

Sustainable Water Integrated Management (SWIM)

Regional Training Event

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Day 1 – Session 3

Risks in PPPs for Water

by

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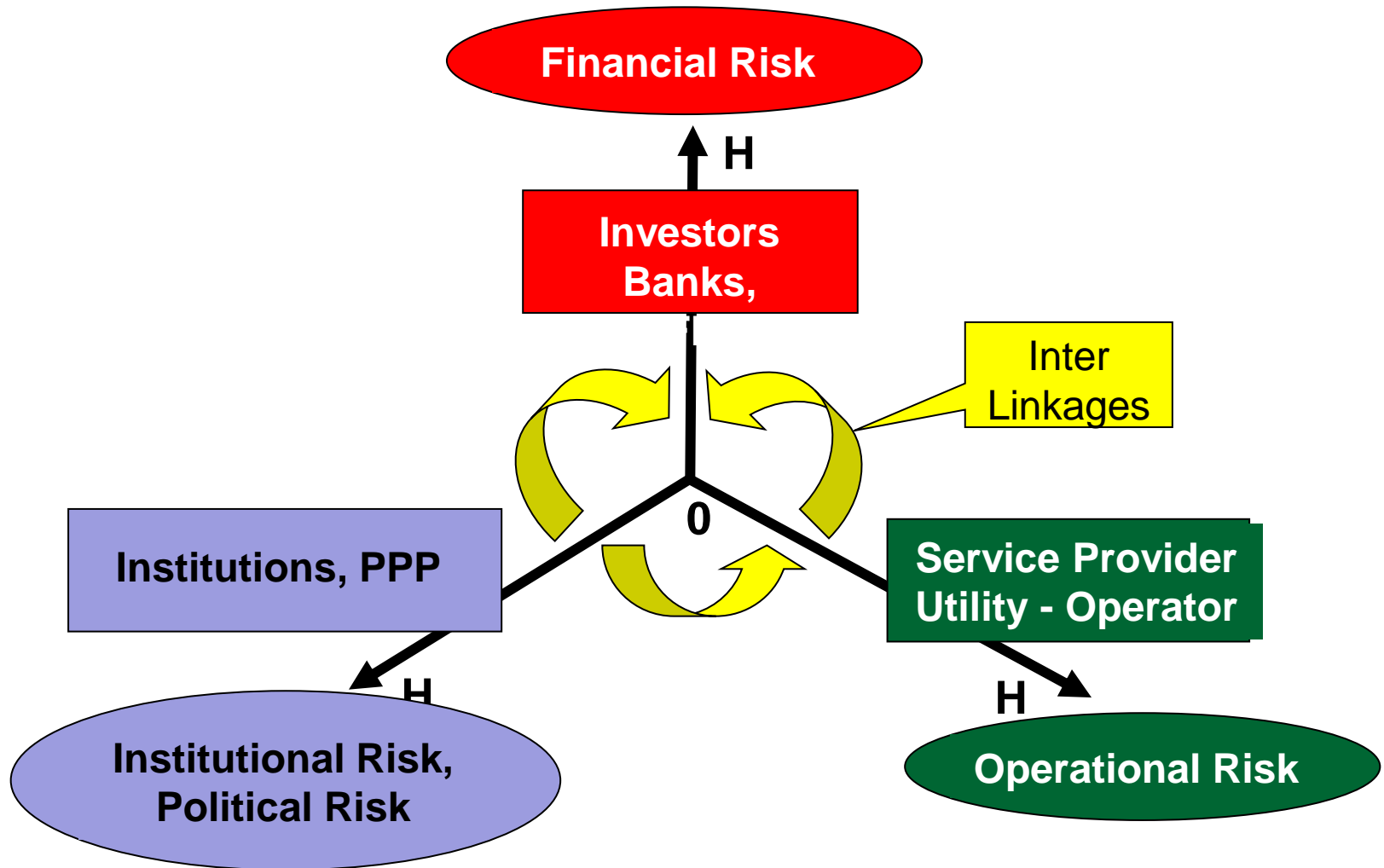
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Part 1: Introduction

Risk Management - A 3-Dimensional View



Background

Globally, there is a move by utilities towards using a Risk Management Framework to enhance safety of water supply / delivery. Recent initiatives include:

- Hazard Analysis and Critical Control Point (HACCP)
- New Zealand Public Health Risk Management Plans
- Australian Framework for Management of Drinking Water Quality
- From Source to Tap: the Multiple Barrier Approach to Safe Drinking Water (Canada)
- WHO Drinking Water Guidelines – Water Safety Plans
- The Bonn Charter – A Drinking Water Quality Framework for the 21st Century

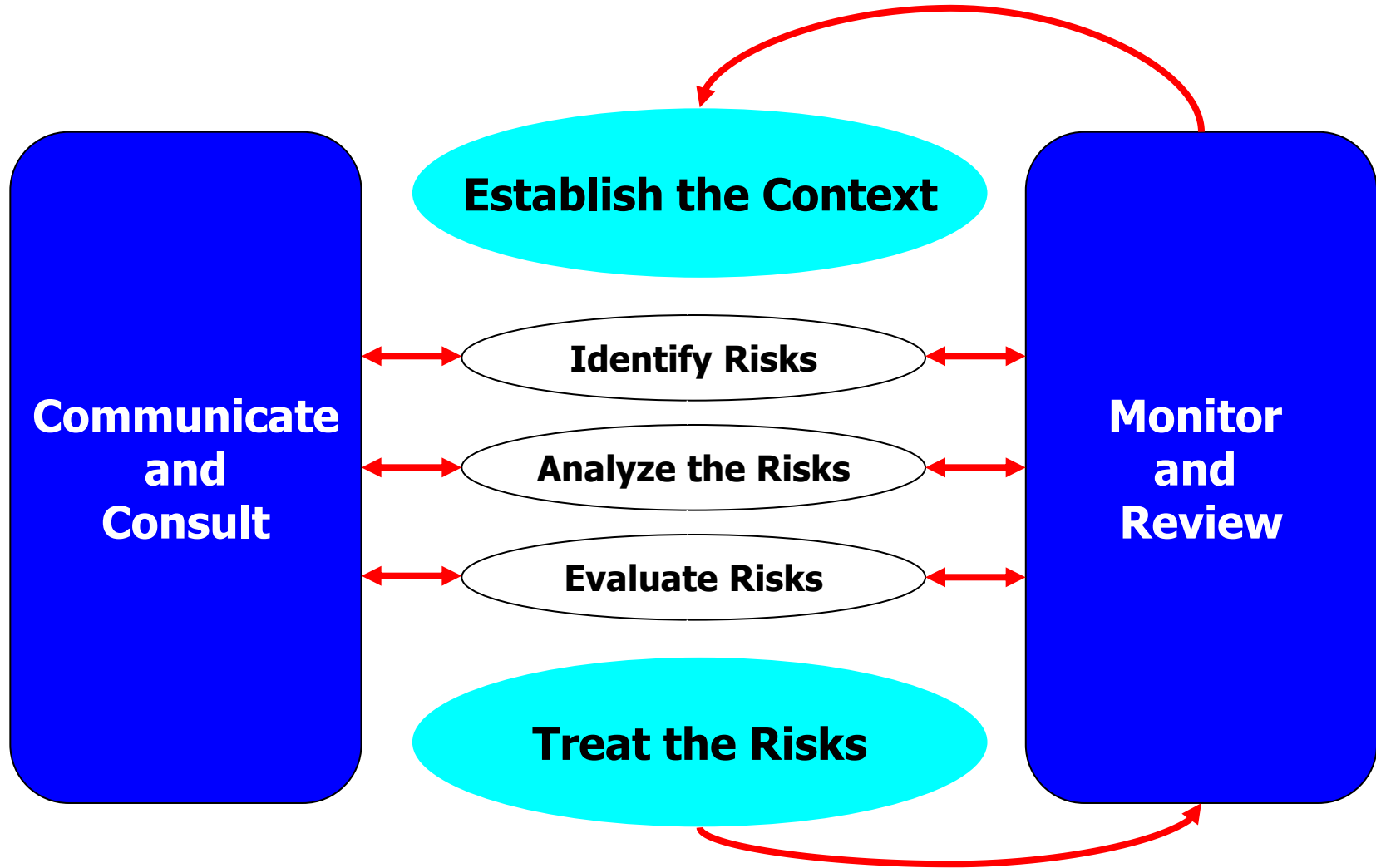
What is Enterprise Risk Management (ERM)

- Systematically identifying, assessing, prioritizing *all* major sources of risks to the business,
- Ensuring that all *significant* risks are considered by involving key staff and stakeholders,
- *Optimizing* the cost to minimize the risks to acceptable levels and the available budgets,
- Ensuring that opportunities to increase revenue for the business are considered as positive risks.

Understanding the Risk Management Process

- What can go wrong?
- How likely is it?
- What are the consequences?

Risk Assessment – Risk Management The Cycle



Risk Assessment – The Likelihood Index (Probability Factor)

Need to identify the likelihood or probability of the risk occurring. (Cf. also classification of Risk in PPPs below)

- High – Very frequent occurrence
- Medium to high – 50 to 70% chance
- Medium to low – 15 to 50% chance
- Low – 1 to 15% chance

Risk Assessment – The Severity Index (Vulnerability Factor)

Once the risk is identified, need to establish the **severity** of the risk. Severity is defined as the impact of the risk. Need to assess the impact on:

- Public health
- Environment
- Compliance
- Commercial
- Financial
- Reputation

Risk Assessment – The Analysis

Risk Management Matrix

		Probability Factor (CI)				
Vulnerability Factor (VR)	Severity	Probability	Very High	High	Medium	Low
			4	3	2	1
	Very High	4	Red	Red	Yellow	Yellow
	High	3	Red	Yellow	Yellow	White
	Medium	2	Yellow	Yellow	White	White
Low	1	Yellow	White	White	White	

Would have an impact on a large number of customers

Would have an impact on a few customers

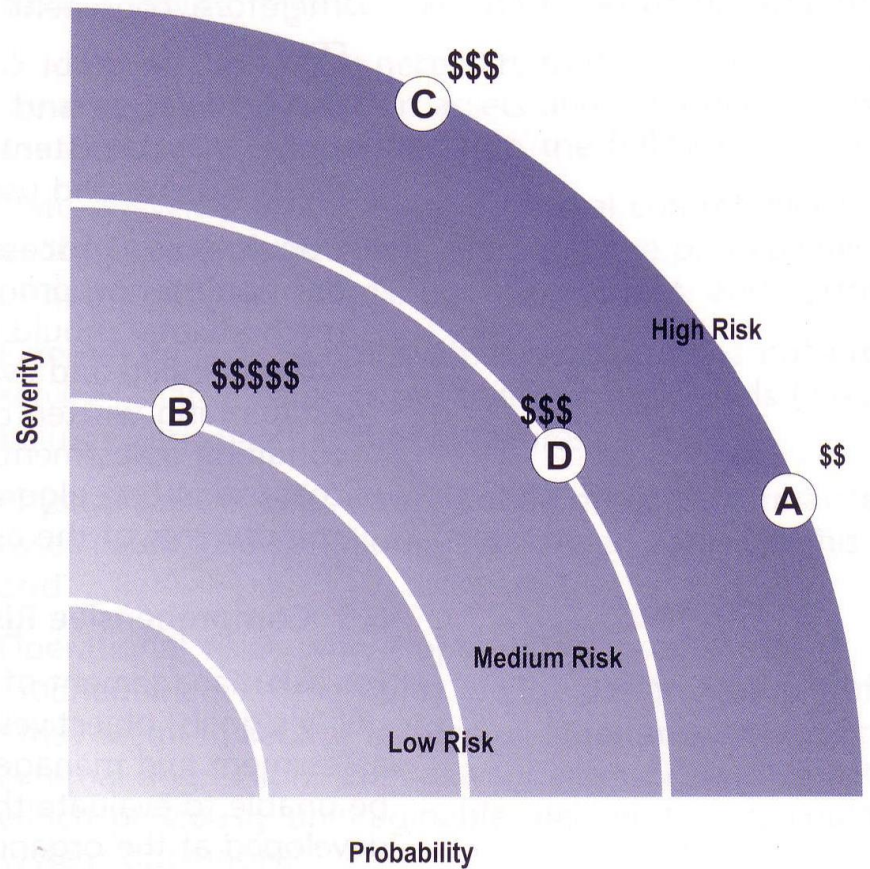
Natural Disaster:
Flooding of WWTP

Aging Infrastructure:
100 yr old Water Transmission Line Servicing a Local Hospital

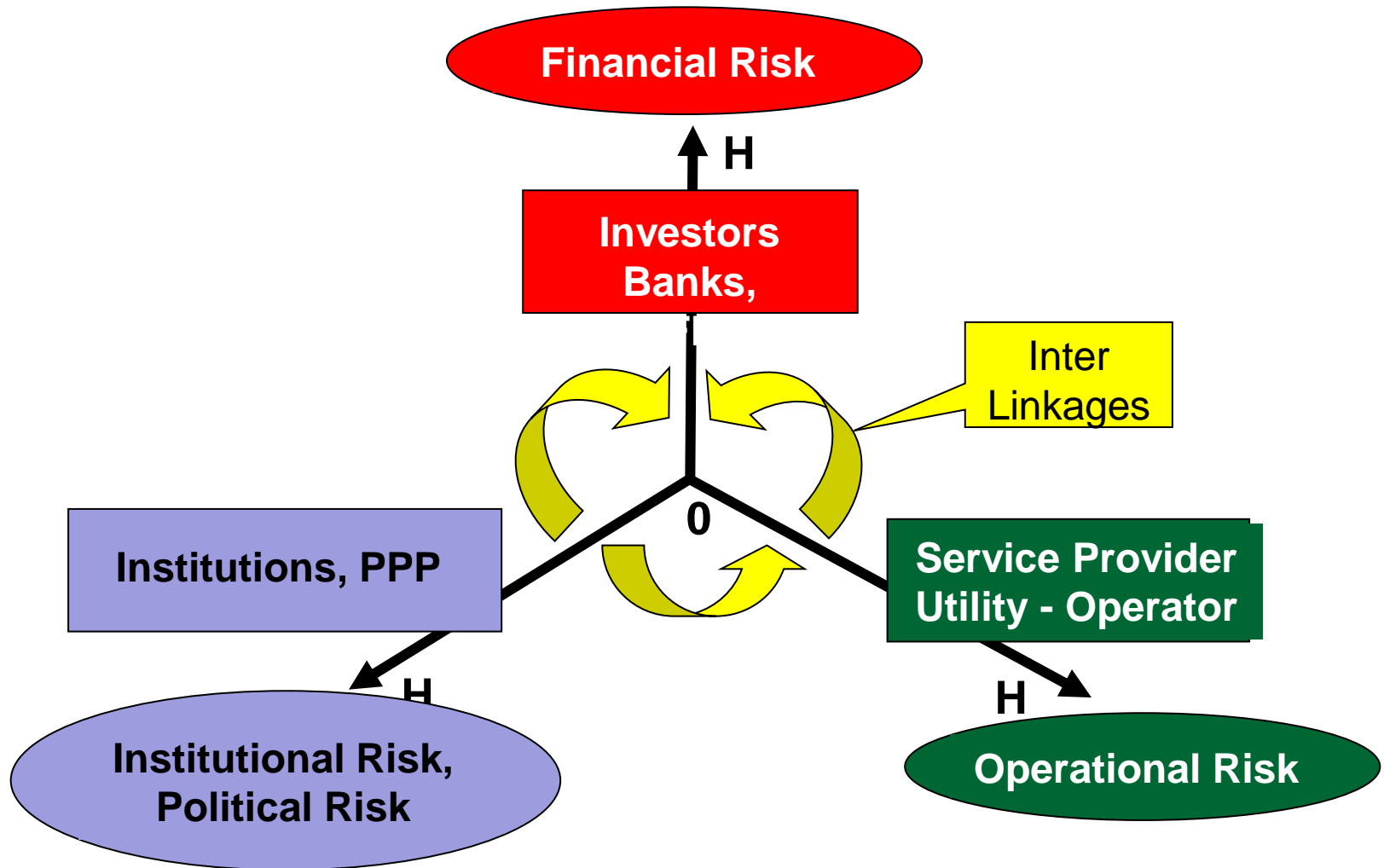
Aging Infrastructure:
100 yr old Watermain Servicing a Small Residential Street

Risk Versus Cost Trade-off

Decisions based on the utility's acceptable level of risk **and** lowest cost for implementation of mitigating actions



Risk Management - A 3-Dimensional View



Part 2: Risks in PPPs

PPP Terminology

PPI : Private Participation in Infrastructure

PSP : Private Sector Participation

P3 : Private Public Partnership

PFP : Privately Financed Projects

PFI : Project Finance in Infrastructure

P_P projects

Examples of Infrastructure

Economic infrastructure

- Transport
 - Ports
 - Roads
 - Airports
 - Rail
- Water
- Energy
- Municipal like sanitation, and solid waste
- Telecommunications

Social infrastructure

- Schools
- Hospitals
- Prisons
- Libraries

Two major approaches for PPP ...

1. The **Project Finance Initiative** (“PFI”)

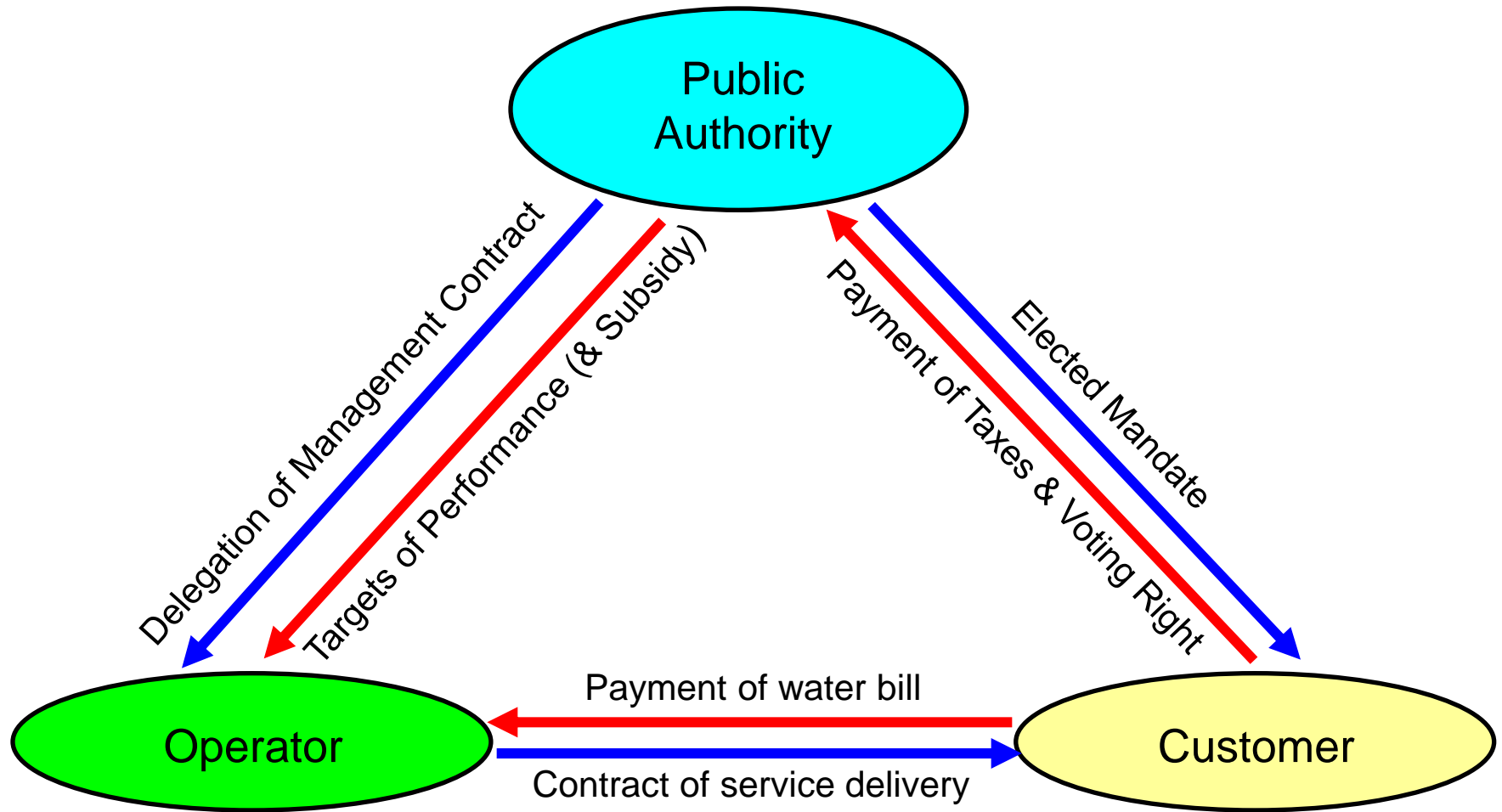
- Green field projects
- Brown field projects

2. The **Delegation of a Public Service** (“DPS”)

- Utility governance, management, O&M
- Service provision (quality, reliability, access)

The triangle of delegation of public service (DPS)

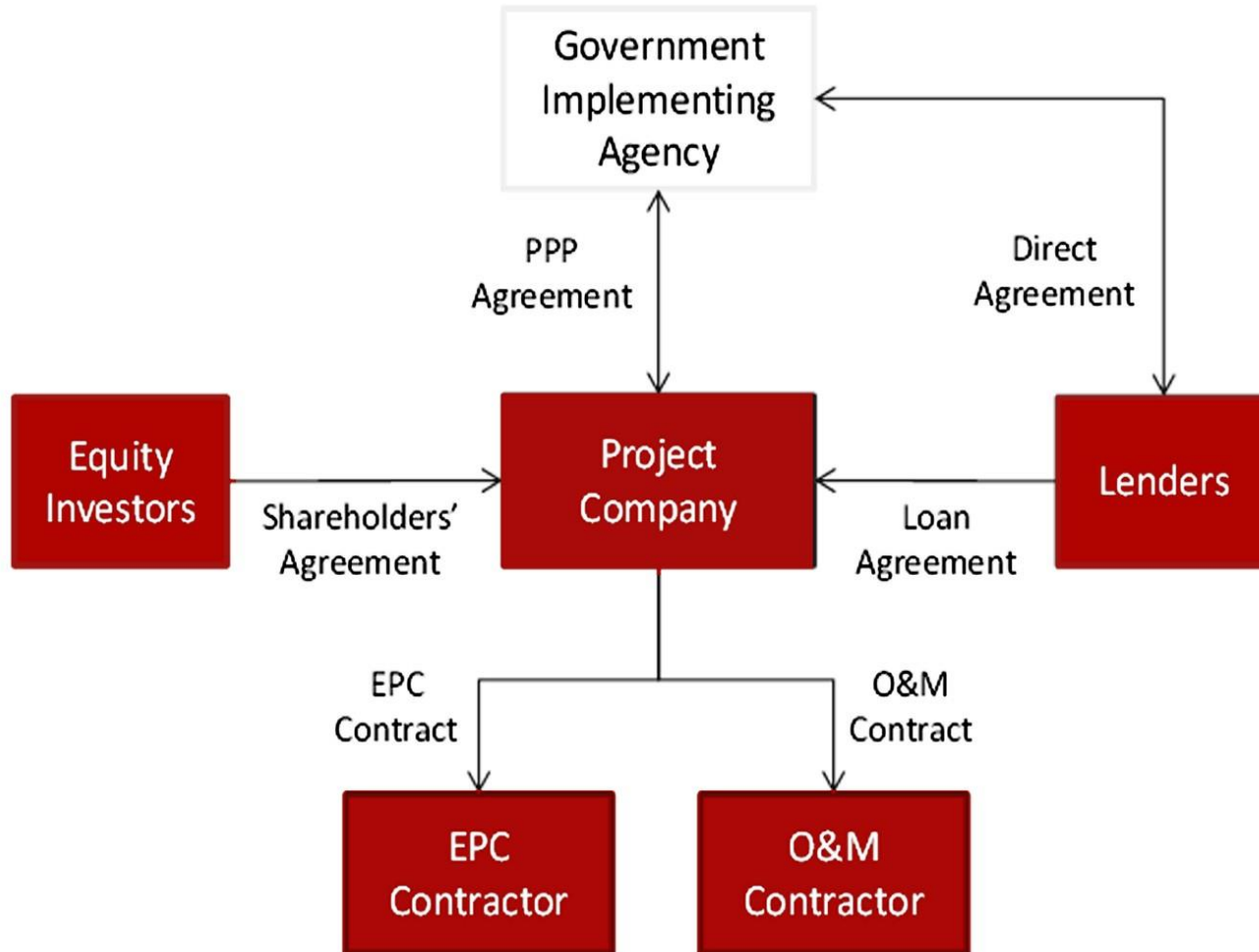
A repartition of responsibilities



Source: Sarah Botton (CEFEB), 2011

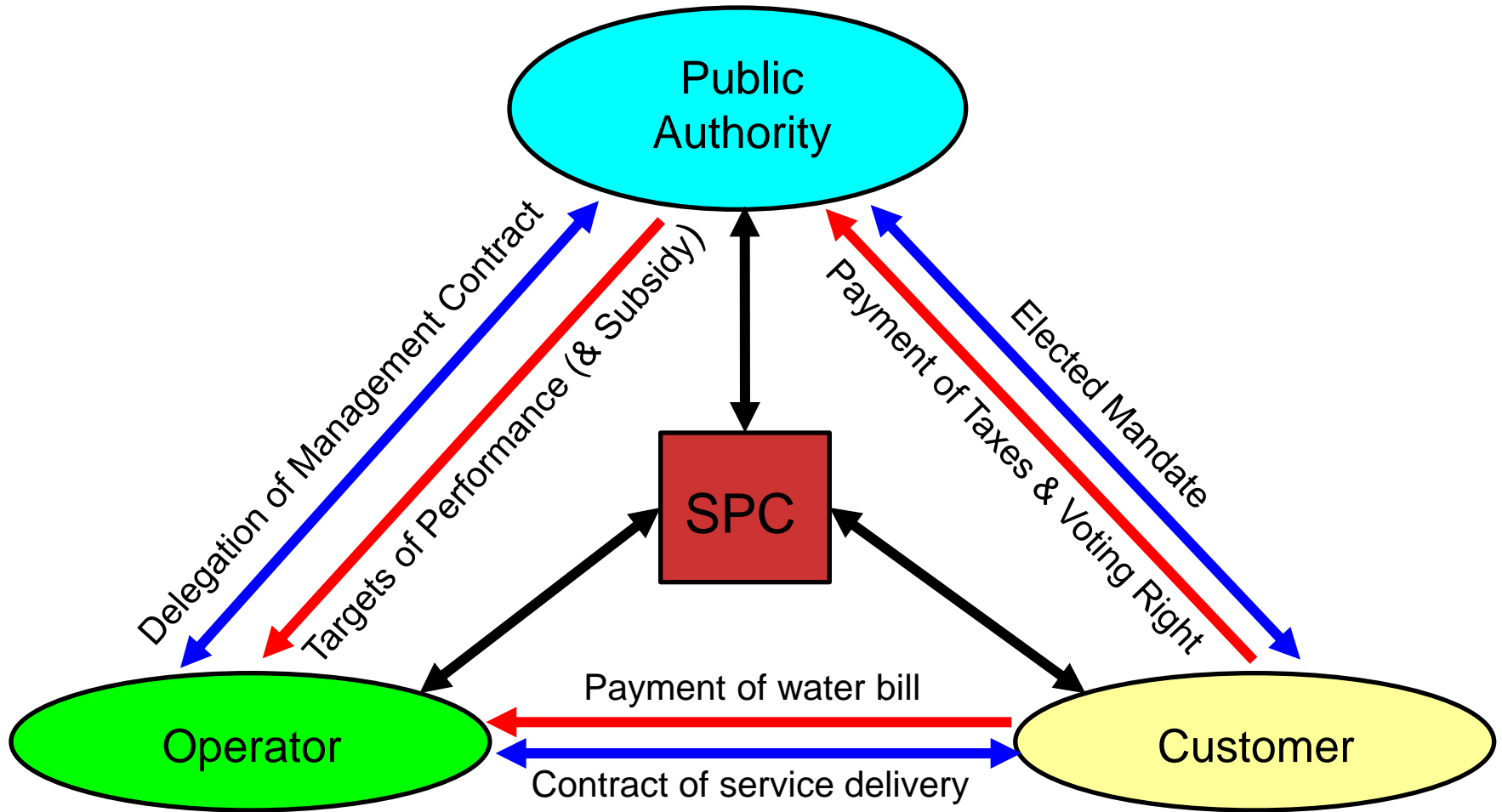
Typical PPP structure in Project Finance (PFI)

A repartition of risks



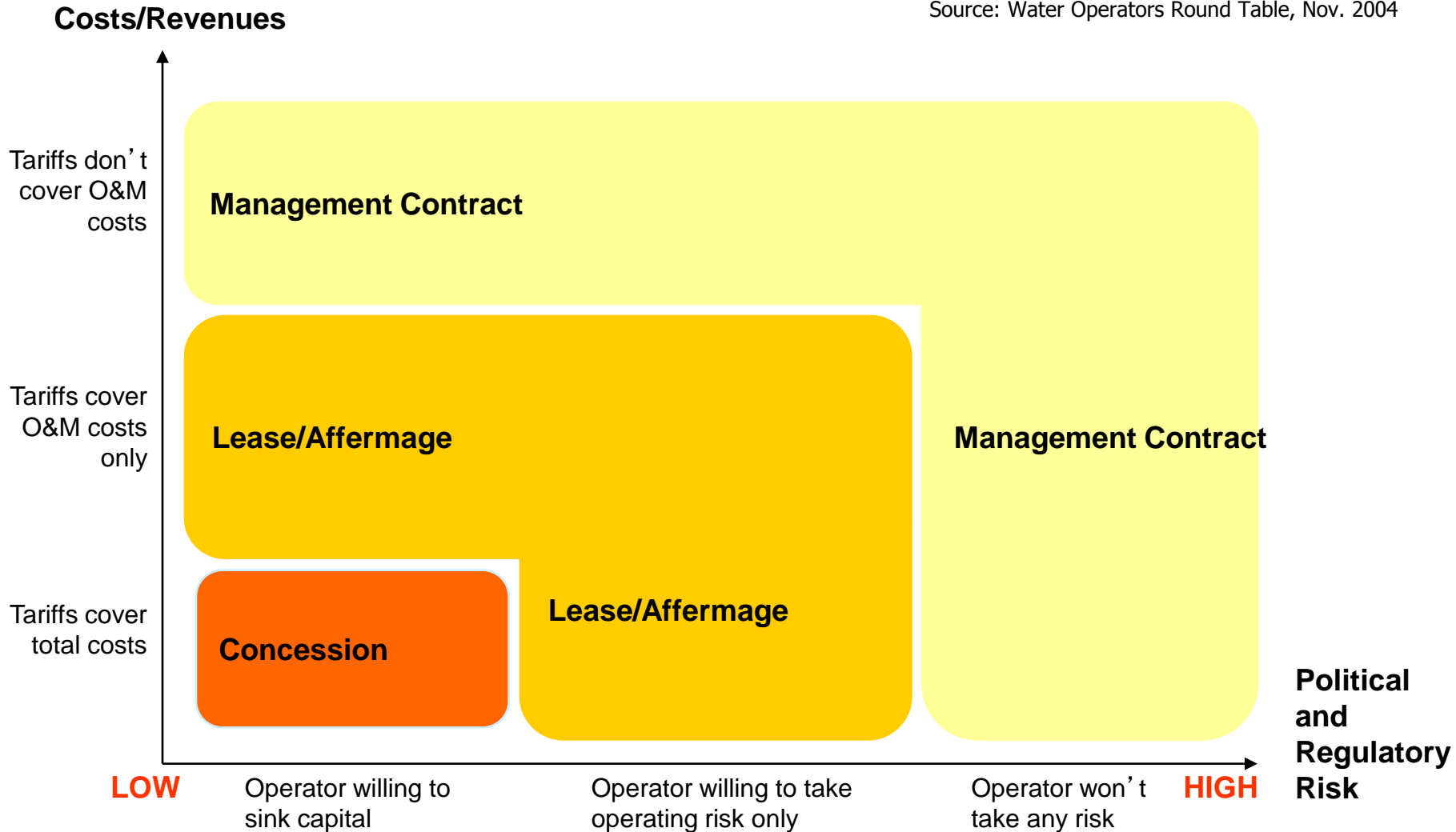
Source: WBI - PPIAF (2012): PPP Reference Guide

Blending DPS with PFI



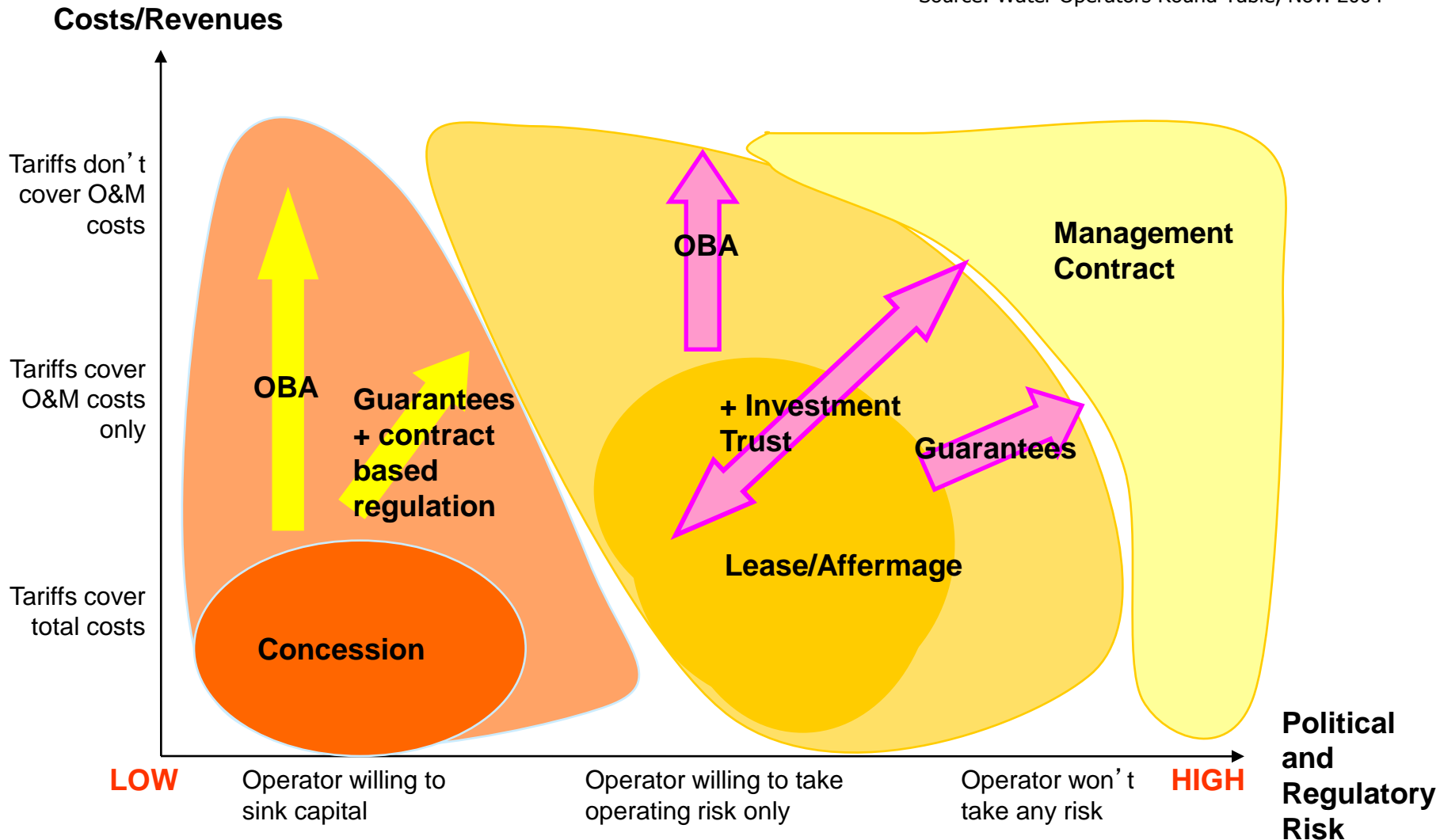
Choosing the 'best' model according to risk and tariff conditions

Source: Water Operators Round Table, Nov. 2004

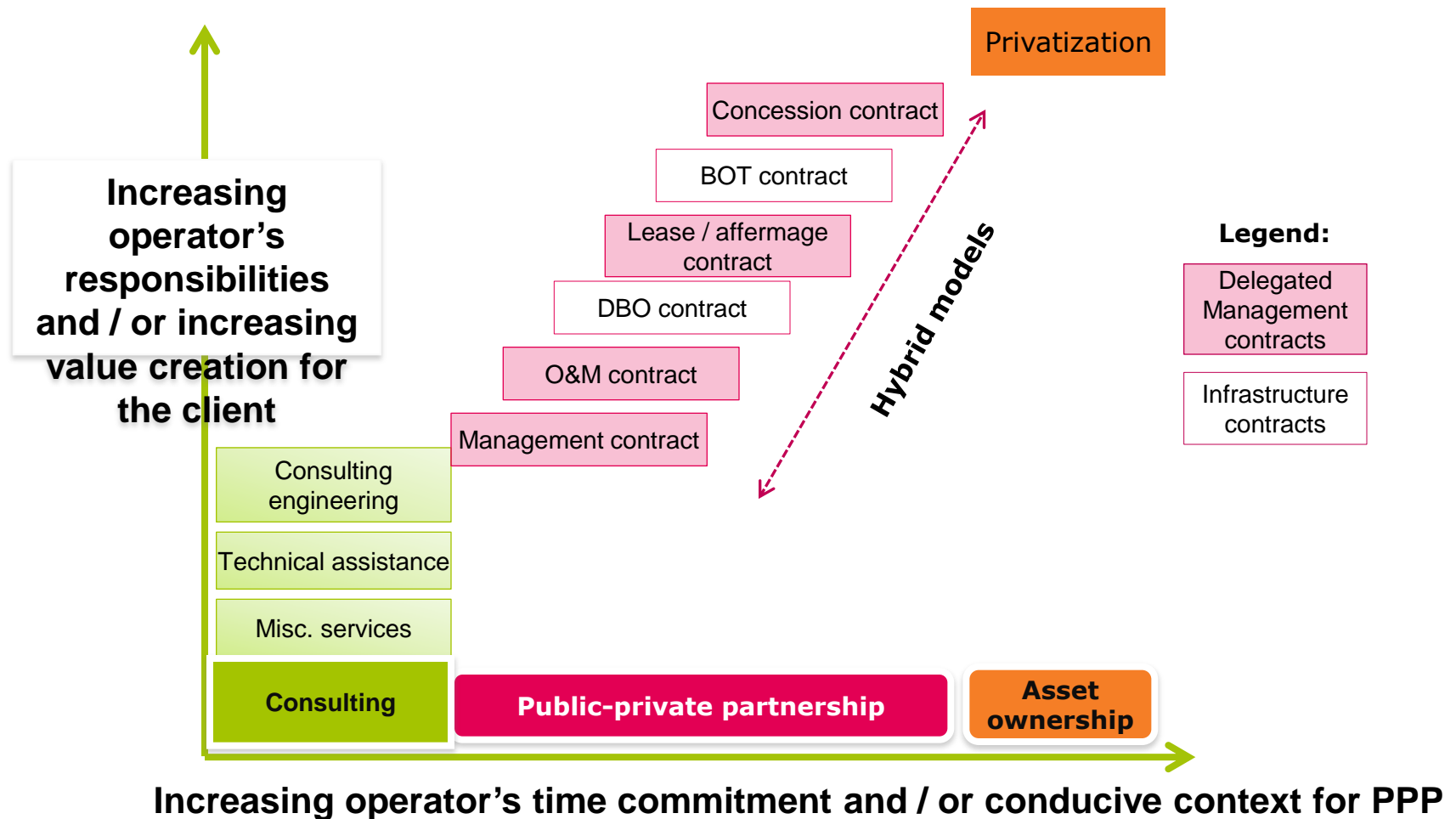


Choosing enhanced models

Source: Water Operators Round Table, Nov. 2004



PBCs can apply for a wide variety of services and contracts



Source: Suez (2014)

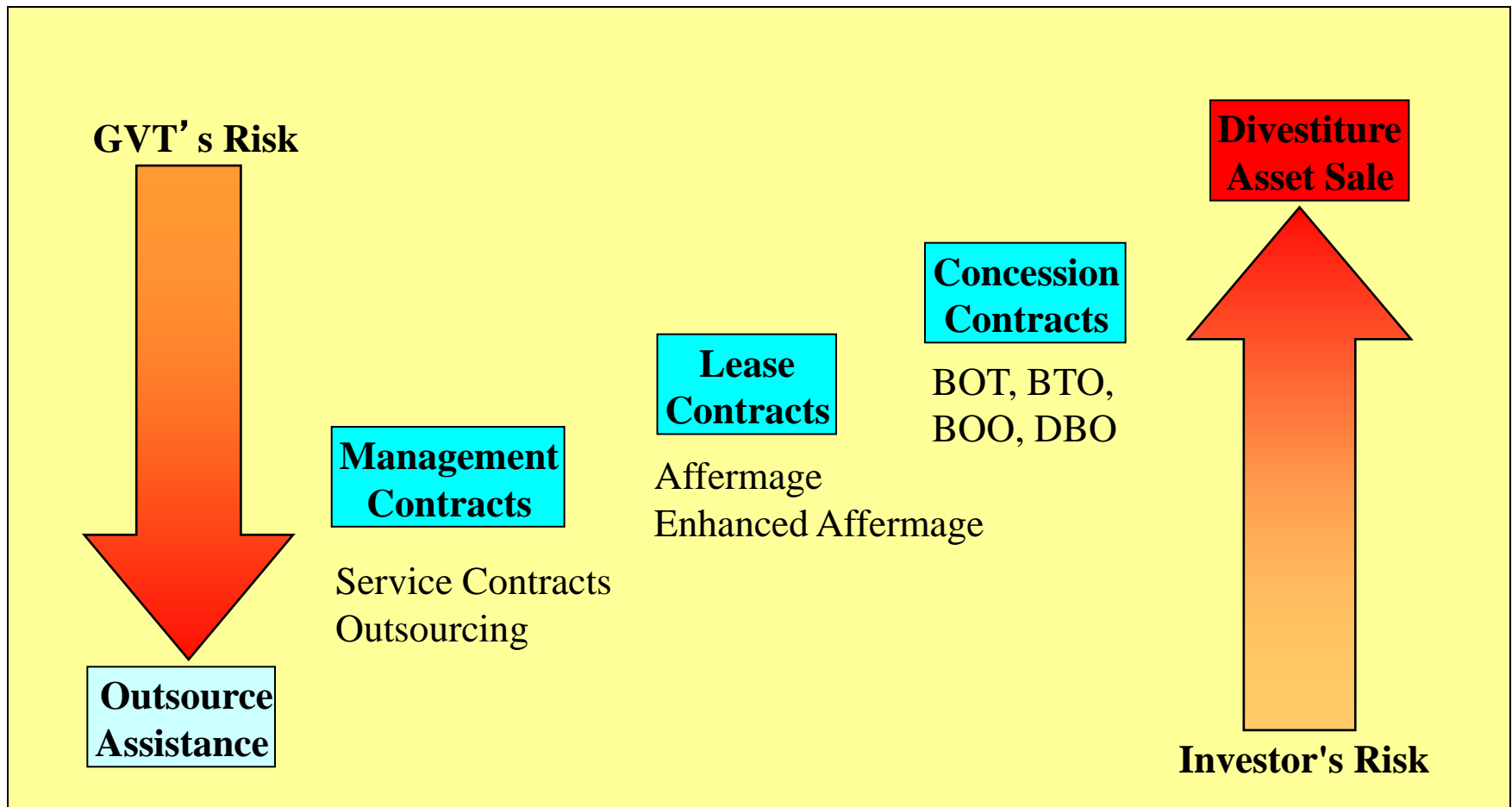
Performance Based Contracts: *challenges*

- ◆ To have a ***validated*** base-line information is a precondition for an effective incentive structure with realistic time-bound performance targets – *inaccuracy of base-line is an issue and a constraint*
 - Sequential, progressive PPP contracts ?
 - Evolving from a contract of means (input based) towards a contract of results (output based) ?

- ◆ Making gains of efficiency ***sustainable through a balanced PPP***

**improving performance – building capacity
& hybrid financing**

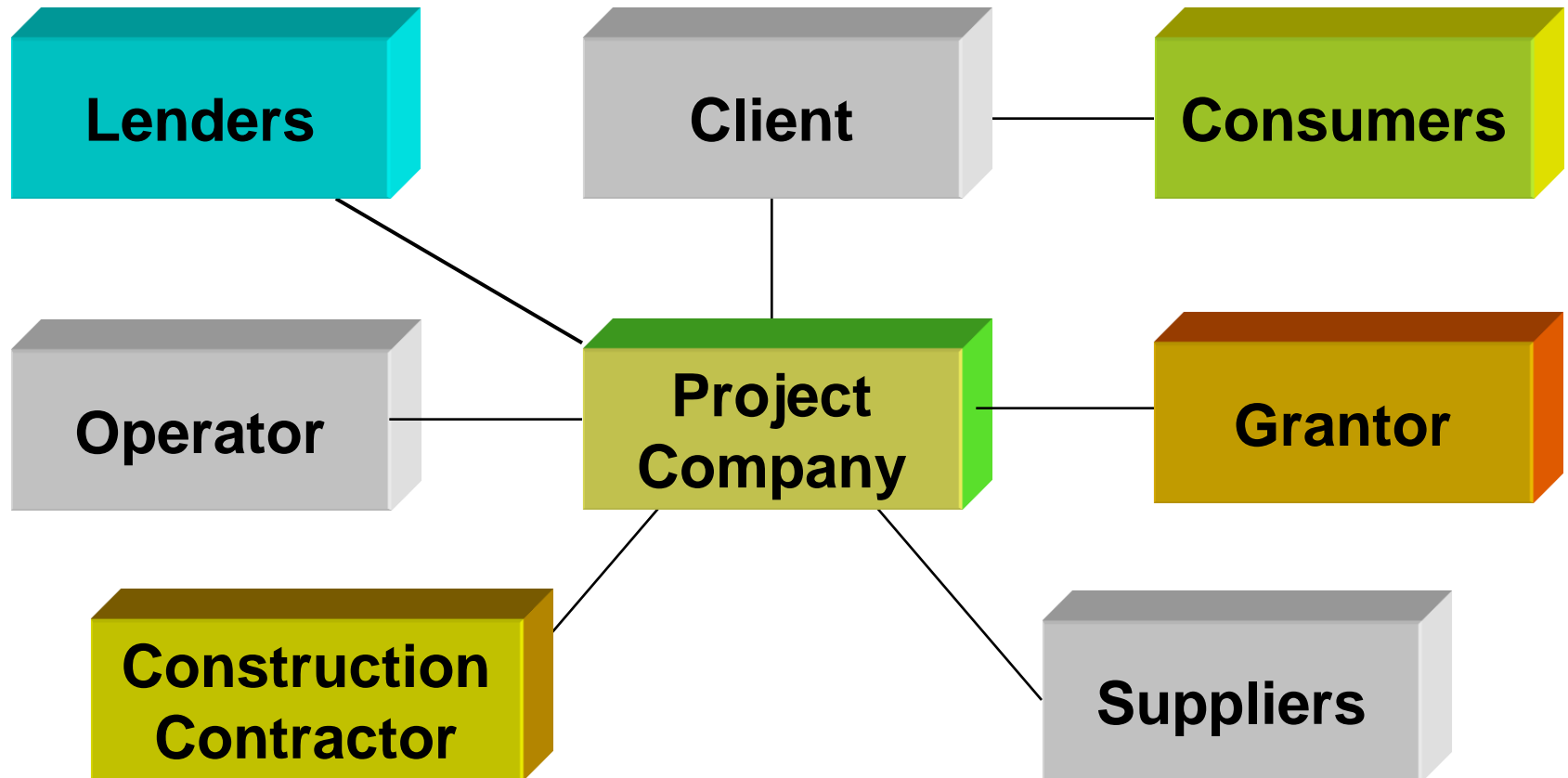
Choice of Contract for a Balanced Risk Allocation



PPPs in Irrigation: some unique risks for investors

- **Demand risk:** projection for water demand in irrigation are dependent on the evolution of agricultural markets
- **Commercial / political risks:** farmers vs. households
- **Raw water supply risk:** usually priority to municipal/hydro over Irrigation in case of drought

BOT - Simplified Diagram



Recent new models for public service infrastructure

Types:

- ❖ **DBO** – Design Build Operate
- ❖ **DBF** – Design Build Finance
- ❖ **DBFO** – Design Build Finance Operate

Generic Term: **DB[X]**

The DB[X] Scheme

- BOT's differ from Design, Build and Operate (DBO) contracts in that financing and asset carrying is provided.
- DBO's aim at guaranteeing BOT advantages with limited risk and complexity.
- Successful cases include North America (DBO), China (DBO), Senegal (DBF)

BOT Major Risks

💧 Construction risks

Delay, costs overruns, penalties

Non-acceptance of the plant by the Client

💧 Operation risks

Non-performance of the plant,

Penalties, costs overruns

💧 Financial risks

Non-achieved equity returns expectations,

Financial support to the Lenders in case of SPC default

Risks on which the Project Company has little leverage

- Revenue - Demand Curves = Revenue sufficient to cover costs
- Exchange - Revenue in Local Currency - Costs in Foreign Currency
- Interest Rate - Variations impact costs
- Financing - Availability of Finance when needed
- Floods, Earthquakes etc.
- Political - Changes in laws etc
- Regulatory – tariffs or standards

Classification of Risks

Probability

- High : Highly likely to occur
- Medium: likely to occur
- Low :Unlikely To occur
- Nil

Impact

- High: Significant Impact
- Medium :will have an effect
- Low :will have a insignificant effect
- None No impact

Quantification of Risks

- ✓ Assign a Monetary value to the impact for each classification (What will it cost to correct replace)
- ✓ Value at risk = Sum of (monetary value of impact X the probability percentage)
- ✓ Value at risk can be reduced by mitigation measures but costs to be incorporated
- ✓ Mitigation only justified if value at risk is reduced with more than the costs

EXAMPLES OF SOME COMMON RISKS - 1

Risk Group	Sub group	Nature	Probability	Impact	Allocation
General	Political	Political opposition	Depends	Depends	Shared
		Change of political decision makers			Public
	Legislative	Change in regulation	Low	Potentially High	Public
Economic		Global recession affecting demand	Depends	Medium	Depends on project agreement
		Inflation	Low	Low	Private
		Interest rate changes	Medium	Depends	Private
Acts of God	Natural events	Floods	Depends	High	Could be shared

EXAMPLES OF SOME COMMON RISKS - 2

Risk Group	Sub group	Nature	Probability	Impact	Allocation
Preparation	Design	Faulty design	Low	High	Private
	Site availability	Access to site	Low	High	Public
Construction	Site	Ground Conditions	Low	Depends	Private /public
		Permits	Medium	Medium	Shared
		Archaeology			
	Construction	Sub contract Failure	Low	Medium	Private
		Price increases	Medium	Medium	Private

EXAMPLES OF SOME COMMON RISKS - 3

Risk Group	Sub group	Nature	Probability	Impact	Allocation
Construction	Delays	Escalated costs	Medium	High	Private depending on reason
		Loss of revenue	Medium	Medium	Ditto
	Changes	fruitless expenditure	Low	Potentially High	Public
Operation	Demand risk	Loss of revenue	Low	Low	Depends on contract
		Service availability	Low	Medium	Private
	Latent	Problems manifest after commissioning			
Termination		By Public authority			

Part 3: Conclusion

Risk Approach

- ✓ Understand the nature of risk
 - The probability of the risk materialising
 - The impact if it materialises
- ✓ The allocation of risk responsibility
- ✓ Do not push risk transfer too far – Needs to be fair and equitable
- ✓ Risk mitigation and migration
- ✓ Impact of remaining risk

Risk Identification Process - 1

Risk identification is a process started in the preparation of the business case as is the heart of a PPP project

Fundamental for every action/area ask

- ❖ **WHAT CAN GO WRONG ?**
- ❖ **WHAT IS CHANCE THAT IT WILL ?**
- ❖ **WHAT HAPPENS WHEN IT DOES ?**
- ❖ **WHO IS RESPONSIBLE ?**
- ❖ **WHAT CAN I DO NOW ABOUT IT ?**

Risk Identification Process - 2

Every Project will be different, so as long as it is systematic, it is a personal choice, but the Process is the same:

- ✓ **Identify the risk**
- ✓ **Allocate the risk to the party best able to manage it
Public /Private/Mixed**
- ✓ **Check acceptability of risk by the allocated party**
- ✓ **Assess the probability**
- ✓ **Assess the impact and quantify**
- ✓ **Consider interrelationships**
- ✓ **Consider mitigation and migration**



Thank you

