



# PROJECT EXPOSÉ

## PPP ZRENJANIN

### WASTEWATER MANAGEMENT



#### Market Research Study

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# 1 EXECUTIVE SUMMARY

The main objective of the project is to protect water quality in River Begej and prevent further pollution caused by discharging untreated wastewaters, in order to improve living conditions for the inhabitants of the City of Zrenjanin and surrounding settlements in accordance with a number of strategic national, regional and local policies, plans and regulations.

The specific objectives are to improve wastewater collection in the City and surrounding settlements; wastewater appropriately treated in a newly constructed wastewater treatment plant (WWTP) before discharge; and further pollution of River Begej prevented.

The project consists of the following main components:

- Measures for the improvement of the existing sewerage system Zrenjanin;
- Construction of new WWTP, location in Zrenjanin;
- Development and connection of the sewerage system Zrenjanin to the new WWTP and to the settlements in the surrounding territory;

The proposed site for the new WWTP is planned to be located on an already planned site in Zrenjanin. The site of the WWTP will require site preparation and flood alleviation measures. There are no major environmental impacts envisaged during the construction and operation of the various project components.

The total eligible project investment cost in constant 2015 prices amounts to €20.657 million. The specific per capita long-term investment cost in constant 2015 prices amounts to approximately €244/capita for the wastewater collection and treatment component of the project - based on the total beneficiary population in the City of Zrenjanin expected to be served in 2018/2019.

The proposed project provides suitable financial analysis conclusions, in that the main financial parameters analysed show that the combined project needs external financial support – as the financial net present value and the financial internal rate of return of the investment are both negative before EU assistance.

The overall project will also provide a number of economic benefits to the immediate and wider areas; the project has an economic rate of return (ERR) of 22% and a cost/benefit ratio of 2 - there are a number of positive health, resource, ecosystem, social and other benefits from the wastewater collection and treatment project.

With the tariffs, the existing tariffs for water are 22.25 RSD per cubic metre for domestic customers and 50 RSD per cubic metre for commerce and industry. For wastewater, the predicted increases are 47.42 RSD per cubic metre for domestic customers and 53.35 RSD per cubic metre for commerce and industry, in 2018/2019. The levels are accord with “full cost recovery” and are within the affordability criteria used and move towards a policy of a “unified” tariff.

The existing Public Utility Company (PUC) will manage and operate the new infrastructure, although there is a need to recruit additional suitably qualified staff and streamline activities of the PUC.

It is intended to procure the scope of delivery and services for planning, construction, financing and operation for the new WWTP and the sewage system as Public Private Partnership Project (PPP) in accordance to the Law on PPP and Concession of the Republic of Serbia of 2011.

In order to facilitate the financing and keep the waste water prices at an affordable level, different grants and subsidies from EU, Serbia and countries outside Serbia shall be available.

## **2 BUSINESS NEED AND CURRENT SITUATION**

Due to the current practice in wastewater collection and its disposal without treatment which has a number of negative effects on the environment. The River Begej is one of the most polluted water streams in the province of Vojvodina. As a trans-boundary river coming from Romania, it enters Serbia being already under pressure from various industrial, domestic and agricultural pollution sources. The pollution of the River Begej and the connected Aleksandrovacki canal is a severe threat to public health and aesthetics for the inhabitants of the City of Zrenjanin and surrounding settlements.

From another perspective, this kind of project is also needed in order to provide a modern infrastructure base for further investments in the city and therefore possible employment of the local population

Therefore the business need of the project is to protect water quality of the River Begej and prevent further pollution caused by discharging untreated in order to improve living conditions, such as public health and aesthetics, for the inhabitants of the City of Zrenjanin and surrounding settlements in accordance with a number of strategic national, regional and local policies, plans and regulations.

The project needs to contribute achieving national goals in environmental protection, which correspond to EU objectives, primarily those set in the Urban Wastewater Directive. It needs to comply with various European, national, regional/local solid waste management related and other environmental related) laws, policies and regulations.

To realize the necessary investments in the new WWTP and sewage collection systems at affordable tariffs in a most efficient way, the project needs financial support and the know-how of competent private partners in design, construction and operation.

### 3 PROJECT OVERVIEW

The PPP comprehends basically the planning, construction, financing and operation of the new WWTP and the sewage collection system in Zrenjanin and is described in detail in the 3 documents “Zrenjanin Wastewater Management” of April 2015, which are attached as additional information to this Exposé:

- Volume 1: NON-TECHNICAL SUMMARY
- Volume 2: FEASIBILITY STUDY
- Volume 3: APPENDICES
  - APPENDIX 1 AGGLOMERATION SCREENING
  - APPENDIX 2 COST BENEFIT ANALYSIS
  - APPENDIX 3 ENVIRONMENTAL AND SOCIAL APPRAISAL
  - APPENDIX 4 ENDORSEMENT LETTER

#### 3.1 OBJECTIVES

The implementation of the project is compatible with national -especially environmental- objectives, which are also aligned with the following international treaties as well as regional and local policies, plans and regulations:

- Principles of Sustainable Development, Agenda 21;
- Millennium Development Goals;
- National Environmental Strategy;
- Paris Declaration on Aid Effectiveness 2005; and
- European Integration and Acquis Communautaire.

The PPP should contribute to achieving national goals in environmental protection, which correspond to EU objectives, primarily those set in the Urban Wastewater Directive. It should also comply with various European, national, regional/local wastewater management related and other environmental related laws, policies and regulations. (See also Volume 1, NON-TECHNICAL SUMMARY; Section 5 INSTITUTIONAL, LEGAL AND POLICY CONTEXT)

The main objective of the PPP itself is to protect water quality in River Begej and prevent further pollution caused by discharging untreated wastewaters, in order to improve living conditions of public health and aesthetics for the inhabitants in the territory of Zrenjanin

The specific objectives are to improve wastewater collection in the City and surrounding settlements; wastewater appropriately treated in a newly constructed WWTP before discharge; and further pollution of River Begej prevented.

A second objective, not less important than the previous one, is to rearrange the PUC in such a way that it may be able to better manage all its activities, including the new WWTP and, at the same time, achieve its own financial sustainability.

### **3.2 SCOPE AND OUT OF SCOPE**

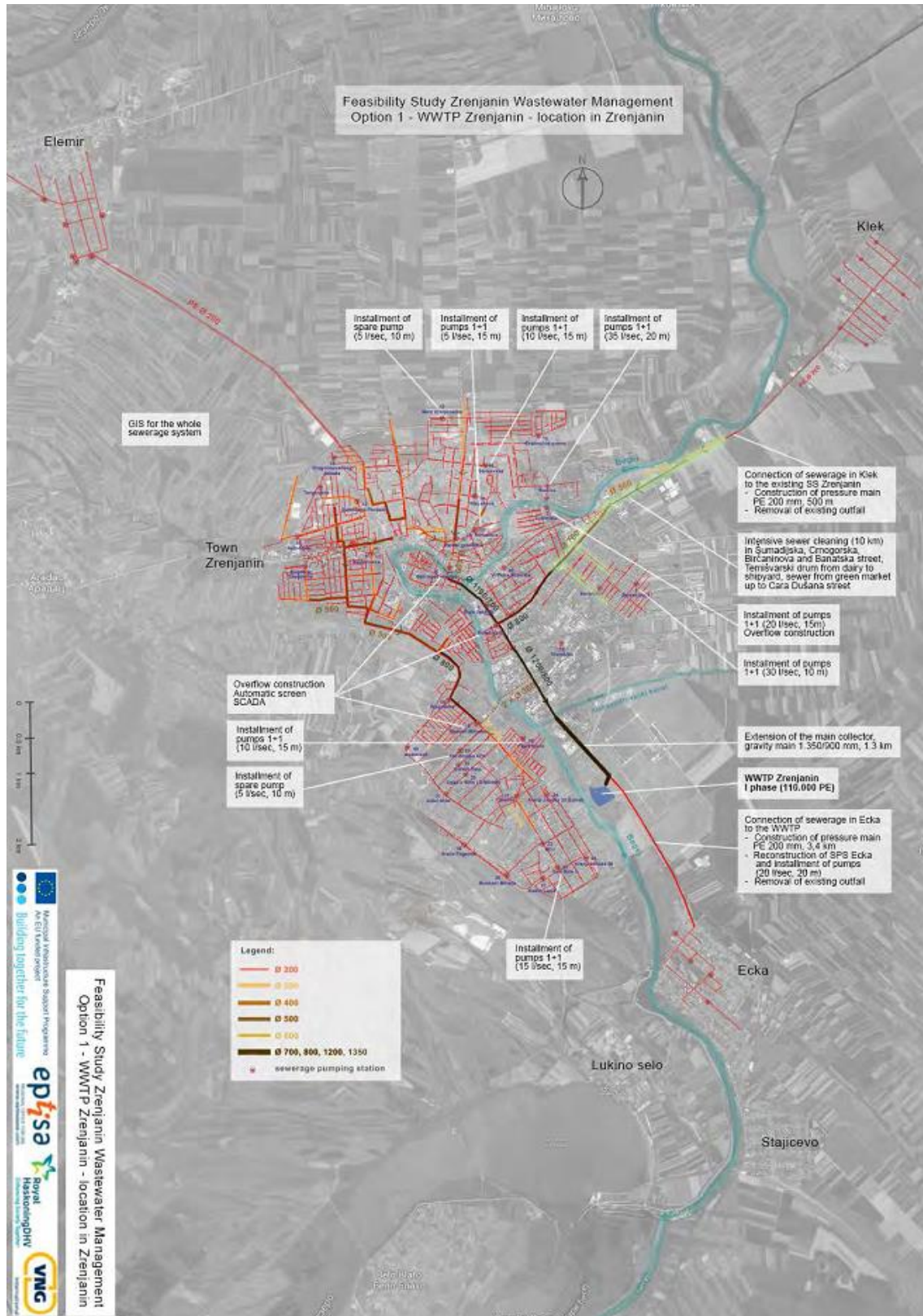
The PPP area includes the City of Zrenjanin administrative area and will also include the citizens and industry of Zrenjanin and surrounding settlements in the territory of Aradac, Elemir, Ečka, Jankov Most, Klek, Lazarevo, Lukino Selo, Lukicevo and Mihajlovo).

Scope is the PPP for planning, construction, financing and operation of new WWTP and sewerage system for households and industries in this area, which is under the complete ownership, operation and management by Zrenjanin Public Utility Company (PUC) "Vodovod I kanalizacija".

Out of scope is the complete water supply based on local sources in the territory and water supply and network by Zrenjanin PUC "Vodovod I kanalizacija" as well as any deliveries and services for surface waters like rivers, canals and lakes.



Figure 1 PPP Option 1 WWTP Site Zenrajnin



### ***3.2.1 Waste Water Treatment Plant***

As shown in Volume 2, FEASIBILITY STUDY; Section 8 OPTIONS FOR WASTEWATER COLLECTION AND TREATMENT – the planned site for the new WWTP, located about 4 km to the south-east of Zrenjanin and close to the River Begej, is optimal for further development of the wastewater/sewerage collection and treatment and chooses from three proposed locations for the WWTP.

The preferred wastewater treatment option is the Conventional Activated Sludge Process (CASP) with biological nutrient removal (BNR). CASP is the most common treatment process used to treat municipal and industrial wastewater.

The proposal is based on a proposed WWTP planned in two phases:

- Phase I 2015-2025  
consists of WWTP 110,000 PE (out of 150,000 PE in total) and
- Phase II 2025-2045  
consists of additional of 40,000 PE (out of 150,000 PE in total).as development phase,  
which will depend on future industrial needs.

### 3.2.2 Sewerage System

The territory of the City of Zrenjanin, includes the City of Zrenjanin and 21 settlements. The existing wastewater collection is organized in the City of Zrenjanin and the settlements Elemir, Ečka, Klek and Melenci.

The Water Utility Zrenjanin maintains the water supply and sewerage systems in the listed settlements. Currently, the existing collection system is mostly separate, with some older sections where sewage and storm waters are still jointly collected. There is around 400 km of the sewerage network, with 26.000 connections. Rest of the settlements in the City administration include organized water supply but no organised wastewater collection. Wastewater from the sewerage is being discharged into surface waters without treatment. Other wastewaters are being discharged into septic tanks. In 2014, 94% of population in City of Zrenjanin and 60 – 75 % of the citizens in the surrounding settlements Elemir, Ečka and Klek discharge the wastewater in the existing sewerage system.

The sewerage system will be developed in accordance with the construction of the new WWTP in two phases too:

#### Phase I 2015-2025

- Measures for the improvement of the existing sewerage system Zrenjanin (rehabilitation of SPSs, SCADA, GIS, intensive sewer cleaning)
- Connection of the sewerage Klek to the sewerage system in Zrenjanin (200 mm, 500 m)
- Connection of the sewerage system Zrenjanin to the WWTP (1350/900 mm, 1.3 km)
- Connection of the sewerage Ečka to the WWTP (pressure main 200 mm, 3.4 km)

## Phase II 2025-2045

- Development of the sewerage in the settlements Aradac, Elemir, Klek, Lazarevo, Ečka, Lukićevo, Stajićevo and Lukino selo.
- Connection of the sewerage in the settlements Aradac and Lazarevo to the sewerage system Zrenjanin
- Connection of the sewerage in the settlement Lukićevo to the new WWTP.
- Connection of the sewerage in the settlements Stajićevo and Lukino selo to the WWTP sewerage in Ečka

### **3.2.3 Operation Services**

The operation of the water supply and sewage system is under the management of the PUC “Vodovod i kanalizacija” Zrenjanin. (See also Volume 2; Feasibility Study; Section 5.6 Assessment of PUC “Vodovod i kanalizacija” Zrenjanin)

In 2013, total coverage of water supply services in the service area of PUC “Vodovod i kanalizacija” Zrenjanin (supplied settlements: Zrenjanin town and suburbs) was 100%. Total coverage of wastewater services in the same area was 100% in town but only 1.8% in villages covered by the project. The PUC reported that 29,896 households are connected to water connections in Zrenjanin City and 18,430 in the project villages. The wastewater connections are 25,268 in the City and 256 in villages.

The comparison of performance indicators for the Zrenjanin service area and City shows the following conclusions:

- The collection ratio for the City and the service area is 81.3% and 85.5% respectively, are relatively low.
- The connection rates to the drinking water and wastewater networks are better, but further extension towards the smaller villages and settlements is needed.
- At present there is no wastewater treatment plant for collected wastewaters;
- The figure for nonrevenue water (28.7/24.5%) is very close to the value stated in EU recommendations;
- The average residential water consumption, in the City is 195 l/capita/day, which is relatively high and higher than the recommended range of 120-150 l/c/d;
- The number of staff per 1.000 connections of drinking water (9) and wastewater (10) shows, that the PUC is heavily overstaffed.

In addition the structure of the organization of the PUC shows the presence of some inconsistencies and duplications. To improve the PUC's performance, it could be possible to carry out other merging of operations aimed at optimizing the use of available human resources and improving. Some changes in the organizational setup of the company are also needed for the WWTP construction and operation.

Enabling the PUC to manage at the best way the new WWTP and is self-sufficient financially, it will be necessary:

- To reorganize the company in such a way that:
  - Avoidance that different units perform the same or similar type of activities
  - Units performing similar activities are grouped together
  - Some of the activities, actually performed by the PUC, are outsourced
  
- To reduce the number of employees, so that at start-up of the WWTP, the PUC staff consists of 165-175 employees, at most.

The changes in workload are the direct consequence of the operational changes on the short and middle-long term and require On-the-job training for technical qualifications of technicians working in the field of wastewater as well as additional responsibilities for staff responsible for the collection, pumping and treatment of wastewater and maintenance of the network and physical service area.

The introduction of a Service Level Contract (SLC) between the City and the PUC is a further possibility to develop the independent position of the PUC, while giving at the same time an instrument to the City to monitor performance and improvements of the PUC. The SLC would also help in defining more accurately the level of services that PUC shall provide as stricter operational criteria are gradually enforced, in particular, higher efficiency of the processes and stricter quality criteria of both drinking water and treated wastewater.

### 3.3 STAKEHOLDERS

(See also Volume 2; FEASIBILITY STUDY; Section 5.5 Institutional Framework)

#### 3.3.1 Main interests and concerns

The purpose of this sub-section is to provide general insight into local, regional and national stakeholders pertinent to the proposed project.

*Figure 2 Stakeholders main interests and concerns*

Stakeholder	Main Interests/Concerns
<p><b>City of Zrenjanin (Main Beneficiary)</b></p>	<p>Comply with national and contribute to reaching EU requirements in environmental protection and urban wastewater management. Improve living and economic development conditions in the City. Obtain as high grant proportion as possible. Create conditions for future rehabilitation of Begej River.</p> <p>Main concerns include: Obtaining EU funding for works; securing funds for local co-financing of works; causing too much financial burden on the population due to several large investments in the similar timeframe (related to wastewater, drinking water and waste management in the City).</p>
<p><b>Local Public Utility Company PUC "Vodovod i kanalizacija"</b></p>	<p>Improve infrastructure and quality of services. Become operators of the new infrastructure. Potential for benefiting from capacity building activities that might be part of the project in the future.</p> <p>Concerned about increased costs of services and potential changes to their operations and/or the structure of the Company.</p>
<p><b>Consumers (Citizens)</b></p>	<p>Improved living and environmental conditions. Cleaner water in the Begej River. Better services and infrastructure.</p> <p>Concerned about increased fees for services</p>
<p><b>Industries</b></p>	<p>Comply with National and Provincial regulations concerning environmental protection and related areas, and avoid any associated penalties. Maintain an image of an environmental friendly company and good relations with the local community and decision makers.</p> <p>Concerned about financial and other costs of improving/introducing wastewater (pre)treatment.</p>
<p><b>Line Ministries Provincial Authorities</b> - Ministry of Agriculture and Environmental Protection: Republic Water Directorate -Government of Autonomous Province of Vojvodina: Secretariat for Urbanism, Construction and Environmental Protection Secretariat for Agriculture, Water Management and Forestry.</p>	<p>Comply with national and EU requirements in environmental protection/wastewater management. Efficient and effective use of EU funds.</p> <p>Concerned about potential unresolved project issues (property, technical documentation) affecting project development, as well as various aspects affecting the long term sustainability of the new infrastructure.</p>
<p><b>EU-Delegation</b></p>	<p>Efficient and effective use of EU funds. Achieving EU objectives in environmental protection/water management.</p> <p>Concerned about commitment of the beneficiary and key stakeholders, divided competencies between the local, provincial and national level, and other factors which might affect the works implementation and long term sustainability.</p>

### 3.3.2 Assessment of PUC “Vodovod i kanalizacija” Zrenjanin

(See also Volume 2; FEASIBILITY STUDY; Section 5.6; Assessment of PUC “Vodovod i kanalizacija” Zrenjanin).

At the present time, the PUC consists of four sectors with 14 Units operating under the direction of the PUC Director, one Deputy Director and four Heads of main working sectors.

The actual responsibilities of the PUC are the following:

1.) Drinking water provision:

- Operation and maintenance of drinking water treatment plants, primary and secondary distribution network of drinking water and well fields
- Development of network extensions and new infrastructure, preparation of tender procedures, construction supervision, and rehabilitation of the existing infrastructure;
- Drinking water quality sampling and laboratory analysis;
- Replacement and repair of damaged water meters, reading of water meters and fee collection.

2.) Wastewater:

- Maintenance and operation of existing sewer network and of a new main collector from the current main discharge point in Aleksandrovacki canal.
- Wastewater quality sampling and analysis.

3.) Other tasks

- The technical responsibilities and activities consist mainly of civil- and mechanical-electrical works.



The existing wastewater network, as well as its extension and the subsequent construction of the required infrastructure and the expansion of the activities necessitates optimization of the operation and maintenance currently carried out by the PUC. Besides being able to better manage all its activities, including the new WWTP, PUC at the same time should achieve its own financial sustainability.

The changes in workload by the project and the further optimization of operation and maintenance requires a competent partner for:

- Training of staff in order to operate the new WWTP, supervise the construction work and handle additional responsibilities and physical service area for the collection, pumping and treatment of wastewater and maintenance of the network. In specific cases new staff with required qualifications shall be contracted.
- Supporting the necessary reorganisation to leaner structure of less units of the PUC, avoiding overlapping of different units in terms of activities performed.
- Prospective outsourcing of different activities, such as Meter reading, billing and collection.
- Reduction of workforce in a socially acceptable manner.

## 4 COST BENEFIT ANALYSIS

The feasibility of the proposed Project Zrenjanin Wastewater Management was secured by the cost benefit analysis (CBA) described in detail in:

- VOLUME 1 NON-TECHNICAL SUMMARY  
Section 9 FINANCIAL AND ECONOMIC ANALYSIS
- VOLUME 2 FEASIBILITY STUDY  
Section 9 FINANCIAL AND ECONOMIC ANALYSIS
- VOLUME 3 APPENDIX 3 COST BENEFIT ANALYSIS

### 4.1 CBA MODEL

#### 4.1.1 *Financial and Economic Analysis*

The CBA has two components:

1. “Financial Analysis” which addresses:

- 1.1. The financial feasibility and viability of the project in strict financial terms considering the investment scenarios/options considered in the technical study. That means the hard numbers of investment and operation and maintenance (O&M) costs of the project, the estimated direct revenues, calculate important financial performance indicators and demonstrate its short term and long term financial viability and sustainability, the investment plan and financial sources proposed to be used to implement the project.
- 1.2. The cash flow from the perspective of the City of Zrenjanin as owner and the PUC as operator of the planned water and wastewater infrastructure. The cash flow analysis includes an estimation of the tariff needed to cover the cost of sustainably operating the planned infrastructure and the affordability of the proposed improved wastewater services for the beneficiary population of Zrenjanin.

2. “Economic Analysis” which aims to answer the question to which extent the project is making optimal use of the allocation of scarce national and EU resources for Serbia and the EU as co-sponsor.

Both the financial and the economic analysis were subjected to a sensitivity and risk analysis. This summarizes the probability that the project will achieve a satisfactory performance (in terms of IRR or NPV), as well as the variability of the results as compared to the “optimal” estimate made under the main financial assessment.

The Project CBA Model utilized, provides a structured framework for the financial assessment of the project. The Model is designed to be consistent with accrual based accounting in which revenues and expenses are recognized when they are earned or incurred, using the Discounted Cash Flow Method or Net Present Value (NPV) analysis.

The “incremental approach” in the model is applied for the calculation of the investment cost, the operation costs, the revenues and the funding gap calculation.

The Model consists of a series of linked worksheets. It develops year on year projections of investment, water and wastewater revenues (based on volumetric water sales) and operating costs. It is followed by financial statements incorporating project capital costs and funding, together with any other major projects and loan repayment obligations.

#### 4.1.2 Worksheets of the CBA Model

The worksheets in the CBA Model are summarized in Table 4.5-1, VOLUME 3; APPENDIX 2 COST BENEFIT ANALYSIS, Section 4.5 Project CBA Model below.

*Figure 3 Worksheets CBA Model*

<b>CBA MODEL FOR PROJECT ZRENJANIN WASTEWATER MANAGEMENT</b>		
<b>No.</b>	<b>Worksheet Title</b>	<b>Description</b>
<b>1</b>	<b>Input</b>	Contains the mayor input variables and assumptions of the model
<b>2</b>	<b>Macro</b>	Contains macroeconomic indicators used in the model including three scenarios
<b>3</b>	<b>Demand</b>	Contains calculation of water and wastewater projections
<b>4</b>	<b>Investment</b>	Contains calculation of capital expenditure and investment plan
<b>5</b>	<b>Operating costs</b>	Contains calculations of operation and maintenance costs
<b>6</b>	<b>Tariff</b>	Calculate possible tariff profile and revenues in RSD
<b>7</b>	<b>Tariff EUR</b>	Estimate tariffs and revenues in EUR
<b>8</b>	<b>Revenues</b>	Contains calculations of revenues in EUR and RSD
<b>9</b>	<b>Affordability</b>	Contains affordability assessment
<b>10</b>	<b>Financing Gap</b>	Contains estimation of financial gap as per EC procedures under structural Funds
<b>11</b>	<b>PUC Statement</b>	Contains Income Statements, Cash-Flow-Statement, balance sheet and financial ratios
<b>12</b>	<b>Economic Elements</b>	Documents the cost of other individual facilities used in the system
<b>13</b>	<b>Economic analysis</b>	Contains output report economic cost benefit analysis

## 4.2 PPP OPTION AND SCOPE

The most sustainable and efficient option for the PPP was determined as the most efficient Lifecycle cost benefit option according to the CBA..

Using a discounted cash analysis (Net Present Values – NPVs, based on a discount rate of 4%), the capital investment, and incremental operation and maintenance costs over the project period of the different options were compared:

<u>OPTION.....</u>	<u>SCOPE.....</u>
• WWTP location	Site Zrenjanin
• Waste water treatment technology	CASB with BNR
• Sewage collection system	Connection to the new WWTP and to settlements in the territory
• Period	30 Years
• 2 Phases	2015 – 2025 and 2025 - 2045

The same parameters were used for technical assistance (4% of the capital investment costs), site supervisions of works (5% of capital investment cost) design, contingencies (5% of capital investment costs), etc. (See also Volume 2, FEASIBILITY STUDY; Section 8.6.6 Cost Estimates and 8.7.4 Investment Costs)

The main differences arise in respect of capital investment costs with regards to site preparation and flood protection; sewerage system pipelines with pumping and with two of the options, the length of the main collector to the WWTP.

The NPV of the chosen option for the PPP in Zrenjanin is 24% better than the second option in Muzlja and even 40% better than the 3<sup>rd</sup> option on site in Lukicevo.

*Figure 4 Option PPP-Project*

Option PPP-Project	Total investment cost, €	NPV WWTP and WW collection investment cost, €	NPV O&M cost, €	NPV total, €
WWTP site Zrenjanin CASP with BNR with sewage collection system 2 Phases: 2015-2025 2025-2045	20.657.000	18.323.000	16.635.000	34.958.000

In addition to the comparison of the Lifecycle costs, a multi-criteria analysis of the proposed wastewater/sewerage collection and treatment options was undertaken with the similar results for the PPP as the best option.

## 4.3 CBA DELIVERIES

### 4.3.1 Financial conclusions

The financial analysis shows:

1. The total eligible **project investment costs** (including contingencies) in constant 2015 prices amounts to **€20.657 million**, giving a **specific per capita long-term investment cost** of approximately **€244/capita** based on the total beneficiary population in the City of Zrenjanin expected to be served in 2018/2019 (date of completion of project first phase).
2. The **Average Incremental Financial Costs** (AIFC, in RSD or € per m<sup>3</sup>) which is a good approximation for the long-term marginal cost of the water supply and the wastewater systems to be implemented, shows values of €0.25 per m<sup>3</sup> for the wastewater system component.

3. For the tariffs, the existing **tariffs** for water are 22.25 RSD/m<sup>3</sup> for domestic customers and 50 RSD/m<sup>3</sup> for commerce and industry. For **wastewater**, the predicted increases are **47.42 RSD/m<sup>3</sup> for domestic customers** and **53.35 RSD/m<sup>3</sup> for commerce and industry**, in 2018/2019. The levels are accord with “full cost recovery” and are within the affordability criteria used and move towards a policy of a “unified” tariff.
4. Both the financial **net present value** and the **financial internal rate of return** of the investment (FRR/C, FNPV/C) **are negative** before EU assistance (**-3.17%; -15,034.408€**), which reflects the need of external financial support for the project. With the project they are slightly positive.
5. The **total project costs** are **€22.295 million**. The calculated “**funding gap**” for the project is 82% which equates to a potential **EC grant of €15.55 million** (or just under 70% of the project value); potential **Government funding of €4.962 million** and a **City contribution of €1.783 million**.

#### ***4.3.2 Economic conclusions***

The economic analysis shows:

1. There are a number of **positive health, resource, ecosystem, social and other benefits** from the wastewater collection and treatment project.
2. Taking into account a **social discount rate of 5%**, the **economic rate of return (ERR)** is calculated at **22.2%**; an **economic net present value of €37.714 million** and a **benefit cost ratio of 2.18**.

## 5 PPP CONTRACTS

It is intended to procure the scope of delivery and services for planning, construction, financing and operation for the new WWTP and the sewage system as PPP in accordance to the Law on PPP and Concession of the Republic of Serbia of 2011.

### 5.1 REASONS FOR PPP ZENRAJIN

The reasons of using the PPP model instead of conventional public procurement is based on the expectation that optimal risk-sharing with private partner the public sector has a greater "value for money" (value for money-VFM) and could have the following advantages:

1. Acceleration of infrastructure provision - PPPs allow the public sector to translate upfront capital expenditure into a flow of ongoing service payments. This enables projects to proceed when the availability of public capital may be constrained (either by public spending caps or annual budgeting cycles), thus bringing forward much needed investment.
2. Faster implementation - the allocation of design and construction responsibility to the private sector, combined with payments linked to the availability of a service, provides significant incentives for the private sector to deliver capital projects within shorter construction timeframes.
3. Reduced whole life costs - PPP projects which require operational and maintenance service provision provide the private sector with strong incentives to minimise costs over the whole life of a project, something that is inherently difficult to achieve within the constraints of traditional public sector budgeting.
4. Better risk allocation - a core principle of any PPP is the allocation of risk to the party best able to manage it at least cost. The aim is to optimise rather than maximise risk transfer, to ensure that best value is achieved.



5. Better incentives to perform - the allocation of project risk should incentivise a private sector contractor to improve its management and performance on any given project. Under most PPP projects, full payment to the private sector contractor will only occur if the required service standards are being met on an ongoing basis.
6. Improved quality of service - international experience suggests that the quality of service achieved under a PPP is often better than that achieved by traditional procurement. This may reflect the better integration of services with supporting assets, improved economies of scale, the introduction of innovation in service delivery, or the performance incentives and penalties typically included within a PPP contract.
7. Generation of additional revenues - the private sector may be able to generate additional revenues from third parties, thereby reducing the cost of any public sector subvention required. Additional revenue may be generated through the use of spare capacity or the disposal of surplus assets.
8. Enhanced public management - by transferring responsibility for providing public services government officials will act as regulators and will focus upon service planning and performance monitoring instead of the management of the day to day delivery of public services. In addition, by exposing public services to competition, PPPs enable the cost of public services to be benchmarked against market standards to ensure that the very best value for money is being achieved. International interest in PPPs is attributable generally to three main drivers:
9. Investment in infrastructure - economic growth is highly dependent on the development and enhancement of infrastructure, particularly in utilities (such as power, water and telecommunications) and transport systems. Furthermore, in many countries there is an urgent need for new social infrastructure such as hospitals and healthcare equipment, prisons, education facilities and housing. For many governments this is seen as the most pressing area for private sector involvement.

10. Greater efficiency in the use of resources - the experience of privatisation has shown that many activities, even those traditionally undertaken by the public sector, can be undertaken more cost effectively with the application of private sector management disciplines and competencies.
11. Generating commercial value from public sector assets - significant amounts of public resources are invested in the development of assets such as defence technology and leading edge information systems that are then often used for a narrow range of applications within the public sector. Engaging private sector expertise to exploit these assets in a wider range of applications can lead to the realisation of substantial incremental value for the public sector.

## 5.2 PPP CHARACTERISTICS

The model of PPP differs from conventional public procurement in several respects. In the PPP model the public and private sector work together to realize public infrastructure projects - such as this Zrenjanin Wastewater Management Project – which have shared the following characteristics:

- Long-term contract as Lifecycle approach on PPP between the public sector and private sector companies involved in PPP's, based on the supply of services, not assets.
- The transfer of certain risks to the private sector, particularly in the area of design, construction, management and / or financing, with clear risk sharing
- Focus on the specification of the output characteristics of the project (outputs) rather than on the input characteristics of the project (inputs), taking into account the implications for PPP's throughout the life course of the project.

- Using private financing ("Project Financing") to delineate the risks transferred to the private sector, based on projected revenues from the facility
- Competitive Dialogue with standardized procurement packs such as output specifications, cash flow models, risk matrix, PPP contracts for different facility types

The first step of the roadmap in the implementation of project construction and management of wastewater treatment plant in the territory of a city Zrenjanin began researching the market.

It is a process that is used to provide indications of the sustainability of a PPP project and to gain potential commercial constraints. It will be used as a tool for assessing the assumption that will be used to develop a partnership model and analysis of the potential and costs.

## 5.3 PPP MODELS

According to the Law on PPP and Concession of the Republic of Serbia of 2011, the Public Procurement Law of 2012 and the meet the two main interests of the City of Zrenjanin

- Obtaining a grant proportion and EU funding for works as high as possible and
- Ensuring the most efficient and sustainable planning, construction, financing and operation for the Zrenjanin Wastewater Management

two basic PPP models are proposed to potential private partners, which should be adjusted to the results of the market research:

1. Concession
2. Management Partnership

### 5.3.1 Concession

Concession is herewith defined as the right for a private partner to perform the activity of public interest, here the planning, construction, financing and operation of Zrenjanin Wastewater Management, in return for a concession fee as authority-pay. The private partner bears the risk associated with the commercial use of the subject of the concession and creates a joint venture PPP with the City of Zrenjanin in charge of implementing the project.

The Concession contract duration ranges between 15 and 30 years and includes the following main agreements:

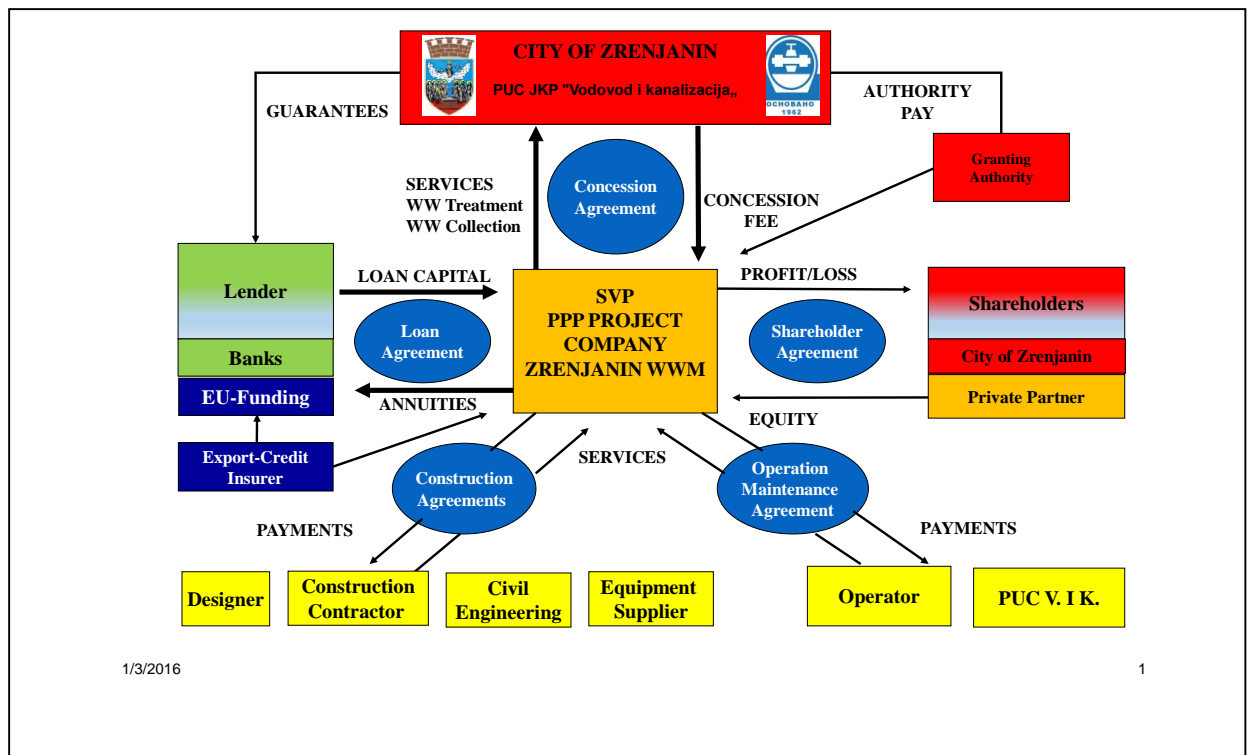
- Concession Agreement
- Implementation Agreement
- Construction Contract
- Operations and Maintenance Contract

- Shareholder Agreement
- Special-Purpose Company Documents
- Loan Agreements
- Inter-creditor Agreement
- Escrow Account / Trustee Arrangements
- Insurance, Licences; Permits; Bills & Decrees

The private partner has to guarantee certain wastewater tariff for consumers and industries as part of the concession fee over the contract period. Necessary tariff adjustments during the contract period will be calculated on a pricing formula according to the concession agreement.

The private partner bears by the guaranteed wastewater tariff all risks, concerning his cost for capital expenditure, finance as well as operation and maintenance for the calculated volumes of treated waste water.

Figure 5 PPP Model Concession



### ***5.3.2 Management Partnership***

The PPP Model of Management Partnership is defined as the right for a private partner to perform the activity of public interest in support of a management contract for asset such as investment and financing as well as operation and maintenance between the private partner and the PUC. Design, construction, financing and operation would be connected by an integrated incentive system as essential part of the management contract..

The investment part of the project ZWM would be similar to the PPP Concession and includes the services for planning, construction and financing over the long-term contract period.

The following agreements would be concluded between the PUC on behalf of the City of Zrenjanin and the different private contractors, operators, banks and institutions directly, supported by a management contract concluded with the private partner.

- Construction Contract
- Implementation Agreement
- Outsourced services Agreement
- Loan Agreements
- Inter-creditor Agreement
- Escrow Account / Trustee Arrangements
- Insurance, Licences; Permits; Bills & Decrees

The PPP would be based on the management contract between the PUC and the private partner directly. According to the management contract, the private partner bears the risks associated with the sustainable realization of investment, financing and operation of the project through the incentive system as essential part of the management contract.

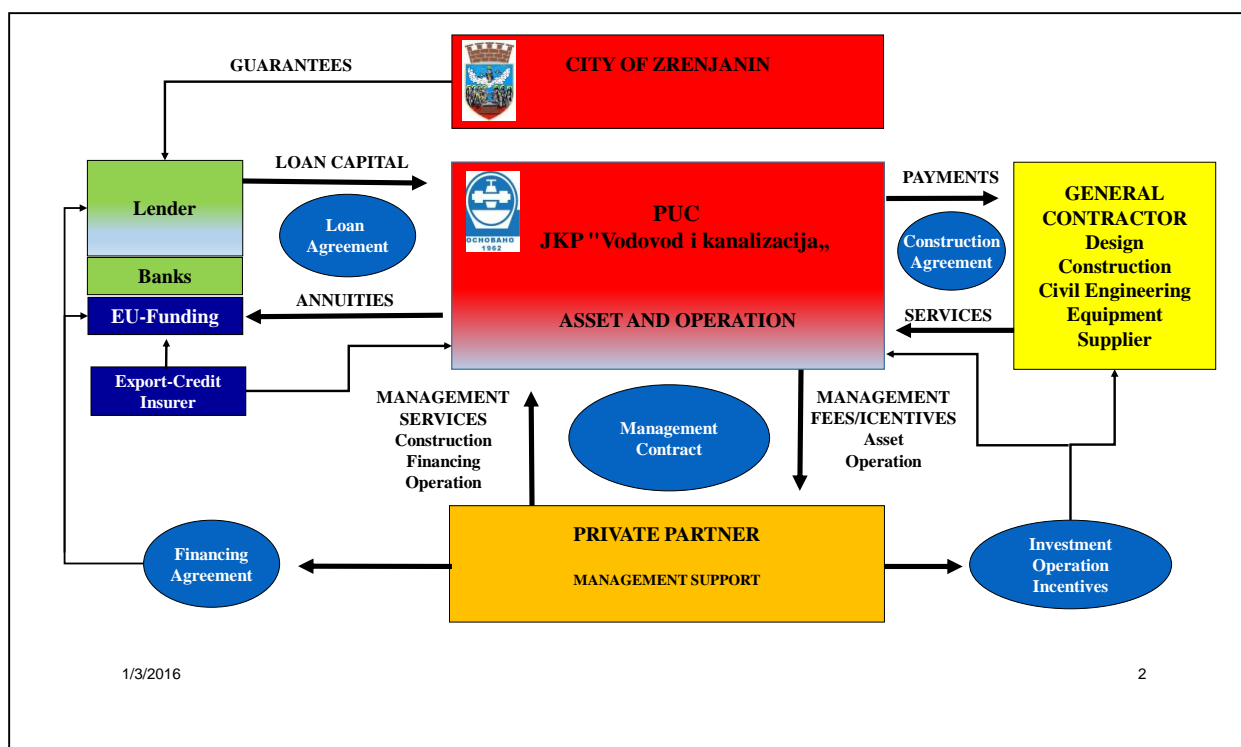
The management fee would comprehend ab fixes basis fee and a second variable fee as bonus/malus system. The repayment for the credit would be determined as annuity, fixed as long as the fixed interest rate of the agreed upon period. The management fee and the repayment for the credit will be paid from PUC from revenues from the services of ZVM.

The operation and maintenance will delivered by the PUC itself under the support and consulting of the private partner according to the management contract.

The management contract contains an incentive system which links the operation and maintenance of the ZWM with the investments.

Management contract would be designed as revolving agreement for period of 5 years and can be extended by a push option from the PUC for a further 5year period.

Figure 6 PPP Model Management Partnership



## 5.4 FINANCIAL REOURCES

The European Union has over 500 million inhabitants. The waste water generated by this large population and by industry is a major source of pollution. It can affect the quality of drinking and bathing waters. It can also increase biodiversity loss and hinder the objective set by the Water Framework Directive of achieving good ecological status in our waters by 2015. The Urban Waste Water Treatment Directive is often perceived as costly but it addresses these challenges with great benefits to both our health and our environment. Just like other water legislation of the European Union, the Directive has clear and binding objectives. However, it is fully flexible on the means to achieve such objectives. Thus it allows alternative solutions and encourages innovations both in waste water collection and treatment.

Serbia is still suffering from a legacy of environmental degradation. For instance, whereas on average within the EU nearly 90% of urban waste water is treated prior to release and nearly 100% of municipal solid waste is collected, in Serbia only 10% of waste water is treated prior to release and only 60% of municipal solid waste is collected. In addition, the municipal solid waste that is collected largely has to be disposed of in landfills that do not adequately protect the environment and public health.

Both the financial net present value and the financial internal rate of return of the investment (FRR/C, FNPV/C) are negative before EU assistance (-3.17%; -15,034.408€), which reflects the need of external financial support for the project.

The total project costs are €22.295 million. The calculated “funding gap” according to CBA for the project is 82% which equates to a potential EC grant of €15.55 million (or just under 70% of the project value); potential Government funding of €4.962 million and a City contribution of €1.783 million.



### Types of financing

Assistance will be provided primarily through twinning, technical assistance, supplies of equipment and possibly also through calls for proposals and direct grants to relevant national authorities. Sector budget support can be considered from 2015 onwards especially to support the PAR and/or public financial management reform, provided that Serbia meets the four pre-conditions for sector budget support. Complementary support to the PAR reform area is provided from the IPA II multi-country programme through cooperation with SIGMA (OECD) and the Regional School of Public Administration.

### Funding the gap

The funding gap after cost recovery must be covered by a mix of instruments, including:

- EU grants.

IPA III during the Candidate phase, which is estimated to commence in 2012 and to finalize in 2019 (the assumed date of accession), when Structural Funds would become available. This assumption is needed for the Financial Plan as the amounts of grants will increase substantially upon achieving the membership status.

- Net Financing without recourse to Government.

This includes a mix of IFIs, domestic and other commercial banks, project finance from KfW and other specialized sources, direct loans to projects (EBRD, EIB, etc.) without recourse to government, i.e. no direct state guarantee or other forms of support that imply that the risk is totally or partially allocated to the public sector. Based on prior experience in other approximation processes (most notably and recently in Romania), this is estimated at 22% of investments, with repayment schedules of 15 years, a grace period of three years and average interest rates of 6%.

- Other donors.  
This includes direct support from project donors, Technical Assistance and specific project components. Such sources amount to approximately 4% of the effort.
  
- Industry/commercial direct investments and private investors.  
Industry is expected to contribute 6.9% of cost on the basis of the overall industrial/commercial share in expenses on utilities of 27.5% of total household income. Private investment is a variable factor, but is estimated to account for 6% of investment needs. It must be noted that private sector investments have a strong dynamizing effect and special emphasis should be made to create favorable conditions, especially in sectors such as waste, where project viability is higher and public sector support should be minimized.
  
- The remaining gap will have to be financed by the public sector through a variety of instruments, which include:
  - a) Central budget;
  
  - b) Local Self-Government budgets;
  
  - c) Other public sector institutions (SEPA, National Investment Plan (NIP));
  
  - d) Economic instruments, most prominently the SEPF, the Budgetary Fund of the Republic of Serbia for Water and the Budgetary Fund of the Autonomous Province of Vojvodina for Water.

The portion remaining after these contributions will also have to be financed by the Public Sector, this time through financial instruments (for example, an EBRD line for environmental projects co-financing). The following financial resources could be available for the PPP Project ZWM:

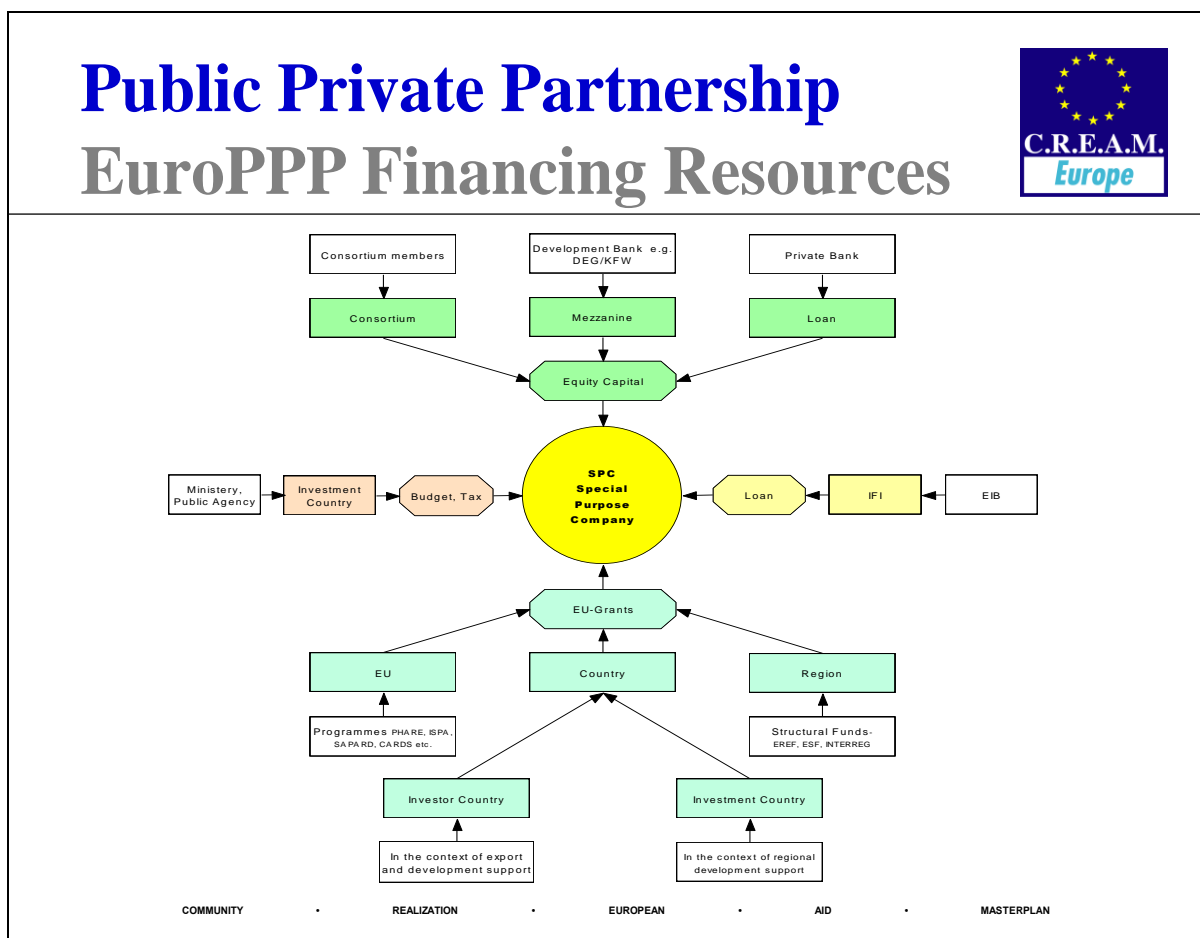


Figure 7 Financial Resources

## 5.5 PROJECT RISKS AND RISK ALLOCATION

*Figure 8 Risk Matrix for PPP Contract*

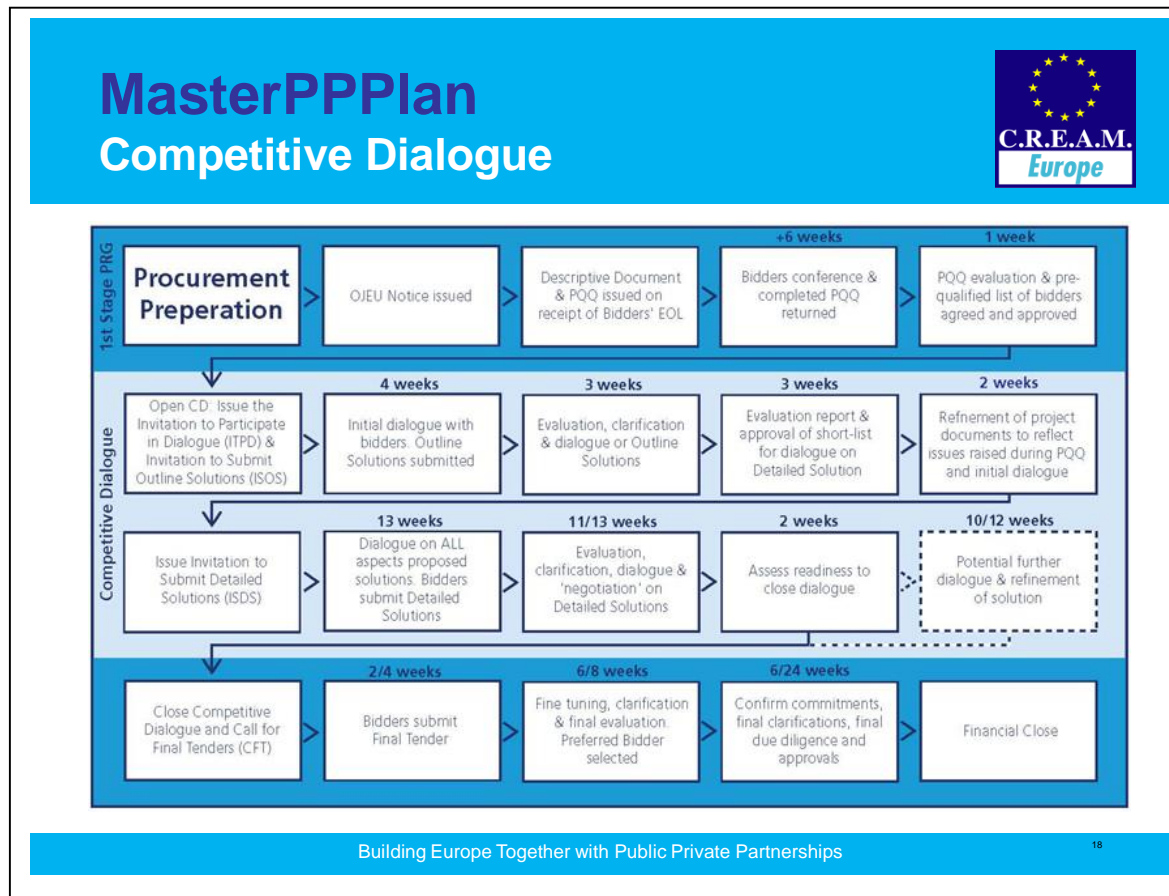
Risk	Type	Mitigation
Pre-completion	<ul style="list-style-type: none"> <li>- Cost over-runs</li> <li>- Delays</li> </ul>	<ul style="list-style-type: none"> <li>(a) Fixed price turnkey contracts</li> <li>(b) Warranties / penalties / incentives</li> <li>(c) Fixed project specification</li> <li>(d) Strong contractors</li> </ul>
Post-completion	<ul style="list-style-type: none"> <li>- Revenue forecasts</li> <li>- Revenue build-up</li> <li>- Operating costs</li> <li>- Management failure</li> </ul>	<ul style="list-style-type: none"> <li>(a) Committed supply contracts</li> <li>(b) Committed off-take contracts</li> <li>(c) Strong operators</li> <li>(d) Performance guarantees</li> </ul>
Technical	<ul style="list-style-type: none"> <li>- Performance</li> <li>- Environmental</li> <li>- Safety</li> </ul>	<ul style="list-style-type: none"> <li>(a) Warranties</li> <li>(b) Proven technologies</li> <li>(c) Public consultation and approval</li> </ul>
Financial	<ul style="list-style-type: none"> <li>- Structure: debt/equity ratio, eg. 75/25</li> <li>- Structure: return on capital</li> <li>- Structure: risk / reward ratio</li> <li>- Foreign exchange</li> <li>- Interest rates</li> <li>- Debt service cover</li> <li>- Taxation</li> </ul>	<ul style="list-style-type: none"> <li>(a) Equitable ROE, ( eg. 15-20 %)</li> <li>(b) Acceptable cover ratios ( e.g 1.5 -2.0)</li> <li>(c) Escrow and reserve accounts</li> <li>(d) Dividend constraints</li> <li>(e) Loan syndication</li> <li>(f) Insurance / financial derivatives</li> <li>(g) Standby funding arrangements</li> </ul>
Legal	<ul style="list-style-type: none"> <li>- Regulatory framework?</li> <li>- Concession law?</li> </ul>	<ul style="list-style-type: none"> <li>(a) Experienced lawyers.</li> <li>(b) Clear, simple documents</li> </ul>
Political	<ul style="list-style-type: none"> <li>- Regime stability</li> <li>- Force majeure aggt.</li> <li>- Political intervention</li> </ul>	<ul style="list-style-type: none"> <li>(a) Clear regulatory regime</li> <li>(b) Investment insurance</li> <li>(c) IFI support</li> </ul>

## 6 IMPLEMENTATION

Figure 9 Road Map for PPP Project ZWM



Figure 10 Time schedule for the Competitive Dialog



Berlin, 8<sup>th</sup> of January 2016