International Performance Indicators Catalogue

Germany (D), Austria (A), Switzerland (CH)
Results of DACH Working group
„ Key performance indicators for European wastewater services”

European Water Utility Expert meeting at EEA
13 - 14 December 2012

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Member of DACH-Working Group

DACH Working Group
“Key performance indicators for European wastewater services”

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ÖWAV	Dipl. Ing. Dr. Stefan Lindtner Dipl. Ing. Dr. Thomas Ertl	ÖWAV, commission Benchmarking ÖWAV, commission Benchmarking
VSA	Dr. Bruno Bangerter (Speaker) Dr. Stefan Binggeli	VSA-commission performance indicators
Stichting RIONED	(Partly) involved until 2009	
Unie van Waterschappen	Vakant	

- Work on performance indicator catalogue since 2004
- Latest meeting May 2012
- Filip Bertzbach is speaking as member of group

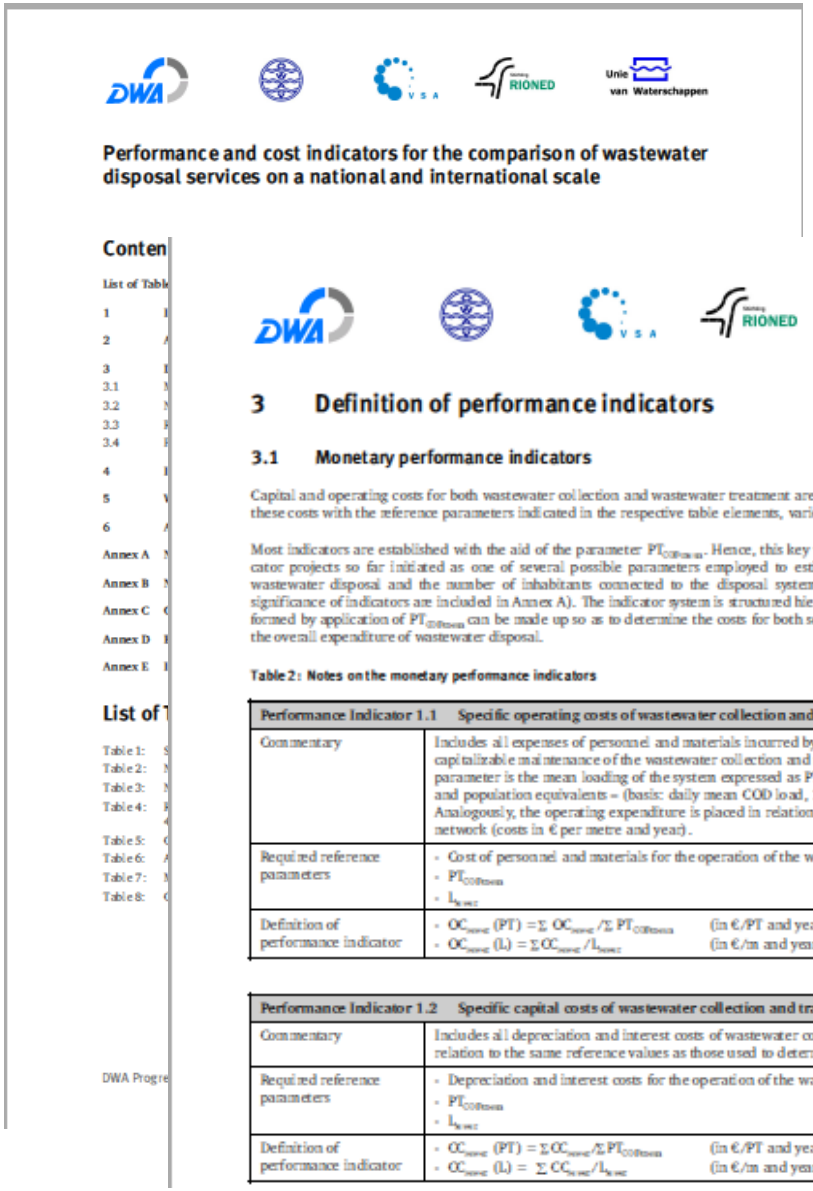
Goals of DACH Working Group

- Provide a set of aggregated indicators on performance of wastewater services, ready for public comparison
- Compare and unify national results
- Set the performance indicator system on a long-term use and ensure its further development.
- Set of PI's which
  - are easy to understand,
  - are broadly applicable
  - are suited for creating transparency
  - provide fair, transparent and reliable comparisons

Source: DACH- Working paper "Strategy" (2010)

Main result: Performance Indicators catalogue and discussion of its application

- Set of Key Performance Indicators
- 15 monetary indicators (including process model)
- 11 Non-monetary performance indicators to describe performance and structural conditions
- Discussion of application:
  - Notes on the capital costs
  - Application constraints
  - Examples of national comparisons
- EWA Workshop with 8 countries in 2009



Performance and cost indicators for the comparison of wastewater disposal services on a national and international scale

Conten

List of Tabl

1 I
2 A
3 I
3.1 N
3.2 N
3.3 P
3.4 P
4 I
5 V
6 A
Annex A N
Annex B N
Annex C C
Annex D I
Annex E I

List of T

Table 1: S
Table 2: N
Table 3: N
Table 4: P
Table 5: C
Table 6: A
Table 7: N
Table 8: C

DWA Progre

3 Definition of performance indicators

3.1 Monetary performance indicators

Capital and operating costs for both wastewater collection and wastewater treatment are shown separatel
these costs with the reference parameters indicated in the respective table elements, various indicators ca

Most indicators are established with the aid of the parameter $PT_{COD\,treat}$. Hence, this key value appears in
cator projects so far initiated as one of several possible parameters employed to estimate the quant
wastewater disposal and the number of inhabitants connected to the disposal systems. (Notes on th
significance of indicators are included in Annex A). The indicator system is structured hierarchically in tha
formed by application of $PT_{COD\,treat}$ can be made up so as to determine the costs for both sections and cost
the overall expenditure of wastewater disposal.

Table 2: Notes on the monetary performance indicators

Performance Indicator 1.1	Specific operating costs of wastewater collection and transport	
Commentary	Includes all expenses of personnel and materials incurred by the operation a capitalizable maintenance of the wastewater collection and transport structu parameter is the mean loading of the system expressed as PT – total number and population equivalents – (basis: daily mean COD load, 120 g COD per P Analogously, the operating expenditure is placed in relation to the length of network (costs in € per metre and year).	
Required reference parameters	- Cost of personnel and materials for the operation of the wastewater collec - $PT_{COD\,treat}$ - L_{sewer}	
Definition of performance indicator	- OC_{sewer} (PT) = Σ OC_{sewer} / Σ $PT_{COD\,treat}$ - OC_{sewer} (L) = Σ OC_{sewer} / L_{sewer}	(in €/PT and year) (in €/m and year)

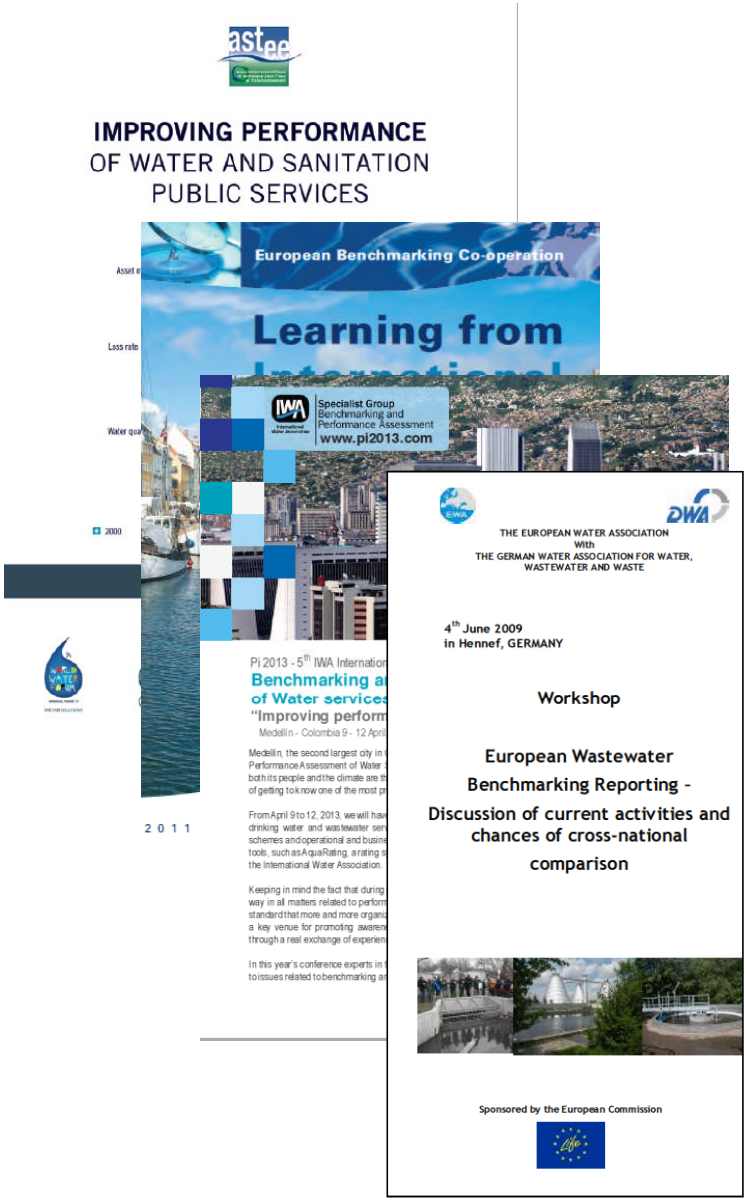
Performance Indicator 1.2	Specific capital costs of wastewater collection and transport	
Commentary	Includes all depreciation and interest costs of wastewater collection and is pl relation to the same reference values as those used to determine the operati	
Required reference parameters	- Depreciation and interest costs for the operation of the wastewater collecti - $PT_{COD\,treat}$ - L_{sewer}	
Definition of performance indicator	- CC_{sewer} (PT) = Σ CC_{sewer} / Σ $PT_{COD\,treat}$ - CC_{sewer} (L) = Σ CC_{sewer} / L_{sewer}	(in €/PT and year) (in €/m and year)

Context of DACH Working Group – Enhancing the cooperation of all interested stakeholders

- Variety of actors and activities in the field of benchmarking and performance indicator systems
- The working group wants to enhance the cooperation of all interested stakeholders with the primary objective of supporting national associations in issues of benchmarking and performance indicator systems.

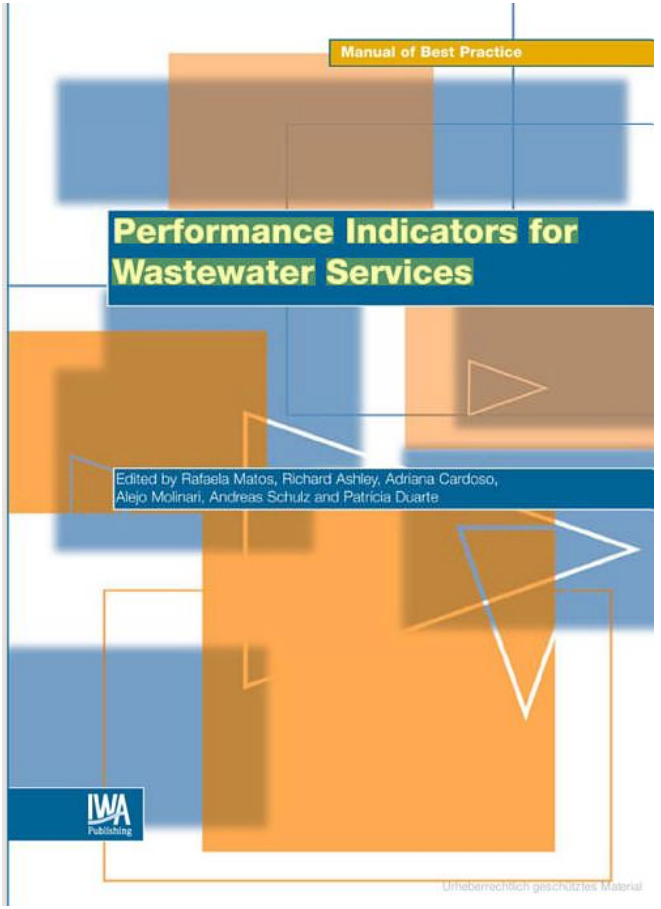
➢ **How to work on performance indicator comparison in the (waste) water sector?**

*DACH- Working paper “Frequently asked questions and answers” (2010)



Use and specify IWA Performance Indicators

- The methodology of the IWA-system is internationally recognized and the DACH system is based on it.
- Compared to the IWA-system the intention and contents of the DACH-system are more extended regarding the following aspects:
  - The possible DACH-system does not claim completeness in academic respect, but focuses on practical and political key performance indicators
  - It extends and specifies definitions from the IWA-system based on years of practical experience

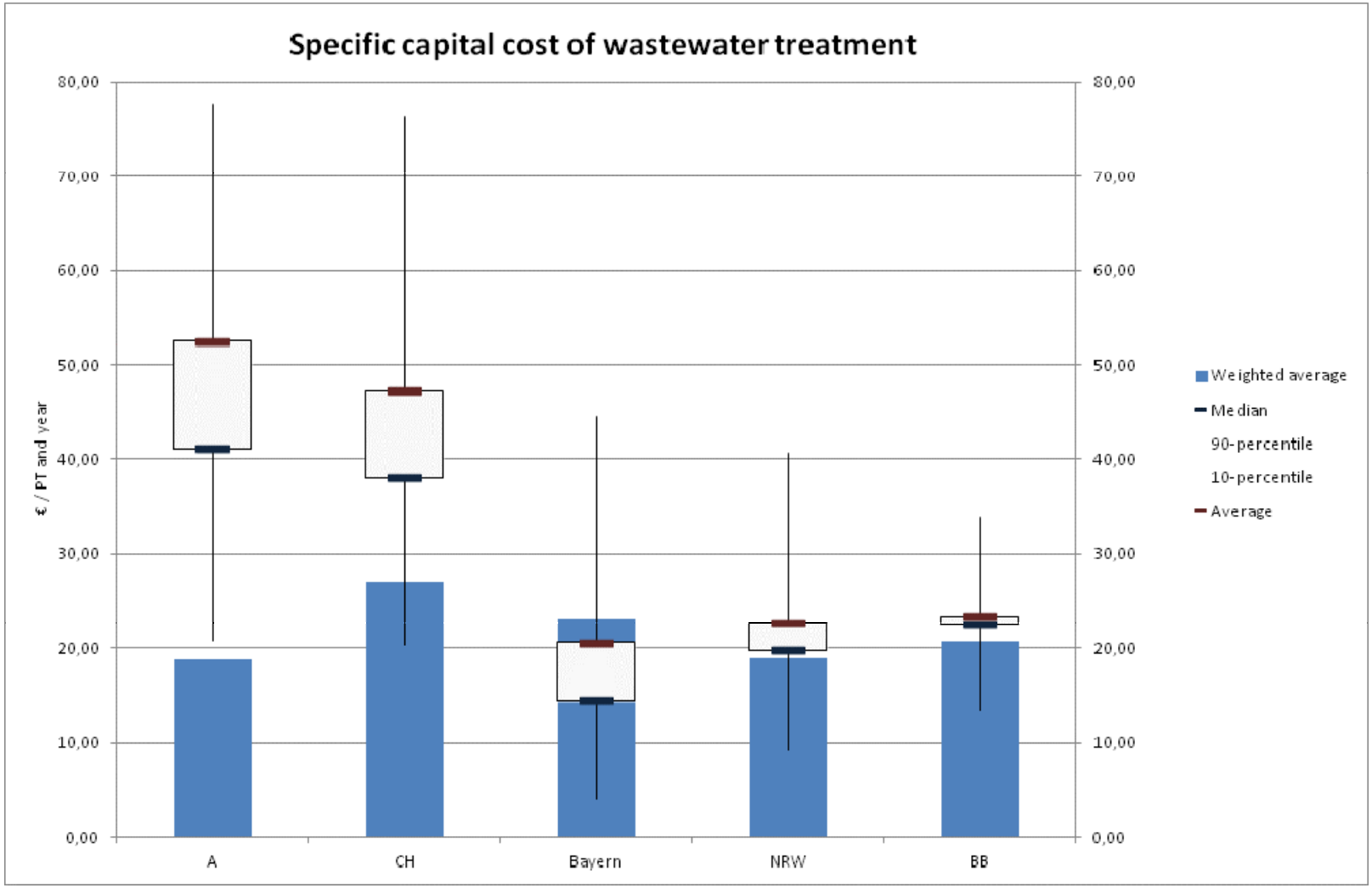


Source: DACH- Working paper “Frequently asked questions and answers” (2010)

A living set of Performance Indicators needs to be based on practical experience

- Results of DACH Working Group are based on and integrated in national work:
  - DWA-Topics: **Corporate-Metric Benchmarking as Component of the Modernisation Strategy - Performance Indicators and Evaluation Principles;** April 2008.
  - ÖWAV-Arbeitsbehelf Nr. 9; 2000: **Kennzahlen für Abwasserreinigungsanlagen** (Performance indicators for WWTPs)
  - VSA, FES 2006: **Definition und Standardisierung von Kennzahlen für die Abwasserentsorgung** (Definition and standards of performance indicators for wastewater sector)

Beware of the limits (1/3) – How to intepret data?

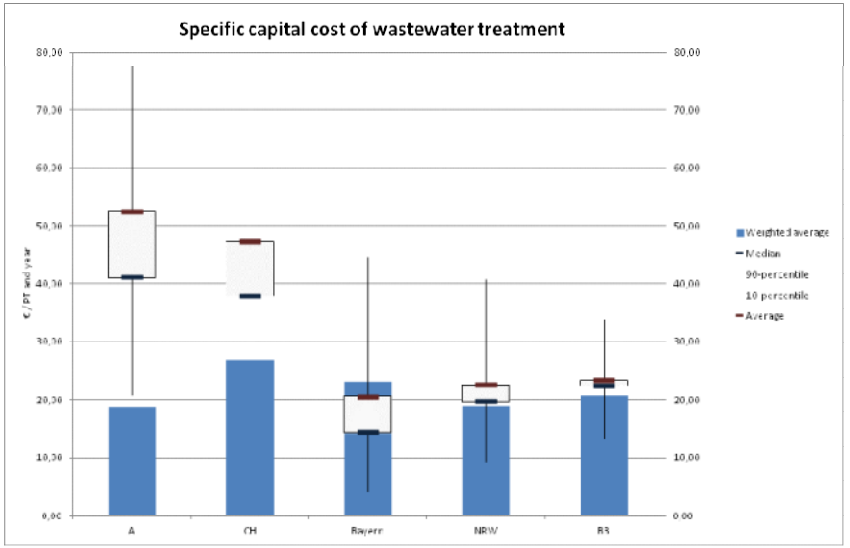


- No simple interpretation without experts possible

Source: O. Hug „Internationale Kennzahlenvergleiche“ VSA/KI-Fachtagung 2011

Beware of the limits (2/3) – How to interpret data? Some answers

- Use different statistical values (weighted average, median, percentile-values, average-values)
- Give interpretation based on background and structural conditions:
  - Size of WWTP
  - Capacity utilization
  - Sewage sludge utilization and disposal
  - Treatment performance
- Knowledge about reference parameter
- Transparency about depreciation and interest accounting



Source: O. Hug „Internationale Kennzahlenvergleiche“ VSA/KI-Fachtagung 2011

Beware of the limits (3/3) – Capital cost

Country	Depreciation Basis	Interest Rate	Span of Useful Life (SL)
CH	PVR Canton-specific	real interest rate (low liabilities, not clearly ascribed to wastewater), state- or canton-specific	assumed, fictitious UL WWTP: 33 years
A Benchmarking	PVR	imputed interest rate	fictitious UL sewerage network 40 years (1999) 80 years (as of 2004) WWTP building structures 30 years WWTP machinery 20 years electrical, measuring, instrumentation & control 10 years
FRG (economic data)	IC, PVR calculatory and per balance-sheet (differing among Federal states, mixed)	imputed interest rate imputed and real interest rates company-specific (mixed)	varying standards in the Federal states

Legend: PVR – Present values of replacement ; IC – Initial costs / production costs

- Transparency about depreciation and interest accounting

Source: DACH-Working Group „Performance and Cost inidicators for the comparison of wastewater services“ (2008)

Being aware of the limits is a strength

- Discussion of application (and limits) supports interpretation
- Key set of Performance Indicators are given
- Reference parameters are thoroughly discussed
- Main processes are identified

Table 1: Monetary performance indicators

	Operating Costs	Capital Costs	Total Costs
Wastewater collection	€ / $PE_{CODmean}$ € / L_{sewer}	€ / $PE_{CODmean}$ € / L_{sewer}	€ / $PE_{CODmean}$ € / L_{sewer}
Wastewater treatment	€ / $PE_{CODmean}$ € / $PE_{CODcapacity}$	€ / $PE_{CODmean}$ € / $PE_{CODcapacity}$	€ / $PE_{CODmean}$ € / $PE_{CODcapacity}$
Sum	€ / $PE_{CODmean}$	€ / $PE_{CODmean}$	€ / $PE_{CODmean}$

Legend:

$PE_{CODmean}$ = Mean loading, expressed as population equivalents. Spec. loading per PE = 120 g COD per day.

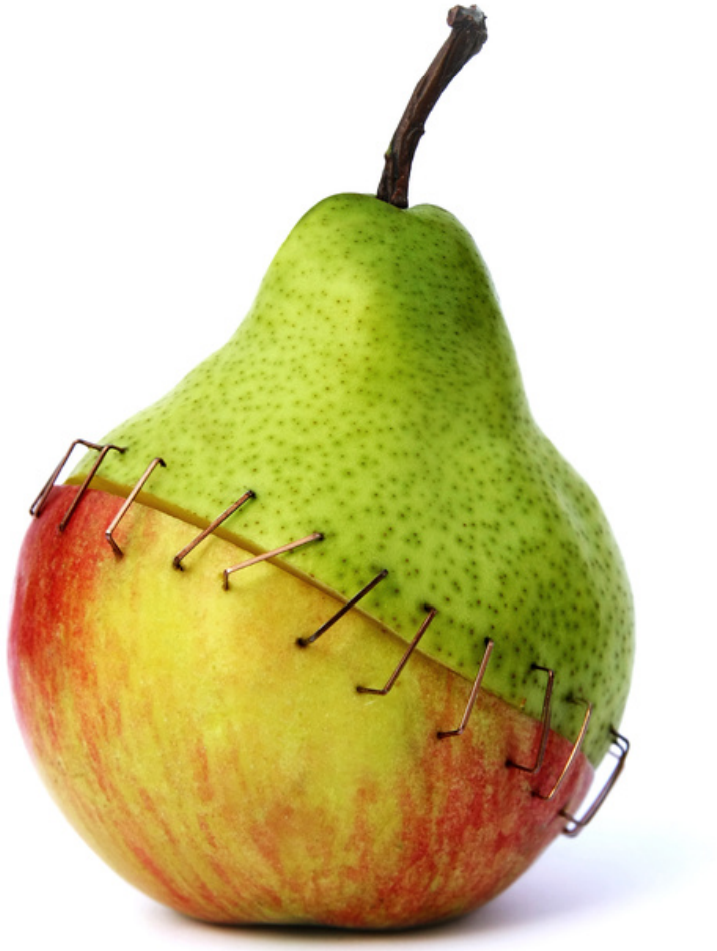
L_{sewer} = Total lenght of all public sewers systems

$PE_{CODcapacity}$ = Design capacity of a WWTP, expressed as population equivalents

Source: S.Thaler „ Wastewater Performance Indicators in Europe", EWA Yearbook 2010/2011

How to work on performance indicator comparison in the (waste) water sector?

- Use and specify IWA performance indicator
- A living set of Performance Indicator needs to be based on practical experience (…and lives on)
- Beware of the strength and limits



Appendix: A living set of Performance Indicators …. lives on …. (an example)

Non-monetary Performance Indicator	Unit	DACH (2008)*	German Core PI's 2012*
Level of connection to sewer	(%)	x	x
Treatment performance (LWa = performance characteristic value) according to ÖWAV (Austrian worksheet)		x	-
Treatment performance (oxygen demand/nutrient load class according to the performance standards of wastewater treatment plants established by the DWA)		x	x
Treatment performance COD	(%)	x	-
Treatment performance N	(%)	x	-
Rate of sewer length requiring rehabilitation	(%)	x	x
Annual rate of sewer renewal	(%)	x	x
Sewage sludge utilisation and disposal	(%)	x	-
Size structure of wastewater treatment plants	(%)	x	x
Mean level of capacity utilisation wastewater treatment plants	(%)	x	x
Specific length of sewers	Km/E	x	x
Specific amount of wastewater	m³/E	-	x
Certification due to Management systems	Number	-	x
Average age of sewer system	Age	-	x
Rate of classified sewer system	(%)	-	x
Specific Energy consumption Wastewater treatment	kWh/m³	-	x
Share of co-generated energy	(%)	-	x
Education and Training per employee	d/Emp.	-	x
Sickness absence	(%)	-	x
Complaints	No/ 1000 con.	-	x
Cost recovery	(%)	-	x

Source: *Performance and Cost inidicators for the comparison of wastewater services (2008);
**A. Schulz/ P. Graf Brenchenkennzahlen Abwasserbeseitigung (2013) forthcoming