



# Session 3: Interactive Hands-on session to prioritize and apply the WICER principles

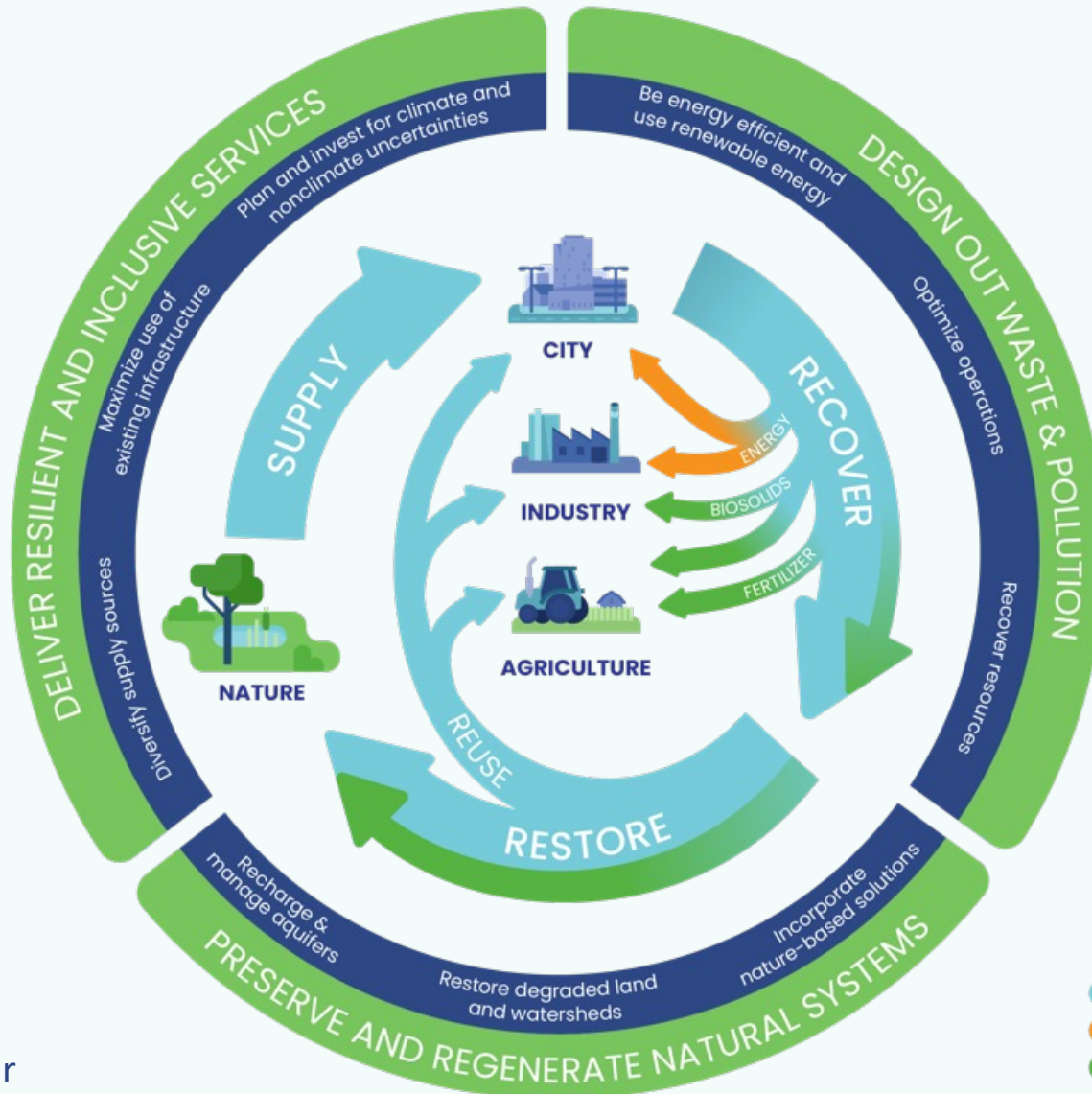
Objective: Get familiar with WICER interventions, identify the benefits of the circular approach, work together to prioritize different WICER interventions

# SCHEDULE AND CONTENTS

TIME	SESSION
9:00 – 10:30	<b>Session 1. Overview of the principles of circular economy and resilience in the water sector</b> <ul style="list-style-type: none"><li>▪ Presentation of the Water In Circular Economy and Resilience (WICER) Framework</li><li>▪ Is your project WICER? Use the WICER quick assessment online tool</li><li>▪ Discussion by table and reporting to the whole group</li></ul>
10:30 – 11:00	Coffee break
11:00 – 12:30	<b>Session 2. Presentation of real case studies and good practices examples</b> <ul style="list-style-type: none"><li>▪ Presentation of cases showcasing different approaches to circular economy</li><li>▪ Discussion by table and reporting to the whole group</li></ul>
12:30 – 13:30	Lunch break
13:30 – 15:00	<b>Session 3. Interactive session to prioritize and apply the WICER principles</b> <ul style="list-style-type: none"><li>▪ Presentation to set up the scene</li><li>▪ Hands-on exercise to prioritize WICER interventions to solve a challenge working in teams</li></ul>
15:00 – 15:30	Coffee break
15:30 – 16:45	<b>Session 4. The importance of the right Policy, Regulation and Institutional Environment and Stakeholder engagement</b> <ul style="list-style-type: none"><li>▪ Presentation to set up the scene</li><li>▪ Presentation on the Australian example</li><li>▪ Hands-on exercise on PIR and stakeholder mapping exercise.</li></ul>
16:45 – 17:00	Closing and next steps



# How to prioritize interventions?



# How to prioritize interventions?



1. Understand  
project & local  
context

2. Assess if  
project/city is  
WICER

3. Showcase  
examples and  
provide tools

4. Identify  
priority areas  
and make a plan

# How to prioritize interventions?



Understand the local political, economic, social and geographic factors

- Local geographical, social, economic, financial , political conditions
- Existing Policy, Institutional and Regulatory Framework
- Goals and interest of key stakeholders (government, citizens, users, etc): Address water scarcity, increase financial sustainability, protect from floods, increase access to services, reduce GHG emissions, improve quality of water bodies...
- Type of project: Water Supply, Sanitation, WRM, Irrigation, Flood Management, Waste Management, Urban, Rural, Centralized solution, De-centralized solution..
- Does the project include building new infrastructure or refurbishing existing infrastructure or both?
- Other local conditions: price of electricity & gas (or % of costs that are related to electricity), water supply demand – gap, cost of different source options, water tariff
- Key sectors in the area? Agriculture, industry, energy...

# How to prioritize interventions?

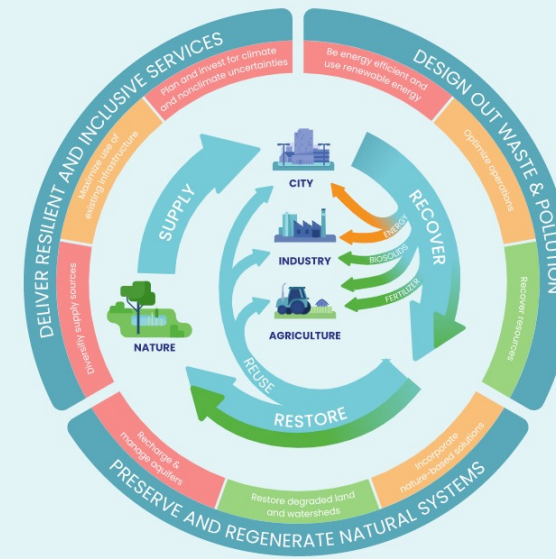


WICER quick assessment tool

can help identify what are the gaps and opportunities - list of potential WICER actions

## IS THE PROJECT WICER?

Anna Delgado of WB



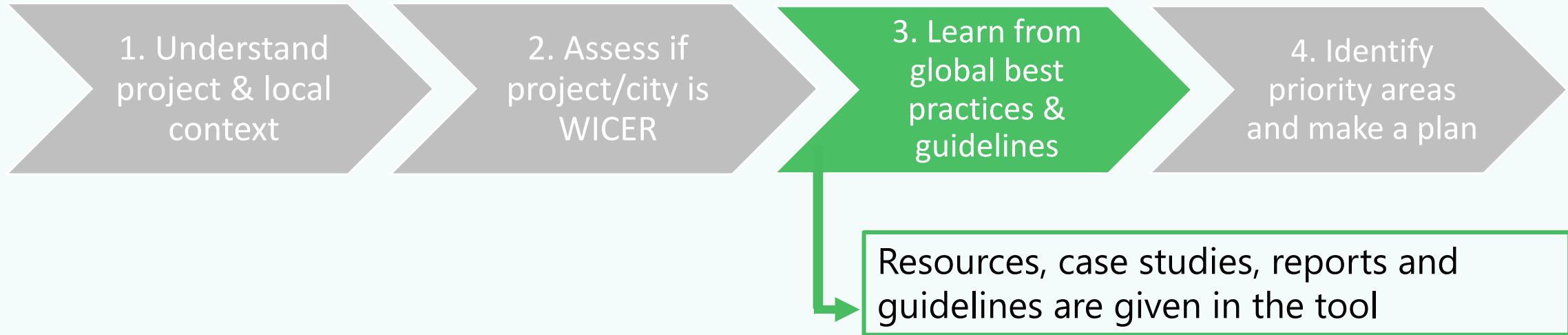
- To continue doing
- To be improved
- To start doing/exploring

Specifics





# How to prioritize interventions?



## Tips & resources

Benefits

Potential Indicators

- Resources such as energy, nutrients and water can be recovered from wastewater. Check [Wastewater from waste to resource report](#) and [Sanitation, Wastewater Management and Sustainability: from Waste Disposal to Resource Recovery](#).
- For small towns: [Wastewater Treatment and Reuse: A Guide to Help Small Towns Select Appropriate Options](#)
- For rural areas: [Safely Managed Sanitation in High-Density Rural Areas: Turning Fecal Sludge into a Resource through Innovative Waste Management](#)
- Water: If planned with reuse in mind, wastewater can be treated to different quality levels and adapted to the requirements of each potential end user (a concept known as “fit for purpose”). Treated wastewater can be used in industrial processes ([Durban, South Africa](#); [Lingyuan City, China](#); [Chennai, India](#)); to cool power plants ([Nagpur, India](#); [San Luis Potosi, Mexico](#)); irrigate crops ([Atotonilco de Tula, Mexico](#); [Dakar, Senegal](#)), public gardens, and parks; recharge aquifers ([Gaza](#)); maintain environmental

# How to prioritize interventions?



<b>MUNICIPALITY OBJECTIVES</b>	To what extent do projects – and the associated WICER actions – align with the municipality and region policy objectives?
<b>ECONOMIC METRICS</b>	How relevant are the various benefits expected to be?
	Are the expected benefits easy to quantify?
<b>FINANCIAL METRICS</b>	How relevant are the various revenues and savings expected to be?
	Are innovative financing and funding options relevant and easy to implement?

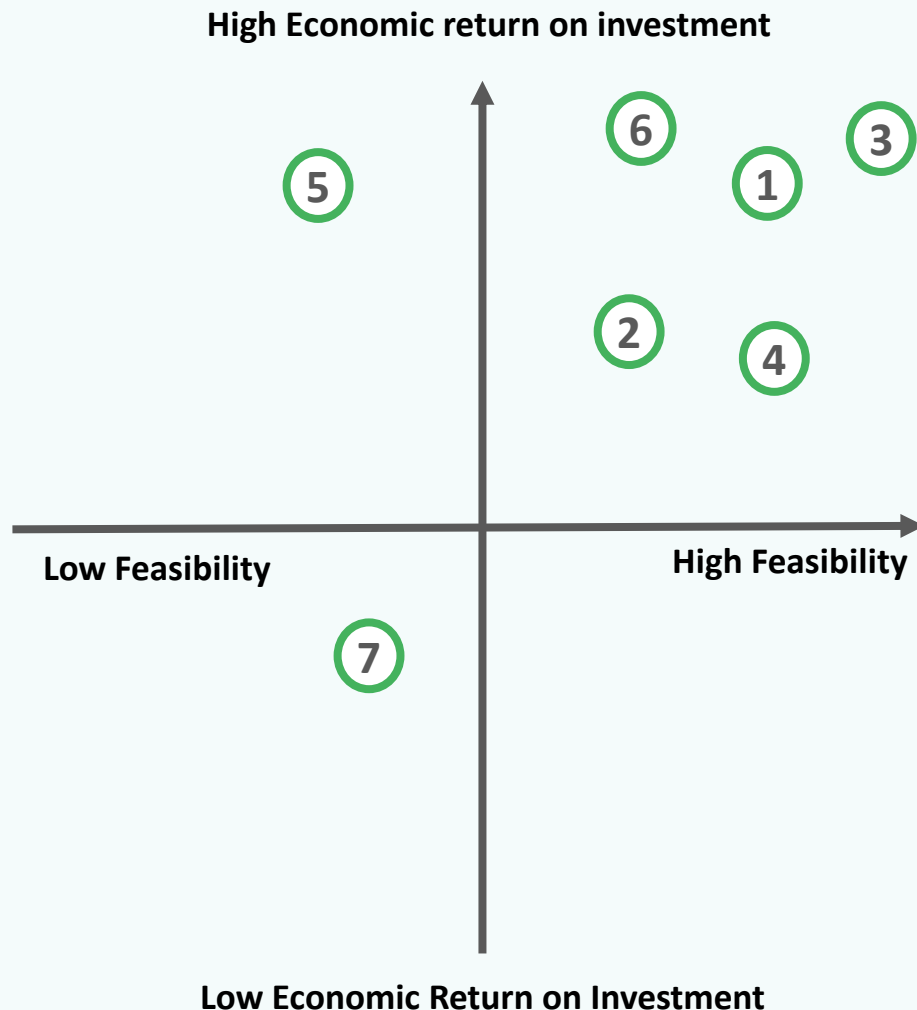




# How to prioritize interventions?



## Example 1



## Potential projects / actions

- ① Invest in NRW reduction programs
- ② Treat and sell reclaimed water to industrial park
- ③ Perform audits to maximize the use of existing WWTP
- ④ Incorporate constructed wetlands in the WWTP
- ⑤ Action 5
- ⑥ Action 6
- ⑦ Action 7

# How to prioritize interventions?



## Example 2

		Benefits					
		decrease CO2 emissions	Additional revenues	regenerated natural systems	...	...	...
WICER actions and interventions	Action 1	H	L	M			
	Action 2		H				
	Action 3	L	M				
	...						
	...						

Should be in line with local goals

Matrix can be populated

- with a X to show a relationship with the action and the benefit
- with Low, Medium and High scores (if known), indicating the relevance for benefits across each intervention

# Linear (base case) vs circular – economic analysis



- When we have identified the interventions, the next step are the economic and financial assessments, which are the foundation for successful WICER project implementation
- A WICER intervention should only be implemented if the benefits to the economy outweigh the costs

1	<b>Definition of project alternative and base case</b>	What is the geographic and functional scope and definition of the WICER measures defining the project and what would the situation without the project look like (base case)?
2	<b>Identification of effects and indicators</b>	What are the positive and negative effects produced by the project when compared to the base case (linear approach)? Are there additional benefits (environmental, economic, financial, social...)?  What are suitable indicators for quantification the costs and benefits of the strategy compared to the base case?
3	<b>Quantitative analysis</b>	How can the costs and benefits be quantified? How do the costs and benefits compare in an IRR or NPV calculation and how robust are the results?

# Linear (base case) vs circular – financial analysis



<b>1</b>	<b>Definition of project</b>	What is the geographic and functional scope and definition of the WICER measures defining the project?
<b>2</b>	<b>Identification of costs and revenues</b>	What are the expected costs and revenues? Are there additional revenue streams that can be created in the circular approach? And additional O&M savings?
<b>3</b>	<b>Quantitative analysis</b>	How can the costs and revenues be estimated?  How do the costs and benefits compare in an IRR or NPV calculation and how robust are the results?  Are there any alternative funding and financing options that can enhance financial feasibility?

## Innovative Funding Options:

- Results-Based Funding
- Impact Fee
- Stormwater (utility) fee
- Insurance premium (saving discount)
- Earmarking tax proceeds for circular/ resilience projects
- Business/ 'Resilience Improvement District
- Funding from other sectors: energy, agriculture, etc

## Innovative Financing Options:


- Green / Climate Bond
- Blended Finance
- Private Financing Through Public Private Partnerships
- Private Financing of Infrastructure by End-User
- Environmental Impact Bond
- Pooled Finance Mechanism
- Municipal Bond

# Financial opportunities created by circular economy principles



## **Circular economy offers the opportunity to:**

- Create additional revenue streams
- Reduce O&M costs
- Offer a better return on investment in a sector heavily subsidized

- 
- Potential to create more innovative business models
  - Potential to attract the private sector (PPP)
  - Potential to tap into other sector's financing (green/climate bonds, environmental impact bonds, etc)

# Example of additional revenues or savings



## Recovering resources from wastewater

### ENERGY

#### Revenue:

- Sale of biogas or electricity
- Sale of carbon credits
- Tipping fees for the collection of organic matter (in co-digestion)

#### Savings:

- Using own-generated electricity in the plant
- Improving energy efficiency



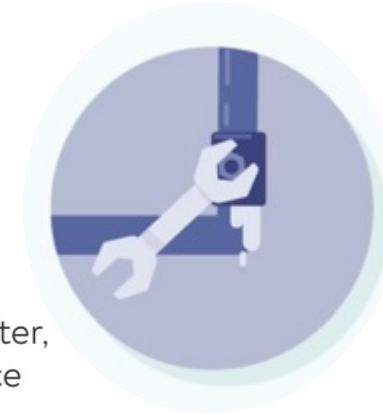
### WATER

#### Revenue:

- Sale of treated wastewater, especially in water-scarce areas

#### Savings:

- Discharge fee/tax



Investments in energy efficiency and reducing NRW can be recovered in less than 3 years

### BIOSOLIDS and NUTRIENTS

#### Revenue:

- Sale of phosphorus as fertilizer
- Sale of biosolids as compost

#### Savings:

- If the biosolids are given away for free (for agriculture, to restore degraded land, etc.) the utility saves transport costs and landfill fees



Investments in nature-based solutions such as upstream reforestation, can reduce treatment needs and costs



# Case Study: Adhya Tirta Batam, Indonesia

## NRW reduction and energy efficiency



### Defining the base/linear case and the circular approach

#### **Linear approach**

The linear approach would be developing new water supply infrastructure

vs

#### **Circular approach**

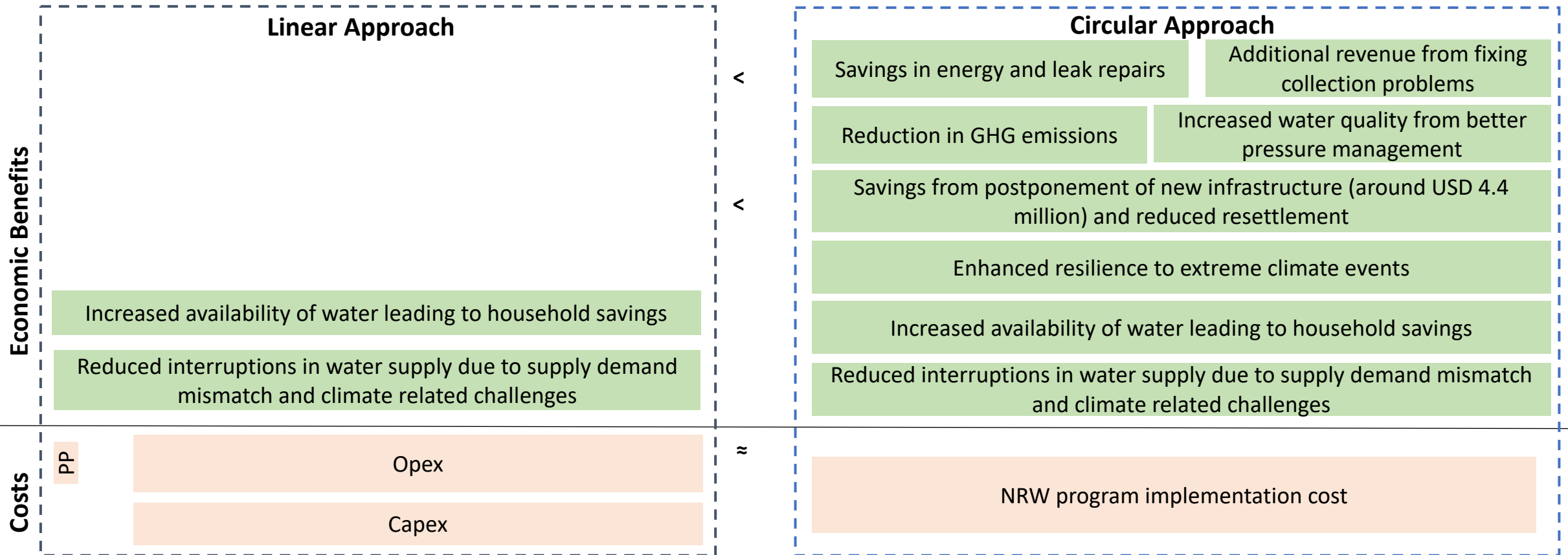
The circular approach here would be increasing the operational efficiency of the existing system (reducing NRW)

# Case Study: Adhya Tirta Batam, Indonesia

## NRW reduction and energy efficiency



### Qualitative Economic assessment



PP (Project preparation) – Feasibility study, survey, environmental and social impact study etc.;  
**Capex** - Water treatment plant; transmission and distribution system; pumping system etc.; **Opex**  
 – Electricity, chemicals, labor, equipment maintenance and replacement etc.

PP (Project preparation) – Feasibility study, survey, environmental and social impact study etc.; **NRW program** -  
 Establishment of district metered areas (DMAs), pressure management, active leakage control, replacement of meters  
 and valves, controlling instruments and SCADA system, Capacitor banks, variable speed drives (VSDs), proportional  
 integral derivative (PID) etc.

**Results from the economic assessment suggest that the circular approach has higher net economic benefits with similar investment cost. This gives a positive push to the project which should be considered in combination with the financial assessment.**

# Case Study: Adhya Tirta Batam, Indonesia

## NRW reduction and energy efficiency



### Financial assessment

	Linear Approach		Circular Approach
Revenues / Savings	Annual Revenue = USD 3.3 million*	<	Annual savings from reduced leakage repairs = USD 1 million
		<	Annual savings from reduced energy cost = USD 0.59 million
Costs	OPEX - USD 0.66 million/annually* or (USD 3.3 million for the 5 years )	=	Annual revenue from sale of additional water = USD 3.3 million
	Capex - USD 4.40 million	≈	Investment on NRW reduction program – USD 7.8 million (annual investment around USD 1.3 million)
			Investment on energy efficiency plan – USD 0.49 million

Note: (1) \* based on broad assumptions; (2) The financial assessment should also include calculation of financial returns.

The financial assessment re-enforces the financial viability of the circular approach and also illustrates that the circular approach has higher returns.

### Conclusion

Results from both the economic and financial assessment conclude that the circular approach (NRW reduction program) is the most viable option

# Hands-on exercise. Discussion questions



- Chose Option A or B and, if you want, assess the city/utility/project using the WICER tool – discuss the results
- **PRIORITIZATION EXERCISE:** Given the challenge and the main goals for the municipality, which actions would you prioritize and why? You can use the given template below to identify interventions and benefits or any other framework to prioritize interventions. Use ideas from the case studies.
- **ECONOMIC AND FINANCIAL ANALYSIS:** Use the given templates below to do a **qualitative** economic and financial analysis of one (or two) of the proposed interventions.
  - What are the positive and negative effects from the circular approach when compared to the traditional/linear approach? What are suitable indicators for the quantification of the costs and benefits?
  - Are there potential operation and maintenance savings and/or additional revenues compared to the linear approach?
  - Are there any alternative funding and financing options that that can enhance financial feasibility?
- **CHALLENGES:** What do you think will be the main challenges to implement those interventions? How would you address the challenges?



# Thank You!

Anna Delgado, Water Sector Specialist

[www.worldbank.org/wicer](http://www.worldbank.org/wicer)

[www.wicer-tool.com](http://www.wicer-tool.com)