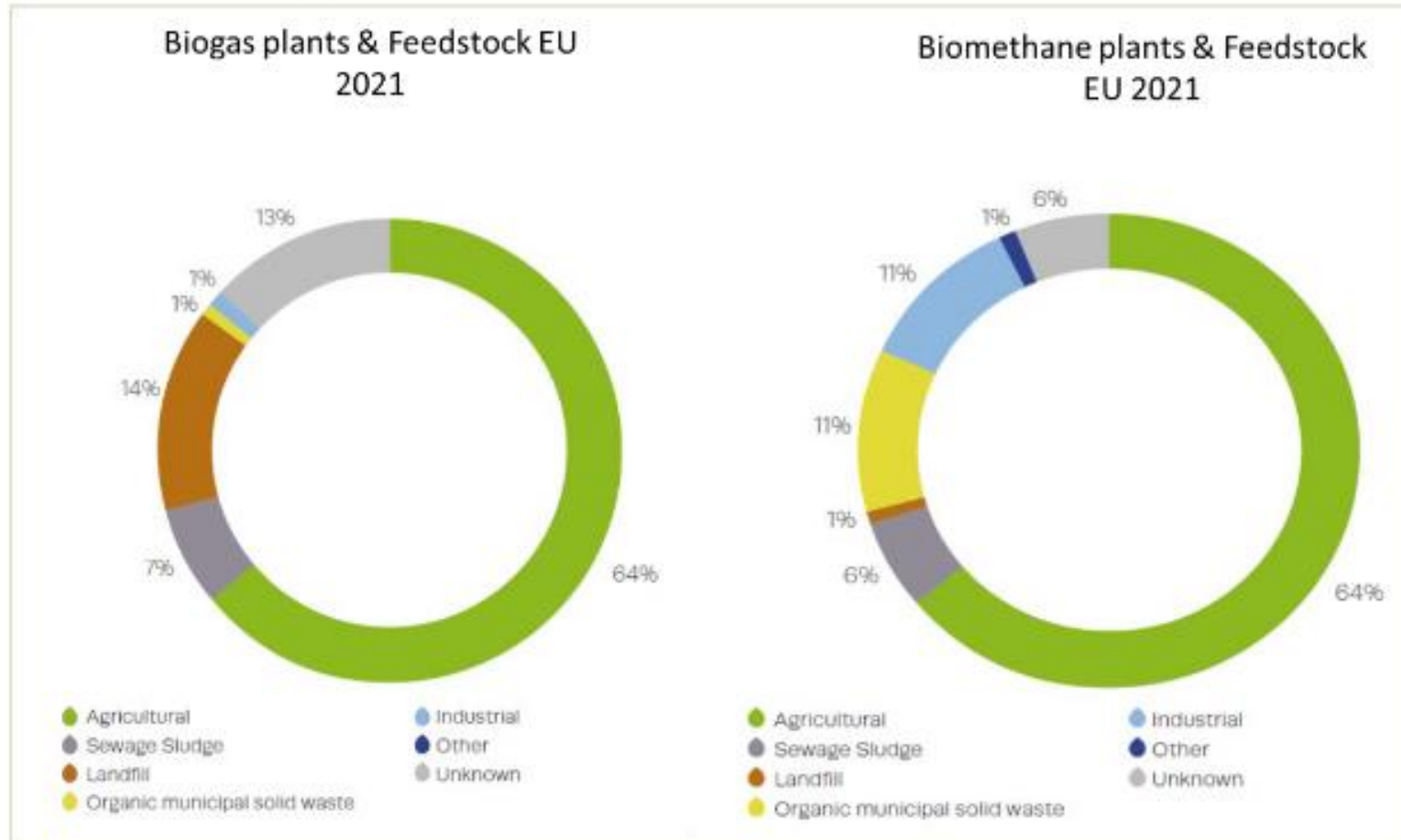


**Table 13. Energy Demand and Production Potential in Scenario 2**

Annual Gas Production Digester 1	4.5	[Mil.m3/a]
Annual Gas Production Digester 1	8.5	[Mil.m3/a]
CHP capacity	8	[MW]
Gross electricity production	30,700	[MWhel/a]
Gross thermal energy	34,600	[MWhth/a]
Net electrical energy	27,600	[MWhel/a]
Net thermal energy	22,500	[MWhth/a]
Energy demand WWTP (wastewater treatment)	4,740	[MWhel/a]
Energy demand WWTP (sludge dewatering)	47	[MWhel/a]
Energy demand digestate dewatering	4,864	[MWhel/a]
Energy demand digestate drying	1,269	[MWhth/a]
<b>Balance electrical energy</b>	<b>17,948</b>	<b>[MWhel/a]</b>
<b>Balance thermal energy</b>	<b>21,231</b>	<b>[MWhth/a]</b>

- The biogas industry has stagnated
- Biomethane production more than triple in 2014-2020.

**Figure 14.** Biogas and Biomethane feedstock in the EU, 2021



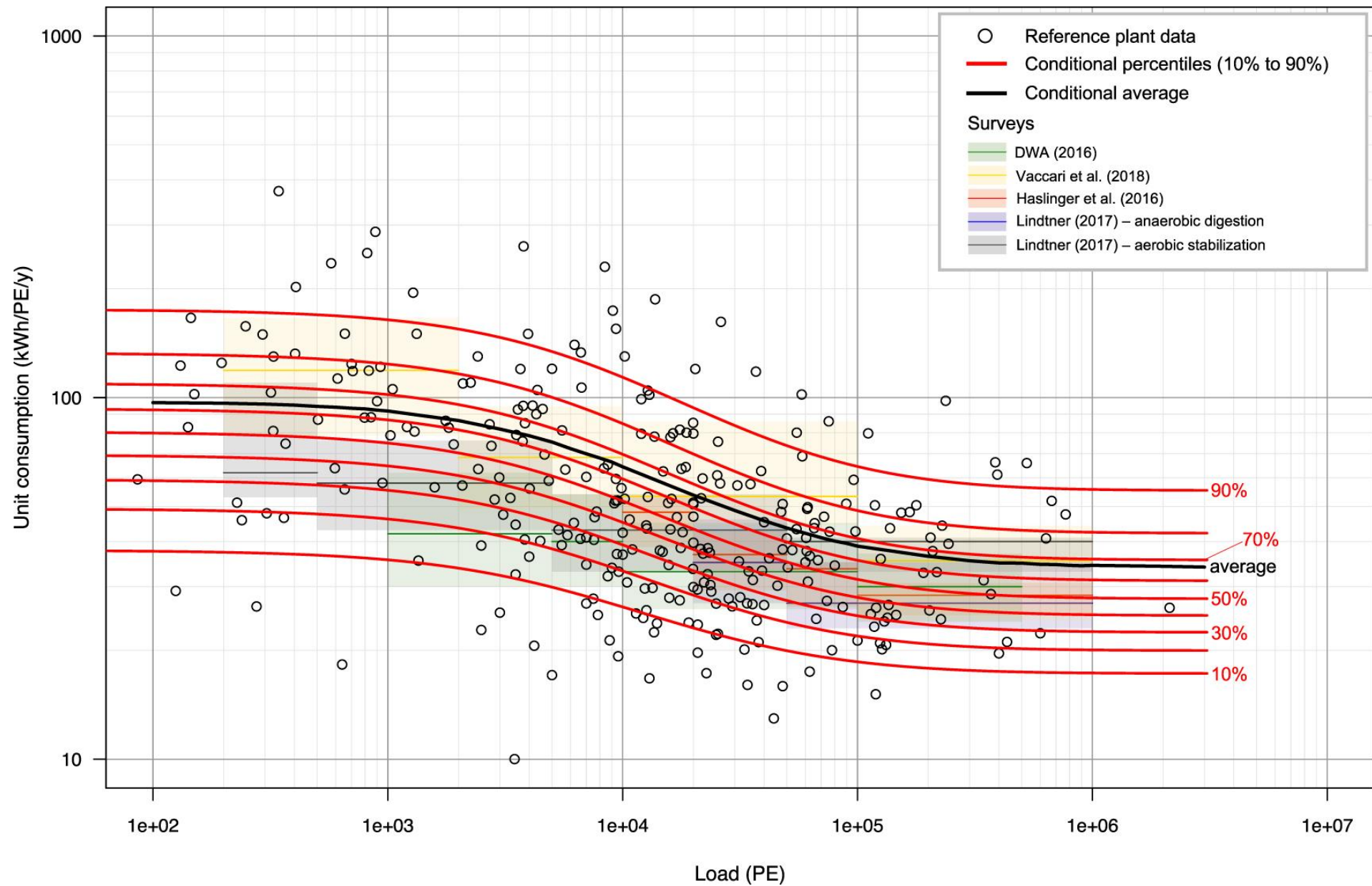
Source: (Eurostat, 2022; European Biogas Association, 2023)

# Energy Audits and Targets

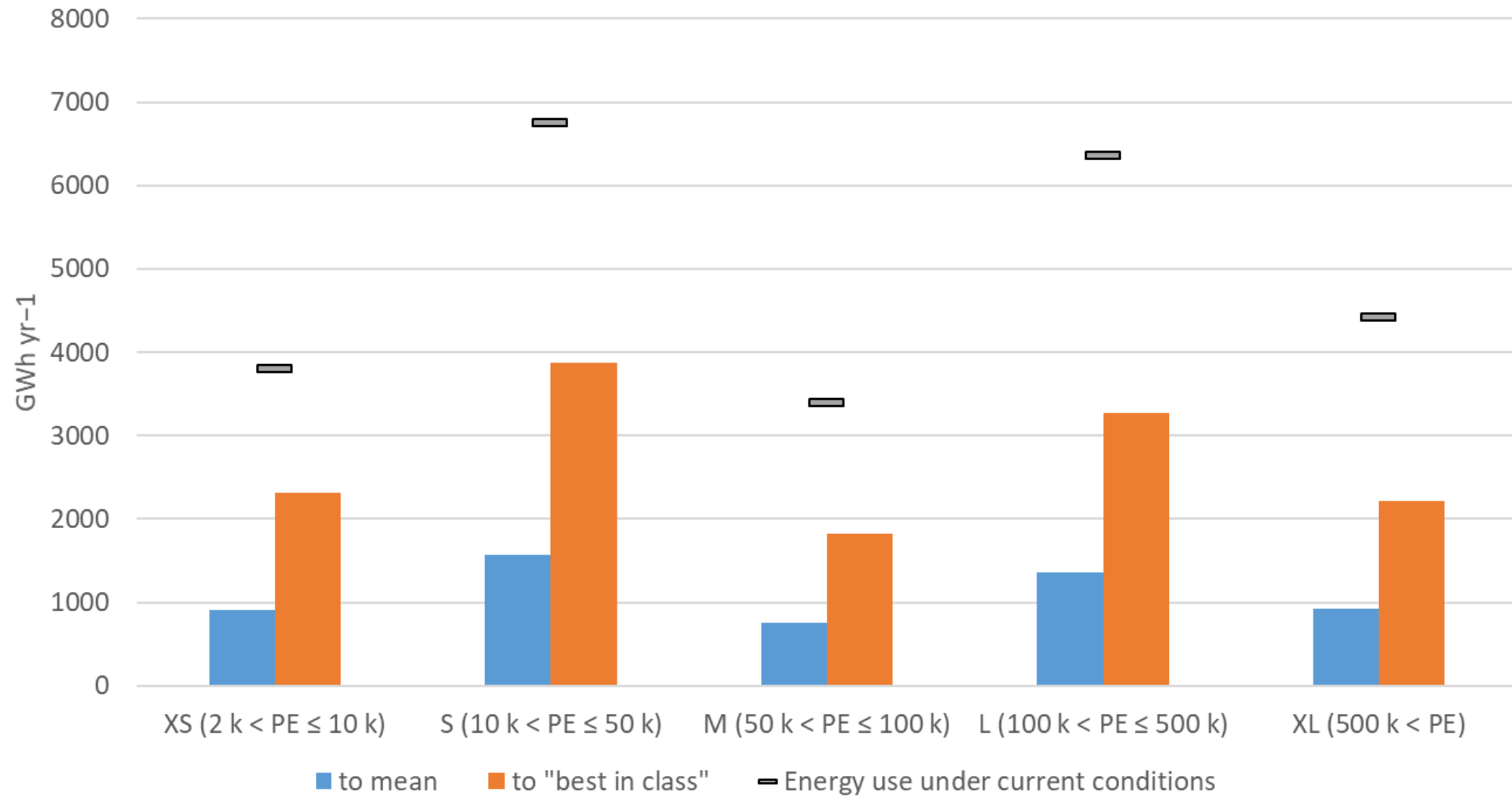
Introduction of obligatory energy audits in larger plants and setting energy use reduction targets based on the sizes of urban wastewater treatment plants (UWWTPs).

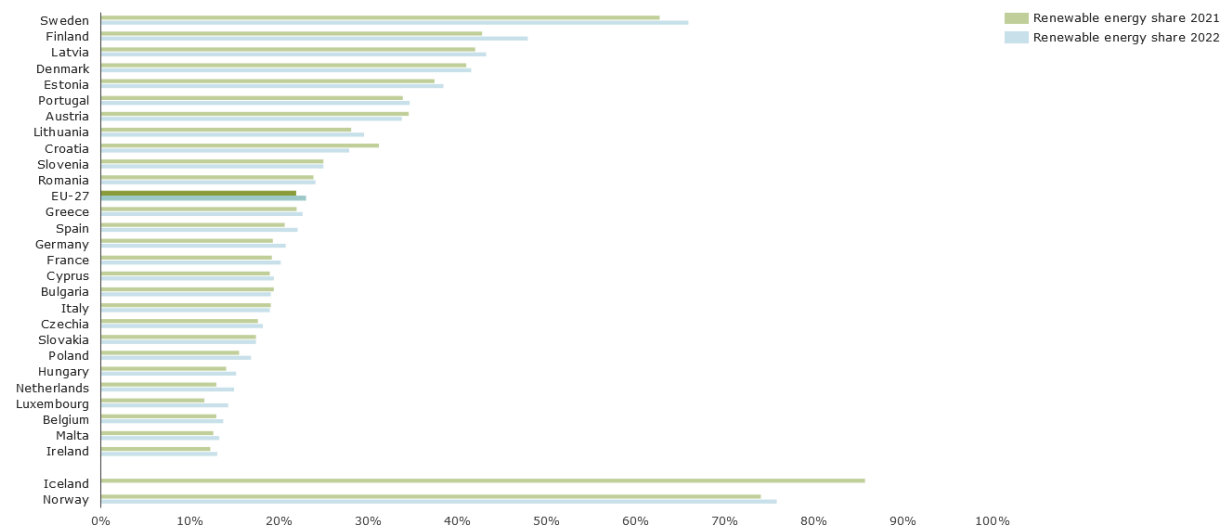
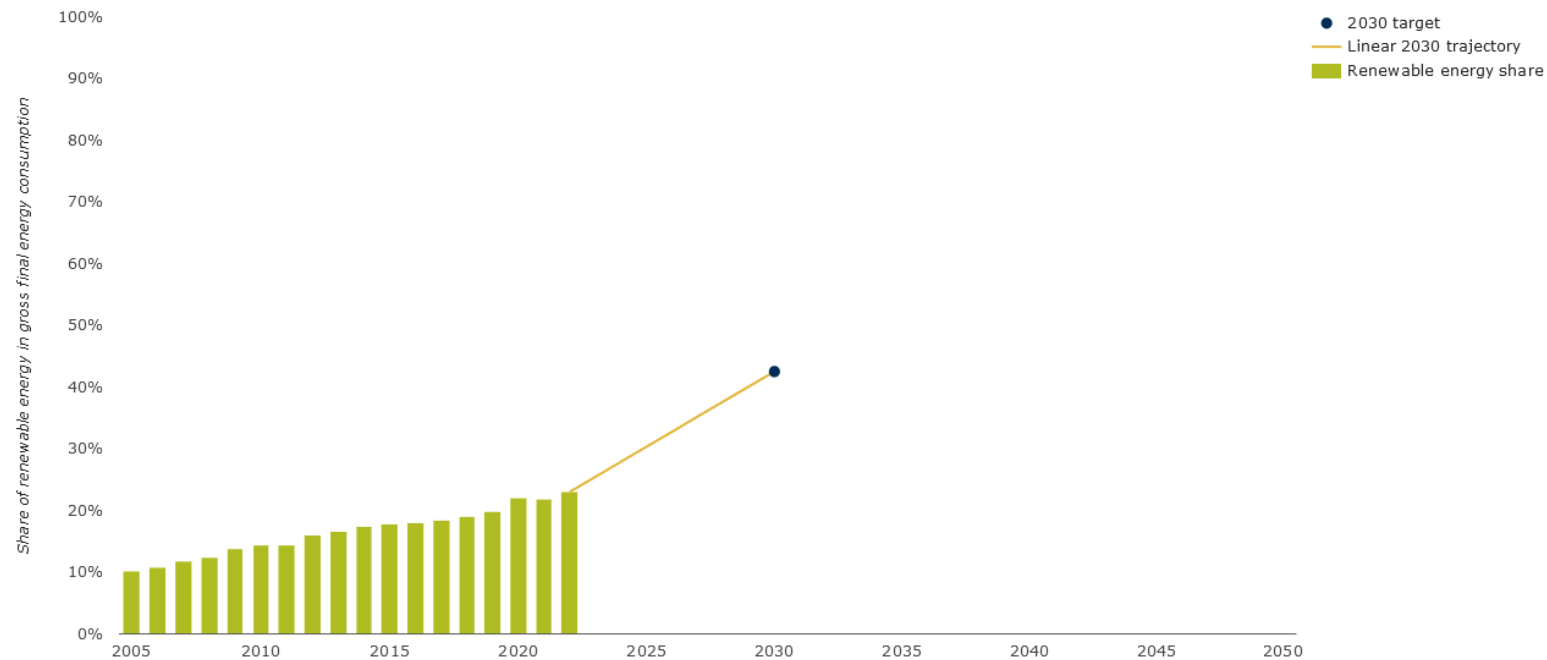
Push operators to assess their potential for energy savings and develop tailored solutions.

Audits save your money 😊

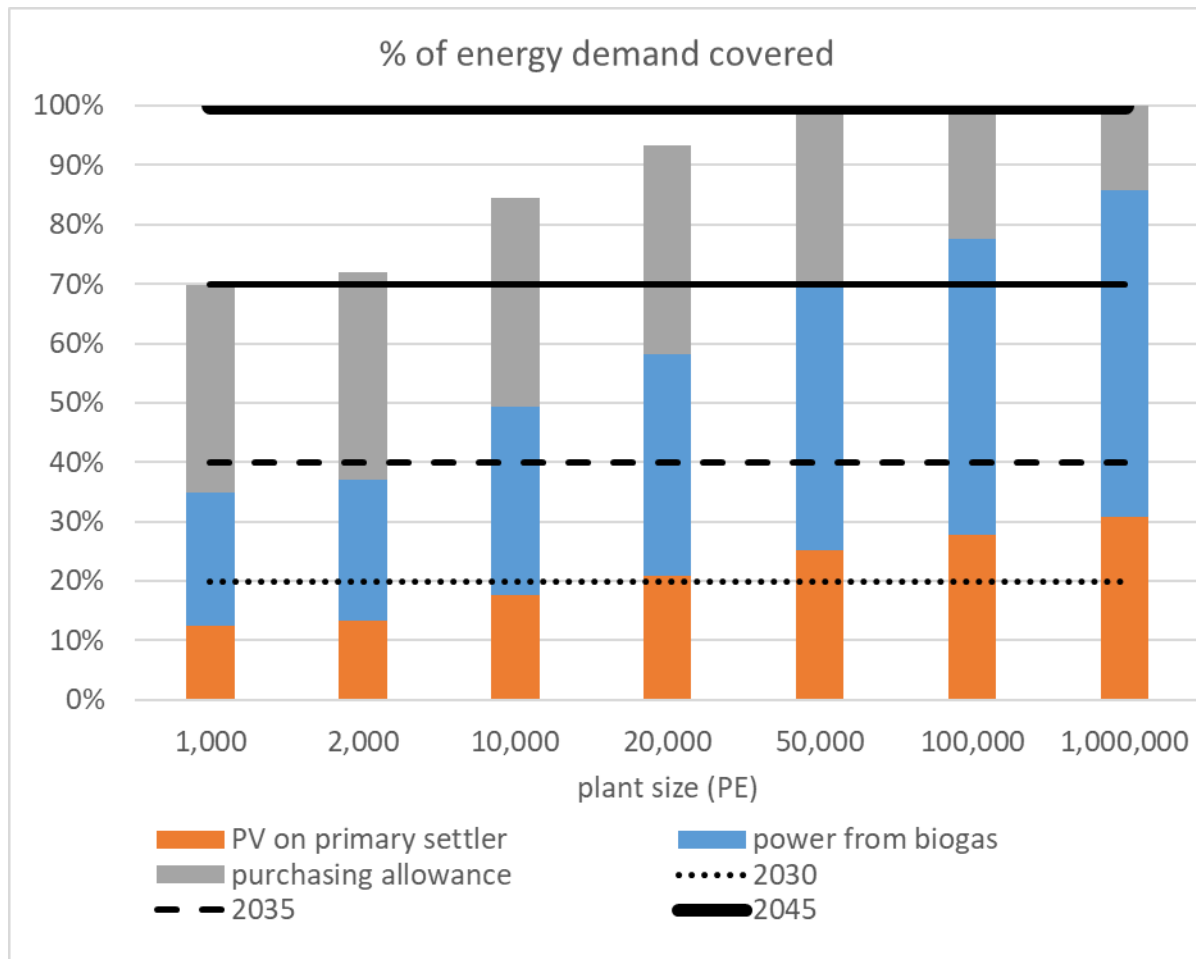


## Savings





Source:EEA



## Esempio (conservativo)

Fabbisogno al miglior **30%**ile

Area sedimentatore primario

**0.042** m<sup>2</sup>/AE

Fotovoltaico:

Produzione **1000** kWh/anno/kWp

Area pannelli **6** m<sup>2</sup>/kWp

CH<sub>4</sub> **0.01** Nm<sup>3</sup>/PE/day, eff. **35%**,  
perdite **3%**



# Esempio (più ottimista)

Fabbisogno al miglior **10%**ile

Area sedimentatore primario

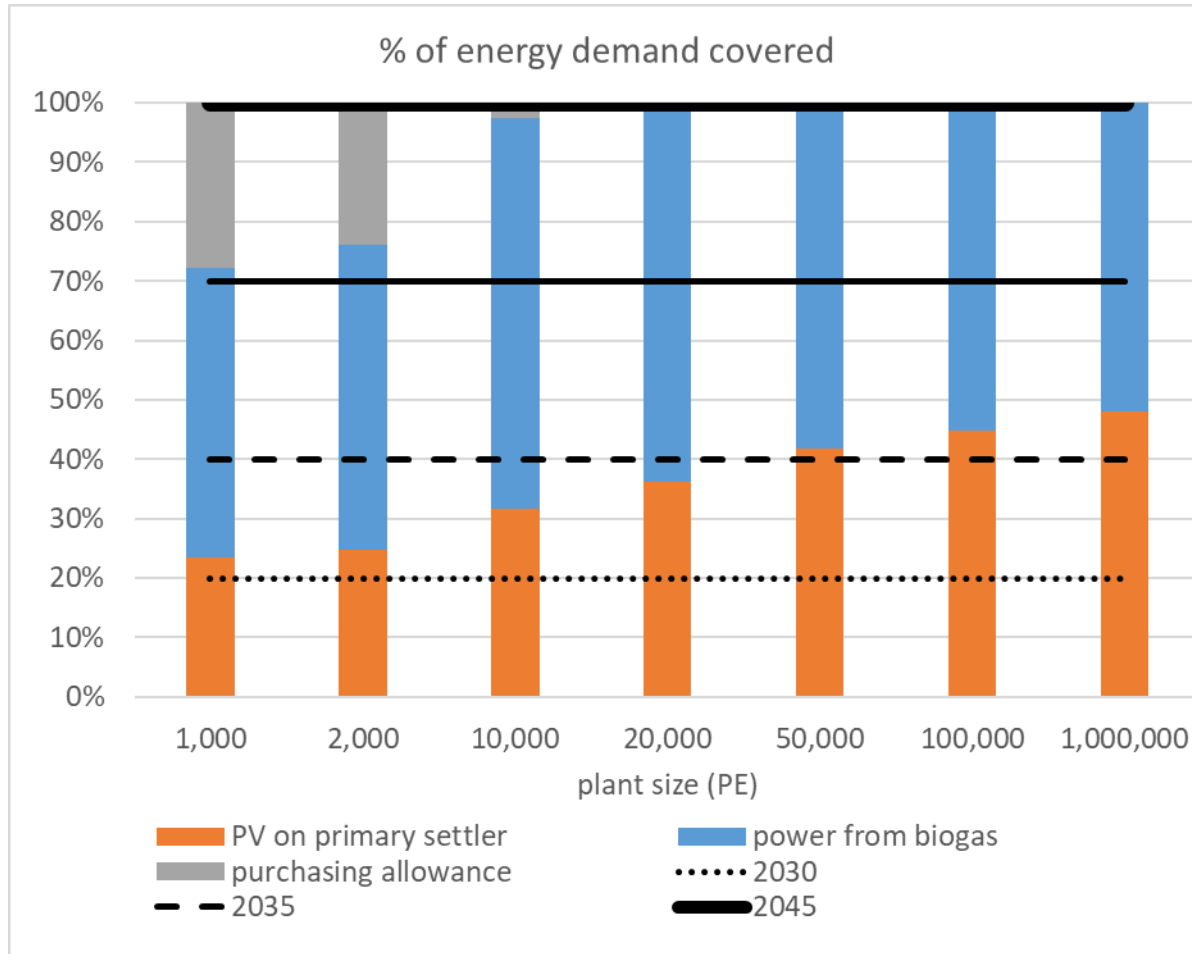
**0.042** m<sup>2</sup>/AE

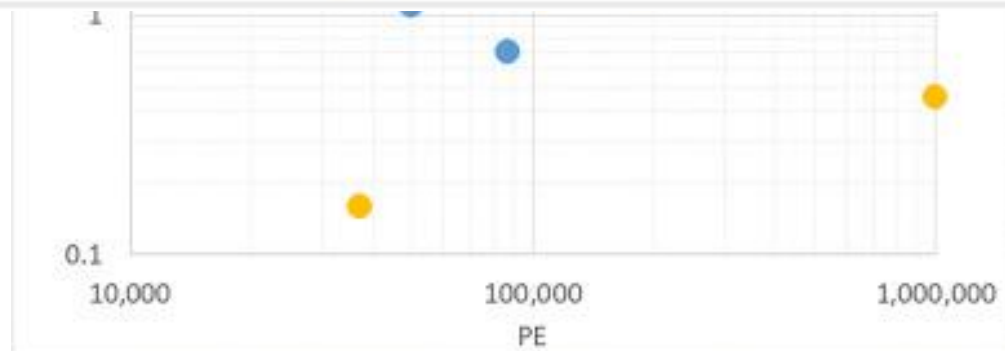
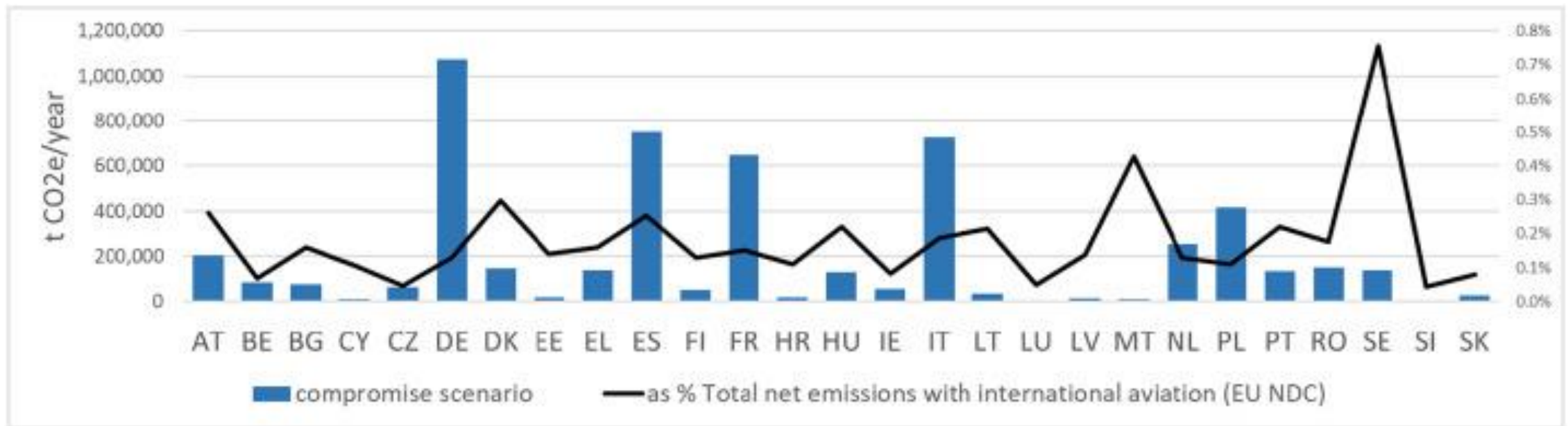
Fotovoltaico:

Produzione **1200** kWh/anno/kWp

Area pannelli **6** m<sup>2</sup>/kWp

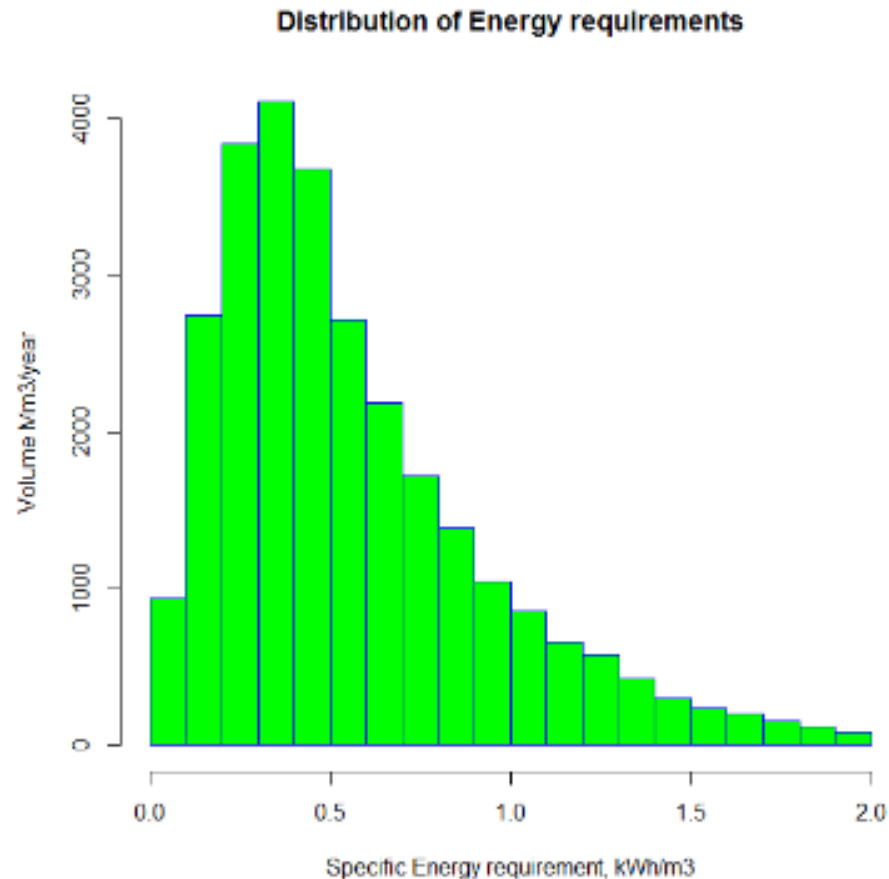
CH<sub>4</sub> **0.014** Nm<sup>3</sup>/PE/day, eff. **35%**,  
perdite **3%**





<https://www.sciencedirect.com/science/article/pii/S0048969722046915>

# Rebound



- Riuso: pompaggi e trattamento
- P removal: reagents
- Micropollutants: energy, reagents

<https://publications.jrc.ec.europa.eu/repository/handle/JRC109870>

# Thank you



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