

**REGIONAL TRAINING EVENT-STRENGTHENING PUBLIC SECTOR
CAPACITY TO MOBILIZE DEPOLLUTION INVESTMENTS
AND
PRIVATE SECTOR PARTICIPATION**

Sustainable Water Integrated Management (SWIM) - Support Mechanism

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*Feasibility and profitability of PPPs in water infrastructure
with case study/ As Samra WWTP*

Conventional Public Finance 1/

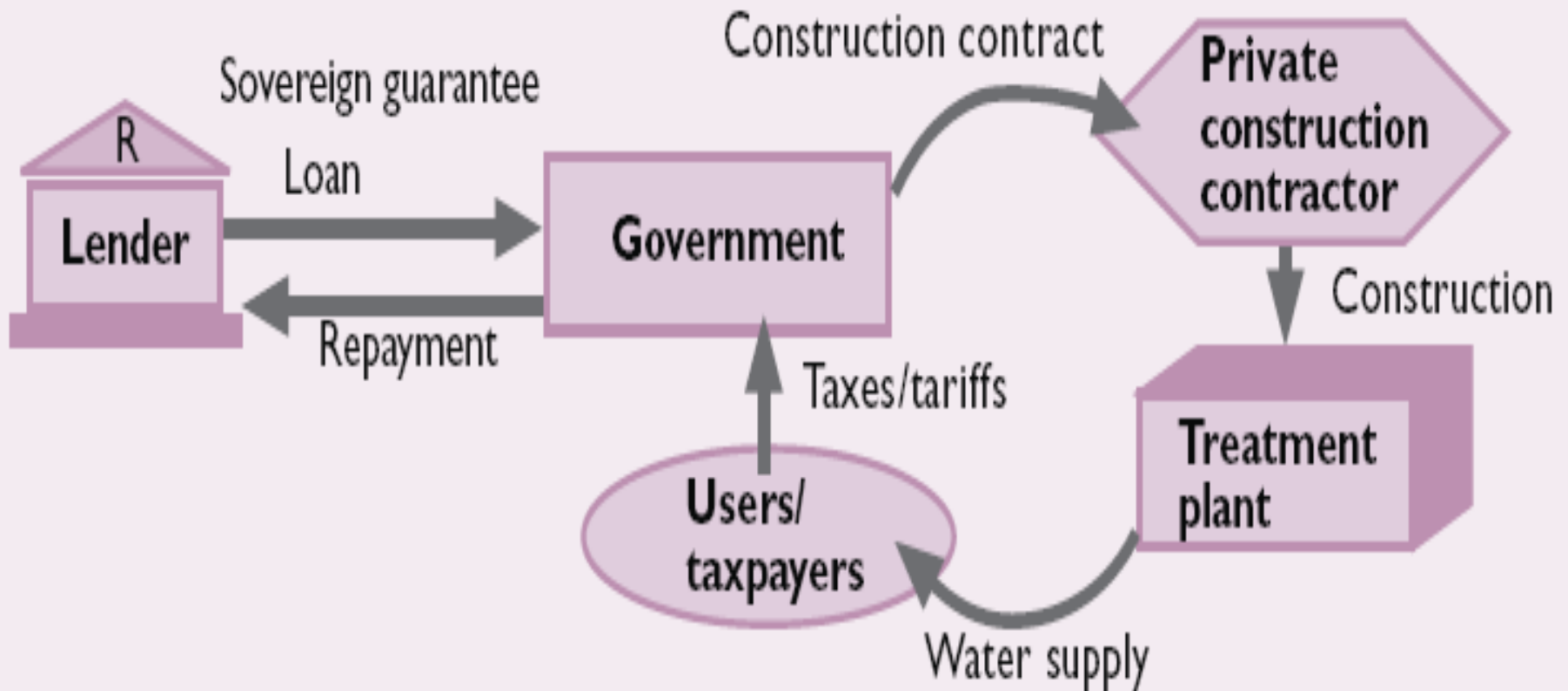
- Governments fund public projects by using existing surplus funds or issuing debt (government bonds) to be repaid over a specific period. Contracts that follow this type of project execution are the usual Engineer and Procure Contracts (EPC).
- A government borrows funds to totally or partially finance an infrastructure project. Naturally, Government may contribute its own equity in addition to the borrowed funds to reduce the total debt.
- In order to borrow, a government gives a sovereign guarantee to lenders to repay these loans. This sovereign guarantee then shows as a liability on Government's list of financial obligations, thus affecting its credit rating.

Conventional Public Finance /2

- Lenders analyze Government's total ability to raise funds for repayment of the loan through taxation and/or general public enterprise revenues, including new tariff revenue from the project, i.e. through taxpayers or users, or both
- Donors may impose certain covenants pertaining to the utility or entity benefiting from the project which could be timely or otherwise. International lending or development institutions may, rightly or otherwise, dictate certain terms that go beyond the project itself
- Though still needed when assessing the magnitude of the portfolio of projects needed to be financed, this funding is less attractive as it taxes already strained government own balance sheets limiting its ability to undertake other projects

Public Finance Structure

(Source: Project Finance Manual, National Treasury South Africa 2001)

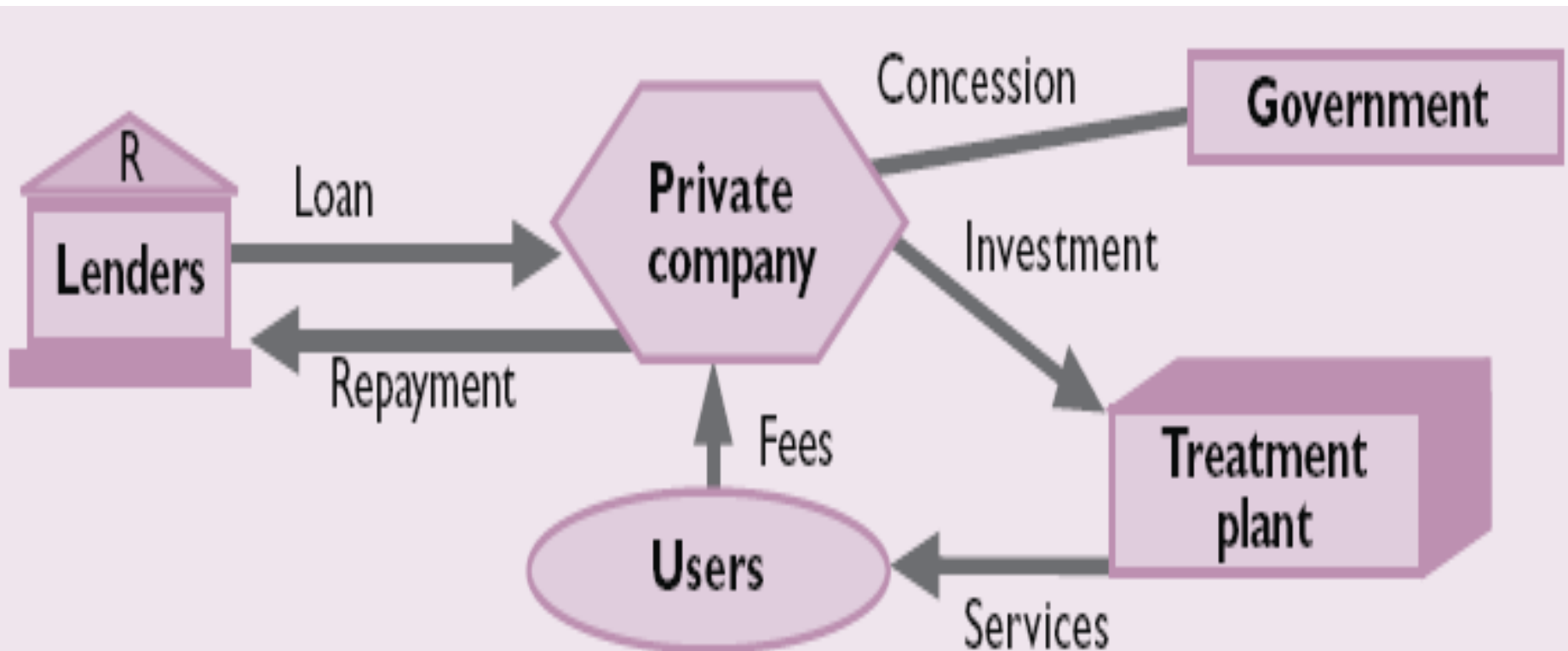


Corporate Finance

- Corporate Finance is used for shorter, less capital-intensive projects that do not warrant outside financing.
- A private company borrows funds to construct a new treatment facility and guarantees to repay lenders from its available operating income and its base of assets.
- The company may choose to contribute its own equity as well.
- In performing credit analysis, lenders look at the company's total income from operations, its stock of assets, and its existing liabilities.
- The loan shows up as a liability on the company's balance sheet
- Generally, however, private companies avoid this option, as it strains their balance sheets and capacity, and limits their potential participation in future projects.

Corporate Finance Structure

(Source: Project Finance Manual, National Treasury South Africa 2001)



Project Finance

1/4

- Project Finance uses the project's assets and/or future revenues as the basis for raising funds.
- The sponsors create a special purpose, legally independent company (SPV) in which they are the principal shareholders.
- SPV usually has the minimum equity required to issue debt at a reasonable cost, with equity generally ranging between 10% and 30 % of the total capital required for the project.
- Individual sponsors often hold a sufficiently small share of the new company's equity, to ensure that it cannot be construed as a subsidiary for legal and accounting purposes.
- The final legal structure of each independent project is different.

Project Finance

2/4

The legal vehicle (company) frequently has more than one sponsor, generally because the project exceeds the financial or technical capabilities of one sponsor. Background to this is that:

- the process requires or encourages a joint venture with certain interests (e.g. local participation or empowerment).
- the sponsors complement each other in terms of capability.
- risks associated with the project have to be shared.
- a larger project achieves economies of scale that several smaller projects will not achieve.
- legal and accounting rules stipulate a maximum equity position per sponsor, above which the project company will be considered a subsidiary; defining the limit of individual sponsors.

Project Finance

3/4

Other features of Project Finance:

- A team or consortium of private firms establish a new project company to build, own and operate a specific infrastructure project. The new project company is capitalized with equity contributions from each of the sponsors.
- The project company borrows funds from lenders. The lenders look to the projected future revenue stream generated by the project and the project company's assets to repay all loans.
- The host country government does not provide a financial guarantee to lenders; sponsoring firms provide limited guarantees. "Off-Balance-Sheet" financing.

Project Finance

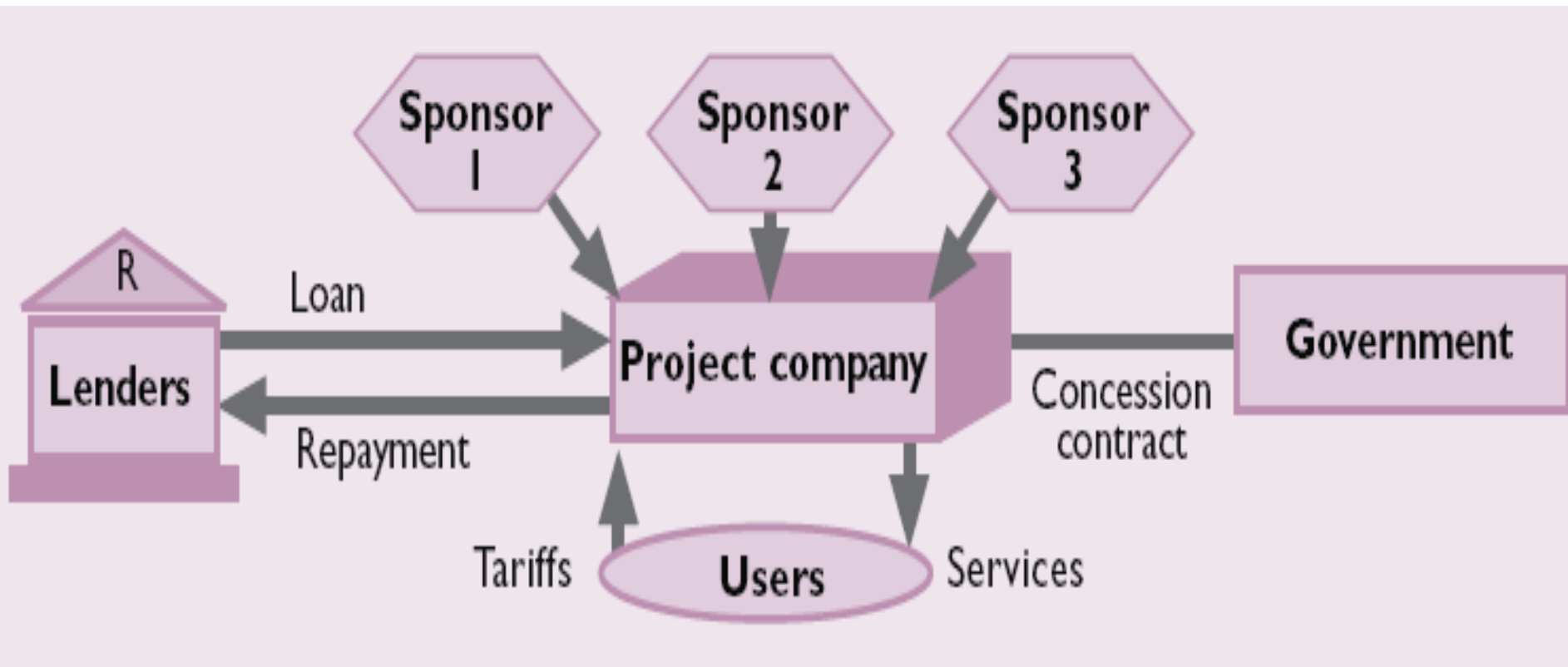
4/4

Other specificities of Project Finance:

- In large projects, different legal vehicles may be established to perform specific functions (i.e. construction, maintenance and actual ownership).
- The structure is often dictated by tax and other legal conditions, as well as by the credit implications for each participant.
- In designing the structure of the project, stakeholders should maintain maximum flexibility. In other words, sponsors often have other interests in the project, including the design, construction or management of the project, for which they will establish independent legal entities.
- These relationships will be governed by additional contracts between the project company and the sponsors.
- Sponsors are not precluded from being lenders; this overlap often occurs in practice.

Project Finance Structure

(Source: Project Finance Manual, National Treasury South Africa 2001)



Drivers for Private Finance

- Capital investment required to build modern wastewater treatment plants remains high. Most governments cannot afford such investment, and prefer to use funds for more socially desirable projects.
- Governments and multilateral lending agencies look at private finance as a means to introduce more commercial methods and approaches in the way public utilities are financed and operated, hence improved efficiencies in operations and in cost recovery.
- Private sector finance can reduce the cost of treatment through competition, efficiency, the introduction of more integrated solutions at the plant level such as using biosolids to fuel the plants, utilization of grey water, or contribution towards cost recovery through accessing new revenue schemes such as capitalization on the revenue potential of dry sludge and Treated Sewage Effluent (TSE).

Basic Criteria for PPP Feasibility

- **Enabling framework** (legislative, regulatory, political... throughout life of project)
- **Well dimensioned, economically relevant project** (social economic need, correct investment size, proven technology)
- **Responsible reliable public party** (decision maker, undertakings, e.g. off-taker, involvement of stakeholders)(country/utility ratings)
- **Motivated, experienced private party** (ability to sustain project-related undertakings, track-record & finances, interest – risk/reward and short term vs long term)
- **Clear and flexible contract** (clear rules, adjustments in the course, benchmark e.g. termination, arbitration, etc.)
- **Smart financing structure** (efficient management and allocation of risks, FOREX, Packaging security, O&M and EPC)

The Project is Bankable once these are met

Alternate Funds for Finance

	<u><i>Source</i></u>	<u><i>Contract</i></u>
• Public Funds	-Budget -Grants -Loans	-EPC -Mgt Contract -Lease
• Private Funds	-Private banks -M L A	-BOO/ -BOT -Concession

PPP Feasibility and Profitability 1/

PPP feasibility study procedure includes five components

1. pre-screening checklist,
2. debt financing test,
3. equity financing evaluation,
4. sensitivity analysis, and
5. capital structure optimization.

PPP Feasibility and Profitability 2/

The integrated analysis framework will help the public entity:

- a. evaluate PPP maturity;
- b. identify risk factors and implementation barriers;
- c. determine debt capacity;
- d. establish minimum requirement for private equity investment;
- e. determine equity and public fund needs;
- f. evaluate and compare public and private financing plans;
- g. optimize capital structure under uncertainty;

Analysis of the financing plans should conclude that the project is able to generate strong cash flows for debt financing.

PPP Feasibility and Profitability /3

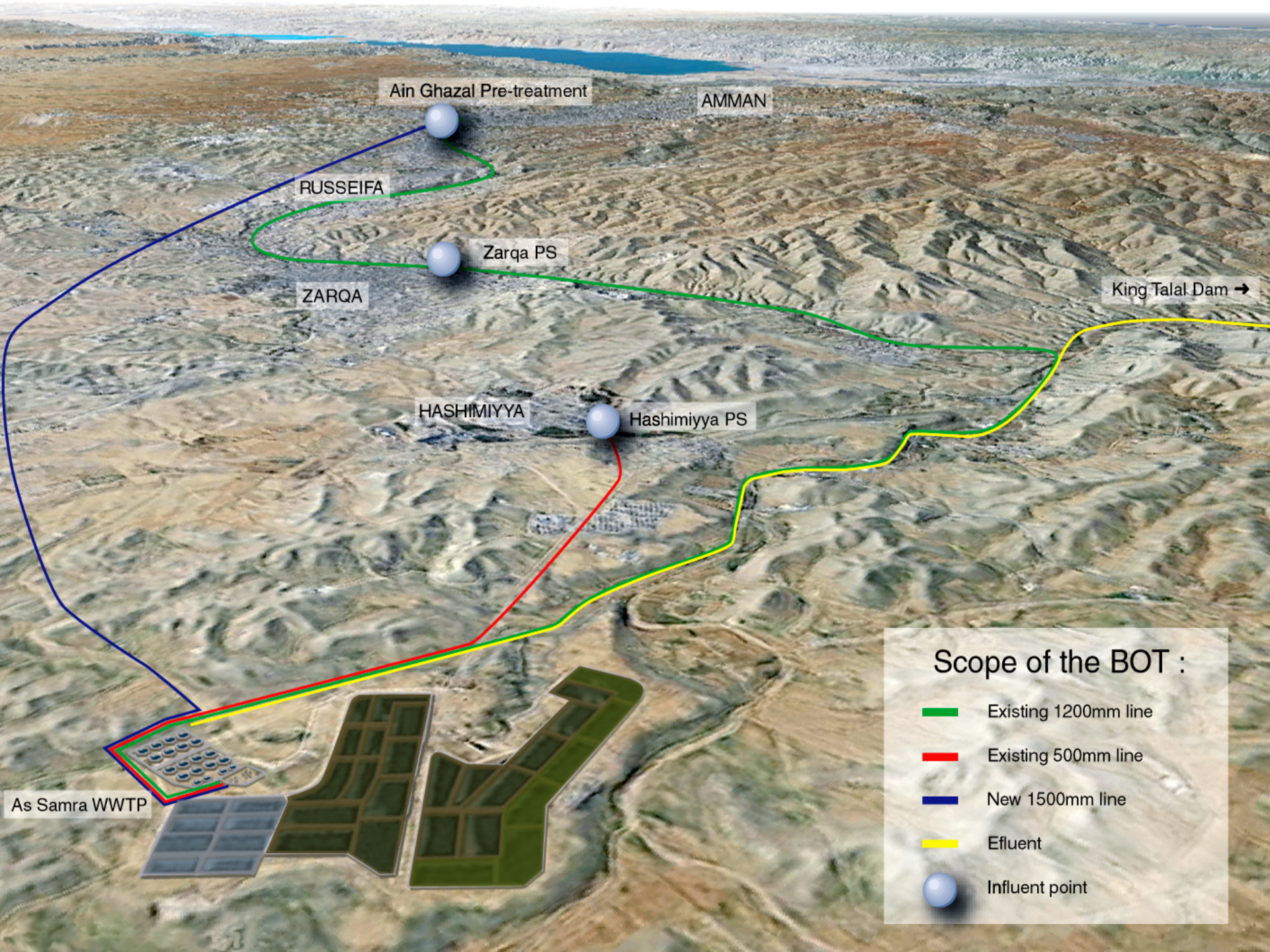
Major findings from the analysis would indicate the following:

1. amount that can be secured towards project capital cost under a public financing scenario from project revenue
2. amount that can be secured from private equity investment ; usually depending on investors' risk preference
3. the balance, if any, can either be secured to the project from the general budget one-time/annual financing, or through grants

The project can then be self-financed through a hybrid financing arrangement combining debt financing with available payment (s) leading to a sound financing plan.

Case Study:

**AS SAMRA WASTEWATER
TREATMENT PLANT IN JORDAN**



Ain Ghazal Pre-treatment

AMMAN

RUSSEIFA

Zarqa PS

ZARQA

King Talal Dam →

HASHIMIYYA

Hashimiyya PS

Scope of the BOT :

Existing 1200mm line

Existing 500mm line

New 1500mm line

Effluent

Influent point

As Samra WWTP

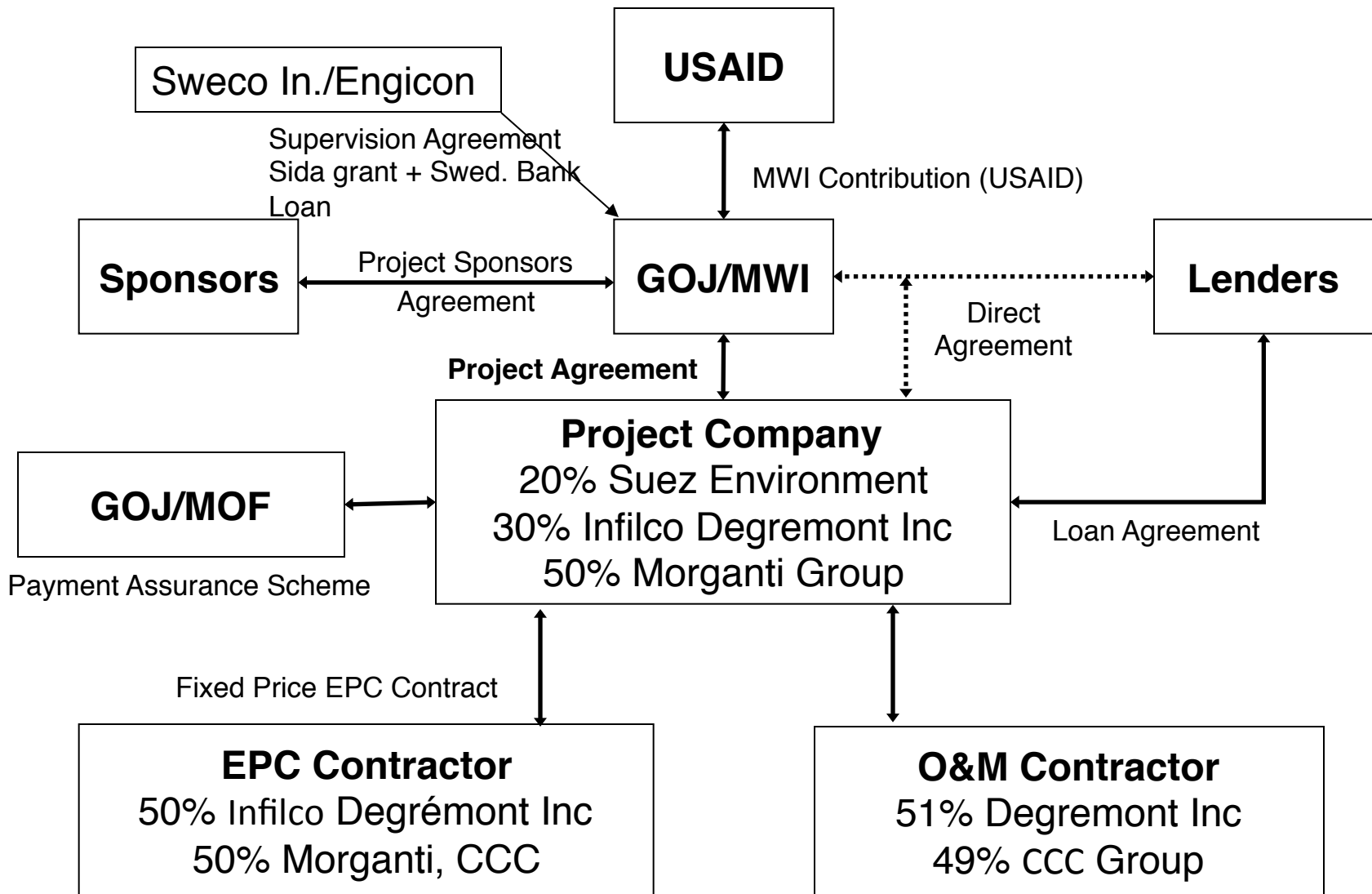
Existing Samra Stabilisation Ponds

Constructed in 1985	Parameter	Effluent quality
		Quality
Design Capacity 68,000 CM/Day. Avg. flow in 2002 - 190,000	BOD5	130mg/l
	Total Suspended Solids	200mg/l
Plant incapable of treating wastewater to meet JS for discharge	Total Nitrogen	150mg/l
	Nematode Eggs	<1 egg/l
	Faecal Coliforms	>10 ⁵ MPN/100ml
	DO	< 1 mg/l
	pH	6-10
	Fat, Oil ,Grease	>12mg/l
	Odours: H2S	>12mg/l

Project Development

1. CBD Notice Published for Pre-qualification 14/02/2000
2. 8 Consortia Submitted Pre-qual. Documents 23/04/2000
3. Five pre-qualified consortia announced 12/06/2000
4. **Draft** RFP issued to Pre-Qualified firms for comments 07/09/2000
5. Formal Issuance of RFP to Pre-qual. Firms 01/03/ 2001
6. Deadline for Submittal of Proposals (2 consortia +
one consortium withdrew before deadline) (Evaluation) 23/07/2001
7. Announcement of Preferred Bidder (Start Negotiations) 10/11/2001
8. Contract Negotiations concluded & Project Agreement Signing 28/07/2002
9. Financial Closing /effective date 10/12/ 2003

Simplified Contractual Framework



Treatment Charges: Structure

Fixed Portion:= $\text{Fix (Cap)} + I_I \cdot \text{Fix}_I (\text{Cap}) + I_C \cdot \text{Fix}_F (\text{Cap}) + I_L \cdot \text{Fix (Op)} + I_R \cdot I_C \text{Fix}_R (\text{Op})$

- Fix (Cap) : Repayment of Senior Debt
- $I_I \cdot \text{Fix}_I (\text{Cap})$: Payment of Senior Debt Interests
- $I_C \cdot \text{Fix}_F (\text{Cap})$: Remuneration of Sponsors Investment
- $I_R \cdot \text{Fix}_R (\text{Op})$: Payment of Fixed Renewal Expenditures
- $I_L \cdot \text{Fix (Op)}$: Payment of Fixed Operation Expenditures

Variable Portion:= $I_L \cdot \{ (A \cdot (V_p - 160)) + B [(X_p \cdot (V_p - 160)) + 160 \cdot (X_p - 0.55)] \}$

- $I_L \cdot A \cdot (V_p - 160)$: Payment of Variable OPEX (Flow)
- $I_L \cdot B \cdot (X_p \cdot (V_p - 160) + 160 \cdot (X_p - 0.55))$: Payment of Variable OPEX (Load)

I_I = Interest rate index

I_C = Currency Exchange rate index JD/USD

I_R = Renewal Index – Construction & Machinery index

$I_L = (50\% \times A_{Lm} / A_0) + (40\% \times B_{Lm} / B_0) + (10\% \times C_{Lm} / C_0)$

A- Labour Index

B- Producer price index

C- Electricity Index

Key Terms of the Project Agreement

- Executed with the Government of Jordan (“GOJ”) represented by the Ministry of Water & Irrigation (“MWI”)
- MWI Contribution (USAID grant) payable on Completion of Sections
- Treatment Charges payable when first (of four) Treatment Lines brought into Operation after 30 months
- Treatment Charges (Fixed and Variable) structured to match Project Company’s Liabilities
- Payment Assurance Scheme to address any revenue shortfall

The Project Company's Main Responsibilities

- Design, engineer, procure, construct & complete As-Samra plant and Ain Ghazal Pre-Treatment according to the Company's accepted Design and the Minimum Technical requirements
- Take delivery of wastewater at the influent points, pre - treat at Ain Ghazal & pumping Station, transport WW in the siphons & other pipes to the plant
- Treat and deliver the treated water at the effluent point
- Treat, store, market and sell and /or otherwise dispose of the sludge according to Jordanian standard safe environmental requirements
- Arrange and manage all power, water, telephone & all other services required for the execution/completion of the works
- Operate the Plant and Ain Ghazal for 22 years and two PS until the year 2010
- Procure all necessary proprietary rights, licenses, agreements, etc..
- Transfer the Plant and all MWI property and Tangible Properties to MWI at the end of the contract period renewed and fully operational

MWI'S Main Responsibilities

- Grant the right to use the site & MWI Property to the Project Company
- Provide existing installations for the supply of power, water, telephone & all services
- Deliver the wastewater at the inlet points
- Enforce Jordanian Laws & Regulations governing industrial discharges to public sewers
- Pay its contribution to the Project Cost (\$92Million) “Tied” to Verifiable Construction Completion Milestones
- Pay the Treatment Charges (according to formula)
- Establish & maintain the Payment Assurance Scheme (Reserve Account Agreement & MOF Guarantee Agreement) to address any revenue shortfall
- Exempt the project company, the sponsors, foreign financiers and contractors from all taxes duties, levies etc. according to the Investment Promotion Law and the government agreement with USAID

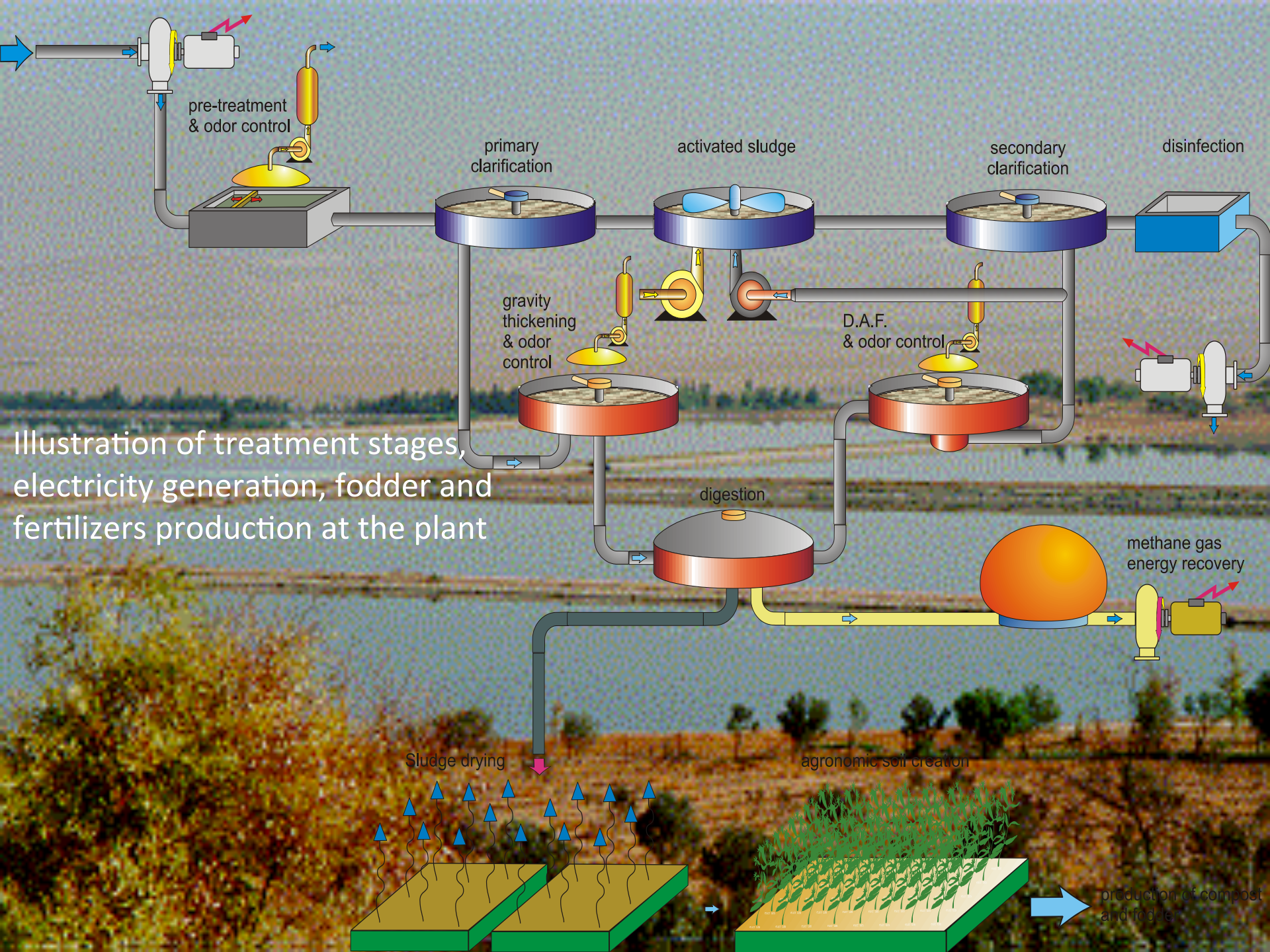
Liquidated Damages and Penalties

- Failure to reach the Final Completion Date, the Project Company should pay \$ 15000/ day (Maximum \$ 8,000,000)
- Liquidated damages for insufficient odour treatment is JD 3000/day
- Liquidated damages for excessive levels of noise is JD 3000/day
- Violation of the treated water quality in terms of BOD, Nitrogen & Bacteria Treatment Charges/2*(% of BOD exceedance+% of Nitrogen exceedance+10% of difference log of bacterial Number)
- The total liquidated damages shall not exceed twice the daily charge

Capped to Fixed F Cap/ month & 50% per year

- Penalties on delay in reporting = 0.05% of TC for the previous month every day

Capped to 2.5% of TC for the previous month



pre-treatment & odor control

primary clarification

activated sludge

secondary clarification

disinfection

gravity thickening & odor control

D.A.F. & odor control

digestion

methane gas energy recovery

Sludge drying

agronomic soil creation

production of compost and fodders

Illustration of treatment stages, electricity generation, fodder and fertilizers production at the plant



Parameter	Effluent Quality
BOD5	6mg/l
Total Suspended Solids	10mg/l
Total Nitrogen	15mg/l
Nematode Eggs	<1 egg/l
Faecal Coli forms	< 40 MPN/100ml
DO	> 1 mg/l
pH	7-9
Fat, Oil ,Grease	<8mg/l
Odours: (H2S, NH3, etc) -	< standard



BOD5	130mg/l
Total Suspended Solids	200mg/l
Total Nitrogen	150mg/l
Nematode Eggs	<1 egg/l
Faecal Coli forms	>10 ⁵ MPN/100ml
DO	< 1 mg/l
pH	6-10
Fat, Oil ,Grease	>12mg/l
Odours: H2S	>12mg/l



Project that Made Many Firsts

- The first BOT Project in Jordan
- The first electricity self-sufficient Wastewater Treatment Plant
- The first mix-finance project (Government, Donors “USAID”, Sponsors and Lenders)
- First Project under private involvement financed by Jordanian Banks
- First Comprehensive environmental project (full cycle) conveyance, treatment and reuse of by products (water, sludge, hydropower and gas)

THANK YOU