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Benchmarking of Municipal Wastewater Treatment Plants

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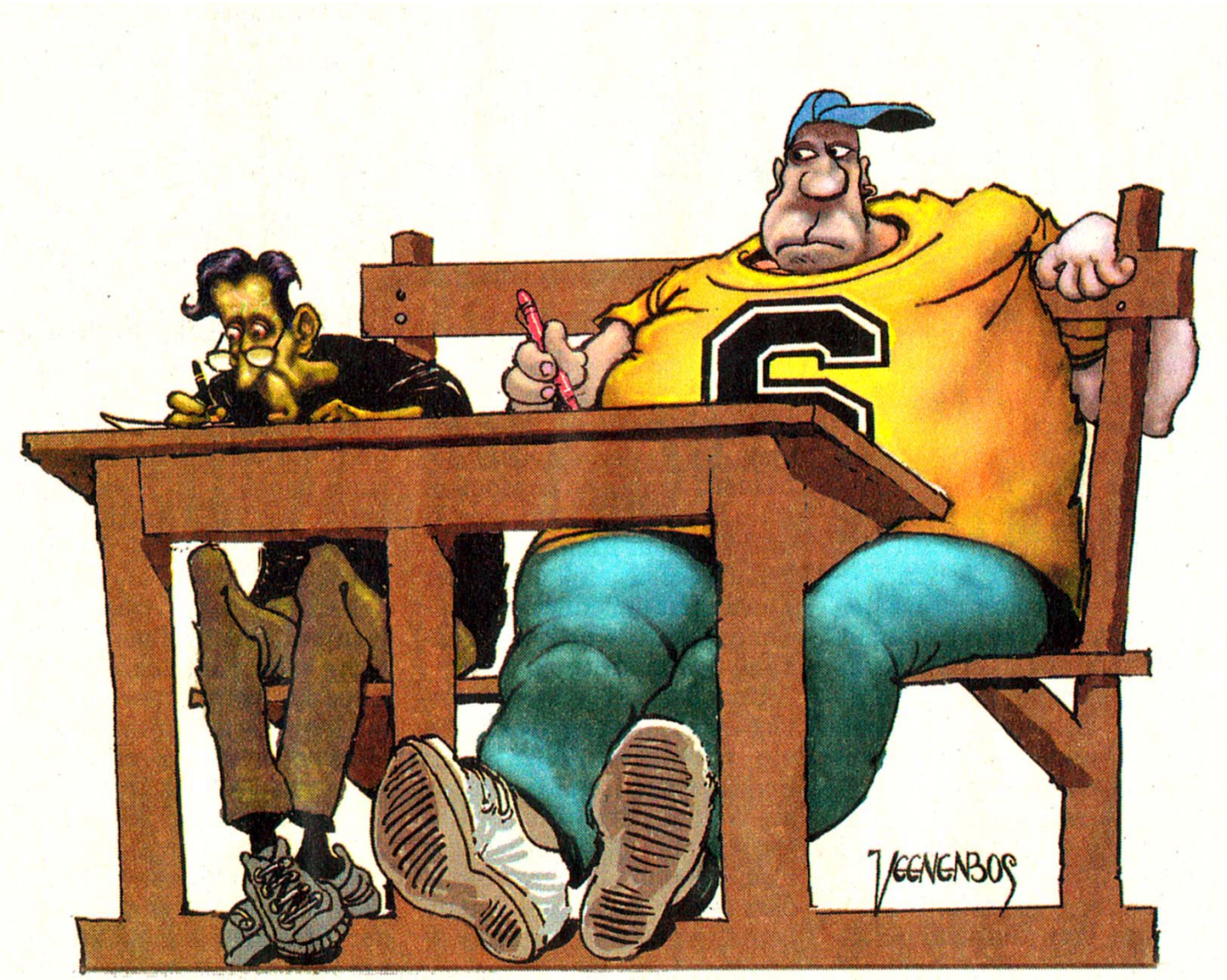
What is "Benchmarking" ?

- **Benchmarking** is the process of identifying and understanding practices from other organisations *to help your organisation improve its performance.*

- **Benchmarking** is not only a comparison of actual costs with "benchmarks",
- *but also a comparison of "business processes" with the aim of the implementation of enhancements.*

Learning from the best

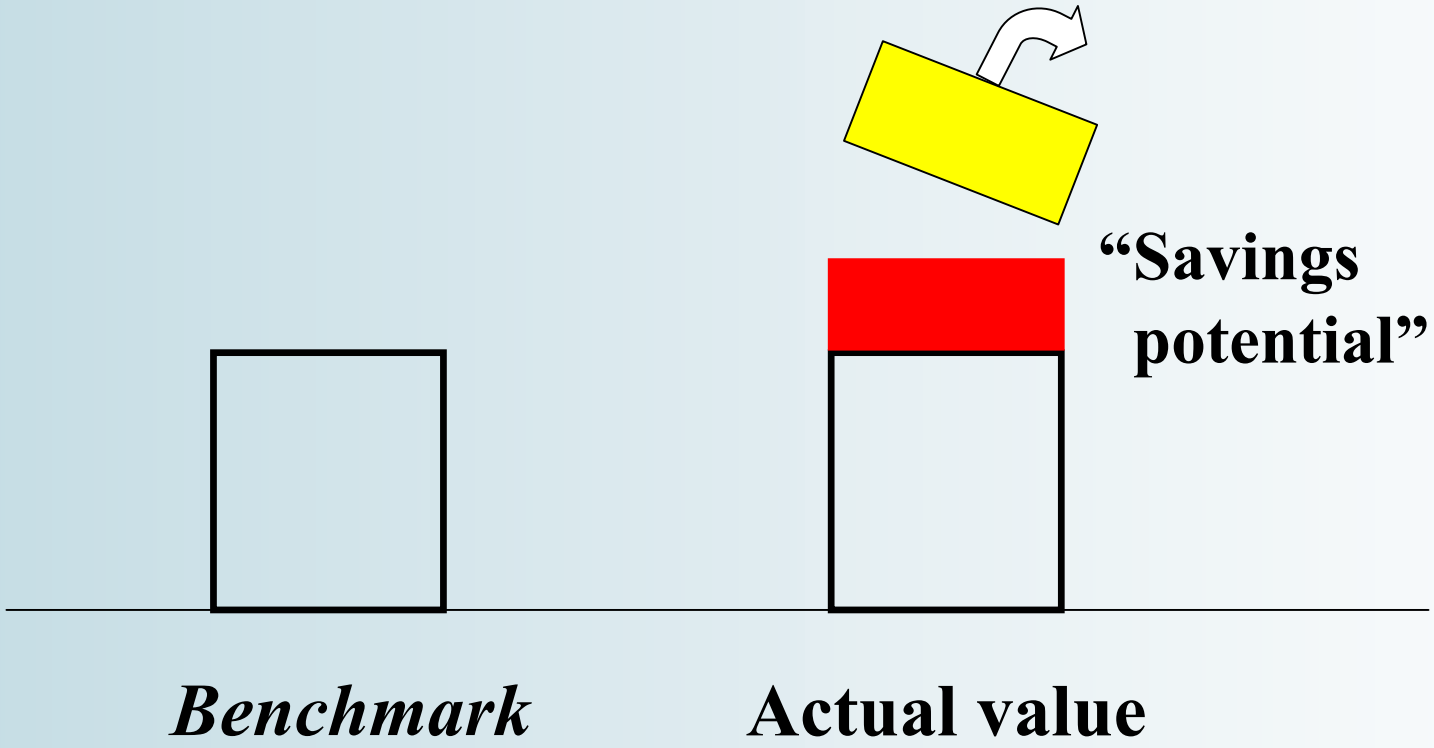


Benchmarking in wastewater business

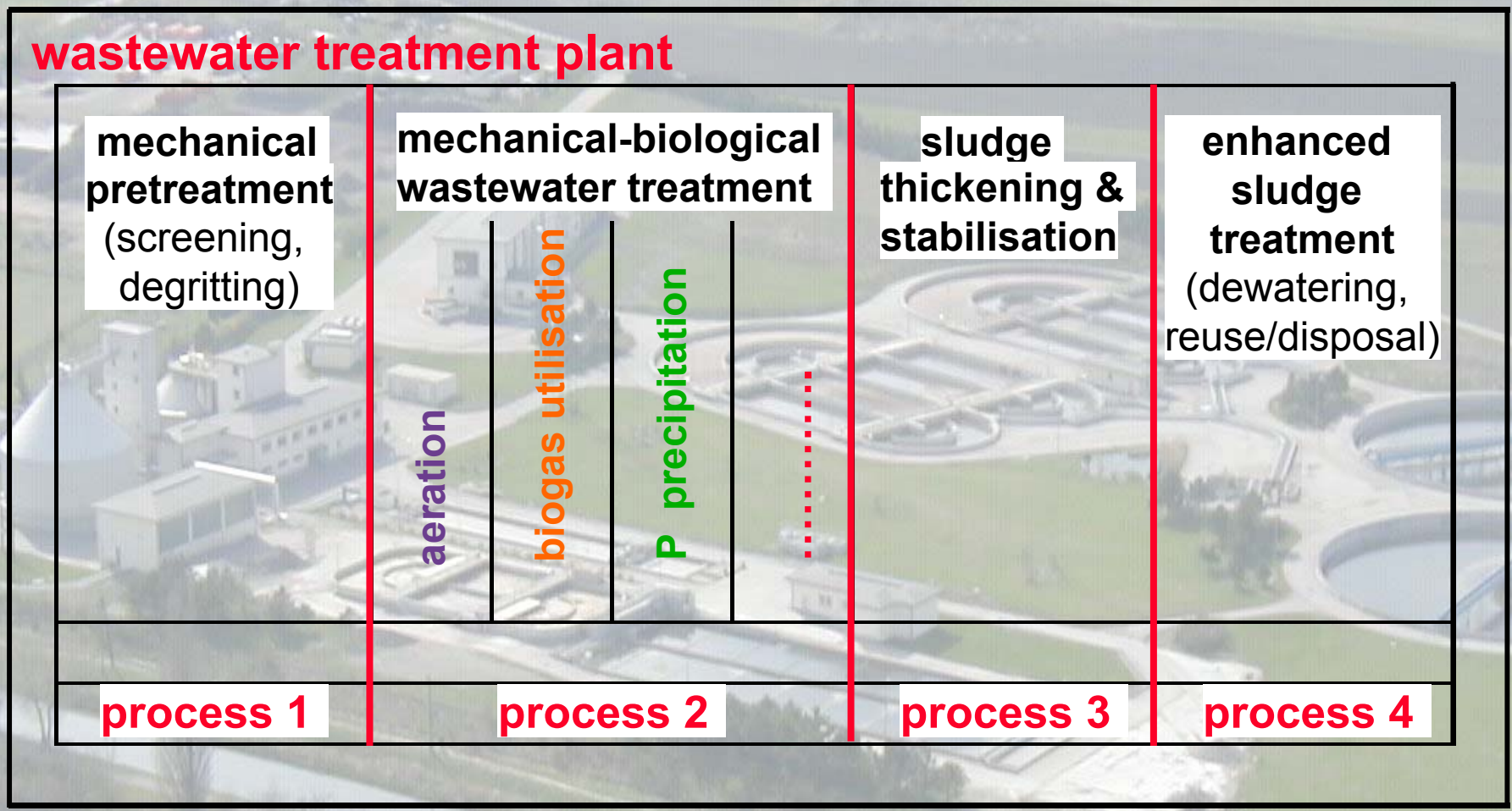
- Within **the wastewater business** there are **processes** which do **not exist elsewhere (sewer operation, wastewater treatment),**
- **some exist in other branches too (administration, management, ...).**

➢ ***This presentation*** *will focus on* ***wastewater treatment*** *related* ***processes*** *with a prevailing* ***engineering aspect.***

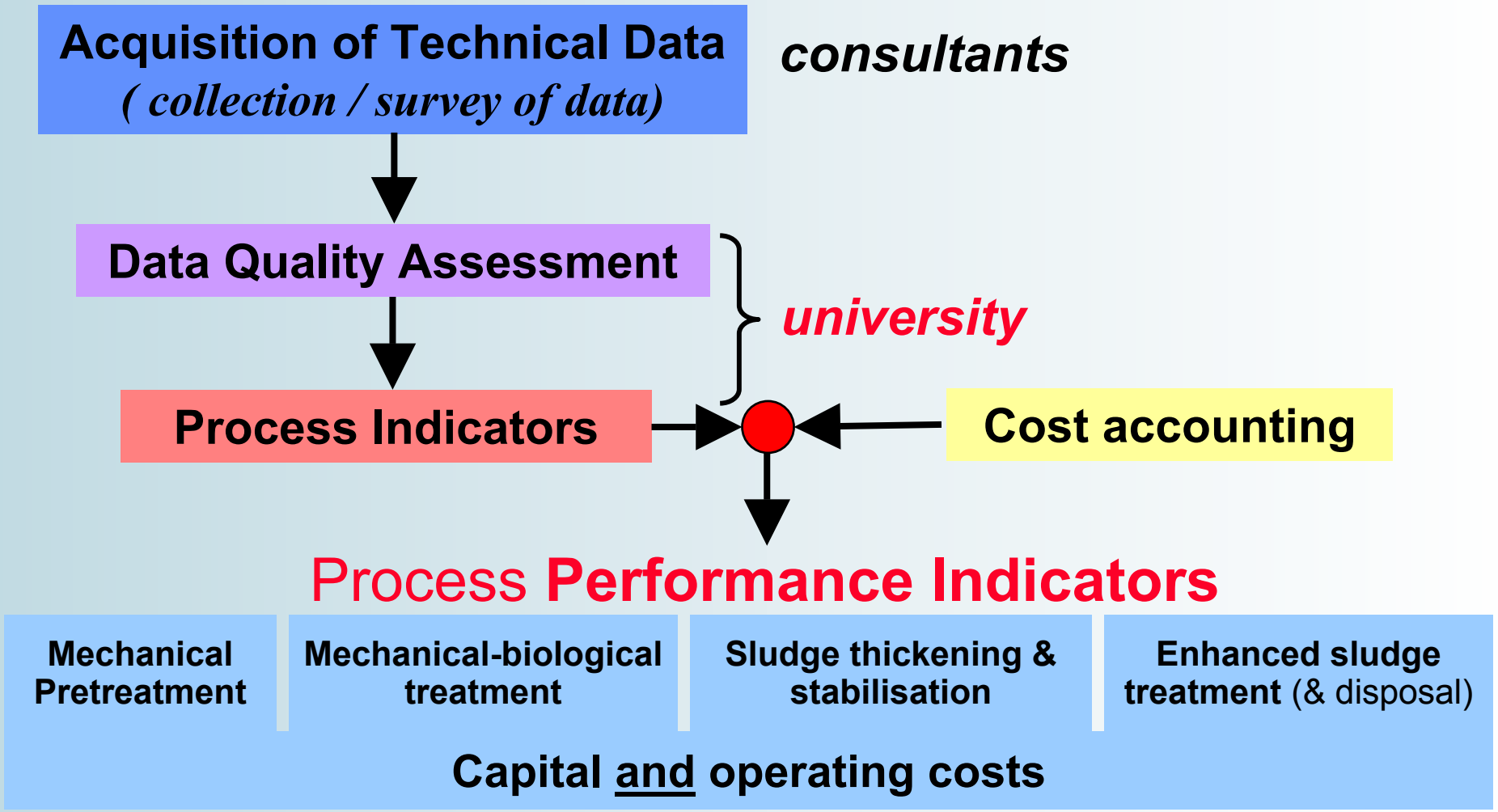
Influences on costs due to site-specific particularities



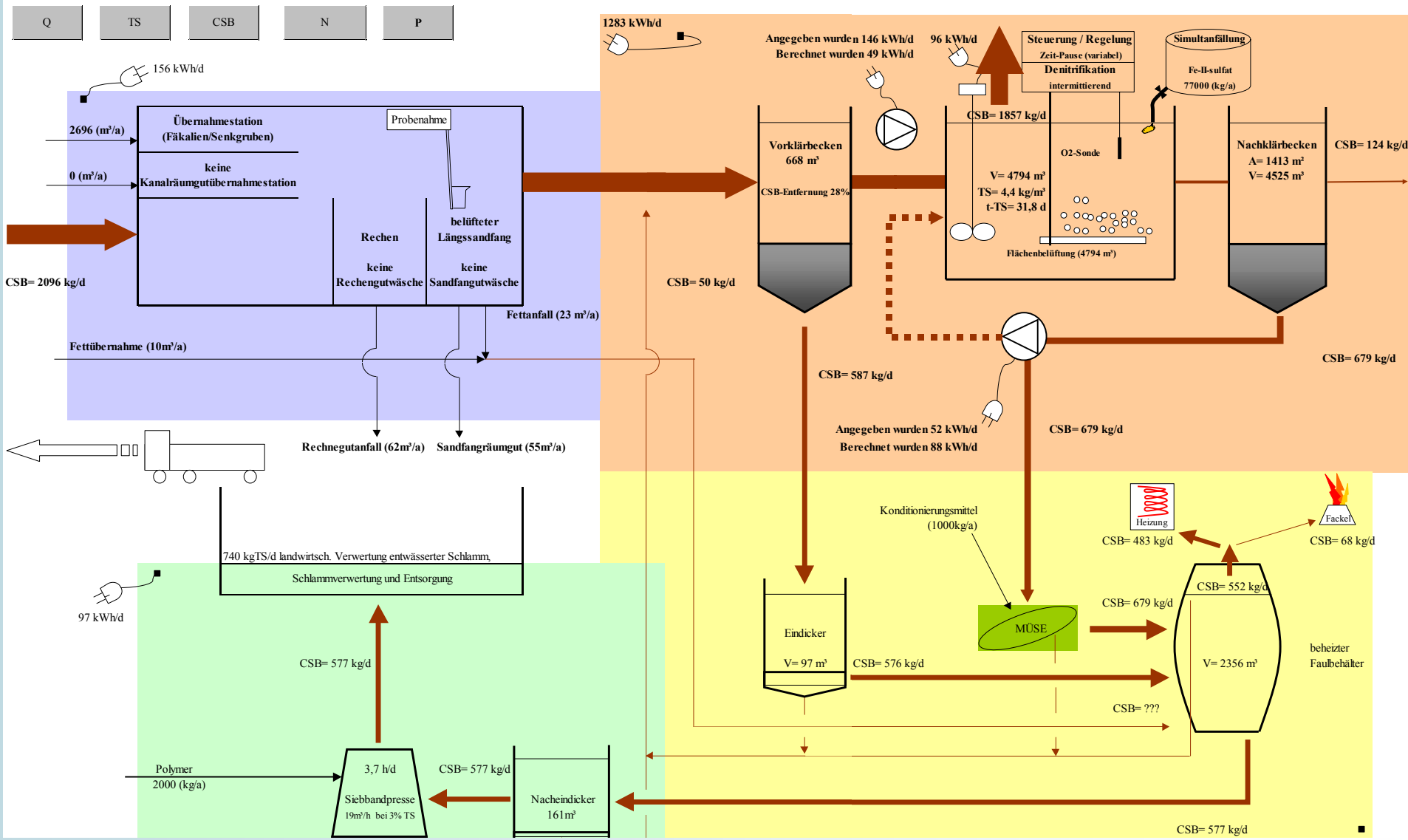
Process definition for comparisons



Development of Performance Indicators

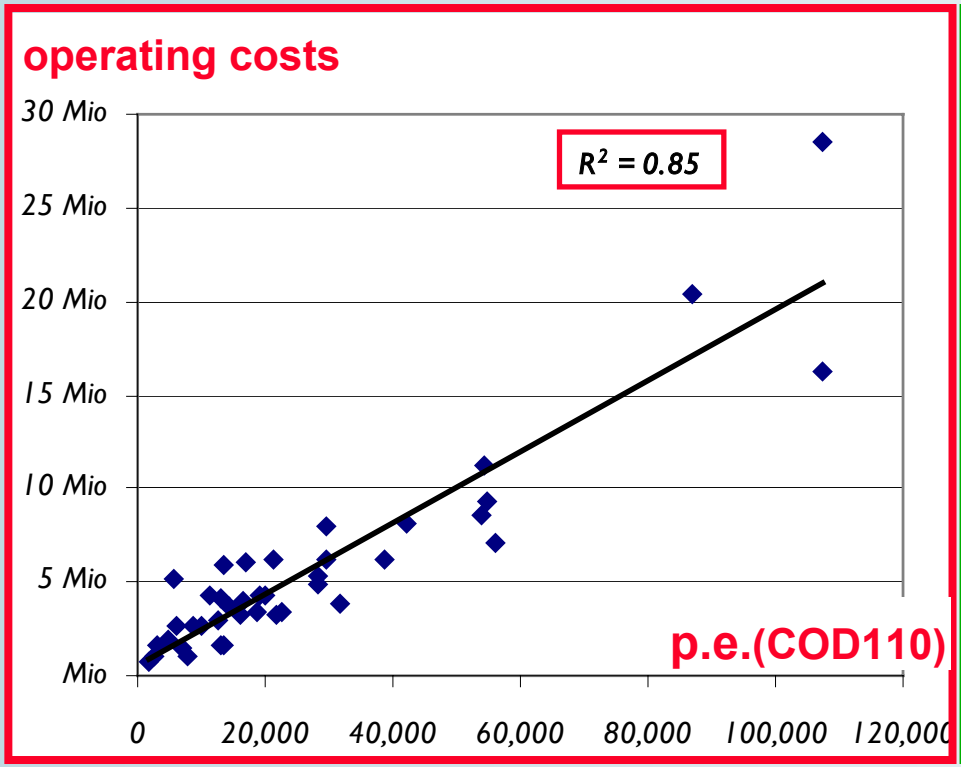


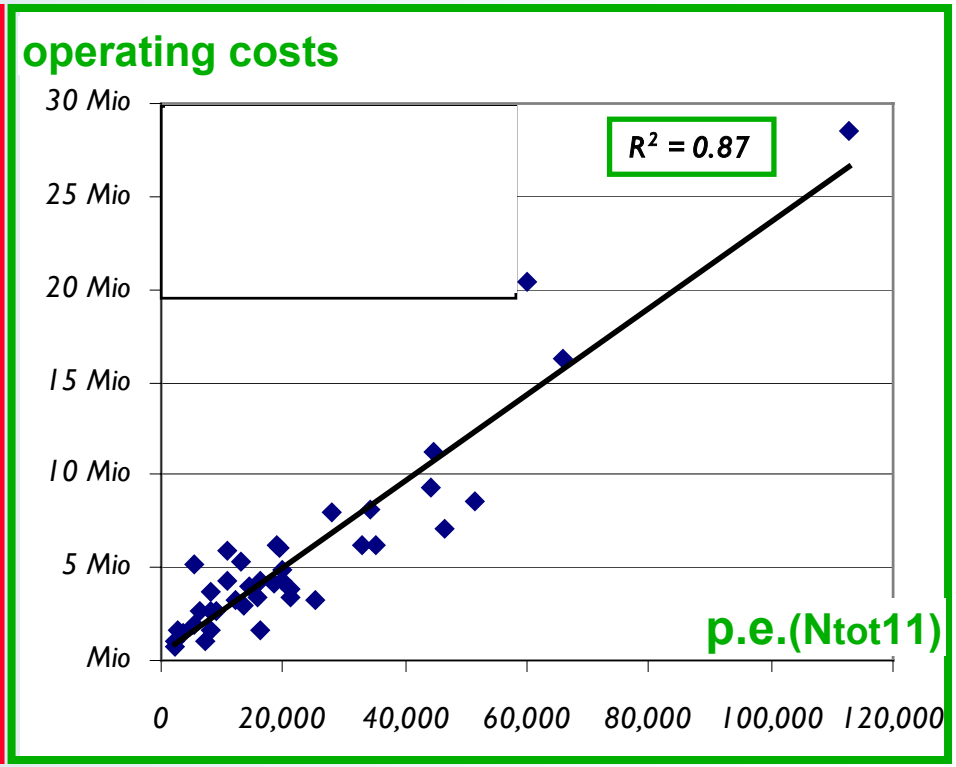
Data Quality Assessment by means of Mass Balances



Process Indicators for Operating Costs

p.e.(COD110) ⇔ p.e.(Ntot11) ?





decided:

p.e.(COD110) as Mean Yearly Load ⇒ MYL-COD

Process Indicators

	Capital costs	Operating costs	Yearly costs
Total	Standard design load (SDL-COD)	Mean yearly load (MYL-COD)	MYL-COD
Process 1	Real design load (RDL-COD)		
Process 2	SDL-COD		
Process 3	RDL-COD		
Process 4			

Criteria for "Benchmark Plant" *("best practice")*

Criteria regarding **operating & total yearly costs:**

- ***In compliance** with current treatment **efficiency requirements (emission standard)***
- ***Sufficient data quality***
- ***Typical municipal wastewater characteristic as COD/N ratio***

These criteria are not relevant for capital costs !

Definition of Benchmarks

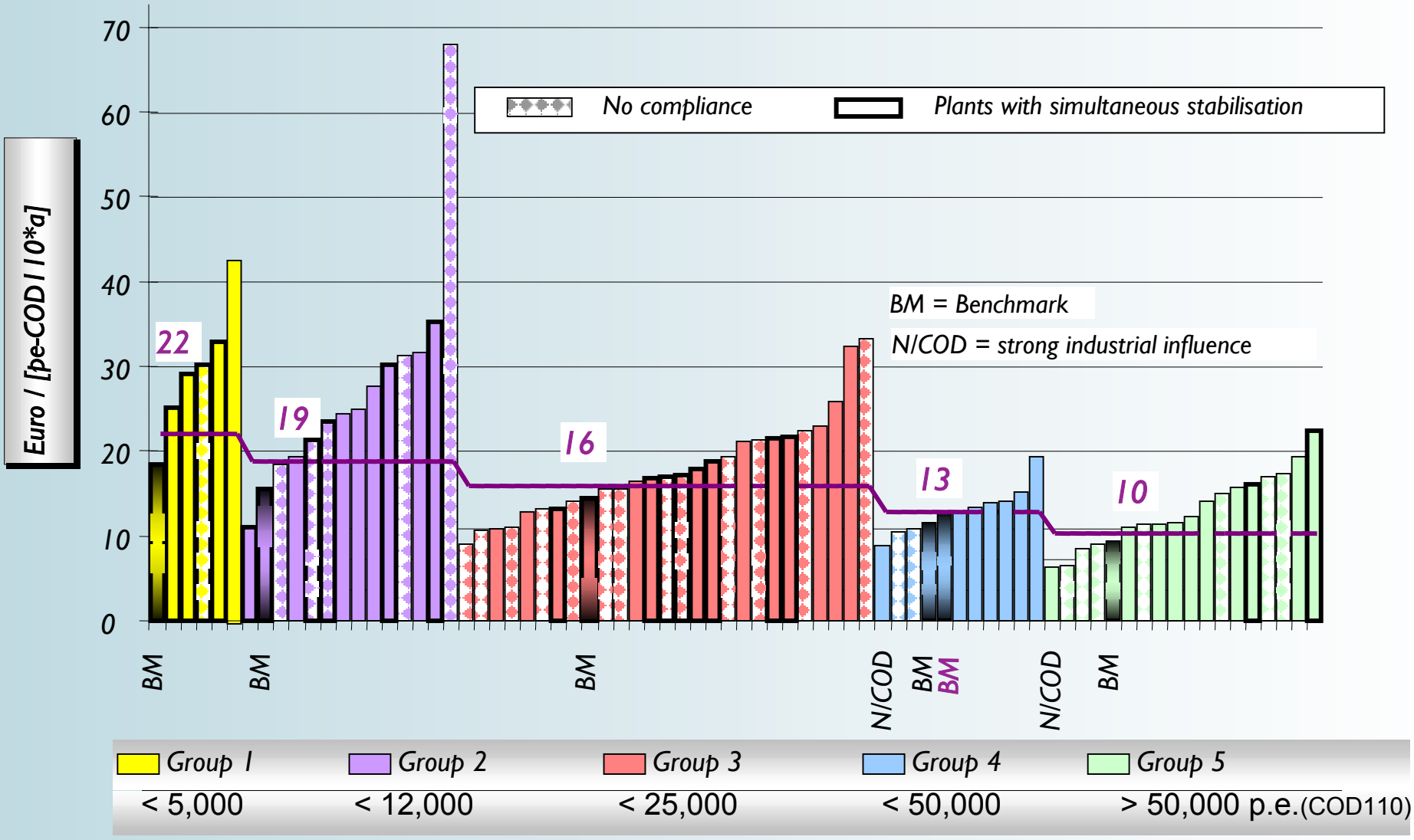
The **Benchmarks** are represented by the plants

- with the **lowest specific costs**
- that meet the **"criteria" for benchmarks.**

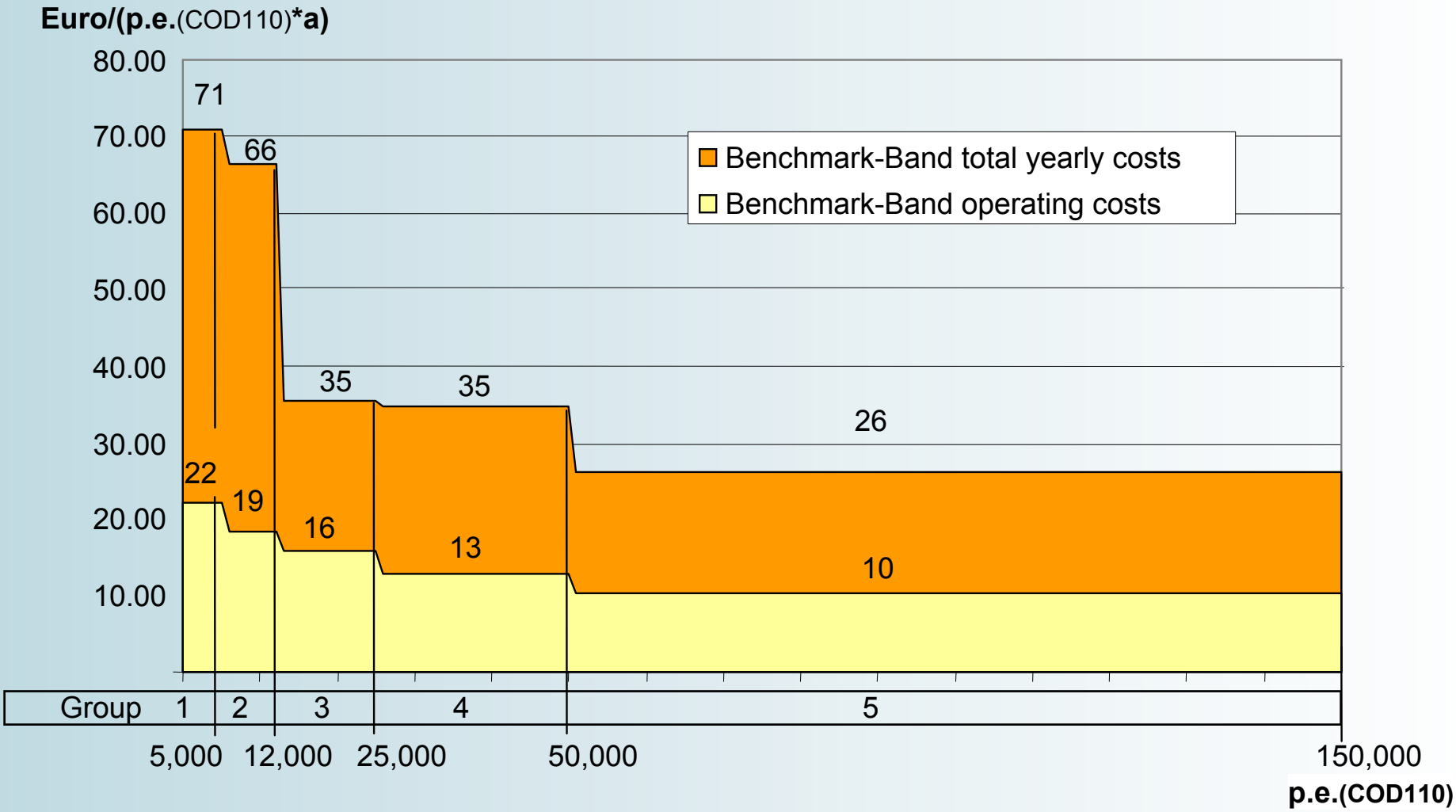
Benchmarks have been defined

- for the **"yearly costs" (capital & operating)**
  - for the **capital costs**
  - for the **operating costs** and
    - for the **operating costs** of **each** of the **four processes (1 … 4).**

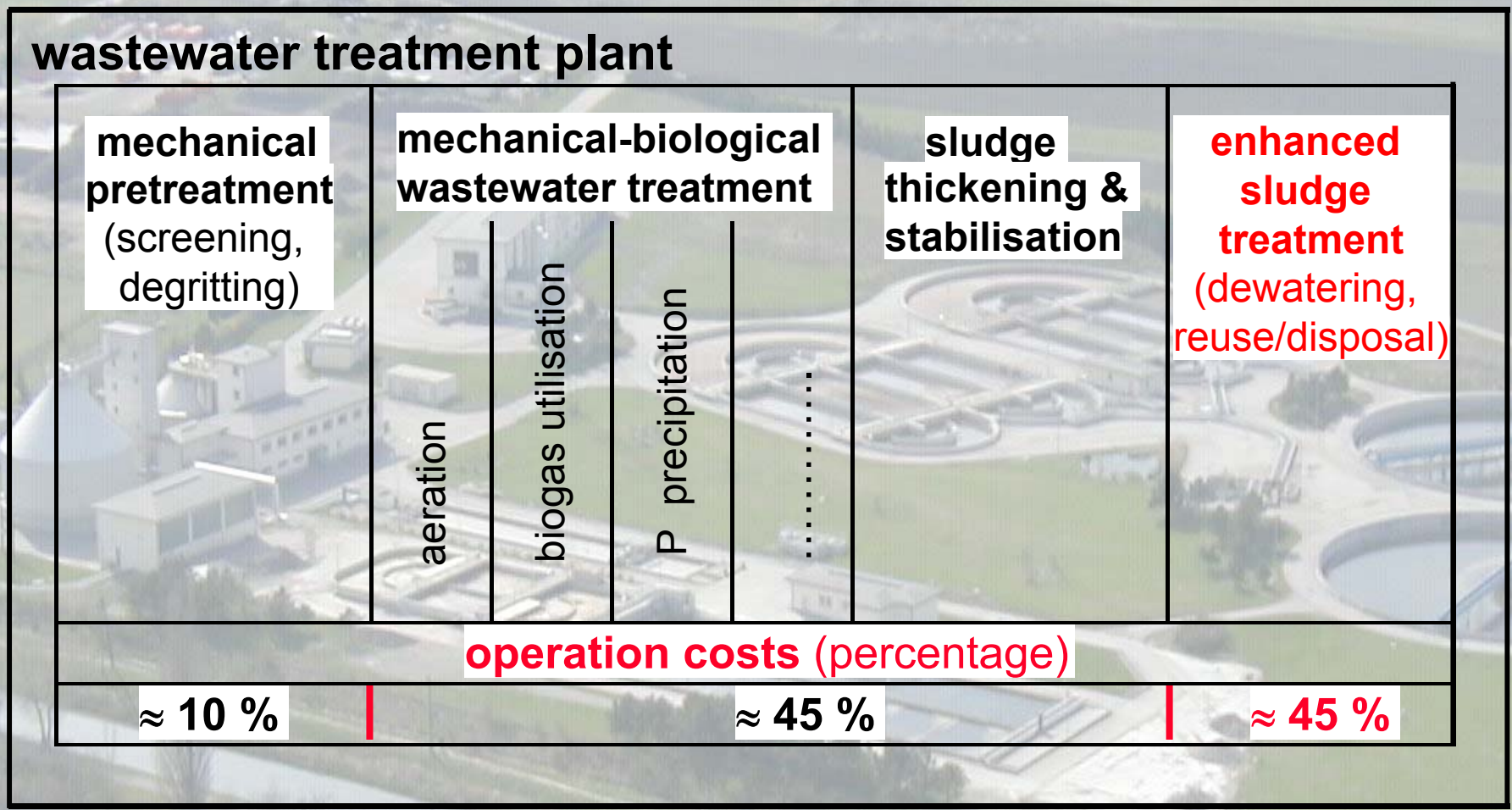
Specific operating costs [Euro/(pe(COD110).a)]



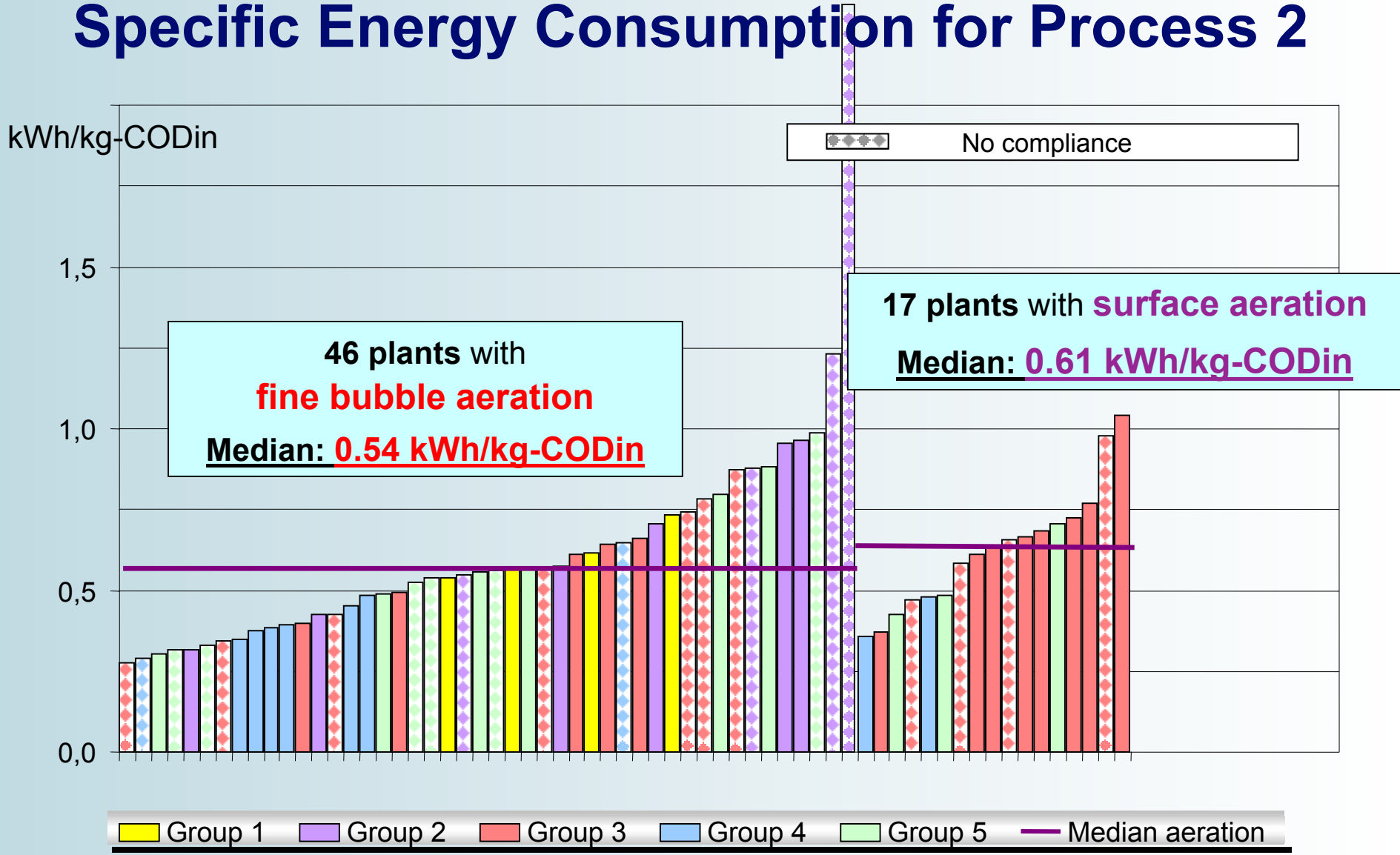
"Benchmark-Band" for operating and total yearly costs



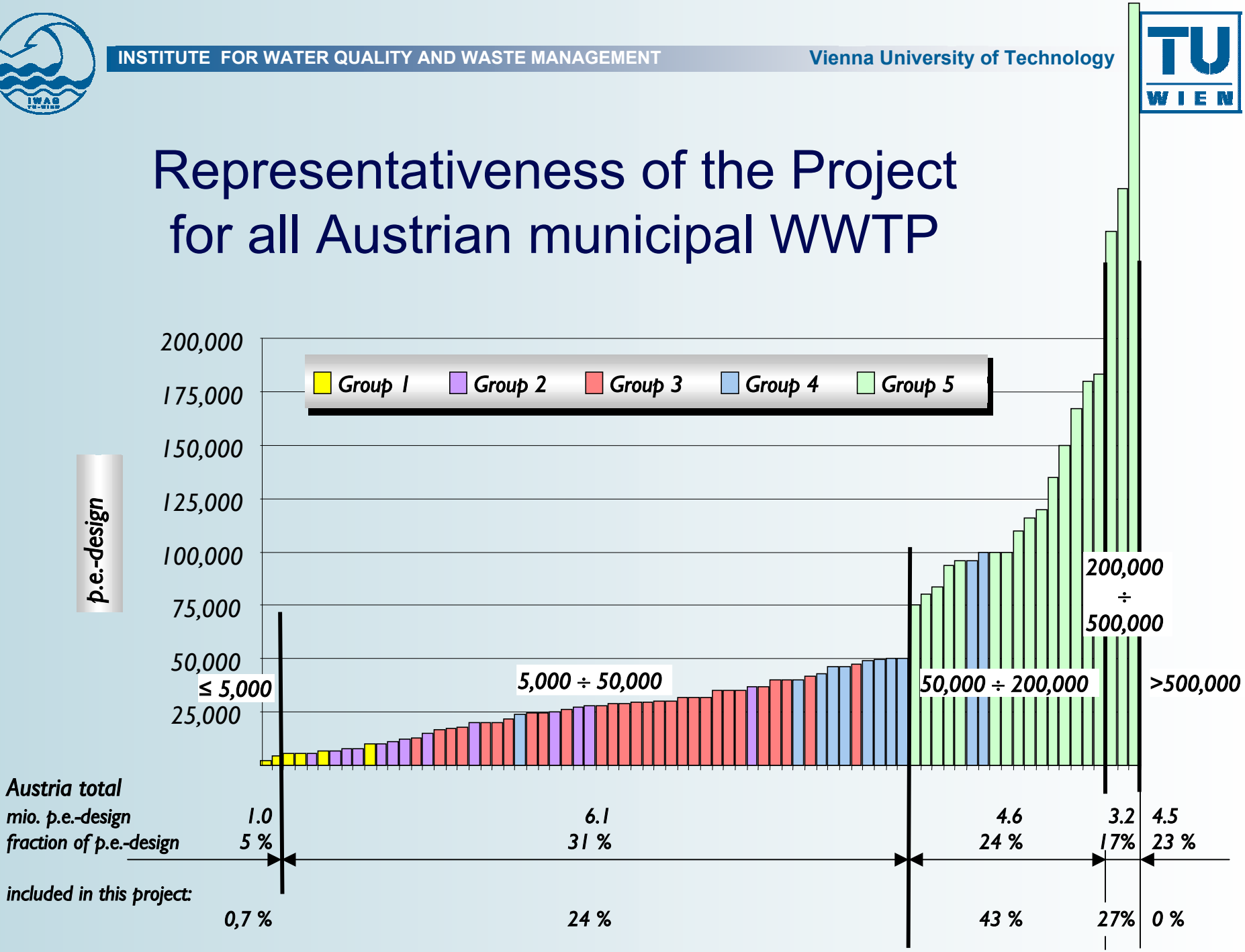
Operating costs related to the defined processes



Specific Energy Consumption for Process 2



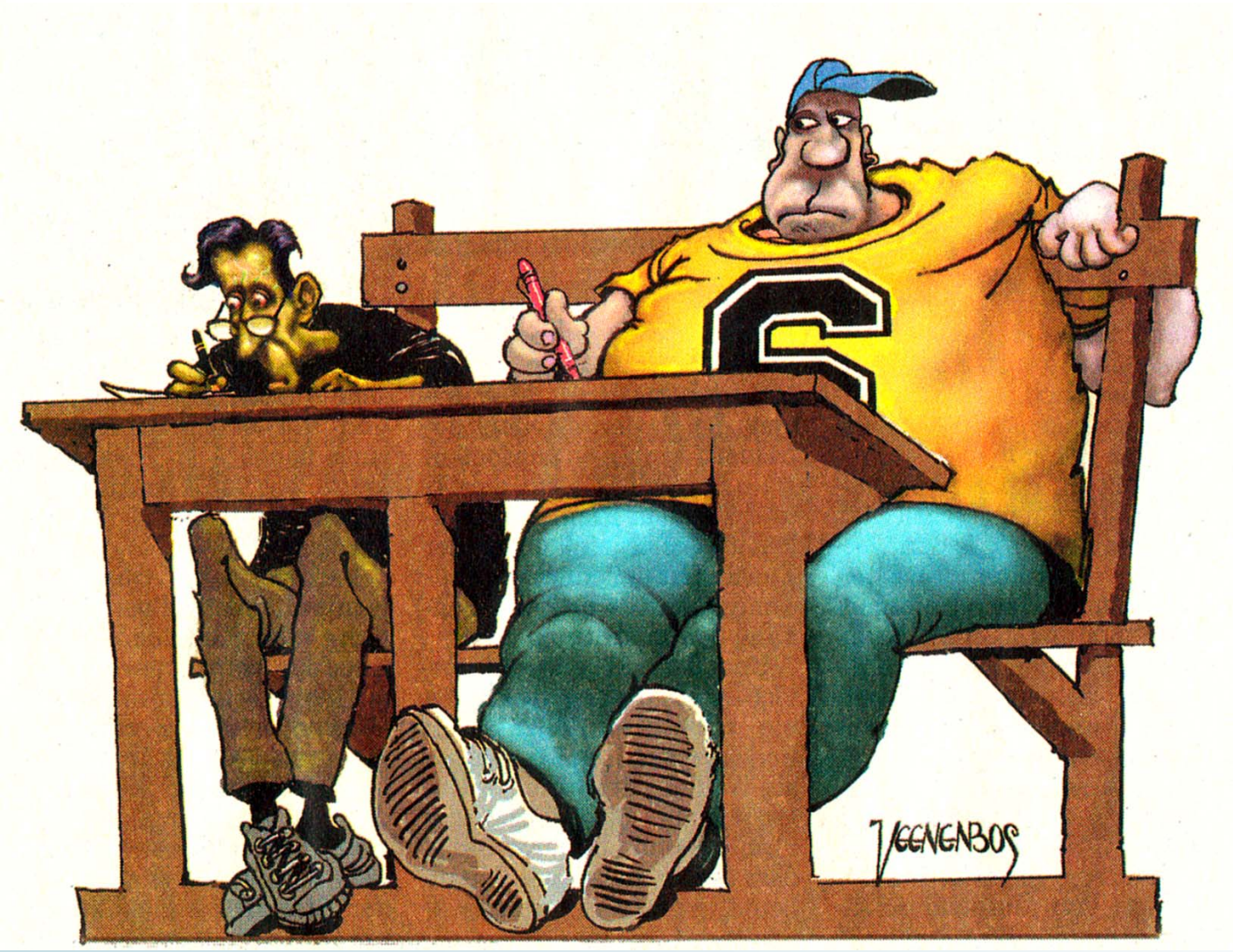
Representativeness of the Project for all Austrian municipal WWTP



Summary and Conclusions

- The **Benchmarking method** developed is universally **applicable to municipal WWTP from 5,000 to 500,000 p.e.** (Final Report on the Internet: www.oewav.at)
- "**Benchmark**-Band" for the total **operating costs** ranges between **10 €/(p.e.(COD110).a)** for group 5 (**> 50.000 p.e.**) and **22 €/(p.e.(COD110).a)** for group 1 (**< 5.000 p.e.**)
- **Operating costs** related to processes: for **Mech.-biol. treatment & Sludge stabilisation ≈ 45 %**, for **Mech. pretreatm.** & **Enhanced sludge treatment ≈ 55 %**
- ***No correlation*** *was found* ***between*** *operating* ***costs and treatment efficiency***

Questions ?



Prospects

- ⇨ The project presented was only the starting point for the cost reduction process and needs further effort
- ⇨ Adaptation of the method to smaller and larger plants
- ⇨ Internet platform
  - data collection
    - data evaluation
      - comparison of performance indicators (PIs)
- ⇨ Discussion of the results in further workshops