



European
Commission

Environment

Catalogue of challenges

Work Package 6

*Ex post evaluation of Cohesion Policy programmes
2007-2013, focusing on the European Regional
Development Fund (ERDF) and the Cohesion Fund (CF)*

Contract: 2014CE16BAT043

*DATE:
October 2015*

*Submitted by:
COWI, CSIL, Milieu*

(Inside front cover)

EUROPEAN COMMISSION

Directorate-General for Regional and Urban Policy
Directorate B - Policy
Unit B.2 Evaluation and European Semester

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Ex post evaluation of Cohesion Policy Programmes 2007-2013 Co-Financed by the ERDF/CF. Work Package 6: Environment

Catalogue of challenges

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October – 2015



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List of abbreviations

CF	Cohesion Fund
EBRD	European Bank for Reconstruction and Development
ERDF	European Regional Development Fund
EU	European Union
IFI	International Financing Institutions



1 Introduction

This is the catalogue of challenges produced under the project "Ex post Evaluation of Cohesion Policy Programmes 2007-2013" Co-Financed by the ERDF / CF. Work Package 6: Environment.

1.1 The evaluation study

The study aims to analyse the progress and achievements of Cohesion Policy in selected areas of environment related infrastructure: drinking water, wastewater treatment, and solid waste management. Special emphasis is given to the financial sustainability of investments, which is examined through a desk study of 20 'major projects' and 10 case studies with site visits. The project includes seven tasks:

- **Task 1: Summary of achievements.** This task provides an analysis of the achievements of Cohesion Policy to meeting the requirements of the *aquis communautaire* in the fields of drinking water supply, wastewater treatment, and solid waste management and treatment.
- **Task 2: Review financial analysis.** This task reviewed the ex-ante financial analysis of 20 selected projects. The results of the task were documented in the first interim report. This forms an important basis for the identification of problems for the catalogue of challenges provided with this report.
- **Task 3: Verifying assumptions.** This task focused on comparing planned and actual values (for key indicators in the financial analysis) for 11 operational projects out of the 20 selected projects. The results were documented in the second interim report. This helped to further qualify the assessment of the financial analyses conducted and thus provided additional insights into the problems described in the catalogue of challenges.
- **Task 4: Case studies.** This task includes case studies of ten out of the 20 selected projects looking into their actual implementation, their effectiveness and relevance as well as key issues in relation to financial sustainability. The projects studied comprised seven operational projects and three projects under implementation. The case studies comprised two pilot studies documented in the second interim report, whereas the remaining eight case studies were documented in a separate report. The case studies, together with the desk studies of 20 projects, comprise the background against which the catalogue of challenges is produced.
- **Task 5: Catalogue of challenges.** This task is documented in this report and provides an overview of the most common problems encountered in financial analysis and solutions to avoid them.
- **Task 6: Seminar.** This task will gather relevant stakeholders from the Member States, IFIs and the Commission to discuss and deepen the analysis of emerging findings. The seminar is scheduled for 8 October 2015. Conclusions from the



seminar will be incorporated into the catalogue of challenges. A discussion paper highlighting main findings and questions to the seminar participants will be prepared and distributed in advance of the seminar along with this report.

- **Task 7: Final report.** This task will summarise the evaluation in a report. The draft final version of this report is due on 10 November 2015. This catalogue of challenges will form part of the final report.

1.2 The catalogue of challenges – purpose, scope and methodology

1.2.1 Purpose

The catalogue of challenges summarises the most common problems encountered in financial analysis of environmental infrastructure projects co-financed by Cohesion Policy programmes with the aim to provide guidance on how to avoid similar problems in the future. In order to assist prioritisation of problem mitigation efforts, the report assesses not only the identified problems and possible solutions, but also the likely impact of the problem on financial sustainability.

1.2.2 Methodology

The catalogue of challenges is based on our findings with respect to financial analysis of the 20 desk case studies and ten field case studies. The identified challenges may have implications for the projects or for the financial sustainability of the service provider or both. The report mentions the (potential) consequences of the challenges identified. The challenges discussed are linked to the individual projects as shown in the table in Appendix A. Where relevant, examples are briefly mentioned in the text as well. It should be noted that since the basis for identifying the problems is an analysis of 20 out of 184 major projects, it cannot be ruled out that additional issues could be identified if looking at a broader selection of projects – or identified problems could turn out to be less common than indicated by the relatively small population analysed. Out of the 20 projects, 15 are water / wastewater projects and five are waste management projects. This split is fairly representative of the entire population, however, five waste management projects is a limited base for drawing general conclusions about 'common problems'.

1.2.3 Financial sustainability

A project is financially sustainable if cumulated total cash flows are non-negative in each year of the project's lifetime. The application form template for 'major projects' requires financial sustainability to be demonstrated.

Financial sustainability is intimately linked to efficient operations and an appropriate charging system capable to recover fully the costs to operate the water and waste services. It is important to note that both sides of this "expenditures and revenues equation" are equally important.



For a number of reasons there has traditionally been a focus on the revenue side (or the appropriate charging system). The rationale for the appropriate charging system has repeatedly been explained by the Commission, for example in this comment to a recent Audit:

"The Commission considers that an appropriate charging system is not only important from the point of view of the ERDF contribution, but also desirable for the financial sustainability of the operation in the long run"¹

Ultimately, financial sustainability has implications for the effective and sustainable operation of the environmental infrastructure, which again means that achievement of environmental policy objectives (waste water and waste management) could be at risk.

1.2.4 Eleven problems in five clusters

The catalogue presents 11 problems. These problems may be characterised as belonging to five main clusters or types of challenges:

- **Challenges that result from the implementation EU directives and regulations** (Problem 1 "Project versus company approach" and Problem 2 "EU grant calculation incentives")
- **Issues of capacity, commitment and involvement** may have major consequences for financial sustainability. This is discussed in Problem 3 "Lack of a financially strong and technically competent contractor" and Problem 4 "Non-involvement of the Beneficiary in project design".
- **Issues related to assumptions** used in project preparation, in particular in relation to demand analysis (Problem 5 "Planned versus actual wastewater discharge" and Problem 6 "Planned versus actual amounts of solid waste")
- **Consequences for financial sustainability of "optimism bias"** in the planning of infrastructure investments². Project implementation delays results in problems as described in Problem 7 "Cash flow management in "major projects" and in Problem 8 "Project implementation delays".

¹ European Court of Auditors 2015 No. 02: "EU Funding of urban wastewater treatment plants in the Danube River Basin: Further efforts needed in helping Member States to achieve EU waste water policy objectives" The quote below is from the Commissions response to paragraph 98.

² There is an extensive literature on how and why costs are underestimated in large investment projects, see for example: "Underestimating Costs in Public Works Projects: Error or Lie?" Bent Flyvbjerg et al in *Journal of the American Planning Association* , vol. 68, no. 3, Summer 2002, pp. 279-295. Similar mechanisms are likely to be at play in "major projects" destined for EU co-funding although here the incentives are strong for underestimating the project implementation period and not very strong for underestimating costs.



- **Are service levels affordable?** Affordability and financial sustainability are objectives that may be in conflict. Some consequences of this contradiction shows up in Problem 9 "Is average household incomes a good indicator for vulnerable groups?" in Problem 10 "Exceeding the affordability threshold and a subsidy mechanism" and in Problem 11 "Tariffs are not increased as per plans in the Application form"

One may consider these five generic groups as overall warning signals for reviewers of financial analysis. In addition to this, specific warning signals for each problem are indicated, where this is appropriate.

1.3 Structure of the catalogue

Chapter 2 presents each 'common problem' according to a standard table of contents:

- Description in non-technical terms
 - > Sector(s) of common problem (water, wastewater, waste)
 - > Project phase of common problem (in project cycle)
 - > Type of common problem (e.g. institutional, technical or demand related)
- Assessment and rating of likely impact on financial performance and financial sustainability
- 'Owner(s)' of risk related to a common problem
- Warning signs for project reviewers
- Good practice actions to mitigate scope of common problem (what should be done differently to avoid problems).



2 Issues in relation to financial sustainability – and what to do about it

In this chapter, we have categorised the most common problems encountered in the financial analysis and good practice actions to avoid or mitigate such problems. We present 11 problems and possible mitigation actions below. The problems presented are “common” both in the sense that they occur in several of the projects analysed and in the sense that they are found in each of the sectors (water supply, waste water and solid waste management). The order does not express a ranking. However, the first problem stated below is the most important of the identified problems.

2.1 Problem 1: Project versus company approach for financial sustainability

2.1.1 Brief description

The vast majority of “major” water projects include both rehabilitation and replacement of existing assets and extension of the service areas or capacity. Such projects are add-ons within an existing water company structure. However, in accordance with the Commission guidelines³, the 'major projects' are assessed based on an incremental approach. This constitutes a major deficiency for the assessment of financial sustainability of the operating company and the services provided.

The Beneficiary may be a water company or the Municipality who owns the assets, but it is the incumbent water company who operates the assets – on e.g. a lease or management contract, who may experience financial sustainability problems. The Application from the Beneficiary focuses on project financial sustainability issues whereas the existing water company in its daily operations focuses on company financial sustainability – and not on project financial sustainability.

When a project falls within an already existing infrastructure, such as rehabilitation of assets or capacity extension, there is a need for assessing the financial sustainability in the overall scenario “with the project” rather than that of the single extended segment. The focus in the Application is on the grant calculation and on project financial sustainability. This is also the recommendation in the new 2014 CBA guidelines.

A company approach to sustainability, which is not taken in the present applications, will evaluate whether, not only the project, but also the water operator will run out of cash, or possibly experience negative cash flows. This is particularly relevant in the

³ For example, DG Regio (2008): “Guide to Cost-Benefit Analysis of Investment Projects”. Bruxelles, July 2008



case of infrastructure that has previously suffered from severe underfunding and deterioration of existing assets.

It must be stressed that a financial analysis at the project level can only measure the effect of a project on the infrastructure owner. That is, a financially instable or weak project can be managed by a financially strong operator/owner, which can absorb temporary losses in operating part of the assets if the company can make surpluses in the operation of the other assets. Vice-versa, even good projects might be disrupted by bankruptcy of its owner if the company are not able to generate sufficient cash to sustain its operations. A related point is that it may be difficult to separately analyse the finances of a particular part of a system, which a project often is, from the finances of the system as a whole if the project is affected by what happens in other parts of the system.

This is why long-term financial sustainability is best analysed at the company level, and not at the project level. However, a company financial sustainability analysis together with the project analysis was not included among the 20 projects reviewed as part of this evaluation.

When a marginal approach to sustainability is taken, it severely reduces the predictive power of whether the utility and the service it provides will be negatively affected by financial sustainability issues. However, this is mainly an issue related to the guidance given by the Commission rather than an issue related to the application forms and their documentation⁴.

The Cost Benefit Analysis guide 2014-2020 has corrected the problem and specifically requires an analysis of sustainability in the "with the project" scenario⁵.

- Sector(s) of common problem (water, wastewater, waste)

The common problem is primarily relevant within the water and wastewater sector because many of the projects are add-ons or rehabilitation of existing infrastructure assets (all reviewed water projects belonged to this group). In solid waste, more often the investment in disposal and treatment facilities (landfill, incineration or recycle facilities) is a "green field" investment and the service provider for collection may be different from the operator of the disposal / treatment facility. However, in some cases the same issue is found in the solid waste sector.

- Project phase of common problem (in project cycle)

⁴ The guidance does not in any way exclude that the project assessment is complemented by an assessment of financial viability of the company. However, the 2008 guidance is ambiguous and does not provide a prescription in favor of a company wide analysis.

⁵ See "Guide to Cost Benefit Analysis of Investment Projects. Economic Appraisal Tool for Cohesion Policy 2014-2020"
http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/cba_guide.pdf accessed September 16, 2015



The common problem is identified in the planning phase but the financial sustainability problem may arise during the operational period if the water company does not receive sufficient revenues to support its operations.

- Type of common problem (e.g. institutional, technical or demand related)

This is an institutional problem, as the issue of company financial sustainability is not properly addressed in the Application.

2.1.2 Assessment and rating of likely impact on financial performance and financial sustainability

The rating of the likely impact is difficult to assess as it depends upon the financial robustness of the incumbent water company as well as the financial sustainability of the project. However, it can be a very serious problem for financial sustainability if the incumbent water operator is having financial problems – experiencing high operating costs and is restricted in increasing water tariffs because of affordability reasons or social issues.

2.1.3 'Owner(s)' of risk related to a common problem

The risk related to the common problem are borne by the incumbent water operator and subsequently the owner of the infrastructure assets. Eventually the water consumers and / or the environment may face the consequences⁶.

2.1.4 Warning signs for project reviewers

If there is no assessment of the incumbent water operator's overall financial performance, the project reviewer will not be able to assess whether the water company will be financial sustainable in the long run after implementing the project. Hence as a minimum, the project reviewer should look for the overall financial performance of the operating company in the submitted documents. Even that may be insufficient, as the level (and thus the costs) of appropriate maintenance and replacement of assets may not be reflected in the accounts.

2.1.5 Good practice actions to mitigate scope of common problem

The possible action to mitigate the problem will be to put in place a sound system whereby the Application shall include information on key financial statistics of the incumbent water company prior to implementing the project and the anticipated financial situation after implementing the project.

⁶ If sewer lines are not maintained and/or a treatment plant is not properly operated due to lack of funds, this impacts on the environment and, hence eventually, the policy objectives are not met.



If the water operator is not in a sound financial position prior to implementing the 'major project', actions should be outlined in the Application or in the Feasibility Study on how to remedy the financial problems as part of a risk management strategy.

At least, the water company shall provide evidence of key financial statistics such as annual net profit, operating margin, collection efficiency, equity, debts over a reporting period of 5 years, etc. in order to give the reviewer more elements to assess the financial sustainability at the company level. The Beneficiary should report on these indices before and after project implementation.

Furthermore, reviewers should consider to assess whether the level of reinvestments are appropriate to maintain the functionality of the system including networks and installations. Ideally, such information should be available from the company's asset management system. In reality, few companies have a complete and up-to-date overview of their assets, let alone a system for preventive maintenance and replacements. In practice, one may have to rely on a simple benchmark such as the ratio of investments to water sold⁷.

⁷ Such a ratio can only be approximate as it depends on a range of factors including density of network, soil conditions, etc. The ratio also depends on the purchasing power of the currency. For example, for Denmark a reasonable ratio would be approximately 3 EUR/m³ for a company that covers both water supply and wastewater. Considering purchasing power parity issues this could translate into a range of 1.50 EUR/m³ up to 3.00 EUR/m³ depending on the country in question. The reader will notice that in many EU countries the combined price of water and wastewater services is lower than these values for "reasonable maintenance" providing yet another indication that underinvestments in asset maintenance is an EU wide problem in the water and wastewater sector.



2.2 Problem 2: EU grant calculation (dis)incentives

2.2.1 Description

It is observed that Beneficiaries are using different thresholds for calculating the affordability of the customers, varying between 2% to 4% of the household budget spent on water services, according to national guidance. The lower the affordability threshold the less income is generated from water tariffs, whereby the calculation of the EU grant will produce a higher grant. This implicitly implies that, *ceteris paribus*, the Beneficiaries using the lowest affordability threshold will obtain a higher EU grant. This provides a "perverse" incentive to keep tariffs low, e.g. not to charge sufficiently to recover costs such as asset depreciation or replacement.

Further, the application forms when forecasting tariff revenues often do not consider income growth. At the same time, Beneficiaries typically assume relatively high-income growth rates, whereby the affordability issue is "eliminated" by growth in households' income levels. However, this income growth assumption should be reflected in the tariff revenues generated and thereby included in the calculation of the EU grant.

The underlying problem is that the calculation of the financing gap and thus the EU grant provides an incentive not to include costs of asset depreciation, replacement, and cost of financing etc. in the tariff calculation. As a result, these costs become difficult to recover creating a financial sustainability issue.

We note that in the 2014-2020 programming period, it will be possible for Beneficiaries to choose a fixed 75 percent funding gap on revenue generating projects as an alternative to a funding gap calculation based on expected revenues. This addresses the mentioned problem.

- Sector(s) of common problem (water, wastewater, waste)

The issue is relevant within all three sectors. It is a systemic issue and has, as such been observed across the projects reviewed.

- Project phase of common problem (in project cycle)

The issue shows up in the project-planning phase where different affordability thresholds used in different countries is used for the calculation of the funding gap. In countries where the threshold is used generally for tariff setting purposes including for utilities that do not receive grants, the regulations for funding gap calculation may inadvertently contribute to reduced financial viability in the sector as a whole.

- Type of common problem (e.g. institutional, technical or demand related)

This is an institutional problem caused by the combination of the (past) regulation on how to calculate the funding gap for revenue generating projects and the subsidiarity



principle according to which affordability guidelines are national. For projects in some countries (Spain, Portugal and Greece) the issue of affordability was not explicitly considered in the applications.

2.2.2 Assessment and rating of likely impact on financial performance and financial sustainability

It is likely to have an impact on financial performance and sustainability in the way that low affordability thresholds provide for higher grant financing. The size and in some case even the direction of the impact are however difficult to assess. On the one hand, a higher grant will result in greater financial sustainability during project implementation. On the other, the effect of the lower tariff revenues resulting from lower threshold tends to reduce the financial sustainability during project operations.

2.2.3 'Owner(s)' of risk related to a common problem

The owner of this risk is the company who operates the environmental infrastructure assets and who will bear the risk of higher non-grant financing. Eventually, the final consumers bear the risk (of either having to pay higher tariffs or the consequences of non-sustainability).

2.2.4 Warning signs for project reviewers

As mentioned above, the Commission has addressed the issue by allowing the option to select an (undocumented) financing gap of 75 per cent. The reviewer should check that this option is applied.

2.2.5 Good practice actions to mitigate scope of common problem

Good practise is to apply the 75% financing gap in accordance with the 2014-2020 guidelines.



2.3 Problem 3: Lack of a financially strong and technically competent contractor

2.3.1 Description

During the review of the major projects, it was emphasized by several Beneficiaries that if the winning contractor was not a financially strong and technically competent contractor it could cause problems during project implementation. Where the contractor was good and competent, the implementation was done more or less within the expected timeframe. On the contrary, in projects with less competent contractors delays were experienced. Furthermore, since the advance that the Beneficiary can get from EU funding is often insufficient to avoid a negative cash flow for the Beneficiary, it will in many cases be necessary to rely either on bridge financing or on the contractor's ability to work with a negative cash flow. Thus the need for financially strong contractors.

The problem is strongly correlated with the public procurement process. Public procurement procedures are important in terms of their effect on projects, including on the quality of the infrastructure produced as well as its financial sustainability and completion time. Giving priority to price in the awarding of contracts can be rectified by according more weight to other factors, such as financial viability, competence and the quality of the bid, in the selection process as well as by a two-stage procedure.

- Sector(s) of common problem (water, wastewater, waste)

The common problem is relevant within all three sectors.

- Project phase of common problem (in project cycle)

The common problem can be identified in the project implementation phase. The financial sustainability problem may affect the contractor and / or the beneficiary (if the project implementation experiences delay due to insufficient or poor quality works performed by the contractor). In both cases the issue occurs early in the project implementation phase and often before the project is put into operation.

- Type of common problem (e.g. institutional, technical or demand related)

There are two institutional problems here. The first relates to cash flow. Many of the new member states have relied on very conservative fiscal policies to achieve macro-economic balance. One of the consequences has been an unwillingness by Ministries of Finance to allow Central Government funds to pre-finance EU co-funded investments.

This other institutional problem relates to procurement and tendering practices. Works contracts that are determined on the basis of (lowest) price need a robust pre-qualification stage, which ensures that all eligible bidders are both financially strong and technically competent. Such problems have been observed, for example, in the Romanian waste project in Cluj, which faced a number of challenges in respect to



procurement (e.g. the selected contractor filed for insolvency almost immediately after being awarded the contract). Other projects have also mentioned the challenges in this regard, for example the Polish projects, some of which have also been influenced by previous Polish procurement regulations, which focused on price as a single selection criterion.

2.3.2 Assessment and rating of likely impact on financial performance and financial sustainability

This can to a high degree impact on the financial performance of the Beneficiary if the contractor is performing unsatisfactorily and works stopped. The impact is typically a significant prolonged project implementation period. This implies that the anticipated revenues will not be as expected and this can cause significant financial problems of the operating company and/or the owner of the operating company.

2.3.3 'Owner(s)' of risk related to a common problem

The owner of this risk is the company who operates the environmental infrastructure assets. Eventually the owner of the company will bear the risk of project delays and thus of delayed revenues.

2.3.4 Warning signs for project reviewers

Since the problem occurs during implementation, it is difficult for reviewers to mitigate. However, at the policy level, comments can be made in relation to procurement practices if these are found to contribute to the problem identified. A warning sign is the lack of any provisions on how to cope with the contractor's capacity risk and the consequent construction delay. The set up of a procurement division to be supported by specialised technical assistance is a typical conditionality attached to the loans provided by the EIB, World Bank etc. This is not a requirement for Cohesion Policy Funds but the issue should be discussed in the risk section of the application form.

2.3.5 Good practice actions to mitigate scope of common problem

At the policy level, a mitigation action is to review (and potentially revise) procurement practices in order to reduce delays and secure that large works contracts have robust two – stage procedures and accord more weight to other factors, such as financial viability, competence and the quality of the bid, in the selection process.

Furthermore, each Beneficiary should have a risk management strategy, which assesses the effects of delays on the project's financial performance. Prevention and/or mitigation measures shall be identified to reduce the risk exposure level. For example, it can be considered to: (i) set up a procurement division, to be supported by specialised technical assistance: (ii) to critically re-assess the feasibility of the



procurement and build schedules; and (iii) to establish adequate contingency to fit within the eligibility period.

Furthermore, each Beneficiary should have a risk management strategy to cope with technically or financially deficient contractors.



2.4 Problem 4: Non-involvement of the Beneficiary in project design

2.4.1 Description

It has been observed that some projects have been prepared with limited involvement of the Beneficiary. This is true for the Romanian waste project in Cluj and the Greek water project. In Cluj, the project was developed centrally on behalf of regional governments/Beneficiaries who only participated in the selection of the locality for the projects. The project concept and application dossier was subsequently handed over to the Beneficiary. This produced a lack of ownership of the project.

If the Beneficiary has not been sufficiently involved in the project preparation, the Beneficiary may not have sufficient ownership of the project and knowledge of project specificities. This may cause a prolonged implementation period and operational difficulties and thus influence project financial sustainability.

- Sector(s) of common problem (water, wastewater, waste)

The common problem is relevant for all three sectors.

- Project phase of common problem (in project cycle)

The common problem is identified in the planning phase but the financial (and operational) sustainability issues are more likely to occur during the implementation and in particular the subsequent operational period.

- Type of common problem (e.g. institutional, technical or demand related)

This is an institutional problem, if the planning set-up for project preparation is too centralised and the regional Beneficiaries (waste companies) are not sufficiently involved in the planning of the project. A version of this occurs in the water sector if the Beneficiary (for example a municipality) and the Operating Company are two different units. Then the Beneficiary may be involved, while the Operating Company is not – leading to similar problems.

2.4.2 Assessment and rating of likely impact on financial performance and financial sustainability

Project delays and operational problems cause inefficient resource use for which the citizens in the end will bear the cost.

2.4.3 'Owner(s)' of risk related to a common problem

The operating company bear the initial costs of delays and inefficiencies, but as mentioned above these will eventually be passed on to the end-consumer.



2.4.4 Warning signs for project reviewers

Project reviewers shall ensure that operators have been fully involved in project preparation including in the selection of technologies to be used. Such involvement shall go beyond just “signing of” on the project – as Beneficiary may “extract” such a signature with the (implicit) threat of not engaging an “uncollaborative” operator in providing the service once the infrastructure has been built.

2.4.5 Good practice actions to mitigate scope of common problem

A possible mitigating action will be for the Application to require a description of how the Beneficiary has been involved in the project preparation process and the extent to which the technical specifications have been agreed among all involved parties.



2.5 Problem 5: Planned versus actual wastewater discharge /water consumption

2.5.1 Description

There are several practises which may lead to faulty budgeting of water consumption and wastewater discharge volumes. One set relates to the demand analysis, which again hinges on population forecasts as well as water consumption forecasts. The analysed projects generally show that the analyses conducted are typically sound, but there are examples of demand for water being overestimated.

The typical cause of demand overestimation in the water sector is over-optimistic assumptions on both population and economic growth. This is especially the case of the projects in Greece and Portugal.

When the water actually consumed is lower than the budgeted amount, the plant will be affected by inefficiencies due to overcapacity and, potentially, there is a financial sustainability risk related to tariff revenues lower than expected.

In the specific case of the wastewater sector, another source of demand overestimation related to the use of the return factors. In fact, the planned amount of wastewater received at the wastewater treatment plants vary due to different assumptions on the return factors applied on water consumption that are made with little or no reference to actual data. Some projects proponents (i.e. in the Romanian, Slovak, Czech Republic, Latvian and Polish cases) are using return a factor of 1.0, i.e. the same consumption is assumed for both water and wastewater, which is unrealistic and likely to be an overestimate thus leading to a tendency to overestimate the hydraulic capacity of the treatment plant. If the volume of wastewater received is lower than the budgeted amount of wastewater, this will affect the operational efficiency of the wastewater treatment plant and capacity issues may negatively affect both financial sustainability and the ability to achieve policy objectives.

- Sector(s) of common problem (water, wastewater, waste)

The problem relates to the water and wastewater sector.

- Project phase of common problem (in project cycle)

The common problem can be identified in the planning phase if the return factor applied cannot be justified. The actual financial sustainability problem may arise during the operational period if more wastewater is received than original planned because of inappropriate planning.

- Type of common problem (e.g. institutional, technical or demand related)

The common problem are demand related.



2.5.2 Assessment and rating of likely impact on financial performance and financial sustainability

The impact on the financial performance is however not likely to be significant as the wastewater from the consumers (households, institutions and commercial entities) constitute only approx. 30% of the wastewater received at the wastewater treatment plants. If the return factor is too low in the planning process, the water company will experience higher operational costs than planned, due to the receipt of higher volumes of water – which, however, shall be covered by increased revenues from tariffs. If unit tariffs are not allowed to increase further or are at their maximum affordable level, operational costs can be higher than by revenues. In other words, an inaccurate tariff setting that is not based on an good estimate of return flows may cause a financial sustainability problem.

2.5.3 'Owner(s)' of risk related to a common problem

The owner of this risk is the water company who operates the wastewater assets. Eventually the owner of the water company will bear the risk of higher operational costs than planned due to higher amounts of wastewater received. If tariffs can be increased to cover the additional costs water consumers will bear the risk.

2.5.4 Warning signs for project reviewers

If no justification of the return factor is given, it will be a warning sign for the project reviewer. Population forecasts should have clear references to relevant authoritative sources and consumption estimates should take into account price elasticities. If these elements are not clear in the demand analysis, this constitutes a warning sign for the reviewer.

2.5.5 Good practice actions to mitigate scope of common problem

Demand analysis: Since demand forecasts are a key assumption which affects the design capacity of the project (and the utilisation rate), cautiousness is suggested. A re-check of the methodology adopted is therefore beneficial to mitigate the risk of demand overestimation. In cases of doubts about the population forecasts, it is appropriate to design the water plant's capacity up to meet intermedite projected population (let's say up to 15 years). If, larger capacity is needed in the future to comply with a population increase, the capacity upgrade of the original plant can be factored in at a certain point of the project's life cycle in order to continue to meet the original project objectives.

Return factor: To base the estimation of the wastewater discharge on historical data, if available, rather than on "artificial" application of return factors. If the water company reports actual figures for wastewater received adjusted for rain (surface waters) and infiltration and compares that to water sold, before the project and the current assumption for the return factor used in the Application, it will give the reviewer an



indication whether the wastewater received after the project will be according to expected levels.

The Beneficiary should report on the return factor prior to project implementation and compare that to the assumptions applied in the Application. Any deviations should be explained.



2.6 Problem 6: Planned versus actual amounts of solid waste

2.6.1 Description

It has been observed that projected waste amounts have been overestimated in the applications compared to actual waste amounts produced. The implication of this overestimation is mainly on the project sizing (i.e. overcapacity), which, in turn, leads to inefficient plant operations and unnecessarily high fixed costs. The resulting tariff will be higher than necessary, and citizens will bear the cost of this inefficiency. The desk reviews showed that two out of five waste management projects overestimated waste generation (Romania and Hungary).

- Sector(s) of common problem (water, wastewater, waste)

The common problem is relevant within the waste sector.

- Project phase of common problem (in project cycle)

The common problem can be identified in the planning phase but the financial sustainability problem arise during the operational period if the waste company does not receive sufficient waste and thus revenues to support the operations.

- Type of common problem (e.g. institutional, technical or demand related)

This is a problem of estimation of the (future) demand.

2.6.2 Assessment and rating of likely impact on financial performance and financial sustainability

This can impact the financial performance of the waste company who operates the infrastructure assets as the revenue stream are lower than anticipated unless waste tariffs are increased even further. This can influence the service affordability to a significant degree, especially when the fixed component of the tariff is prominent.

In addition, oversized waste treatment plants will also influence the financial sustainability of the operator through higher loan financing of the facility but also due to higher than necessary fixed maintenance costs.

2.6.3 'Owner(s)' of risk related to a common problem

The owner of this risk is the waste company who operates the waste infrastructure assets. Eventually the owner of the waste company will bear the risk of higher lower revenues due to lower amounts of waste received than planned and oversized capacity. If tariffs can be increased to cover the missing revenues, the waste consumers/producers will bear the risk.



2.6.4 Warning signs for project reviewers

If unit waste amounts collected per capita are significantly larger than the benchmarks at national/regional level this is a warning sign for the project reviewer. If waste amounts are solely based on national averages, this is also a warning sign, which could indicate that the projection is either over or under-estimating the waste amounts by taking into account the specificities in the project area (e.g. composition of waste in rural versus urban areas). Further, if the projection of waste amounts does not consider possible decoupling between waste growth rates and income growth rates this is also a warning sign.

2.6.5 Good practice actions to mitigate scope of common problem

A good practice is to perform a benchmarking analysis of equivalent waste producers in similar surroundings. Hence, the Beneficiary should in e.g. the Feasibility Study report on the unit waste produced per inhabitant in urban and rural areas respectively for different geographical areas. If assumed waste amounts are below or above benchmark levels, the capacities of waste treatment facilities should also be verified, as under/oversized treatment plants lead to inefficient use of public funding.

To mitigate the risk of demand overestimation, the following factors shall be duly analysed when forecasting waste consumption as well as variations in the type of waste produced:

- The expected population growth and economic growth.
- The present national norms in waste management and expected changes herein.
- Changes in the consumption habits of the waste producers, correlated with the standard of living, the change in public attitude towards re-use and recycling activities, the adoption of clean products and clean technologies, etc.
- The potential market for waste sub-products (i.e.: recyclables and compost).



2.7 Problem 7: Cash flow management for 'major projects'

2.7.1 Description

The ten case studies showed that it was very typical that the project was initiated prior to receiving project approval from EU Commission. In some cases (e.g. Lithuania, Poland and Greece), this caused problems and delays because the beneficiary did not expect the approval process to be as long as it was. In other cases (e.g. Malta and Portugal), the beneficiary was expecting this and had a plan for bridge financing.

- Sector(s) of common problem (water, wastewater, waste)

The common problem is relevant within all three sectors.

- Project phase of common problem (in project cycle)

The common problem could be identified in the planning phase but the financing problem was realised during project implementation where contractors could not receive timely payments due to lack of financing sources on behalf of the Beneficiary. Any delay in project implementation affects the financial sustainability of the project/operator as it postpones the date of arriving in positive cash flow territory.

- Type of common problem (e.g. institutional, technical or demand related)

This is a financing/institutional problem if project financing is not available when needed.

2.7.2 Assessment and rating of likely impact on financial performance and financial sustainability

This impact the financial performance of the operating company/project as the expected revenue stream is postponed because of project delays as compared to the planned operation. This may affect the financial sustainability of the projects and the operating company. The longer the delay the more serious the financial sustainability issue. The impact of lack of financing on the financial sustainability of the operating company can be very high.

2.7.3 'Owner(s)' of risk related to a common problem

The risk of lack of available financing on the owner/operator of the infrastructure is a delayed project implementation. This will influence the overall financial sustainability of the project/company, as the revenues will be received later than planned.



2.7.4 Warning signs for project reviewers

If the project financing is not documented fully and secured this represents a warning sign for project reviewers. If the project is not finally approved by the EU Commission this also constitutes a warning sign, that project implementation may be delayed.

If no bridge financing mechanism is proposed, it can also signal a warning sign to the project reviewer.

2.7.5 Best practice actions to mitigate scope of common problem

The Beneficiary shall document in the Application that financing is available and that bridge financing is available in case the project experiences delays in project approval from the EU Commission. Given the risk of non-approval of the project, beneficiaries should also show how they will manage this risk and ensure the financing for the project.

The focus here is on ensuring that finance is available if Commission approval of the project is delayed. But it is equally important to minimise delays by ensuring that the necessary documentation is properly prepared and the *ex ante* analysis required is properly carried out so that there is no reason in these regards for undue delay.



2.8 Problem 8: Optimism bias with regard to length of implementation period

2.8.1 Description

Delayed project implementation impedes achievements of timely financial performance.

Most project Applications reviewed showed a clear optimism bias with regard to the foreseen length of the implementation period, including, but not limited to, the period of construction of the infrastructure assets. As a result, operational start for many projects was delayed (eight out of 11 projects with four of these being seriously delayed). Factors contributing are longer than anticipated tender preparation processes and projects approval processes⁸. An extreme example is the Greek case study, where objections from the citizens in the area regarding the location of the WWTP delayed the project for more than 10 years. This illustrates that environmental projects can also experience problems of obtaining consensus for project implementation for the more controversial projects, especially waste and wastewater projects. Furthermore, as mentioned the construction period is also often underestimated. This delay in operations affect the revenue stream and thus affect the financial sustainability of the projects/operators.

- Sector(s) of common problem (water, wastewater, waste)

The common problem is relevant within all three sectors. Based on the projects reviewed, the tendency seems to be more pronounced in the waste sector than in the water sector. Based on the small sample of projects, it is not possible to come to a firm conclusion as to why this is the case, but factors contributing seem to be linked to higher complexities of waste projects as well as waste projects being 'greenfield' projects where those involved have less prior experience in the area as compared to the water and wastewater projects, where utilities typically have prior experience from other investment projects.

- Project phase of common problem (in project cycle)

The common problem materialises in the planning phase but the financial sustainability problem arises during the operational period, if companies do not receive in due course sufficient revenues to support the operations.

- Type of common problem (e.g. institutional, technical or demand related)

⁸ An example hereof is the delays in approval of major projects, for example in Bulgaria, caused by concerns in DG COMPETION about state aid issues. This example is mentioned here to illustrate that sometimes delays are caused by issues that ex ante were not even considered to be a factor in the decision making process.



This is an “institutional” problem which reflects that there are incentives to underestimate the time needed in the project development and application process. Often this is related to the political acceptability of the project.

2.8.2 Assessment and rating of likely impact on financial performance and financial sustainability

This can influence the financial performance of the operating company as the revenue stream is postponed because of project delays as compared to the planned operation.

2.8.3 'Owner(s)' of risk related to a common problem

The owner of this risk is the company who operates the environmental infrastructure assets and who will bear the risk of project delays and thus of delayed revenues.

2.8.4 Warning signs for project reviewers

If project implementation periods are too short considering the activities to be undertaken as well as considering experience from similar projects and no slack/contingency periods are included, this constitutes a warning sign for the project reviewer.

2.8.5 Good practice actions to mitigate scope of common problem

The Beneficiary should identify the possible factors causing delay and assess the risk of the delays in question materialising. This analysis should be translated into a risk strategy to cope with the consequences of delays experienced during implementation. The effects of possible construction delays on the project financial performance shall be assessed within the project risks, and prevention and/or mitigation measures identified to reduce the risk exposure level. For example, the set-up of a Project Implementation Unit to be assisted by technical assistance for project management during implementation.



2.9 Problem 9: Affordability for low income groups – is average household incomes a good indicator?

2.9.1 Description

Affordability is calculated as the ratio of the monthly (annual) household bill to the monthly (annual) disposable (after tax) income. The size of the bill depends on the number of persons in the household. The (future) level of disposable household income depends on the number of income earners and on the assumed development in real incomes over the reference period. The definition of an affordability threshold is subjective. The Member State may set such threshold and many have. In some Member States, the threshold is part of sector regulation and /or to consumer protection regulation.

As part of project analysis, Beneficiaries, generally, use the average household expenditure (for example for water and wastewater) in relation to the average household disposable income. While this may be in line with national guidelines it is a questionable approach as it does not address the question of affordability for low income population groups. For example already in 2002, EBRD recommended to consider not only average incomes but also income distribution when determining “affordable” tariff levels⁹.

Tariff increases can relatively easily be absorbed by the average income households, whereas this is more difficult for the low income households. Lack of consideration of income distribution and impacts on low income population groups is a major weakness and limitation of the analyses presented in the project dossiers. This could lead to a deteriorating water bill collection efficiency and thus impede the financial sustainability of the water company. The SIMARSUL water project in Portugal is an example of a project where tariff collection poses a problem. The waste management project in Cluj, Romania is also an example of a project which is likely to face some challenges in this respect (not yet operational).

- Sector(s) of common problem (water, wastewater, waste)

The common problem is relevant within all three sectors.

- Project phase of common problem (in project cycle)

The problem may be identified in the planning phase if only the ratio of average household water expenditures to average household expenditures is considered. The impact on financial sustainability may materialize during the operations if the water company has problems in collecting water bill revenues as a result; or, as may also be

⁹ See EBRD and Danish Ministry of Environment (2002): “Water Prices in CEE and CIS Countries. A toolkit for assessing willingness to pay, affordability and political acceptability”. Copenhagen March 2002.



the case, a popular reaction leads politicians (such as municipal councils) or national regulators to not grant tariff increases to cover (reasonable) increases in cost.

- Type of common problem (e.g. institutional, technical or demand related)

This is an institutional issue. There is no uniform affordability guideline and many countries have national guidelines. However, guidelines are insufficient to solve the underlying conundrum. This requires a combination of policies including appropriate policies for social protection of low income groups – policy areas that are outside the (direct) influence of policy makers in the environmental infrastructure sectors.

2.9.2 Assessment and rating of likely impact on financial performance and financial sustainability

Directly or indirectly, the concerns about affordability are likely to have an impact on financial performance and sustainability of the operating company. If the payment for the infrastructure services exceed a certain threshold level for the lowest decile of the population, this may indicate a financial sustainability problem for the company.

2.9.3 'Owner(s)' of risk related to a common problem

The owner of this risk is the company who operates the environmental infrastructure assets and eventually the owner of the company will bear the risk of a lower collection efficiency and/or the risk of politically motivated limits on tariffs / tariff increases. As usual, eventually the final consumers bear the risk of the consequences of non-sustainability.

2.9.4 Warning signs for project reviewers

It is a warning sign for the project reviewer if affordability analyses are confined to the analyses based on average household incomes and there is no consideration of income distribution and impacts on low income groups.

2.9.5 Good practice actions to mitigate scope of common problem

A good practice action is to supplement the average affordability assessment with an assessment of how the water or waste bill facing the low income groups will affect the households' expenditures on water or waste. This should be accompanied by an assessment on how this will affect the operating company if collection efficiency deteriorate and the risk of political interference in the tariff setting process. If the tariffs go beyond the defined affordability ratio, possible remedies (including e.g. progressive tariffs, vouchers or subsidies) shall be identified so as to ensure social affordability for the low income groups on the one hand, and the project's financial sustainability on the other (see also next section).



If analysis of the vulnerable population groups indicates a payment problem, this should be addressed in the Application. However, often the solutions should be found in social policy, which is outside the scope of the project application (and outside the scope of the Beneficiary, Operating Company and even sector ministries). Even if the analysis does not indicate an affordability problem, it may be important to pre-empt political instincts to keep tariffs low, inter alia with a careful discussion and presentation of the affordability issues.



2.10 Problem 10: Exceeding the affordability thresholds and a price subsidy mechanism

2.10.1 Description

Because waste water (and solid waste) collection and treatment is a public good, usually operating in the contexts of market failure and monopoly, there is an argument for supplying more of this service than what the markets would do. The polluter pays principle suggests that the corresponding costs should be paid by polluters, but in practice a range of instruments may be used to secure the required financial resources for an adequate supply of water, wastewater and solid waste services.

In some projects, tariffs will have to increase if the full cost recovery principle has to be implemented. These tariff increases may lead to the affordability threshold being exceeded. The approach taken by most Beneficiaries is to plan with lower tariffs to meet the affordability threshold. Governments, typically local governments, are then expected to compensate for the missing revenue. The Malta case study may be a case in point. Here the Government has a long history of subsidizing the water sector partly with reference to the economy wide benefits (for tourism etc.) of sanitation. While this approach is sound and aligned with common practice across EU countries, there are two problems.

One problem is that no information is provided in the Applications about the institutional arrangements that will be adopted to compensate the operating company for the missing tariff revenues. Typically, the Application does not contain a description of the price subsidy mechanism to be applied in case prices have to be capped¹⁰.

The second, and underlying, problem is that these institutional mechanisms are typically not in place. Compensation takes place on an ad hoc basis, if at all.

This combination of problems implies that (i) Companies may experience financial sustainability problems due to missing or uncertain revenues; and (ii) the financial appraisal included in the application forms may, or may not, provide an accurate picture of the future financial situation for the company. Thus accurate ex ante assessment of financial sustainability is difficult.

- Sector(s) of common problem (water, wastewater, waste)

The common problem is relevant within all three sectors.

- Project phase of common problem (in project cycle)

¹⁰ In the Malta project, this was not the case. The Government knew they did not want consumers to pay the full costs was prepared to continue to provide subsidies, which they did. The data were open – 4% (of water and energy) and openly presenting a very low affordability threshold.



The common problem is identified in the planning phase but the financial sustainability problem is likely to arise during the operational period if the company does not receive sufficient revenues to support its operations.

- Type of common problem (e.g. institutional, technical or demand related)

This is an institutional problem, as the solution implies a set-up of a predictable revenue compensation mechanism, which Beneficiaries / municipalities typically are unwilling, and often unable, to establish.

2.10.2 Assessment and rating of likely impact on financial performance and financial sustainability

Companies implementing projects that rely on public operational subsidies run a considerable risk of negative impacts on performance due to insufficient and unpredictable revenues.

2.10.3 'Owner(s)' of risk related to a common problem

The owner of this risk is the company who operates the environmental infrastructure assets. As usual, eventually the final consumers bear the risk of the consequences of non-sustainability.

2.10.4 Warning signs for project reviewers

If tariffs are planned to increase above pre-stated threshold levels and / or the proposal includes a subsidy scheme without clear mechanisms and commitments to secure implementation; this is a warning signal for project reviewers.

2.10.5 Good practice actions to mitigate scope of common problem

A good practice action will be to put in place a public subsidy scheme with clear mechanisms and commitments to secure implementation. A cross subsidy scheme (between consumer groups) could be part of such a solution, but the limits of cross subsidization must be recognized.

According to the Water Framework Directive, "costs" include environmental and resource costs. In this light, a system of payment for ecological services (PES) could also serve to both meet WFD requirements and possibly contribute to financial sustainability (for example by reducing the necessary costs for drinking water treatment). However, PES systems are not yet well developed and we did not find any examples of such systems being considered in the case studies.



2.11 Problem 11: Tariffs are not increased as per plans in the Application

2.11.1 Description of common problem

The Application Forms of the reviewed projects included plans for how tariffs should be increased during the project implementation period typically with a phasing-in period. However, it was observed in some cases that tariffs have not been increased as per the planned tariff increases. This was seen in particular in the Estonian project. Typically reasons are given that tariffs cannot be raised prior to provision of improved services to consumers and consumers' perceiving this improvement in service. However, in particular in water, if tariffs are kept too low, the water resources will not be used efficiently, and, in addition, there is a threat to the financial sustainability of the services.

- Sector(s) of common problem (water, wastewater, waste)

The common problem is relevant within all three sectors.

- Project phase of common problem (in project cycle)

The common problem is identified ex post in the operational phase as tariffs have not been increased as per the Application. The financial sustainability problem may arise during the operational period as the operating company does not receive sufficient revenues to support its operations.

- Type of common problem (e.g. institutional, technical or demand related)

This common problem is an institutional problem as tariffs have not been increased as fast and to the expected levels as foreseen.

2.11.2 Assessment and rating of likely impact on financial performance and financial sustainability

This can influence the financial performance of the operating company, as tariffs are not increased. It will provide the operating company with less financial resources if tariffs are kept too low for a longer period. Initially, it is likely to lead to underinvestment in preventive maintenance and renewal.

2.11.3 'Owner(s)' of risk related to a common problem

The owner of this risk is the company who operates the environmental infrastructure assets. Eventually the owner of the company will bear the risk of project delays and thus of delayed revenues.



2.11.4 Warning signs for project reviewers

If initial tariffs are clearly too low, this indicates institutional and political obstacles to adhere to the cost recovery principle. One indication hereof may be that tariffs are proposed to increase dramatically following the project implementation.

2.11.5 Good practice actions to mitigate scope of common problem

To make the tariff increase acceptable, the project promoter should make a proposal for gradual adjustment (phasing-in) of tariffs. An appropriate pace and timing for such adjustments should be duly considered, e.g. paired with visible signs of work progress and/or service quality improvements, in order to increase the acceptability of users.



Appendix A Overview of the eleven problems and their appearance in projects studied

Insert table

The ten case studies

No.	Challenge	ERSUC waste proj, Portugal	Cluj waste project, Romania	Gdansk waste project, Poland	Kohtla-Järve water proj, Estonia	Zory water, Poland	Koropiou and Paianias water, Greece	SIMARSUL water, Portugal	Brno water, Czech Republic	Malta water	Sludge treatment, Vilnius, Lithuania
1	Project versus company approach				(X)	X	X	X	X	X	X
2	EU grant calculation incentives	x	x	x	x	x	x	x	x	x	x
3	Lack of a financially strong and technically competent contractor		X	X		X					
4	Non-involvement of the Beneficiary in the project design		X				X				
5	Planned versus actual wastewater discharge /water consumption						X	X		X	
6	Planned versus actual amounts of solid waste		X								
7	Cash flow management for 'major projects'		(X)	X		X	X				X
8	Optimism bias – implementation period	X	X	X		X	X	(X)	(X)		
9	Affordability for vulnerable groups		X			X	X	X			
10	Exceeding the affordability thresholds and price subsidy mechanisms		X					X			
11	Tariffs are not increased as per plans in the Application				X						

Note: The projects in Romania, Estonia and Greece were not operational at the time of the case study – and hence, the assessment is not based on actual data from the operational phase. Irrelevant fields are marked in grey. (X) signifies that the problem was observed but only to a lesser extent.

Ten projects studied only through desk studies (ex-ante data – and ex-post data for operational projects):

Nr.	Challenge	Sofia waste man., Bulgaria	Győr region waste, Hungary	WQ in Jihlava/Svratka rivers, Czech Rep.	Riga water, Latvia	Nova Sol water, Poland	Jiu Valley water, Romania	Vigo water, Spain	Nagykanizsa water, Hungary	Tarnow mountains water, Poland	Liptovska water, Slovenia
1	Project versus company approach			X	X	X	X	X	X	X	X
2	EU grant calculation incentives	X	X	X	X	X	X	X	X	X	X
3	Lack of a financially strong and technically competent contractor										
4	Non-involvement of the Beneficiary in the project design										
5	Planned versus actual wastewater discharge/water consumption										
6	Planned versus actual amounts of solid waste		X								
7	Cash flow management for 'major projects'										
8	Optimism bias – implementation period			X		X				X	
9	Affordability for vulnerable groups		X	X	X	X		X	X	X	
10	Exceeding the affordability thresholds and price subsidy mechanisms										
11	Tariffs are not increased as per plans in the Application										

Note: The Jihlava/Svratka project in the Czech Republic, the Nova Sol project in Poland and the Tarnow Mountains project in Poland were operational at the time of doing the desk study. Only for these three projects is the assessment based on comparison of planned and actual values where relevant. Irrelevant fields are marked in grey (challenges 3, 4, 7, 10 were not analysed as part of the desk study).

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Luxembourg: Publications Office of the European Union, 2014

ISBN [number]

doi:[number]

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Printed in Denmark

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