Financial Sustainability Rating Tool for Urban Water Systems

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trust

D22.1

TRANSITIONS TO THE URBAN WATER SERVICES OF TOMORROW

Financial Sustainability Rating Tool for Urban Water Systems

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LIST OF ABBREVIATIONS

FSRT	Financial Sustainability Rating Tool
IWA	International Water Association
SAT	Self Assessment Tool within TRUST
UWCS	Urban Water Cycle Services

1. OBJECTIVE OF THIS REPORT

This document represents the paper version of D22.1, the TRUST Financial Sustainability Rating Tool for Urban Water Systems (FSRT), for its official submission to the Commission. Truth to be told, the deliverable itself is – as it name implies – an online tool, and therefore cannot be contained within this document. Deliverable D22.1 can be accessed at the following URL:

http://fsrt-trust.ing.unibo.it/fsrt/

In the context of this internal report the main targets, development process and methodology of the FSRT are presented. Further, it offers insights in scoring and weighting procedures and discusses its limitations. The online Financial Sustainability Rating Tool is considered to be a live tool. In other words, as the project progresses, the Tool will be updated with feedback from users (e.g. due to the contact form within the Tool). In any case, it is highly recommended to visit and try the Tool online.

2. INTRODUCTION

"Whether operating in a developed or developing country context, well-run utilities are founded on being financially sustainable."

Rothstein/Galardi (2009)

Solid financial position of water and wastewater utilities builds the basis for their sustainable services in the future, because it allows adequate investments into infrastructure renewal, technical innovations and ecological measures. The Financial Sustainability Rating Tool offers water supply and/or wastewater removal companies an opportunity to rate the utility's financial sustainability. It gives the user an indication, which area from financial situation over asset management to business operation needs optimization. The Tool also evaluates different forecasts (e.g. population development) and country specific characteristics (e.g. inflation rate) to assess future trends. Barometers with green to red indicators for each area as well as overall scores visualize the results of the web based rating. To achieve meaningful results the tool is directed at utilities, which provide either only one of the two services or are able to split up the information and costs related to each service.

The Inter-American Development Bank and the International Water Association (IWA) are currently also working on a professional rating system for water and sanitation utilities called AquaRating. AquaRating has eight different assessment areas, in which the business performance is measured and evaluated: service quality, access to services, operational efficiency, efficiency in investment planning and execution, management efficiency, financial sustainability, environmental sustainability and corporate governance. The application is voluntary and bound to a rating fee (see Krause et al. (2012)). In return, the utilities get a certificate on their overall performance.

In contrast to the IWA project the rating tool, which is developed under TRUST, focusses on the financial sustainability of water utilities. The rating tool shall be freely available for all water utilities and thereby shall create incentives to prove if the current financing strategies and related economic measurements also ensure a sustainable operation of urban water systems in the future. The non-binding nature of the Tool application shall prevent participations barriers, because especially water supplier who expect a poor financial sustainability rating result shall not hesitate to make use of the rating tool. A mapping of the holistic water respectively wastewater business including social, environmental and economic factors is desirable, but includes also the risk that the complex reality cannot be covered adequately. Therefore the rating tool under TRUST task 2.2.4 is specialised on the economic influences, whereas the other factors are taken into account if they have direct influence on the utility's value preservation and expansion. Main purpose of the tool is rather a good public image than a self-rating. Accordingly, it has set itself the goal to uncover

economic deficits and/or best practises to show the user where potentials for development are and which financial strategies are already viable for the future.

The self-assessment tool (SAT) which was already developed in TRUST WP 3.1 is also based on a scoring model, representing indicators for all five sustainability dimensions: economic, environmental, social, infrastructural and governnace.[1] Especially utilities, for which the application of SAT has detected deficits in the economic dimension, are encouraged to apply the FSRT for deeper insights and rough recommendations for improvement actions.

[1] See TRUST report on SAT

3. FINANCIAL SUSTAINABILITY

Achieving sustainability in urban water cycle services (UWCS) is a complex objective. Under the TRUST project the well-known triple bottom line approach, which considers social, economic and environmental perspectives equivalent was supplemented by the inner categories assets and governance. In the context of TRUST, "sustainability in urban water cycle services (UWCS) is met when the quality of assets and governance of the services is sufficient to actively secure the water sector's needed contributions to urban social, environmental and economic development in a way that meets the needs of the present without compromising the ability of future generations to meet their own needs" (TRUST (2012): 1).

Table 1 shows the main sustainability objectives and criteria identified within TRUST. Considering the fact that the preservation and expansion of the existing infrastructure, the implementation of modern technologies as well as environmental measures are associated with investments, a solid financial position is an essential foundation for sustainable water and wastewater services in the future.

Table 1 - Objectives and criteria of the UWCS sustainability dimensions[2]

DIMENSION	OBJECTIVES	ASSESSMENT CRITERIA
Social	S1) Access to urban water services S2) Effectively satisfy the current users' needs and expectations S3) Acceptance and awareness of UWCS	S11) Service coverage S21) Quality of service S22) Safety and health S31) Willingness to pay
Environment	En1) Efficient use of water, energy and materials En2) Minimisation of other environmental impacts	En11) Efficiency in the use of water (including final uses) En12) Efficiency in the use of energy En13) Efficiency in the use of materials En21) Environmental efficiency (resource exploitation and life cycle emissions to water, air and soil)
Economic	Ec1) Ensure economic sustainability of the UWCS	Ec11) Cost recovery and reinvestment in UWCS (incl. cost financing) Ec12) Economic efficiency Ec13) Leverage (degree of indebtedness) Ec14) Affordability
Governance	G1) Public participation G2) Transparency and accountability G3) Clearness, steadiness and measurability of the UWCS policies G4) Alignment of city, corporate and water resources planning	G11) Participation initiatives G21) Availability of information and public disclosure G22) Availability of mechanisms of accountability G31) Clearness, steadiness, ambitiousness and measurability of policies G41) Degree of alignment of city, corporate and water resources planning
Assets	A1) Infrastructure reliability, adequacy and resilience A2) Human capital A3) Information and knowledge management	A11) Adequacy of the rehabilitation rate A12) Reliability and failures A13) Adequate infrastructural capacity A14) Adaptability to changes (e.g. climate change Adaptation) A21) Adequacy of training, capacity building and knowledge transfer A31) Quality of the information and of the knowledge management system

[2] (TRUST (2012): 4).

4. RATING TOOLS – DEFINITIONS AND REQUIREMENTS

The classic, traditional ratings deal with the creditworthiness of businesses or countries. Beyond this, there are other conceivable purposes of ratings which have already been used (see Schäfer (2004): 14). As especially sustainability approaches get socially and politically more and more important a modern form of rating has gained notability: the corporate responsibility rating. Within a corporate responsibility rating the results of both a social cultural rating and an environmental rating feed in to rate of the company's sustainability. Criteria are for example workplace safety, social commitment as well as energy and water consumption (see Bönning/Haßler (2007): 365 - 369).[3]

Although the TRUST Financial Sustainability Rating Tool focuses on the utility's financial position it considers its value preservation and extension and thus goes beyond the credit standing. Before the FSRT is presented in Chapter 3, the following sections deal with the general definitions and requirements of ratings.

4.1. Definitions

Rating

In the financial sector "[...] a rating (typically) is an assessment, for a given time horizon, of an obligor's ability to honor its contractual obligations" (Izzi et al. (2012): 155). More generally a rating is an evaluation of persons, objects, situations or processes using suitable scales. Hereby the designation 'rating' can mean the evaluation process as well as the results (see Schäfer (2004): 13 and Schäfer (2002)). Depending on the addressee of the rating, one can distinguish between external ratings, internal ratings and self-ratings. Whilst the results of external ratings by agencies like Standard & Poor's or Moody's are publicly, banks and other financial intermediaries perform internal ratings e.g. to assess the corporate clients' creditworthiness before providing debt finance (see Krahnen/Weber (2001) : 3,4).

Self-Rating

A self-rating is the "[...] determination of one's own rating with reference to a standard scale" (Merriam-Webster's Dictionary). As the expression pretends, the aim of the self-rating is not the determination of creditworthiness of a borrower, but rather assessment of a company's internal risk control and strategic corporate management. When applying the self-rating a company shall get an overview of its insolvency risk from bank perspective. Via detection and improvement of critical business units one can enhance the risk and thereby

[3] For the measuring of corporate environmental performance in form of sustainability ratings see also Delmas/Blass (2010).

the performance of the company in an external rating or an internal bank rating (see Müller et al. (2011): 29 f.). Similar to the normal rating other priorities than the creditworthiness are conceivable.

Rating Categories & Criteria

Different criteria respectively performance indicators help to describe the position of a utility with respect to the overall objective. Further, building categories of indicators to present a special business area provides the ability of inner ratings and thereby more transparency of results for the user. Generally, the more categories a rating includes, the wider it would be, and the more indicators (for each category) a rating has, the deeper it would be. The decision for the Tool's width and depth depends on its particular target.

Rating Scale

The projection of rating results into a rating scale respectively rating symbols offers an opportunity to visualize the extent to which the overall objective (e.g. credit standing or financial sustainability) was achieved. The well-known rating notches from the leading rating agencies range between AAA and D (see Brunner et al. (2000): 3, 8).[4] The division into rigid classes or risk profiles promotes the result's interpretability; nonetheless visualization in form of barometers allows continuous transitions.

Rating Tool

Ratings can have different possible configurations. One can distinguish in solicited and unsolicited ratings, depending on whether a rating is done optional or not (see Schäfer (2004): 15). Furthermore, the rating can be carried out once or periodically. Used in a recurring process, long-term trends can be assessed additionally to regular outcomes.

The rating can facilitate different functions. Rating results can play an informative role, they can be used for monitoring and in best case give incentives for further advance (see Schäfer/Lindenmayer (2004): 15; Schäfer (2002)). By uncovering deficits a user knows where potentials for development lie and where adjustments are necessary. Beyond that, the outcomes may be used for external and/or internal accountability.

"A typical procedure used today is the scoring method. It relies on a well-defined set of criteria, each of which is scored separately. The individual scores relating to the set of criteria are weighted and then added up, yielding the overall score. This score is translated in one of the rating classes, defined as an interval on the real line that extends from minimum overall score to its maximum" (Krahnen/Weber (2001) : 8).[5] Although a basic structure is very

[4] For detailed information see Moody's (2013) and Standard & Poor's (2012).

[5] An overview on further statistical methods to develop rating models is given in Hayden/Porath (2006).

popular, scoring models have usually different criteria respectively indicators, rating scales, aggregation rules and weights. Further the rating can include quantitative criteria, which are typically backward-looking and also qualitative criteria, primarily forecasts and subjective estimates, which are typically forward-looking (see Brunner et al. (2000): 7). Even scoring models with the same objective can differ widely due to subjective influences, choices and priorities by developing experts.

4.2. Rating and Indicator Requirements

The requirements for a rating tool are in general independency, reliability and objectivity (see Everling (1994): 1610). Furthermore, following properties should be adhered to when selecting appropriate indicators (see Bardt (2011): 13-14): meaningfulness, simplicity, measurability, data availability, regularity, target suitability, consensuality, and clarity.

Nonetheless, goal conflicts exist, which usually makes a prioritization of requirements necessary.

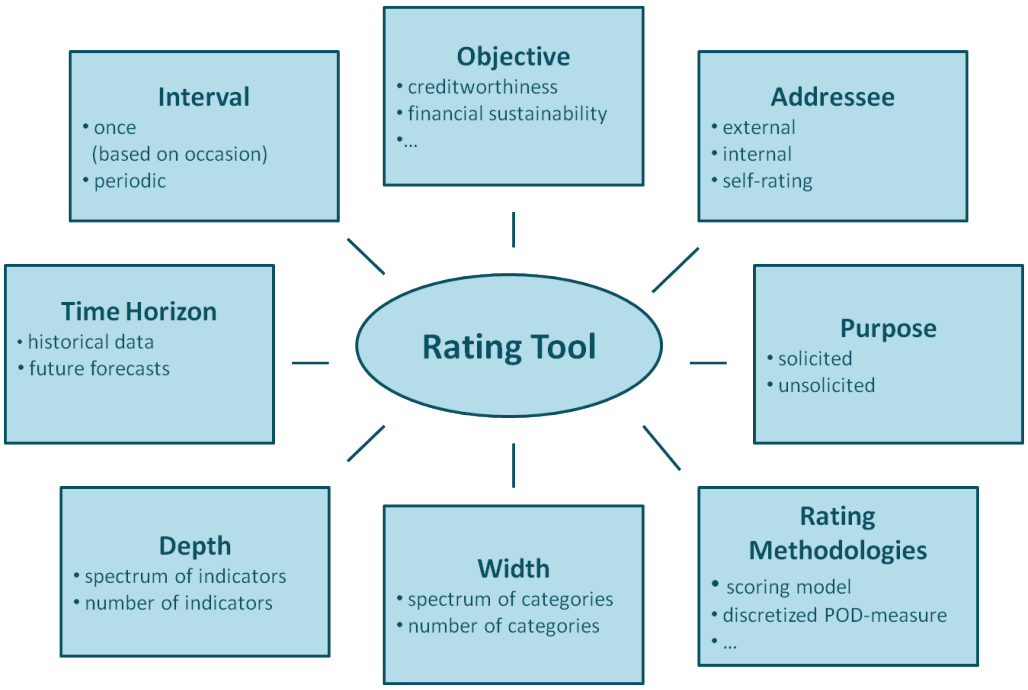

Figure 1: Main Characteristics of a Rating Tool[6]

[6] Own illustration.

4.3. Summary

To summarize the definitions and requirements of the Chapter 2, components and design options of a rating process can be represented as follows:

5. FINANCIAL SUSTAINABILITY RATING TOOL FOR URBAN WATER SYSTEMS

As shown in Chapter 2 a rating tool has various design options depending on the overall objective. The rating tool, which is developed under TRUST, focuses on the financial sustainability of a water supplier or a wasterwater utility. Detailed bookkeeping and cost accounting build the basis for analysis of financial sustainability. Multiservice water companies, which provide several services (water and wastewater or/and waste disposal), are encouraged to perform an adequate cost allocation for each service to entry separate data for each service into the evaluation. To achieve meaningful results the tool is directed at utilities, which provide either only one of the two services or are able to split up the information and costs related to each service.

Main target of the FSRT is to give a user an indication, which area from financial situation over asset management to business operation needs optimization. Further, the Tool considers different forecasts (e.g. future cost development) and country specific characteristics (e.g. gross domestic product) to assess future challenges. The tool aims not to denounce a utility against others or to test its creditworthiness, but to encourage utilities to identify critical areas with respect to a solid financial position and to be open-minded for improvement actions.

It is important to note that improvement actions are recommended from financial perspective – goal conflicts with other objectives or problems, like water scarcity, must be questioned critically, e.g. the influences of new tariff designs (which are desirable from financial perspective) on the water demand.

The addressee of the rating is a utility itself, which makes a self-rating tool very suitable. The results are not externally required or published, so the application is optional. Furthermore, a utility can use the tool once but also periodic (e.g. once a year) to have either a quick snap shot of the current financial situation or to get a dynamic view on the financial position. The FSRT considers historical data as well as forecasts to expand an observed time span. The conceptual design of the FSRT is based on a scoring modell, which contains 4 categories and 21 indicators. The following figure summarizes characteristics of the FSRT before the conceptual procedure and methodology are explained.

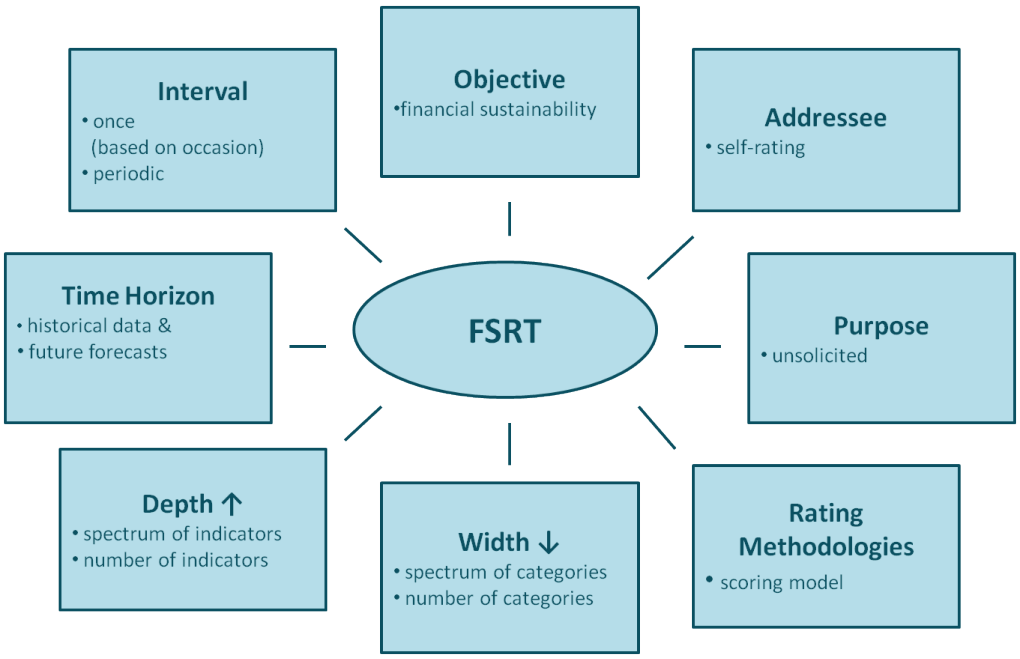

Figure 2: Characteristics of the Financial Sustainability Rating Tool[7]

5.1. Method and Design of the FSRT

The Tool requires an entry of various performance indicators of a utility, some of which are used directly and some are used for further calculations within the Tool. In the first step the indicators, which feed into the rating get a score based on the utility's performance. In the second step the scores are weighted with respect to the importance of each indicator. In the third step the weighted scores of each indicator are summed up within all four areas from financial situation over asset management to business operation and forecasts. Besides the numerical rating scores, barometers with green to red indicators for each of the four categories visualize the results of the rating (inner rating) to allow more transparency in contrast to an exclusive overall score. The Barometers reflect that transitions between the rating results are fluent. In step four, the areas respectively categories are weighted as well with respect to their importance, so that in step five the FSRT can generate an overall score (outer rating) in form of the summarized partial results. The rating process and conceptual design can be seen in Figure 3.

[7] Own illustration.

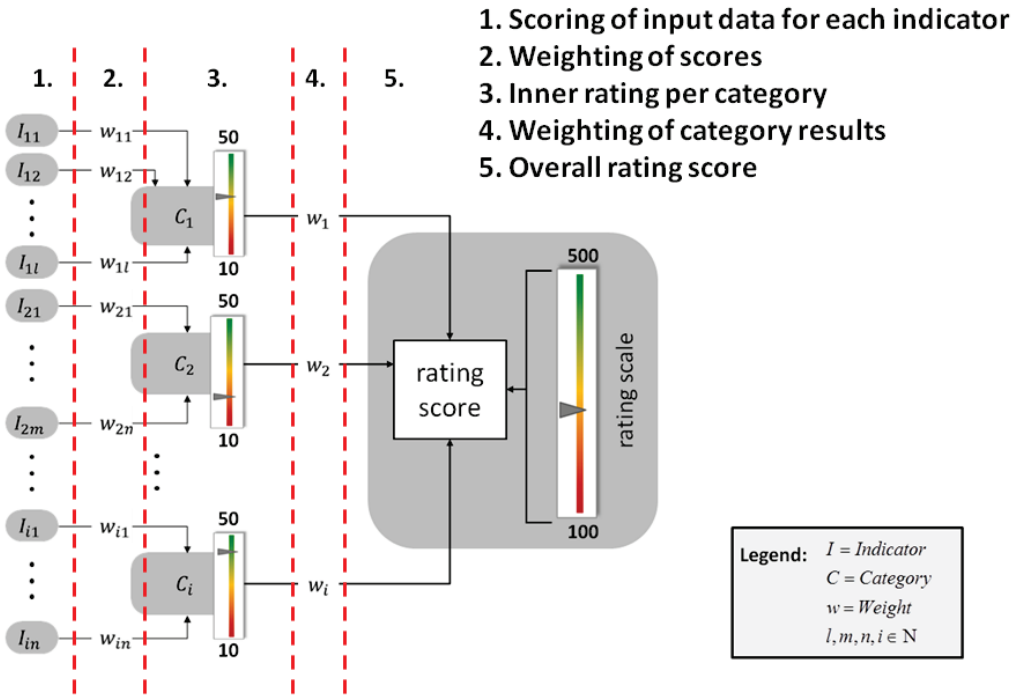

Figure 3: Conceptual Structure of the Financial Sustainability Rating Tool[8]

While developing a rating tool the main challenges are selection, evaluation and weighting of the most relevant categories and indicators, which enable an evaluation of a utilitys' financial sustainability. Therefore, it is important that practitioners and scientists specifically review the appropriateness of the selected indicators and scales. The next sections give insights to the aggregation process as well as the scoring and weighting procedure.

5.1.1. Selection of Categories and Indicators for Financial Sustainability

Rating the financial sustainability of course analyses traditional criteria, such as cash-flow, capital structure and liquidity, which are used beside others by the major rating agencies, i.e. Standard & Poor's or Moody's (see Krahnen/Weber (2001): 9). In addition, sectors specific criteria, which cover water and/or wastewater service characteristics, must be included into the rating. The performance indicators for water and/or wastewater, published by the International Water Association (IWA), provide a detailed overview of a variety of indicators (see Alegre et al. (2006) and Matos et al. (2003)). In selecting appropriate indicators, it was important to find a balance between the conflicting goals simplicity of application and significance and holism of the results. Further, as the Tool is available online, a certain

[8] Own illustration.

degree of standardization is presupposed, which makes the analysis of qualitative data difficult. Therefore, indicators such as 'quality of accounting' had to be omitted.

Four subcategories were built to rate the financial sustainability: financial situation, asset management, business operation and forecasts. This offers a user an opportunity to see which area in particular performs well, and in which potential for optimization is given. In the following Table the indicators describing the four categories are presented. Some of them are direct input variables, others are calculated within the tool or rely on external sources (e.g. inflation rate).

Table 2: Performance Indicators feeding into the FSRT

FINANCIAL SITUATION	ASSET MANAGEMENT	BUSINESS ADMINISTRATION	FORECASTS
Liquidity indicator	Average mains/sewer age	Economic regulation	Forecasted population growth rate
Equity ratio	Investments in tangible assets per capita	Inflation rate	Forecasted costs growth rate
Cash return on assets ratio	Annual mains/sewer replacement rate	Gross domestic product per capita	Forecasted revenues growth rate
Cost recovery I: Revenue structure	Non-revenue water by volume	Late payments ratio	Expected cost recovery
Cost recovery II: Subsidies	Proportion of energy costs	Tariff policy	Planned tariff adaptations
			Planned price adaptations

5.1.2. Scoring of the Indicators via adequate Scoring Intervals

Each indicator gets 1 to 5 points based on its contribution to financial sustainability (see Figure 4) . The challenge is to find appropriate intervals for each indicator to evaluate the input data X. The scoring intervals were created with respect to finance and rating literature[9] as well as already existing benchmarking results[10] for water and/or wastewater utilities. Further, european statistics[11] and discussions on cost recovery, water pricing and tariff designs[12] were used to define the scoring intervals.

Figure 4: Indicator Scoring based on their Financial Sustainability

SCORE	CONTRIBUTION TO FINANCIAL SUSTAINABILITY
5	very good
4	good
3	medium
2	acceptable
1	less acceptable

[9] See beside others Heesen/Gruber (2011): §5, The Saarbrücker Model in Küting/Weber (2009), Gräfer/Schneider (2010), Füser/Heidusch (2002). For further information on corporate finance as well as finacial reporting and analysis see Revsine et al. (2012), Ross et al. (2010).

[10] See beside others Lafferty/Lauer (2005); Landesregierung Nordrhein-Westfalen (2013); DWA (2011).

[11] See besides others Eurostat (2012a), (2012b), (2013).

[12] See also the TRUST report on 'Customer perspectives on new urban water services'.

As an example of the methodology, the indicator 'Cost Recovery I: Revenue Structure' from the category financial situation is presented in the following. As the fixed costs proportion of a network industry, especially the water and wastewater industry, is extremely high with around 80 % of the total costs, it is interesting to see whether the revenue structure mirrors this phenomena adequately. It is desirable that fixed costs correspond to the fixed income to ensure a sustainable cost recovery even in times of change (demography, climate, etc.). Consequently, variable revenues should correspond to the variable costs. The performance indicator 'Cost Recovery I: Revenue Structure' reflects the ratio between variable revenues and variable costs, regarding the water and/or wastewater service, at the end of the fiscal year.

$$Cost\ recovery\ I\text{: }Revenue\ Structure\ = \frac{Variable\ costs}{Total\ costs} - \frac{Variable\ revenues}{Service\ revenues}$$

The indicator should be measured against an ideal value of X ≥ 0 (see Table 3). Especially a value of X << 0 is alarming, because in this case the funding model extremely depends on variable, volumetric based revenues and thereby to a volatile factor. If revenues are highly depended on the actual consumption, factors as population decline and increased use of water saving technologies can cause a gap between costs and revenues. From a financial perspective a possible measure would be to revise the tariff structure. The impact on water demand, especially in countries which face water scarcity, has to be proved separately.

Table 3: Scoring Interval for the Performance Indicator "Cost Recovery I: Revenue Structure"

COST RECOVERY I: REVENUE STRUCTURE	SCORE
0 ≤ X	5
-0,15 ≤ X < 0	4
-0,3 ≤ X < -0,15	3
-0,45 ≤ X <-0,3	2
X <-0,45	1

5.1.3. Weighting of the Categories & Criteria

Weighting Methodology

The weighting was done via paired comparison in each category, for every relevant indicator. "In the method of paired comparisons objects are presented in pairs to one or more judges. [...] The basic experimental unit is the comparison of two objects A and B, by a single judge who, in the simplest situation, must choose one of them" (David (1988): 1). The method is especially characterized by its simplicity and comprehensibility of the weighting process. The subjectivity of results is a major critic point, but it can be overcome by using judgements of more experts.

To be more objective both task partners UNIBO and TUDO/IWW applied the method separately, and average weightings were feeded into the FSRT. The categories can be pairwise compared like this as well, but in the current version of the Tool, the influence of the categories on the overall score is equivalent. To weight the indidicator's importance on the overall objective financial sustainability, each combination of two indicators (1 and 2) in one category was evaluated via the following sheme (see Table 4).

Both partners filled their results in a weighting matrix (see Table 5) before the average was taken. Further, the weights were multiplied with the factor 10 for a better visualization of the results. In consequence the scale for each category reaches from 10 to 50 points and the overall scale from 100 to 500 points.

Table 4: Evaluation Options between two Indicators

EVALUATION	MEANING
4 – 0	indicator 1 is significantly more important than indicator 2
3 – 1	indicator 1 is more important than indicator 2
2 – 2	indicator 1 is as important as indicator 2
1 – 3	indicator 1 is less important than indicator 2
0 – 4	indicator 1 is significantly less important than indicator 2

Table 5: Example: Weighting Matrix for the Area Financial Situation

INDICATOR	#	1	2	3	4	5	POINTS	WEIGHT	FACTOR
Liquidity Indicator	1	\							
Equity ratio	2		\						
Cash return on assets ratio	3			\					
Cost recovery I: Revenue structure	4				\				
Cost recovery II: Subsidies	5					\			
Sum							40	100 %	10

Weighting Results

The weights resulting from the paired comparison as described above are presented in the following table.

Table 6: Weights for each relevant Indicator

FINANCIAL SITUATION	ASSET MANAGEMENT	BUSINESS ADMINISTRATION	FORECASTS
Liquidity indicator 1.25	Average mains/sewer age 2.38	Economic regulation 2.00	Forecasted population growth rate 1.67

Equity ratio 2.88	Investments in tangible assets per capita 2.25	Inflation rate 1.00	Forecasted costs growth rate 1.33
Cash return on assets ratio 3.38	Annual mains/sewer replacement rate 2.25	Gross domestic product per capita 1.5	Forecasted revenues growth rate 1.92
Cost recovery I: Revenue structure 1.50	Non-revenue water by volume 1.88	Late payments ratio 2.75	Expected cost recovery 1.17
Cost recovery II: Subsidies 1.00	Proportion of energy costs 1.25	Tariff policy 2.75	Planned tariff adaptations 2.42
			Planned price adaptations 1.50

5.1.4. Summary and Limitations

Summing up, the scoring model provides an aggregated quick insight into the utility's financial position. Figure 5 shows an overview of the FSRT including the scoring process.

However, the analysis of deviations usually stays in the task pane of a utility. The challenge here is to identify potential for the further development as well as to take and prioritize necessary improvement actions. These improvement actions can encompass an optimization of the existing technologies and working methods, or the implementation of new technologies and organizational solutions (see Cabrera et al. (2011): 96-97). If, as a result new target values for different performance indicators have to be set, the employees should be directly involved – on the one hand to ensure feasibility, and on the other hand to raise the employees' awareness of the objectives. But before selected improvement actions are presented in Section 3.3, the limitations of the tool should be discussed.

The main challenge of ratings is to break done a complex reality into a simple model. Due to the need for aggregation not all available data can be considered. Focusing on one special objective like financial sustainability offers the possibility for more depth, but makes it very

difficult to consider goal conflicts with other objectives (e.g. the influence of new tariff designs on water demand). Although, the rating results can indicate deviations from a solid financial position and show in which area in particular (financial situation, asset management, business operation, forecasts) they occur, the Tool cannot replace a detailed business analysis.

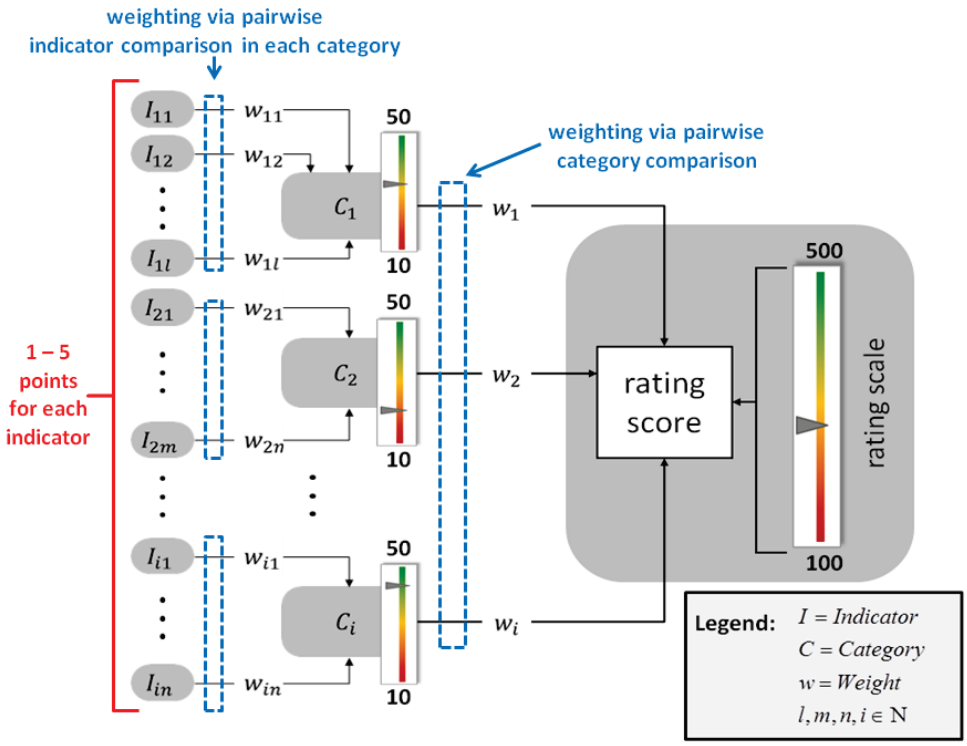

Figure 5: FSRT Overview including the Scoring Process[13]

Further, the rating results are not biuniquely, caused by subjectivity during development process. Other experts might choose different indicators and weights, which causes different results. The feasibility and usefulness of the results and recommendations must still be individually analyzed, partly due to poor comparability between the countries.

Next, the significance of the Tool is limited, because the rating offers merely a snapshot of the current financial sustainability of a utility. Over time comparisons are thus important to see the utility's development, as it is a dynamic process. From developer perspective periodically ratings make adjustments necessary (scoring intervals, etc.), but at the same time ratings have the benefit that these adjustments are normally done easily.

[13] Own illustration.

5.2. Application of the Tool

For each service the Tool considers 37 input variables, 14 inner calculations and 21 indicators with an actual scoring result (see an overview in Annex I). It is recommended to use the same reference date for all input variables particularly annual data.

As mentioned before, the tool is directed at utilities, which provide either only one of the two services or are able to split up the information and costs related to each service. Otherwise meaningful results cannot be achieved.

The accuracy of the input data is vital for the reliability of the results. Therefore, a user should note following instructions before applying the Online-Tool:

- Each question needs to be answered.
- It is important to obtain all necessary data.
- Not to hurry helps to avoid input errors caused by time pressure.
- To check the input variables carefully avoids input errors, too.
- Approximations should be avoided if possible, because it might distort the results.
-
- If any further questions arise, the user is able to give feedback to the Tool developers via the contact form.

5.3. Recommendations for Improvement Actions

The Tool encompasses 21 selected performance indicators, which help to analyse a utility's financial position. If the Tool detects deficits in one of the evaluated areas, specific recommendations help to take the first step to improve financial sustainability. For further information, the TRUST report "Options for sustainable financing of water infrastructure" is recommended.

Next, using the performance indicators for water and/or wastewater, published by the International Water Association (IWA), based on annual values allows a holistic perspective and analysis of the utility's development. Moreover, the comparison with other utilities is highly recommended. Benchmarking projects (national but in particular also transnational) offer an opportunity to see how the market has evolved, and where the company stands in comparison to others in the sector.

Beside these general recommendations selected improvement actions for each area are presented below:

Financial Situation

- Implementation or development of efficient cost type accounting, cost center accounting and product cost accounting under consideration of the current law and actual information needs within a utility.
- Awareness of the costs' ascertainability, structure, controllability and decision relevance.
- Development of efficient cost management systems.
- Identification of cost drivers and their optimization.
- Identification of cost reduction potential in favor of investments (e.g. in old infrastructure, new technologies and ecologic measures).
- Analysis of capital structure and increase in the equity ratio (e.g. recruiting new partners)

Asset Management

- Detection of inefficient investments, processes and measures.
- Dynamic identification and reporting of critical assets.
- Target network analysis or/and planning via simulation software considering both technical and financial asset data.
- Enhanced investments in renewal and replacement of old and/or critical tangible assets.
- Increased use of profitability calculations (e.g. Life Cycle Costing).
- Consideration of the Return on Investment (ROI) for improved investment planning.
- Implementation of cost-benefit analysis for outsourcing alternatives.
- Structured leakage detection and implementation of leakage reduction measures.
- Advanced energy saving measures (e.g. implementation of energy management systems or energy audits).

Business Administration

- Approximation of revenue structure to the actual cost structure to avoid lack of cost recovery (the fixed costs should be almost covered by fixed revenues).
- The use of cost transparency as driver for customers' price acceptance and willingness to pay.
- Analysis of the customers' payment behavior and reduction of late payments via enhanced customer contact as well as systematic and stringent collection procedures.
- Consideration of the inflation rate in the context of price adjustments.

Forecasts

- Early identification and consideration of future trends.

- Detailed analysis of cost development (e.g. rising energy costs).
- Detailed analysis of revenue development (e.g. demographic change, future water demand).
- Development of sustainable pricing strategies.

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ANNEX I

In the following table the performance indicators including their source, formula, unit and description are presented. Moreover, the defined scoring intervals for each relevant indicator can be taken from the table.

Context Information

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
1	**Country**	See IWA PI (CI1)	Scroll down selection	One single choice is valid	Scope of activity of the organisation as a whole.	None. Used to decide the currency, inflation rate and the gross domestic product.	
2	**Type of activity**	See IWA PI (CI2)	Check Box - water - wastewater - gas - electricity - garbage - other	Multiple choices are valid	Scope of activity of the organisation as a whole, beyond the water supply.	None. Used to decide which input fields show up: water only, wastewater only, water & wastewater.	
3	**Type of asset ownership**	IWA PI (CI3)	Scroll down selection - public - private - mixed	One single choice is valid	Ownership of the water supply infrastructure.	None.	
4a	**System input volume (water)**	IWA definition	Input data in m³	X > 0	The volume input to water supply system during the assessment period.	None. Used to calculate the proportion of the non-revenue water.	
4b	**System input volume (wastewater)**	compare IWA PI (wF1)	Input data in m³ -Total, thereof - domestic wastewater - commercial & industrial wastewater - storm water	X > 0 Plausibility check: domestic wastewater + commercial & industrial wastewater + storm water = Total system	Collected sewage, corresponding to the volume of domestic, commercial and industrial inputs to the sewer system plus storm water inputs, during the assessment period.	None.	
5a	**Mains length (w)**	IWA PI (C8)	Input data in km	X > 0	Total transmission and distribution mains length (service connections not included), at the reference date. Mains that are not yet in use or have been put out of service on a permanent basis shall not be accounted for.	None. Used for the annual mains replacement rate.	
5b	**Total sewer length (ww)**	IWA PI (wC1)	Input data in km: - Total, if not combined sewer thereof - storm sewer - domestic sewer	X > 0 Plausibility check: storm sewer + domestic sewer = Total	Total length of sewers managed by the undertaking at the reference date. Service connections excluded.	None. Used for the annual mains replacement rate.	
6a	**Residential population (w)**	IWA PI (E5)	Input data No.	X > 0	Total population who lives on a permanent basis in the area served by the water undertaking, at the reference date.	None. Used for unit investment.	
6b	**Residential population (ww)**	IWA PI (wE1)	Input data No.	X > 0	Total population living permanently in the area that is the responsibility of the wastewater undertaking, at the reference date.	None. Used for unit investment.	

Financial situation I

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
7a	**Total costs (w)**	IWA PI (G4)	Input data in Euro	X > 0	Total costs during assessment period, including capital and running costs, regarding the water supply service.	None. Used for the proportion of energy costs.	
7b	**Total costs (ww)**	IWA PI (wG5)	Input data in Euro	X > 0	Total costs, including capital and running costs, regarding the wastewater service, during the assessment period. Exchange rate of local currencies shall be referred to the end of the year.	None. Used for the proportion of energy costs.	
8a	**Fixed costs (w)**	Own, not in IWA/TRUST indicators yet	Input data in Euro	X > 0	Costs occurring regardless of the actual output quantity, regarding the water supply service, during the assessment period.	None. Used for plausibility check.	
8b	**Fixed costs (ww)**	Own, not in IWA/TRUST indicators yet	Input data in Euro	X > 0	Costs occurring regardless of the actual output quantity, regarding the wastewater service, during the assessment period.	None. Used for plausibility check.	
9a	**Variable costs (w)**	Own, not in IWA/TRUST indicators yet	Input data in Euro	X > 0 Plausibility check: Total costs - fixed costs = variable costs	Costs depending on the actual output quantity, regarding the water supply service, during the assessment period.	None. Used for cost recovery I: revenue structure.	
9b	**Variable costs (ww)**	Own, not in IWA/TRUST indicators yet	Input data in Euro	X > 0 Plausibility check: Total costs - fixed costs = variable costs	Costs depending on the actual output quantity, regarding the wastewater service, during the assessment period.	None. Used for cost recovery I: revenue structure.	
10a	**Total revenues (w)**	IWA PI (G1)	Input data in Euro	X > 0	Total operating revenues minus capitalised costs of self-constructed assets, regarding the water supply service, during the assessment period.	None. Used for cost recovery II: subsidies.	
10b	**Total revenues (ww)**	IWA PI (wG1)	Input data in Euro	X > 0	Total operating revenues minus capitalised costs of self-constructed assets , regarding the wastewater service, during the assessment period. Capitalised costs of self-constructed assets have more correctly to be intended not as revenue but as an economic correction of each type of cost to negative apportion. These capitalisations have consequently to be negative allocated even for the calculation of annual revenues.	None. Used for cost recovery II: subsidies.	
11a	**Sales revenues (w)**	IWA PI (G3)	Input data in Euro	X > 0	Operating revenues from sales during the assessment period, regarding the water supply service.	None. Used for cost recovery I: revenue structure.	
11b	**Service revenues (ww)**	IWA PI (wG3)	Input data in Euro	X > 0	Operating revenues from wastewater services, during the assessment period. Service revenues include domestic, commercial and industrial service revenues (see IWA PI (wFi2)).	None. Used for cost recovery I: revenue structure.	

Financial situation II

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
12a	**Fixed revenues (w)**	Own, not in IWA/TRUST indicators yet	Input data in Euro	X ≥ 0	Fixed revenues from sales (basic charges), regarding the water supply service, during the assessment period.	None. Used for plausibility check.	
12b	**Fixed revenues (ww)**	Own, not in IWA/TRUST indicators	Input data in Euro	X ≥ 0	Fixed revenues from wastewater charges (basic charges), during the assessment period.	None. Used for plausibility check.	
13a	**Variable revenues (w)**	Own, not in IWA/TRUST indicators yet	Input data in Euro	X ≥ 0 Plausibility check: Sales revenues - fixed revenues = variable revenues	Variable revenues from sales, depending on the actual consumption, regarding the water supply service, during the assessment period.	None. Used for cost recovery I: revenue structure.	
13b	**Variable revenues (ww)**	Own, not in IWA/TRUST indicators yet	Input data in Euro	X ≥ 0 Plausibility check: Sales revenues - fixed revenues = variable revenues	Variable revenues from wastewater services, depending on the actual wastewater production, during the assessment period.	None. Used for cost recovery I: revenue structure.	
14a	**Subsidies (w)**	Own, not in IWA/TRUST indicators yet	Input data in Euro	X ≥ 0	Total amount of subsidies, regarding the water supply service, at the end of the fiscal year.	None. Used for cost recovery II: subsidies.	
14b	**Subsidies (ww)**	Own, not in IWA/TRUST indicators yet	Input data in Euro	X ≥ 0	Total amount of subsidies, regarding the wastewater service, at the end of the fiscal year.	None. Used for cost recovery II: subsidies.	
15a	**Cash-flow (w)**	IWA PI (G45)	Input data in Euro	X ≥ 0	Total available is the sum of net income, depreciation and the net value of decrease or increase in working capital, regarding the water supply service, during the assessment period.	None. Used for cash return on assets ratio.	
15b	**Cash-flow (ww)**	IWA PI (wG41)	Input data in Euro	X ≥ 0	Total available is the sum of net income, depreciation and the net value of decrease or increase in working capital, regarding the wastewater service, during the assessment period.	None. Used for cash return on assets ratio.	
16a	**Current assets (w)**	IWA PI (G49)	Input data in Euro	X ≥ 0	Current assets include cash at bank and in hand, accounts receivable from drinking water, other accounts receivable, inventories and prepaid expenses, at the reference date, regarding the water supply service. When this variable refers to annual values, it should be assessed at the end of the fiscal year.	None. Used for liquidity indicator.	
16b	**Current assets (ww)**	IWA PI (wG45)	Input data in Euro	X ≥ 0	Current assets include cash at bank and in hand, accounts receivable from wastewater services, other accounts receivable, inventories and prepaid expenses, regarding the wastewater service, at the reference date. When this variable refers to annual values, it should be assessed at the end of the fiscal year.	None. Used for liquidity indicator.	

Financial situation III

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
17a	**Total assets (w)**	IWA PI (G50)	Input data in Euro	X > 0	Sum of intangible assets (including goodwill and net value of licenses and rights), tangible assets (including net value of water undertaking plants and net value of other assets), financial assets (including net value of financial investments) and current assets, regarding the water supply service, at the end of the fiscal year.	Non. Used for shareholders' equity.	
17b	**Total assets (ww)**	IWA PI (wG46)	Input data in Euro	X > 0	Sum of intangible assets (including goodwill and net value of licenses and rights), tangible assets (including net value of water undertaking plants and net value of other assets), financial assets (including net value of financial investments) and current assets, regarding the wastewater service, at the end of the fiscal year.	None. Used for shareholders' equity.	
18a	**Current liabilities (w)**	IWA PI (G53)	Input data in Euro	X ≥ 0	Current liabilities include accounts payable, current portion of long term debt and miscellaneous current liabilities, at the reference date, regarding the water supply service. When this variable refers to annual values, it should be assessed at the end of the fiscal year.	None. Used for total debt and liquidity indicator.	
18b	**Current liabilities (ww)**	IWA PI (wG49)	Input data in Euro	X ≥ 0	Current liabilities include accounts payable, current portion of long term debt and miscellaneous current liabilities, regarding the wastewater service, at the reference date. When this variable refers to annual values, it should be assessed at the end of the fiscal year.	None. Used for total debt and liquidity indicator.	
19a	**Long term liabilities (w)**	IWA PI (G52)	Input data in Euro	X ≥ 0	Sum of bonds and long term financial debts at the reference date, regarding the water supply service.	None. Used for total debt.	
19b	**Long term liabilities (ww)**	IWA PI (wG48)	Input data in Euro	X ≥ 0	Sum of bonds and long term financial debts at the end of the fiscal year, regarding the wastewater service.	None. Used for total debt.	
Ia	**Total debt (w)**	IWA PI (G47)	Current liabilities + Long term liabilities		Sum of long term liabilities (bonds and long term financial debts) and current liabilities, at the end of the fiscal year, regarding the water supply service.	None. Used for shareholders' equity.	
Ib	**Total debt (ww)**	IWA PI (wG43)	Current liabilities + Long term liabilities		Sum of long term liabilities (bonds and long term financial debts) and current liabilities, at the end of the fiscal year, regarding the wastewater service. Calculation: w G43 = wG48 + wG49	None. Used for shareholders' equity.	

Financial situation IV

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
IIa	**Liquidity indicator (w)**	IWA PI (Fi41)	(Current assets/Current liabilities)*100		Current ratio = Current assets/current liabilities, at the reference date. The ratio measures the short-run paying ability of the water undertaking. This indicator is assessed for a reference date.	X ≤ 80 % 80 < X ≤ 90 % 90 % < X ≤ 100 % 100 % < X ≤ 110 % 110 % < X ≤ 130 % 130 % < X ≤ 145 % 145 % < X ≤ 155 % 155 % < X ≤ 170 % 170 % < X	1 2 3 4 5 4 3 2 1
IIb	**Liquidity indicator (ww)**	IWA PI (wFi41)	(Current assets/Current liabilities)*100		Current ratio = Current assets/current liabilities, at the reference date. The ratio measures the short-run paying ability of the wastewater undertaking. This indicator is assessed for a reference date.	X ≤ 80 % 80 < X ≤ 90 % 90 % < X ≤ 100 % 100 % < X ≤ 110 % 110 % < X ≤ 130 % 130 % < X ≤ 145 % 145 % < X ≤ 155 % 155 % < X ≤ 170 % 170 % < X	1 2 3 4 5 4 3 2 1
IIIa	**Shareholders' equity (w)**	IWA PI (G48)	Total assets - Total debt		Surplus of the assets over the liabilities, at the end of the fiscal year, regarding the water supply service. Shareholders' equity includes subscribed share capital, capital reserves, other reserves and net income for the year.	None. Used for equity ratio.	
IIIb	**Shareholders' equity (ww)**	IWA PI (wG44)	Total assets - Total debt		Surplus of the asset over the liabilities , regarding the wastewater service, at the end of the fiscal year. Shareholders' equity includes subscribed share capital, capital reserves, other reserves and net income for the year.	None. Used for equity ratio.	
IVa	**Equity ratio (w)**	Not in IWA PI	(Shareholders' equity/ Total assets)*100		The equity ratio describes the ratio from the shareholders' equity on the total assets, regarding the water suppy service, during the assessment period.	X ≤ 12 % 12 % < X ≤ 26 % 26 % < X ≤ 40 % 40 % < X ≤ 55 % 55 % ≤ X	1 2 3 4 5
IVb	**Equity ratio (ww)**	Not in IWA PI	(Shareholders' equity/ Total assets)*100		The equity ratio describes the ratio from the shareholders' equity on the total assets, regarding the wastewater service, during the assessment period.	X ≤ 12 % 12 % < X ≤ 26 % 26 % < X ≤ 40 % 40 % < X ≤ 55 % 55 % ≤ X	1 2 3 4 5

Financial situation V

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
Va	**Cash return on assets ratio (w)**	Not in IWA PI	(Cash-flow/Total assets)*100		This performance indicator measures the cash return on the total assets, regarding the water supply service, during the assessment period.	X ≤ 3 % 3 % < X ≤ 7 % 7 % < X ≤ 11 % 11 % < X ≤ 15 % 15 % < X	1 2 3 4 5
Vb	**Cash return on assets ratio (ww)**	Not in IWA PI	(Cash-flow/Total assets)*100		This performance indicator measures the cash return on the total assets, regarding the wastewater service, during the assessment period.	X ≤ 3 % 3 % < X ≤ 7 % 7 % < X ≤ 11 % 11 % < X ≤ 15 % 15 % < X	1 2 3 4 5
VIa	**Cost recovery I: Revenue structure (w)**	own, not in IWA/TRUST indicators yet	Variable costs/Total costs - Variable revenues/Sales revenues		This performance indicator reflects the ratio between the variable revenues and thevariable costs, regarding the water supply service, at the end of the fiscal year.	The indicator should be measured against an ideal value of 1. Especially a value of x « 0 is alarming, because in this case the funding model extremely depends on variable, volumetric based revenues and thereby to a volatile factor. One possible measure would be to revise the tariff structure. 0 ≤ X -0,15 ≤ X < 0 -0,3 ≤ X < -0,15 -0,45 ≤ X <-0,3 X <-0,45	5 4 3 2 1
VIb	**Cost recovery I: Revenue structure (ww)**	own, not in IWA/TRUST indicators yet	Variable costs/Total costs - Variable revenues/Service revenues		This performance indicator reflects the ratio between the variable revenues and the variable costs, regarding the wastewater service, at the end of the fiscal year.	The indicator should be measured against an ideal value of 0. Especially a value of x « 0 is alarming, because in this case the funding model extremely depends on variable, volumetric based revenues and thereby to a volatile factor. One possible measure would be to revise the tariff structure. 0 ≤ X -0,15 ≤ X < 0 -0,3 ≤ X < -0,15 -0,45 ≤ X <-0,3 X <-0,45	5 4 3 2 1

Financial situation VI

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
VIIa	**Cost recovery II: Subsidies (w)**	Own, not in IWA/TRUST indicators yet	(Subsidies/Total Revenues)		The proportion of the total subsidies in the total revenues, regarding the water supply service, at the end of the fiscal year.	A sustainable company concept should favour to stand almost on its own, especially when the costs shall be adequately distributed among the polluters. The smaller the indicator, the more independent the company. 0 = X 0 < X ≤ 0,05 0,05 < X ≤ 0,10 0,10 < X ≤ 0,25 0,25 < X	 5 4 3 2 1
VIIb	**Cost recovery II: Subsidies (ww)**	Own, not in IWA/TRUST indicators yet	(Subsidies/Total Revenues)		The proportion of the total subsidies in the total revenues, regarding the water supply service, at the end of the fiscal year.	A sustainable company concept should favour to stand almost on its own, especially when the costs shall be adequately distributed among the polluters. The smaller the indicator, the more independent the company. 0 = X 0 < X ≤ 0,05 0,05 < X ≤ 0,10 0,10 < X ≤ 0,25 0,25 < X	 5 4 3 2 1

Asset Management I

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
20a	**Average mains age (w)**	IWA PI (CI53)	Input data in years	X > 0	Average mains age for the global water supply system based on the age of each main and its length.	X ≤ 30 30 < X ≤ 45 45 < X ≤ 60 60 < X ≤ 75 75 < X	5 4 3 2 1
20b	**Average sewer age (ww)**	Not in WW PI's, based on the definition for water supply (20a)	Input data in years	X > 0	Average sewer age for the global wastewater system based on the age of each sewer and its length.	X ≤ 40 40 < X ≤ 55 55 < X ≤ 70 70 < X ≤ 85 85 < X	5 4 3 2 1
21a	**Investments for asset replacement and renovation (w)**	IWA PI (G34)	Input data in Euro	X ≥ 0	Total cost of the investments related to the *replacement* and *renovation* of existing water supply assets ("like for like", i.e., maintaining the approximately the same functionality of existing infrastructure), including capitalised cost of self-construction [...], regarding the water supply service, during the assessment period.	None. Used for investments in tangible assets.	
21b	**Investments for asset replacement and renovation (ww)**	IWA PI (wG32)	Input data in Euro	X ≥ 0	Total cost of the investments related to the replacement and renovation of existing wastewater assets ("like for like", i.e., maintaining the approximately the same functionality of existing infrastructure), including capitalised cost of self-construction [...], regarding the wastewater services, during the assessment period.	None. Used for investments in tangible assets.	
22a	**Investments for new assets and reinforcement of existing assets (w)**	IWA PI (G33)	Input data in Euro	X ≥ 0	Total cost of the investment in tangible assets that constitute a new development for the service (new assets and *reinforcement* of existing assets), including capitalised cost of self-construction [...] regarding the water supply service, during the assessment period.	None. Used for investments in tangible assets.	
22b	**Investments for new assets and reinforcement of existing assets (ww)**	IWA PI (wG31)	Input data in Euro	X ≥ 0	Total cost of the investment in tangible assets that constitute a new development for the service (new assets and reinforcement of existing assets), including capitalised cost of self-construction [...] regarding the wastewater service, during the assessment period.	None. Used for investments in tangible assets.	

Asset Management II

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
VIIIa	**Investments in tangible assets (w)**	IWA PI (G32)	Investments for asset replacement and renovation + Investments for new assets and reinforcement of existing assets		Total costs of the investments in tangible (expenditures for plant and equipment), including capitalised cost of self-constructed assets, regarding the water supply service, during the assessment period.	None. Used for investments in tangible assets per capita.	
VIIIb	**Investments in tangible assets (ww)**	IWA PI (wG30)	Investments for asset replacement and renovation + Investments for new assets and reinforcement of existing assets		Total costs of the investments in tangible (expenditures for sewers, treatment plants and equipment), including capitalised cost of self-constructed assets, regarding the wastewater service, during the assessment period.	None. Used for investments in tangible assets per capita.	
IXa	**Investments in tangible assets per capita (w)**	analogical to IWA PI (F27)	Investments in tangible assets / Residential population Euro per capita		This indicator describes the investments in tangible assets per inhabitant in the supply area.	X < 5 5 ≤ X < 10 10 ≤ X < 15 15 ≤ X < 20 20 ≤ X	1 2 3 4 5
IXb	**Investments in tangible assets per capita (ww)**	analogical to IWA PI (F27)	Investments in tangible assets / Residential population Euro per capita		This indicator describes the investments in tangible assets per inhabitant in the service area.	X < 10 10 ≤ X < 25 25 ≤ X < 40 40 ≤ X < 55 55 ≤ X	1 2 3 4 5

Asset Management III

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
23a	**Mains replacement**	IWA PI (D22)	Input data in km	X ≥ 0	Mains length replaced during the assessment period.	Non. Used for annual mains replacement.	
23b	**Sewer replacement (ww)**	IWA PI (wD27)	Input data in km	X ≥ 0	Length of replaced sewer, regarding the wastewater service, during the assessment period.	Non. Used for annual sewer replacement.	
Xa	**Annual mains replacement rate (w)**	IWA PI (Op18)	(Mains replacement/Mains length)		Annual rate of mains replacement, regarding the water supply service.	X ≤ 0.005 0.005< X ≤ 0.01 0.01 < X ≤ 0.015 0.015 < X ≤ 0.02 0.02 < X	1 2 3 4 5
Xb	**Annual sewer replacement rate (ww)**	IWA PI (wOp23)	(Sewer replacement/Total sewer length)		Annual rate of sewer replacement, regarding the wastewater service.	X ≤ 0.005 0.005< X ≤ 0.01 0.01 < X ≤ 0.015 0.015 < X ≤ 0.02 0.02 < X	1 2 3 4 5
24	**Non-revenue water (w)**	IWA PI (A21)	Input data in m³	X ≥ 0	Difference between the system input volume and the billed authorised consumption (including exported water) during the assessment period. Non-revenue water includes not only the real and apparent losses but also the unbilled authorised consumption.	Non. Used for non-revenue water by volume.	
XI	**Non-revenue water by volume (w)**	IWA PI (Fi46)	(Non-revenue water/System input volume)*100		The proportion of the non-revenue water in the total water, at the end of the fiscal year.	X ≤ 0.025 0.025 < X ≤ 0.05 0.05 < X ≤ 0.10 0.10 < X ≤ 0.20 0.20 < X	5 4 3 2 1

Asset Management IV

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
25a	**Energy costs (w)**	IWA PI (G11)	Input data in Euro	X > 0	Total costs of energy (including energy for pumping and other water supply undertaking activities, such as workshops, office building energy consumption, laboratories, etc.), within the period of assessment, regarding the water supply service. This variable includes not only the component proportional to the energy consumption but all the other components of energy costs, such as power tariffs and taxes.	Non. Used for the proportion of energy costs.	
25b	**Energy costs (ww)**	IWA PI (wG11)	Input data in Euro	X > 0	Total costs of energy regarding the wastewater service, within the period of assessment, regarding the wastewater service. This variable includes not only the component proportional to the energy consumption but all the other components of energy costs, such as power tariffs and taxes.	Non. Used for the proportion of energy costs.	
XIIa	**Proportion of energy costs (w)**	Own, not in IWA /TRUST indicators yet	(Electrical energy costs/Total costs)		The proportion of the electrical energy costs in the total costs, regarding the water supply service, at the end of the fiscal year.	X ≤ 0.10 0.10 < X ≤ 0.20 0.20 < X ≤ 0.30 0.30 < X ≤ 0.40 0.40 < X	5 4 3 2 1
XIIb	**Proportion of energy costs (ww)**	Own, not in IWA /TRUST indicators yet	(Electrical energy costs/Total costs)		The proportion of the electrical energy costs in the total costs, regarding the wastewater service, at the end of the fiscal year.	X ≤ 0.10 0.10 < X ≤ 0.20 0.20 < X ≤ 0.30 0.30 < X ≤ 0.40 0.40 < X	5 4 3 2 1

Business Administration I

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
26a	**Economic regulation (w)**	Own, not in IWA /TRUST indicators yet See IWA 'Regulation of Water and Wastewater Services'	Checkbox: - yes, price cap - yes, revenue cap - yes, yardstick competition - yes, other - no	Multiple choices are valid.	The type of economic regulation in the country, regarding the water supply service.	yes no	5 1
26b	**Economic regulation (ww)**	Own, not in IWA /TRUST indicators yet See IWA 'Regulation of Water and Wastewater Services'	Checkbox: - yes, price cap - yes, revenue cap - yes, yardstick competition - yes, other - no	Multiple choices are valid.	The type of economic regulation in the country, regarding the wastewater service.	yes no	5 1
27	**Inflation rate**	Eurostat yearbook 2012	Input data in %		Average annual inflation rate, within the period of assessment. Eurostat: The inflation rate [...] is calculated as the rate of change of the all-items harmonised index of consumer prices. IWA PI for wastewater services description (p.102, no code): Annual percentage change in consumer price index in the country.	Those countries with relatively stable and low inflation rates tend to display an appreciation in their currencies, as their purchasing power increases relative to other currencies, whereas higher inflation typically leads to a depreciation of the local currency (EU average march 2013: 1,9 %, see Eurostat April 2013) X ≤ 0,5 % 0,5 % < X ≤ 1,5 % 1,5 % < X ≤ 2,5 % 2,5 % < X ≤ 3,5 % 3,5 % < X	5 4 3 2 1
28	**Gross domestic product per capita (GDPPC)**	IWA PI (CI 82), GDPPC (TRUST), Eurostat yearbook 2012	Countries' volume indices of GDP per capita (Index EU27 average = 100)		Gross domestic product (GDP) is the most frequently used measure for the overall size of an economy, while derived indicators such as GDP per capita – for example, in euro or adjusted for differences in price levels – are widely used for a comparison of living standards, or to monitor the process of convergence across the European Union (EU).	Measure via Eurostat, Index: EU27 average = 100. X < 75 75 ≤ X < 100 100 ≤ X < 125 125 ≤ X < 150 150 ≤ X	1 2 3 4 5

Business Administration II

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
29a	**Annual debt from customers (w)**	IWA PI (G43)	Input data in Euro	X ≥ 0	The annual debt from customers, regarding the water supply service, is the difference between the *annual amount billed during the year* (G44) and *the water sales revenue for direct consumption* (G36) as well as *exported water* (G37).	None. Used for late payments ratio.	
29b	**Annual debt from customers (ww)**	IWA PI (wG39)	Input data in Euro	X ≥ 0	The annual debt from customers, regarding the wastewater service.	None. Used for late payments ratio.	
30a	**Annual amount billed during the year (w)**	IWA PI (G44)	Input data in Euro	X > 0	Annual amount billed during the year, regarding the water supply service. This variable refers to annual values.	None. Used for late payments ratio.	
30b	**Annual amount billed during the year (ww)**	IWA PI (wG40)	Input data in Euro	X > 0	Annual amount billed during the year, regarding the wastewater service. This variable refers to annual values.	None. Used for late payments ratio.	
XIIIa	**Late payments ratio (w)**	IWA PI (Fi37)	[1- (Annual debt from customers/Amount billed during the year)]		This indicator must be assessed on an annual basis	X ≤ 0.65 0.65 < X ≤ 0.75 0.75 < X ≤ 0.85 0.85 < X ≤ 0.95 0.95 < X	1 2 3 4 5
XIIIb	**Late payments ratio (ww)**	IWA PI (wFi37)	[1- (Annual debt from customers/Amount billed during the year)]		This indicator must be assessed on an annual basis	X ≤ 0.65 0.65 < X ≤ 0.75 0.75 < X ≤ 0.85 0.85 < X ≤ 0.95 0.95 < X	1 2 3 4 5

Business Administration III

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
31a	**Tariff policy (w)**	Own, not in IWA /TRUST indicators yet	Scroll down selection: - volume charge - flat-rate - two components tariffs (fixed charge & volume charge) - various types of tariffs are offered (leads to optional question)	One single choice is valid. If "various types" -> go to 32.	The tariff structure for households, regarding the water supply service. The flat-rate model is characterised by customers paying only a fixed monthly or annual fee, regardless of the amount of water consumed. In the case of pure volume charges, the end-consumer's bill is the price per unit of water, e.g. in cubic metre, times the quantity of the individual water consumption. Under the two-part tariff model, the consumer has to pay a fixed charge plus a variable charge.	pure volumetric charges two components tariff flat-rate	1 3 5
31b	**Tariff policy (ww)**	Own, not in IWA /TRUST indicators yet	Scroll down selection: 1) - volume charge - flat-rate - two components tariffs (fixed charge & volume charge) - various types of tariffs are offered (leads to optional question) 2) based on - only the used drinking water - the consumption of drinking water and a storm water component	One single choice each (1 and 2) is valid. If "various types" -> go to 32.	The tariff structure for households, regarding the wastewater service. The flat-rate model is characterised by customers paying only a fixed monthly or annual fee, regardless of the actual amount of wastewater produced. In the case of pure volume charges, the end-consumer's bill is the price per unit of wastewater, e.g. in cubic metre, times the quantity of the individual water consumption. Under the two-part tariff model, the consumer has to pay a fixed charge plus a variable charge.	pure volumetric charges two components tariff flat-rate + only drinking water drinking water and storm water	1 3 4 + 0 1
32a	**Tariff policy (optional) (w)**	Own, not in IWA /TRUST indicators yet	% of the population supplied - volume charge - flat-rate - two components tariffs (fixed charge & volume charge)	X ≥ 0 Plausibility check: volume charge + flat-rate + two components tariff + others = 100 %	Optional input data, if the utility offers different types of tariffs. Percentage of the supplied population per tariff model.	X = % of people supplied with pure volume tariffs X = 0 0 < X ≤ 5 5 < X ≤ 10 10 < X ≤ 20 20 < X	5 4 3 2 1
32b	**Tariff policy (optional) (ww)**	Own, not in IWA /TRUST indicators yet	% of the population supplied - volume charge - flat-rate - two components tariffs (fixed charge & volume charge)	X ≥ 0 Plausibility check: volume charge + flat-rate + two components tariff + others = 100 %	Optional input data, if the utility offers different types of tariffs. Percentage of the connected population per tariff model.	X = % of people supplied with pure volume tariffs X = 0 0 < X ≤ 5 5 < X ≤ 10 10 < X ≤ 20 20 < X	5 4 3 2 1

Forecasts I

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
33	**Forecasted population growth rate (w & ww)**	IWA PI (CI81)	Input data in (- / +) % per year	X ≥ 0 and X ≤ 0	Forecasted average annual population growth rate for the future ten years.	X < - 0.05 - 0.05 ≤ X < 0 0 ≤ X < 0.025 0.025 ≤ X < 0.05 0.05 ≤ X	1 2 3 4 5
34a	**Forecasted costs growth rate (w)**	Own, not in IWA/TRUST indicators yet	Input data in (- / +) % per year	X ≥ 0 and X ≤ 0	Forecasted average annual costs growth rate regarding the water supply service for the future ten years, i.e. due to climate change, new treatment methods or expected increasing energy costs .	X < - 0.025 - 0.025 ≤ X < 0 0 ≤ X < 0.025 0.025 ≤ X < 0.05 0.05 ≤ X	5 4 3 2 1
34b	**Forecasted costs growth rate (ww)**	Own, not in IWA/TRUST indicators yet	Input data in (- / +) % per year	X ≥ 0 and X ≤ 0	Forecasted average annual costs growth rate regarding the wastewater service for the future ten years, i.e. due to climate change, new treatment methods or expected increasing energy costs .	X < - 0.025 - 0.025 ≤ X < 0 0 ≤ X < 0.025 0.025 ≤ X < 0.05 0.05 ≤ X	5 4 3 2 1
35a	**Forecasted revenues growth rate (w)**	Own, not in IWA/TRUST indicators yet	Input data in (- / +) % per year	X ≥ 0 and X ≤ 0	Forecasted average annual (total) revenues growth rate regarding the water supply service for the future ten years, i.e. due to price raises.	X < - 0.025 - 0.025 ≤ X < 0 0 ≤ X < 0.025 0.025 ≤ X < 0.05 0.05 ≤ X	1 2 3 4 5
35b	**Forecasted revenues growth rate (ww)**	Own, not in IWA/TRUST indicators yet	Input data in (- / +) % per year	X ≥ 0 and X ≤ 0	Forecasted average annual (total) revenues growth rate regarding the wastewater service for the future ten years, i.e. due to price raises .	X < - 0.025 - 0.025 ≤ X < 0 0 ≤ X < 0.025 0.025 ≤ X < 0.05 0.05 ≤ X	1 2 3 4 5
XIVa	**Expected cost recovery (w)**	Own, not in IWA/TRUST indicators yet	Total costs * (1+ Forecasted costs growth rate)^10 -Total revenues* (1+ Forecasted revenues growth rate)^10		Forecasted total costs minus forecasted total revenues, regarding the water supply service.	X > 0 X = 0 X < 0	5 3 1
XIVb	**Expected cost recovery (ww)**	Own, not in IWA/TRUST indicators yet	Total costs * (1+Forecasted costs growth rate))^10 -Total revenues* (1+ Forecasted revenues growth rate)^10		Forecasted total costs minus forecasted total revenues, regarding the wastewater service.	X > 0 X = 0 X < 0	5 3 1

Forecasts II

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
36a	**Planned tariff adaptations (w)**	Own, not in IWA/TRUST indicators yet	Checkbox: Change of the tariff structure into: - volumetric charge - flat-rate - two components tariffs (fixed charge & volumetric charge) - no adaptations planned In case of volumetric charges: - constant - increasing - declining block tariff	Multiple choices are valid.	Planned tariff adaptations for the future ten years, regarding the water supply service.	now volumetric charges **OR** volumetric charges before and no adaptations now two components **OR** two components before and no adaptations now flat-rate **OR** flat-rate before and no adaptations	1 3 5
36b	**Planned tariff adaptations (ww)**	Own, not in IWA/TRUST indicators yet	Checkbox: Change of the tariff structure into: - volumetric charge - flat-rate - two components tariffs (fixed charge & volumetric charge) - no adaptations planned In case of volumetric charges: - constant - increasing - declining block tariff	Multiple choices are valid.	Planned tariff adaptations for the future ten years, regarding the wastewater service.	now volumetric charges **OR** volumetric charges before and no adaptations now two components **OR** two components before and no adaptations now flat-rate **OR** flat-rate before and no adaptations	1 3 5

Forecasts III

No.	Performance Indicator	Source	Formula/Unit/Selection	Valid Value	Description	Scoring	Score
37a	**Planned price adaptations**	Own, not in IWA/TRUST indicators yet	Checkbox depending on the answer in 36a) - - - - - - - - - - - - - - - - - - - **flatrate and two components tariffs:** - increasing fixed prices - decreasing fixed prices - no adaptations of the fixed prices planned - - - - - - - - - - - - - - - - - - - **volumetric charges and two components tariffs:** - increasing volumetric prices - decreasing volumetric prices - no adaptations of the volumetric charges planned	Multiple choices are valid.	Planned price adaptations for the future ten years, regarding the water supply service.	**<u>two components tariffs</u>** stable fixed and volumetric prices **OR** decreasing fixed & stable volumetric prices **OR** stable fixed prices & decreasing vol. prices decreasing fixed & increasing vol. prices **OR** stable fixed prices & decreasing vol. prices decreasing fixed & decreasing vol. prices increasing fixed & increasing vol. prices **OR** increasing fixed &stable vol. prices increasing fixed & decreasing volumetric **<u>volumetric charges</u>** increasing (5), decreasing (1), no adaptations (2) **<u>flat-rate</u>** increasing (5), decreasing (1), no adaptations (2)	 1 2 3 4 5 5,1,2 5,1,2
37b	**Planned price adaptations**	Own, not in IWA/TRUST indicators yet	Checkbox depending on the answer in 36a) - - - - - - - - - - - - - - - - - - - **flatrate and two components tariffs:** - increasing fixed prices - decreasing fixed prices - no adaptations of the fixed prices planned - - - - - - - - - - - - - - - - - - - **volumetric charges and two components tariffs:** - increasing volumetric prices - decreasing volumetric prices - no adaptations of the volumetric charges	Multiple choices are valid.	Planned price adaptations for the future ten years, regarding the wastewater service.	**<u>two components tariffs</u>** stable fixed and volumetric prices **OR** decreasing fixed & stable volumetric prices **OR** stable fixed prices & decreasing vol. prices decreasing fixed & increasing vol. prices **OR** stable fixed prices & decreasing vol. prices decreasing fixed & decreasing vol. prices increasing fixed & increasing vol. prices **OR** increasing fixed &stable vol. prices increasing fixed & decreasing volumetric **<u>volumetric charges</u>** increasing (5), decreasing (1), no adaptations (2) **<u>flat-rate</u>** increasing (5), decreasing (1), no adaptations (2)	 1 2 3 4 5 5,1,2 5,1,2

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