

# The contribution of sanitation to the Paris Agreement - *What is stopping us?*

Aug 28, 2018 | World Water Week, Stockholm



Empowered lives.  
Resilient nations.



sustainable  
sanitation  
alliance

# Overview

---

- 16:00      *Welcome and introduction – Dr. Sarah Dickin*, Stockholm Environment Institute

## ***Setting the scene:***

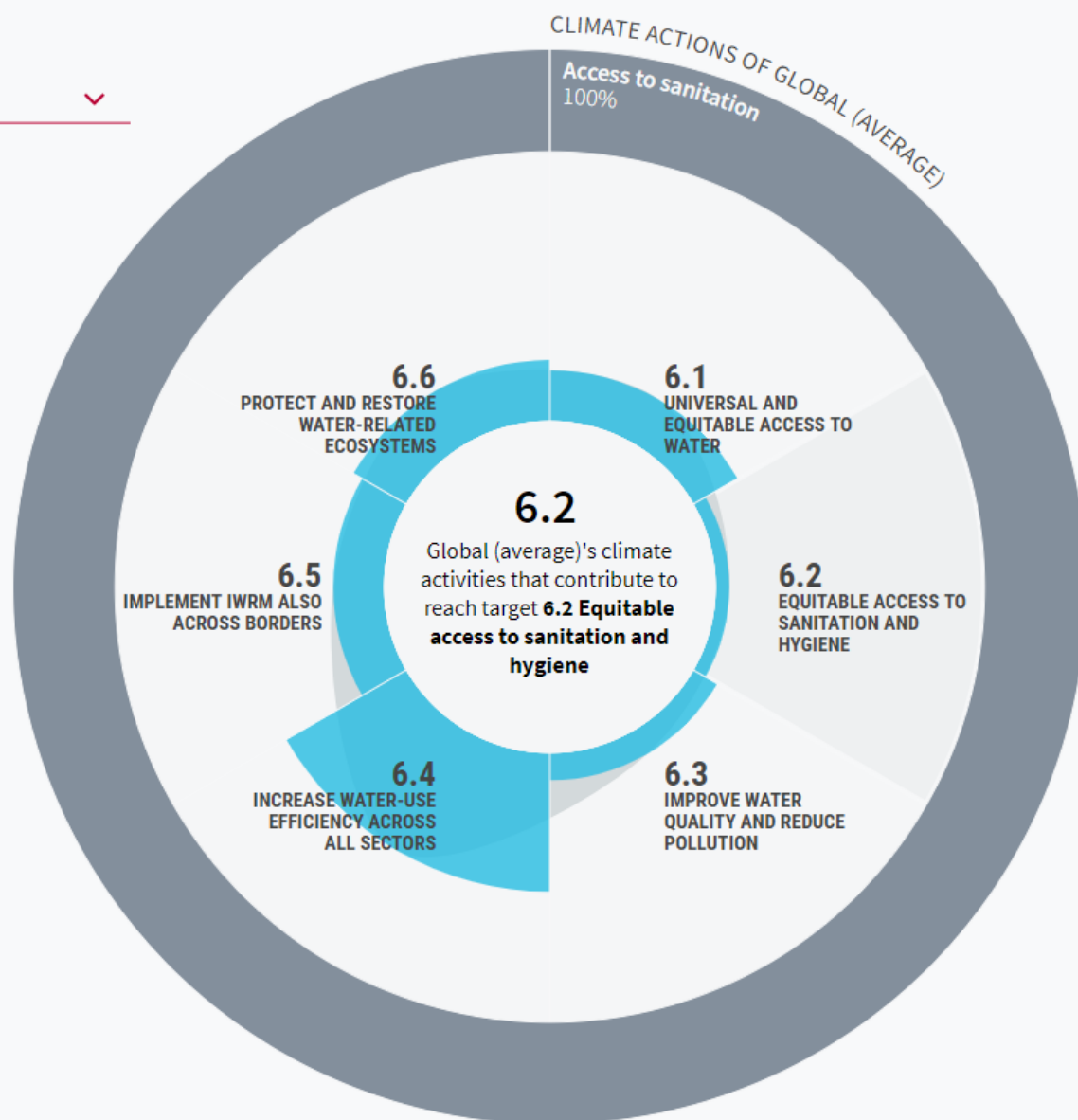
- *Sanitation and the climate change agenda - H.E Henk WJ Ovink*, Special Envoy for International Water Affairs, Kingdom of The Netherlands, and Sherpa to the High-Level Panel on Water
- *The perspective of the Climate Funding – the barriers for Sanitation funding?* **Mr. Alastair Morrison**, Senior Water Sector Specialist, Green Climate Fund (GCF)

## ***Providing the cases:***

- *Key challenges in implementing Sanitation-Climate projects in the MENA region – Ms. Lara B. Nassar*, Regional SuSanA Coordinator, MENA Chapter, BORDA-WesCA, **Ms. Salam Almomany**, GIZ advisor of the WaCCliM Programme in Jordan
- *Sanitation and wastewater management in Paris - from an adaptation and mitigation perspective – Mr. JD Berthault* Vice President of greater Paris sanitation Authority and Greater Paris Metropolitan Councillor, SIAAP

## ***Raising the questions:***

- 17:05      *Audience-led panel discussion*
- 17:25      *Concluding remarks - Dr. Alejandro Jimenez*, UNDP – SIWI Water Governance Facility





BLUE MARBLE Dec 7 1972, Apollo 17



# Nations Unies

## Conférence sur les Changements Climatiques 2015

COP21/CMP11

Paris France



What comes next is the massive task to undo these failing actions, mitigate their origins, adapt for their impacts and rethink the future and our responsibilities.

**1** NO  
POVERTY



**2** ZERO  
HUNGER



**3** GOOD HEALTH  
AND WELL-BEING



**4** QUALITY  
EDUCATION



**5** GENDER  
EQUALITY



**6** CLEAN WATER  
AND SANITATION



**7** AFFORDABLE AND  
CLEAN ENERGY



**8** DECENT WORK AND  
ECONOMIC GROWTH



**9** INDUSTRY, INNOVATION  
AND INFRASTRUCTURE



**10** REDUCED  
INEQUALITIES



**11** SUSTAINABLE CITIES  
AND COMMUNITIES



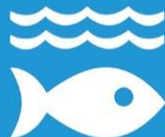
**12** RESPONSIBLE  
CONSUMPTION  
AND PRODUCTION



**13** CLIMATE  
ACTION



**14** LIFE  
BELOW WATER



**15** LIFE  
ON LAND



**16** PEACE, JUSTICE  
AND STRONG  
INSTITUTIONS

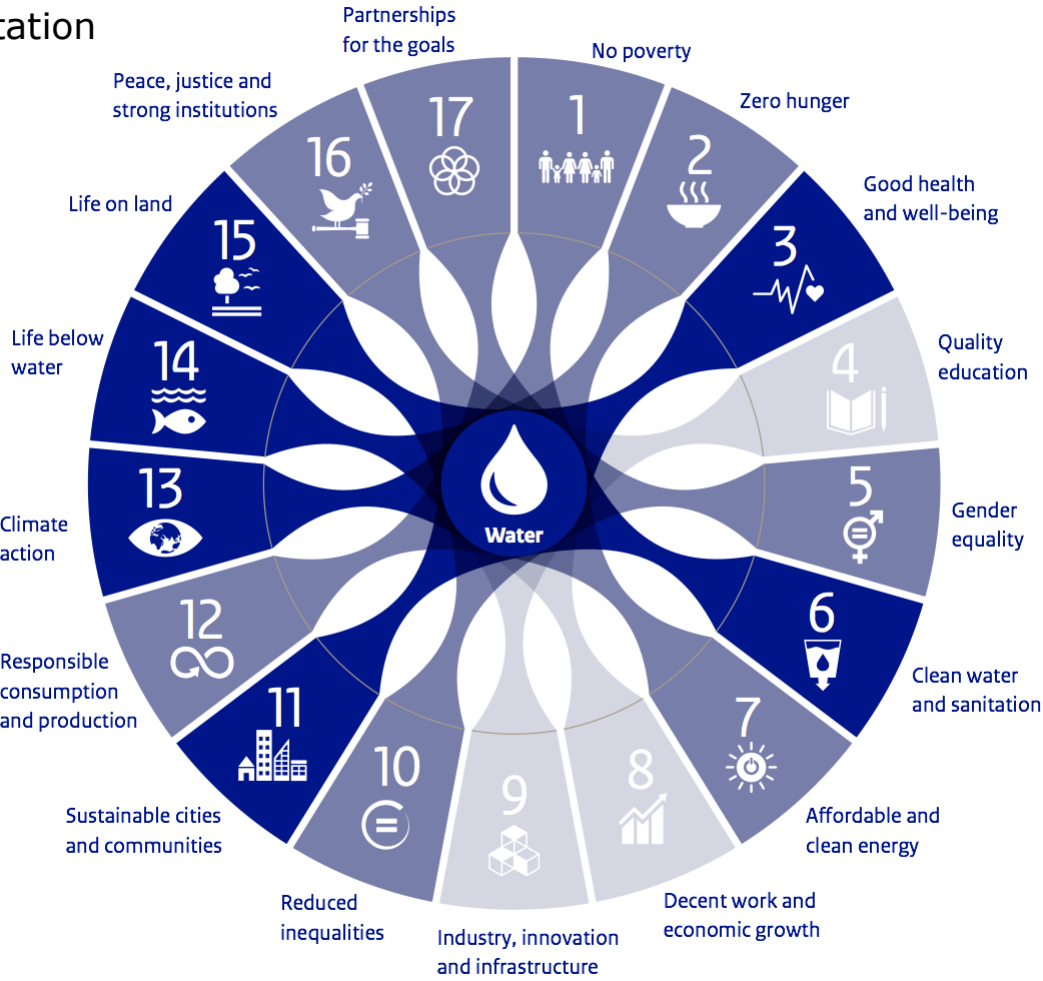


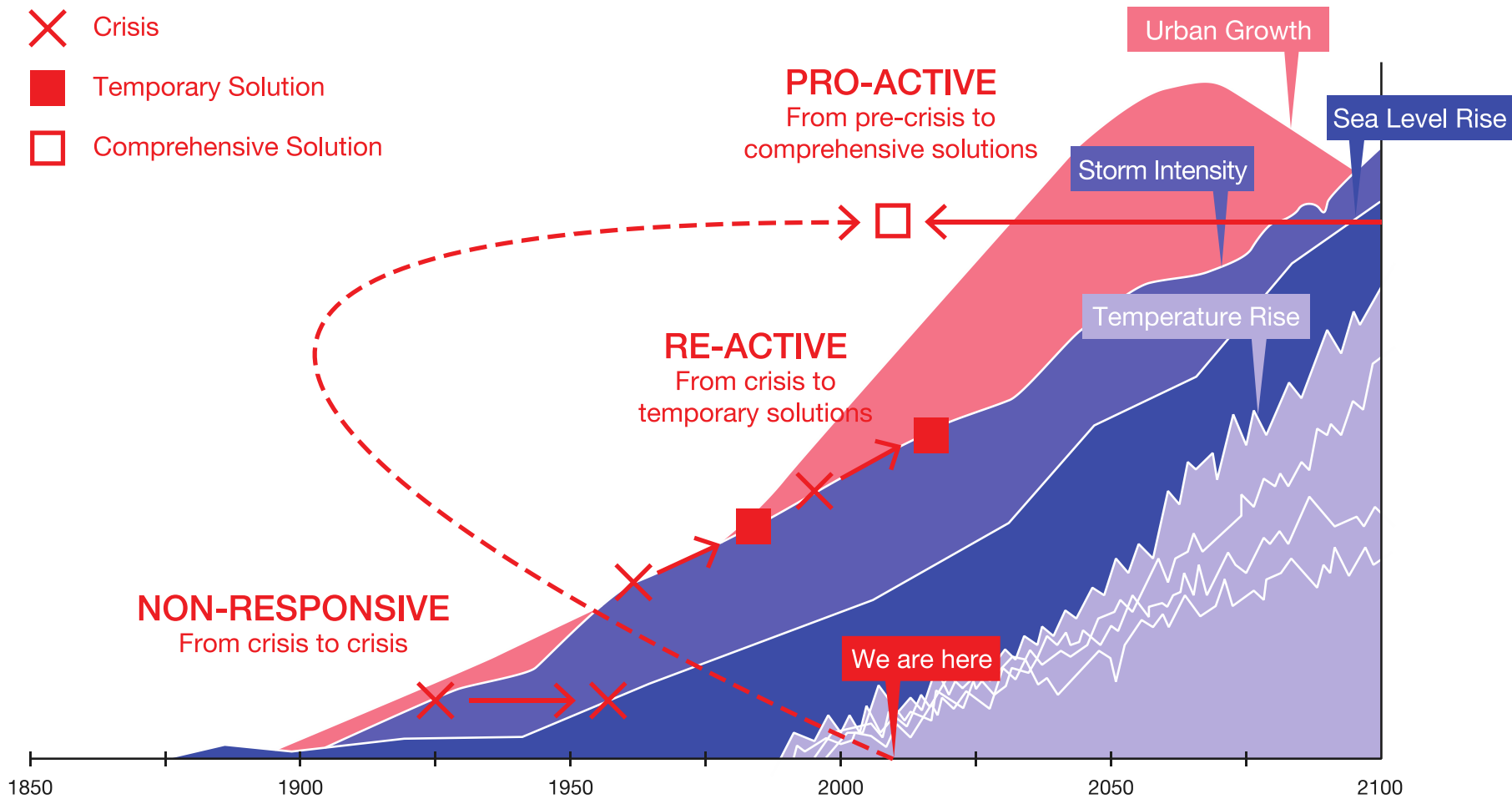
**17** PARTNERSHIPS  
FOR THE GOALS



**SUSTAINABLE  
DEVELOPMENT  
GOALS**

Mitigation and Adaptation



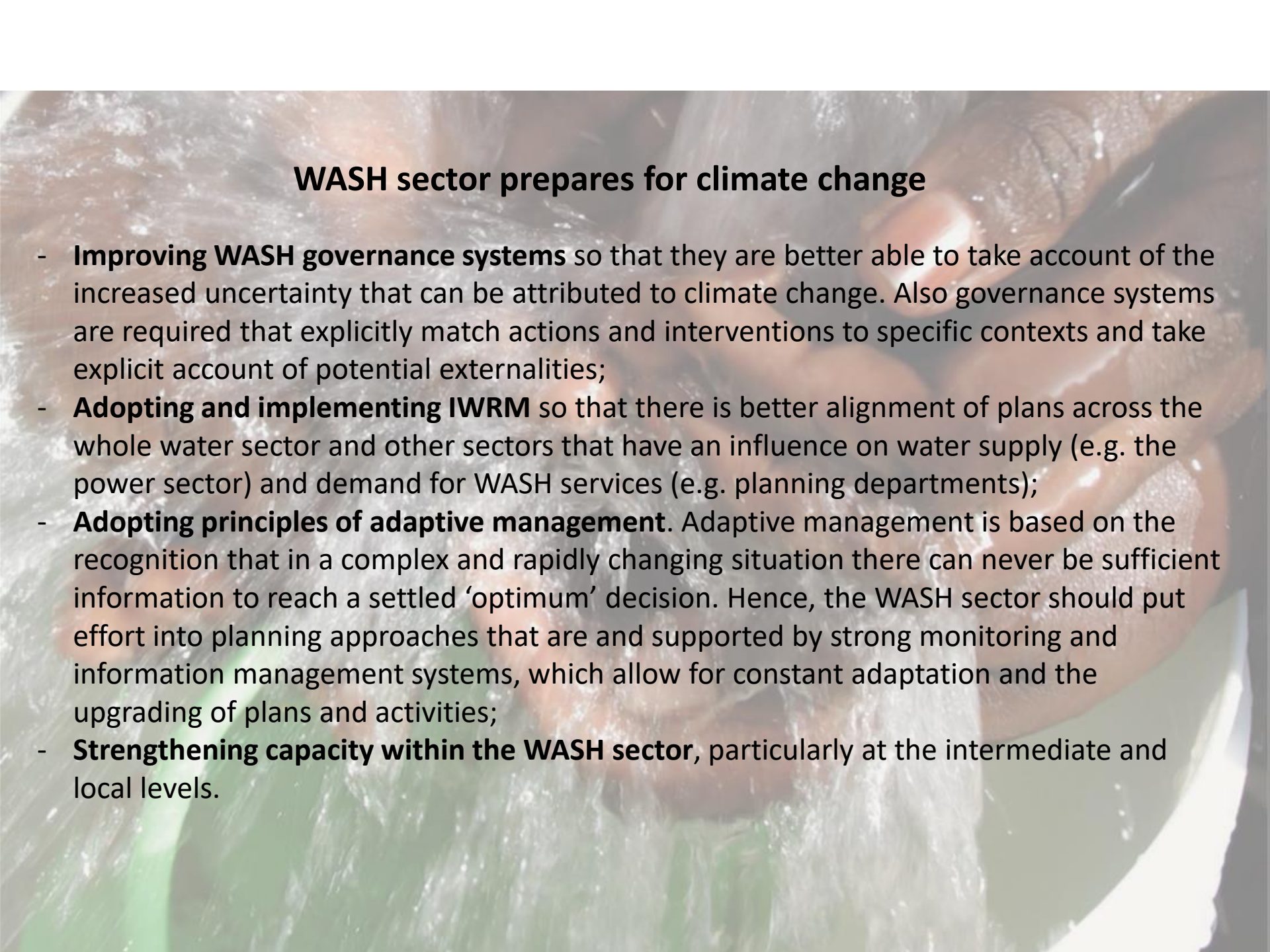






## WWC:

- **Climate change has the potential to impact on all the components of a water supply system** (i.e., not just the sources of water) and that these potential impacts can be varied in nature;
- Some potential impacts are likely to be **direct and very obvious** (e.g. increased incidence of extreme floods that damage WASH infrastructure), whereas others are likely to be **indirect and more uncertain** in nature and severity (e.g. sea level rise leading to migration away from coastal areas);
- Given the range and uncertainty of climate impacts, there will **not be unique strategies** for mitigating or adapting to climate change. The challenge will be development of water governance systems, which ensure that strategies are based on a solid understanding of the impacts of climate change on the different components of individual WASH services delivery systems.



## WASH sector prepares for climate change

- **Improving WASH governance systems** so that they are better able to take account of the increased uncertainty that can be attributed to climate change. Also governance systems are required that explicitly match actions and interventions to specific contexts and take explicit account of potential externalities;
- **Adopting and implementing IWRM** so that there is better alignment of plans across the whole water sector and other sectors that have an influence on water supply (e.g. the power sector) and demand for WASH services (e.g. planning departments);
- **Adopting principles of adaptive management.** Adaptive management is based on the recognition that in a complex and rapidly changing situation there can never be sufficient information to reach a settled 'optimum' decision. Hence, the WASH sector should put effort into planning approaches that are and supported by strong monitoring and information management systems, which allow for constant adaptation and the upgrading of plans and activities;
- **Strengthening capacity within the WASH sector**, particularly at the intermediate and local levels.

# Water Utility Pathways in a Circular Economy





# Pathway Junctions

Throughout the pathways, there are critical junctions where water, energy or materials intersect and opportunities arise to transition to the circular economy. These junctions can be seen as units of analysis and action for utilities, whereby they can gain an insight to and create partnerships for transitioning to the circular economy.



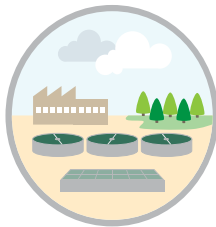
## WATER-WISE COMMUNITIES

The behaviour of citizens – as consumers and professionals – underpin strategies for delivering water services. Water-wise communities include informed citizens who realise the role they have to play to make a difference, and are instrumental in supporting the integration of water across sectors through their personal and professional choices and decisions.



## INDUSTRY

As large water users, water polluters and potential customers for materials, industry as partners can help bring circular economy solutions to scale. An increasing awareness of environmental risk means industry leaders are increasingly looking for ways to reduce their water footprint and minimise environmental degradation.



## WASTEWATER TREATMENT PLANTS

Wastewater treatment plants are part of the old paradigm; we now think of and design resource factories, energy generators and used water refineries. Whereas the conventional imperative was to remove pollutants, it has now shifted to reuse and recycle resources.



## DRINKING WATER TREATMENT PLANTS

The binary system of dirty water in, clean water out is now more nuanced. With multiple sources, the concept of different water quality for different purposes and the need to keep production costs low mean that drinking water treatment plants should be designed to process the same water molecules time and time again with greater efficiency.



## AGRICULTURE

Agriculture will always be the largest water user and a significant water polluter, which gives great impetus to forging partnerships and creating business opportunities. Water utilities should look across the agricultural supply chain for efficiencies, improvements and value-added, competitive products and services.



## NATURAL ENVIRONMENT

The role of the natural environment in providing water services is well understood but undervalued. The significant potential of the natural environment can be unlocked in providing treatment, storage, buffer and recreational solutions, giving rise to multiple benefits and cost-savings.



## ENERGY GENERATION

Establishing energy independence, using less carbon-based energy and contributing renewable energy to the grid can all be achieved in cooperation with the energy sector. Fluctuating fuel prices, unreliable supplies and emerging legislation are key incentives for creating win-win partnerships.



# The Water Pathway

Existing water systems are often inefficient – from catchment to consumer, back to catchment, water is lost, polluted, wasted and misused. Such systems will continue to exacerbate the projected gap between available freshwater supply and demand. The water pathway should be developed as a closed loop system, with cascading water quality options determined and differentiated by use. Critical to this are diversified resource options, efficient conveyance systems and optimal reuse. The first line of defence against water scarcity should be a comprehensive demand management strategy that promotes sustainable lifestyles and creates tangible incentives to conserve.



- Potable water
- Non-potable water
- Wastewater
- Reclaimed water
- Greywater
- Rainwater

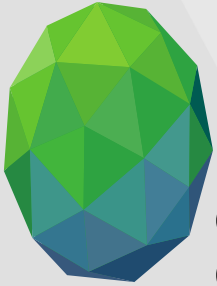
- |   |   |
|---|---|
| <b>1</b> Upstream investments                         | <b>6</b> Reused water for industry      |
| <b>2</b> Rainwater harvesting                         | <b>7</b> Direct potable reuse           |
| <b>3</b> Greywater recycling for non-potable reuse    | <b>8</b> Leakage / Water loss           |
| <b>4</b> Greywater for agriculture and aquaculture    | <b>9</b> Reduction in water consumption |
| <b>5</b> Reused water for agriculture and aquaculture | <b>X</b> Onsite treatment               |

An aerial photograph of an industrial facility, likely a wastewater treatment plant or a chemical processing plant. The image shows several large, circular, light-colored storage tanks or clarifiers arranged in a row. There are various industrial buildings, pipes, and infrastructure surrounding these tanks. The overall scene is a complex of industrial structures.

## EXAMPLE - Energy and Raw Materials Factory

- The ERMF enables the recovery of clean water, cellulose, bioplastics, phosphate, bio-ALE, and biogas from municipal wastewater. The value of the recovered resources including the reduction of maintenance cost in the Netherlands is estimated at approximately €233,000 million per year from 2030. This is approximately €14 per person per year. Similar investments are needed to create ERMFs.
- Assuming that all the necessary investments for ERMFs are provided and the revenues of €14 per person per year are extrapolated to a global population of 7 billion people, the total revenues will be about €100 billion per year. The ambitions articulated in the SDGs on water and sanitation (UN 2017) have recently been estimated at US \$114 billion per year up to 2030 (World Bank 2017).
- The circular economy (introduction of ERMF at global scale) and the UN SDGs on water and sanitation therefore provide potential win-win's.





GREEN  
CLIMATE  
FUND

# The GCF portfolio and sanitation

Alastair Morrison  
Water Sector Senior Specialist  
Green Climate Fund

World Water Week  
Stockholm, Sweden  
27<sup>th</sup> August 2018

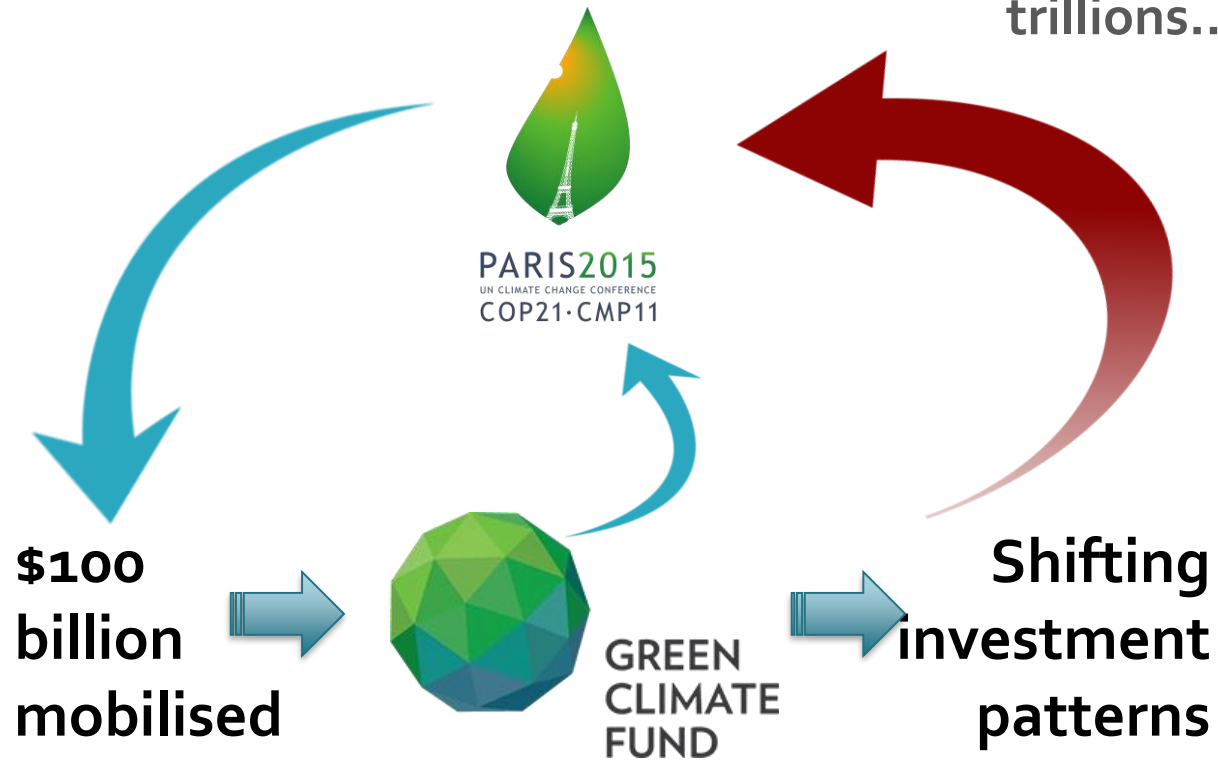




# **Part I: Introduction to the GCF**



## The Paris Agreement & shifting the trillions...



foster climate resilience and low greenhouse gas emissions development (Art 2, Para 1. b.).)

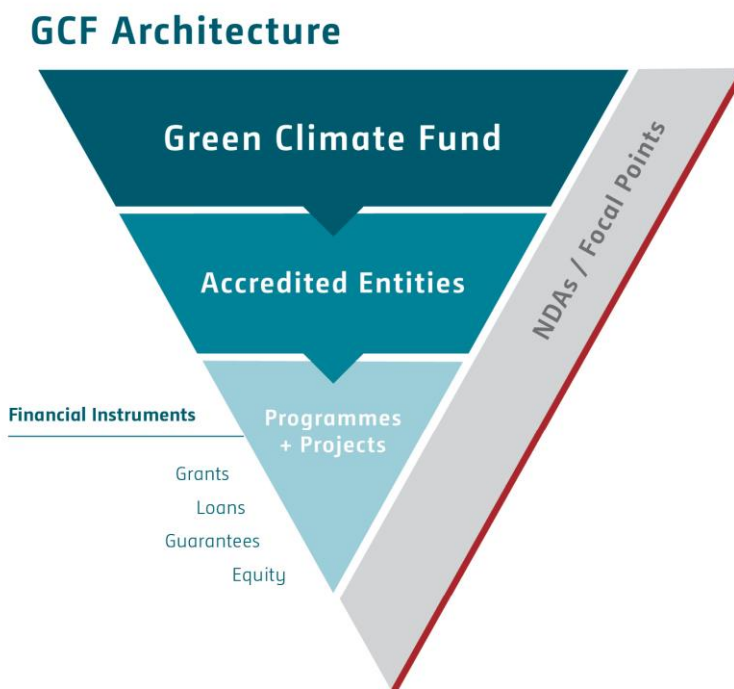


## Our Vision

### With a Mandate:

To promote low-emission and climate resilient development in developing countries.

# The GCF Architecture





## Project generation – by Accredited Entities and Government





## **Part II: The water portfolio... and sanitation?**



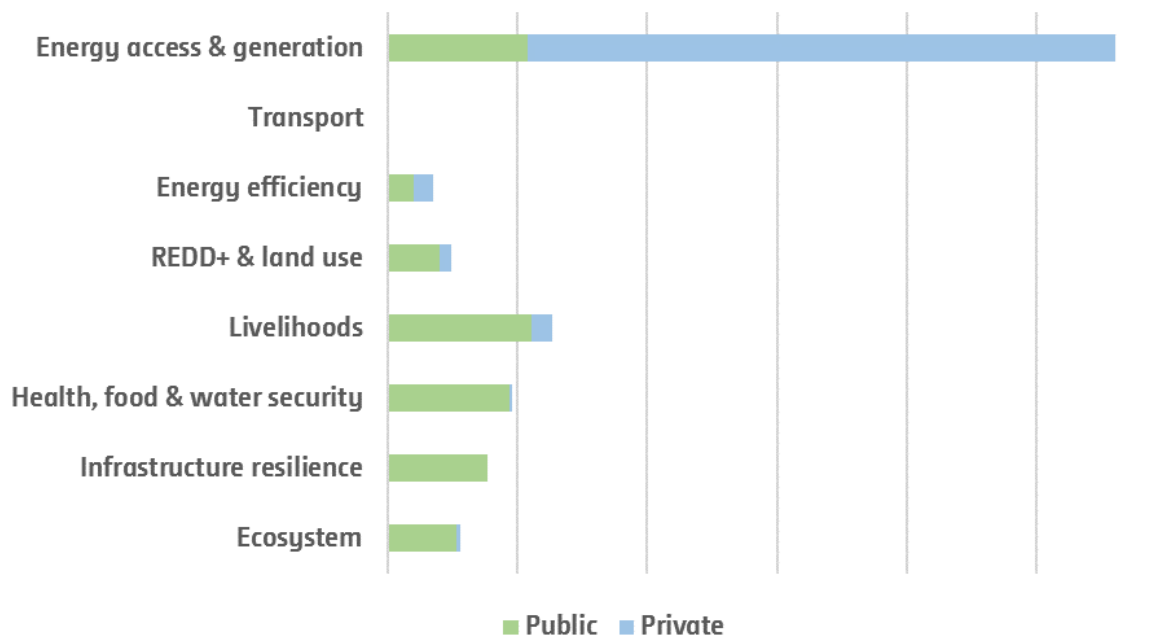
## GCF Portfolio By Water Subsectors

Subsector	# Approved projects	Total value approved (\$M)	# Pipeline projects
Coastal	5	141	9
Flood	3	153	7
Water supply	3	102	9
Drainage/sanitation/health	1	18	1
Irrigation	2	63	5
Hydropower	2	136	-
Ecosystems/wetlands	2	30	2
Drought	3	93	10

# Investments by Results Areas

## Energy has a business model

Relative weight of area in public and private sector projects



Status as of B17 (July 2017)



# Where are the Partners?

59 entities accredited to date – but few in the health sector







## National priority?

**All GCF projects prioritised by the National Designated Agency:**  
Sanitation rarely on the agenda



# The Climate Rationale

**Adaptation projects must address climate change impacts:**

Example 1 - Extra costs of providing sanitation in flood zones:

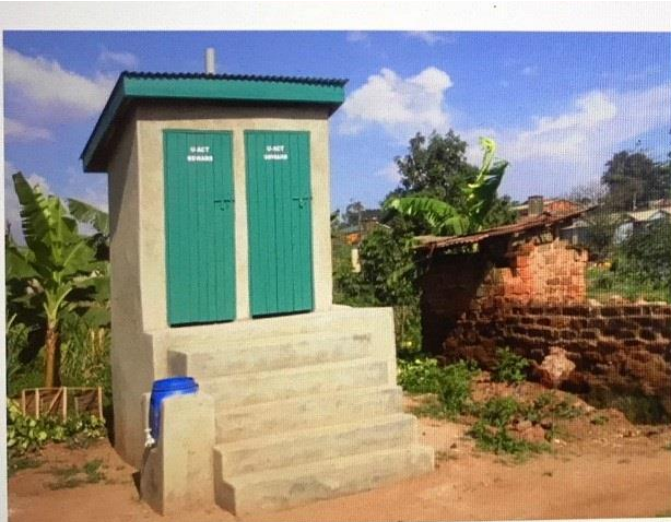


Fig. 2 Raised VIP latrine

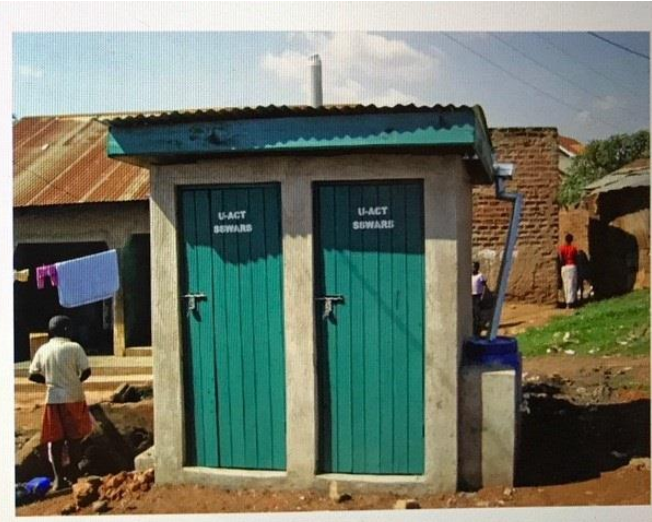


Fig. 3 Ground-level VIP latrine

# The Climate Rationale

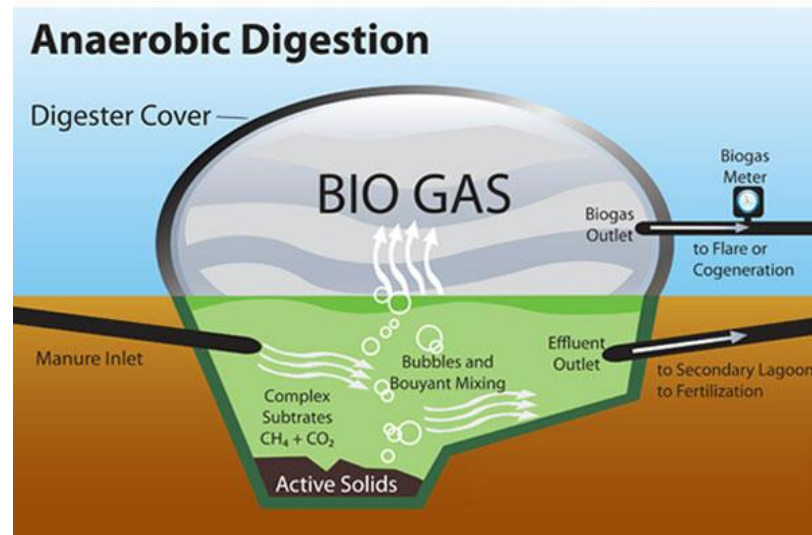
**Adaptation projects must address climate change impacts:**  
Example 2 – Resettlement costs of people displaced by climate change:



# The Climate Rationale

**Mitigation projects must reduce greenhouse gas emissions:**

Example 3 – Capturing methane from wastewater:





# The Climate Rationale

**Mitigation projects must reduce greenhouse gas emissions:**

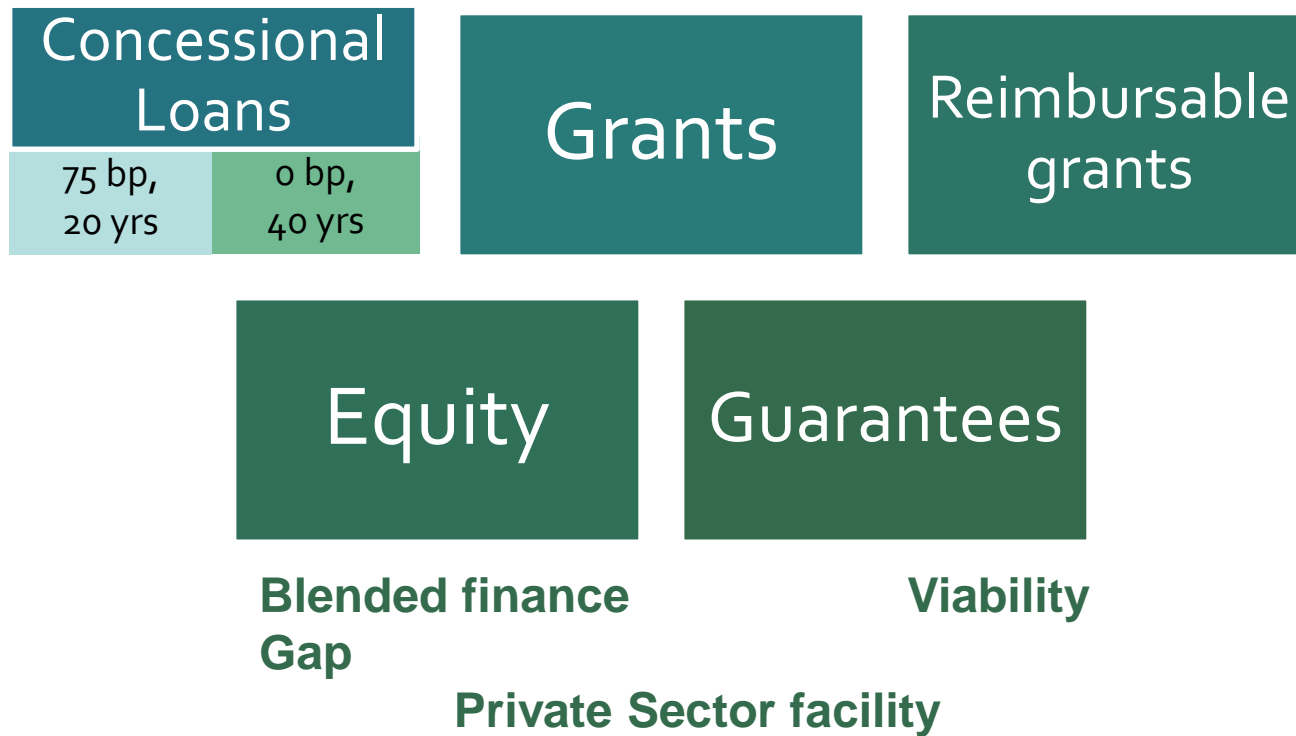
Example 4 – Less wastewater and more energy efficient treatment plants:







## Not only grants ...





**Governance,  
the enabling environment  
and ownership:**

**Is it sustainable?**





# Where is the Paradigm Shift?

- Central to GCF's mandate, the shift towards low-emissions and climate-resilient development pathways - is aligned with the Paris Agreement, ambitious and contribute to reduce temperature increase below 2 degrees Celsius.
- Focus on country ownership and direct access entities – paradigm shift to how climate finance has been allocated in the past. Indeed, we have now 59 entities accredited, of which half are national and regional direct access entities,
- Projects must catalyze impact beyond a one-off project or investment (sector examples follow)
- GCF is the only climate finance institution for which gender mainstreaming is considered as part the decision making for funding.
- Private Sector Facility that recognizes the role of the private sector in tackling climate change, facilitating private sector engagement in financing climate change solutions.



## **GCF - Results Areas**

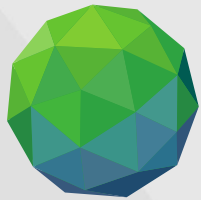
### **Adaptation - not necessarily SDG6**

**[1.0] Increased resilience and enhanced livelihoods of the most vulnerable people, communities, and regions**

**[2.0] Increased resilience of health and wellbeing, and food and water security**

**[3.0] Increased resilience of infrastructure and the built environment to climate change threats**

**[4.0] Improved resilience of ecosystems and ecosystem services**



GREEN  
CLIMATE  
FUND

For more info, visit [www.greenclimate.fund](http://www.greenclimate.fund)

### Quick links

[GCF 101](#)

[GCF portfolio](#)

[Accredited Entity composition](#)

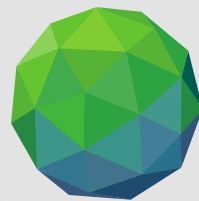
[Resources mobilized](#)

Alastair Morrison

GCF Water Sector Senior Specialist

[amorrison@gcfund.org](mailto:amorrison@gcfund.org)





**GREEN  
CLIMATE  
FUND**

# The contribution of sanitation to the Paris Agreement - *What is stopping us?*

Aug 28, 2018 | World Water Week, Stockholm



Empowered lives.  
Resilient nations.



sustainable  
sanitation  
alliance

**6** CLEAN WATER  
AND SANITATION



**13** CLIMATE  
ACTION



sustainable  
sanitation  
alliance

**What's Stopping us in the  
MENA region ?**



# What's really stopping us??

**Financial**

**Social/cultural**

**Institutional**

**Data**

**“Pilotitous”**



**sustainable  
sanitation  
alliance**

Lara Nassar – Regional SuSanA Coordinator

[Nassar@borda-wesca.org](mailto:Nassar@borda-wesca.org)

Manal Al Sharaideh – Regional SuSanA Researcher

[Alshraideh@borda-wesca.org](mailto:Alshraideh@borda-wesca.org)

**[www.susana.org](http://www.susana.org)**



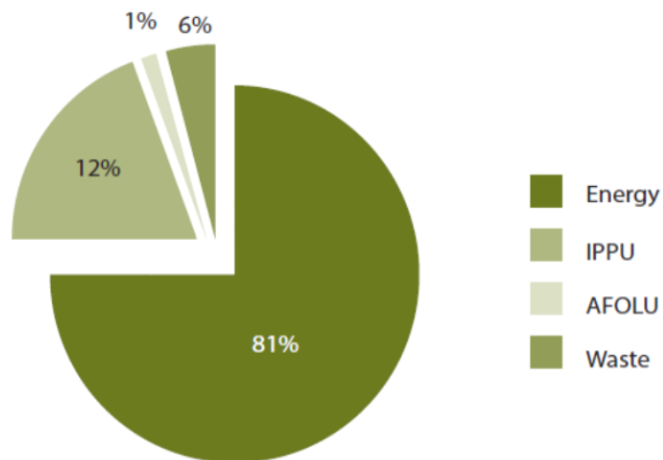
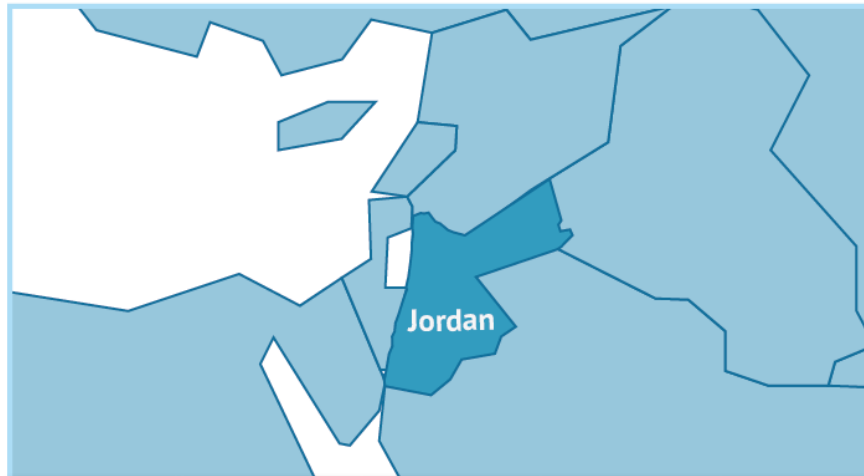
# Water Utilities Mitigating Climate Change- Towards Strengthened NDCs

Case study from Jordan

August 28, 2018



# Jordan Key Facts

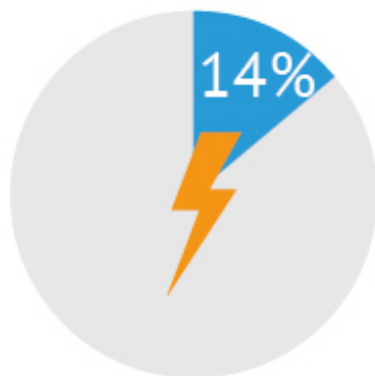


- Second most water-scarce country in the world
- Annual population growth of 5.3%
- Water demand > Available water resources
- 28 Mt CO<sub>2</sub>eq(2012)
- 15% of the GHG from energy is from water pumping
- Wastewater accounted for 9% of total waste emissions.

# Energy & Water Nexus in Jordan

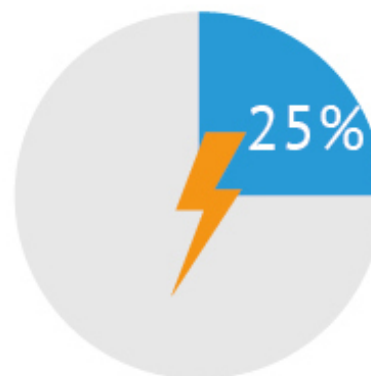
## Energy for Water 2014 - 2030

2015



14 % of national energy consumption attributed to water

BAU 2030



BAU scenario: 25 %

**Electricity generation is expected to grow at an annual average growth rate of 4.1 % until 2040.**

# Jordan NDCs



Hashemite Kingdom of Jordan

Intended Nationally Determined Contribution (INDC)<sup>1</sup>

## Jordan's INDC Summary

Jordan nationally determines to reduce its greenhouse gas emissions by a bulk of 14 % until 2030. This contribution of GHGs reduction will be unconditionally fulfilled at, maximally, 1.5 % by the Country's own means compared to a business as usual scenario level.

However, Jordan, conditionally and subject to availability of international financial aid and support to means of implementation, commits to reduce its GHGs emissions by additional, at least, 12.5 % by 2030.

The outcome targets above are accompanied by a diverse combination of numerous GHGs cut-oriented actions in all involved sectors of emissions in addition to the adaptation actions in targeted sectors. These actions (policies, strategies, legislations, measures, etc) are articulated in this document. The methodological approaches underlying Jordan's INDC are included in this communication as well.

# How does Jordan address climate relevant water actions in its NDCs?

Jordan is strongly committed to the goals of the PA to respond to climate change.

## Climate Change Policy of the Hashemite Kingdom of Jordan 2013-2020

### Mitigation

### Adaptation

#### ACTIVITIES

**Diversifying renewable energy sources (biogas, solar, wind, hydro)**

**Improving Energy Efficiency in water and wastewater utilities**

**Empowering Water User Associations (capacity development, financial sustainability)**

**Rainwater Harvesting technologies**

**Irrigation efficiency**

**Operational efficiency of wastewater treatment**

**Circular economy approaches and safe use of treated wastewater**

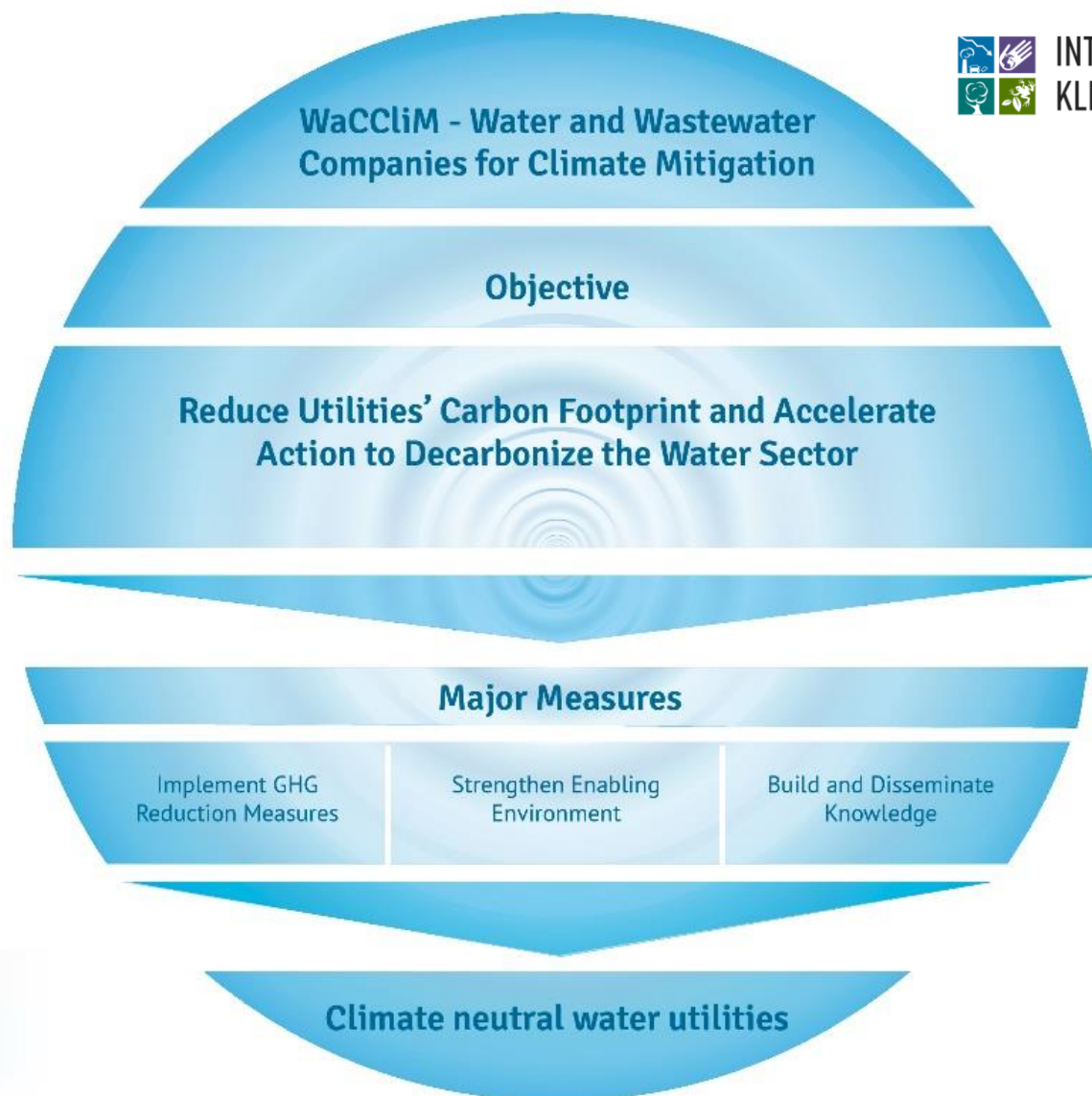
**Water Efficiency**



# Water and Wastewater Companies for Climate Mitigation (WaCCliM)



INTERNATIONALE  
KLIMASCHUTZINITIATIVE (IKI)





# WaCCliM Pilot Utility in Madaba, Jordan



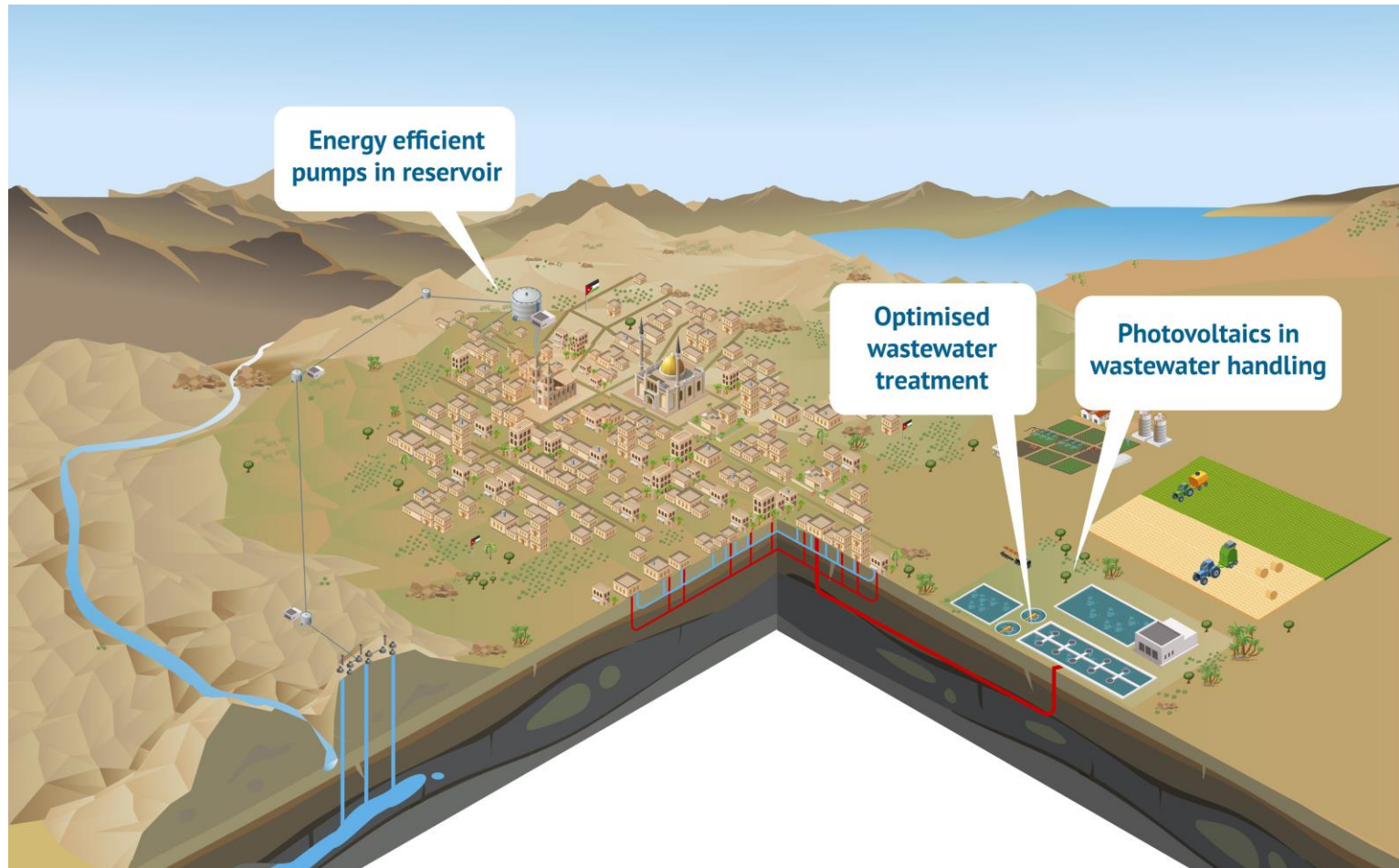
Total CO<sub>2</sub>  
(28,000 t CO<sub>2</sub>-eq/a)  
73% attributed to water supply

Total Energy  
consumption  
(30.4 MWh/a)



# WaCCliM Pilot Utility in Madaba, Jordan

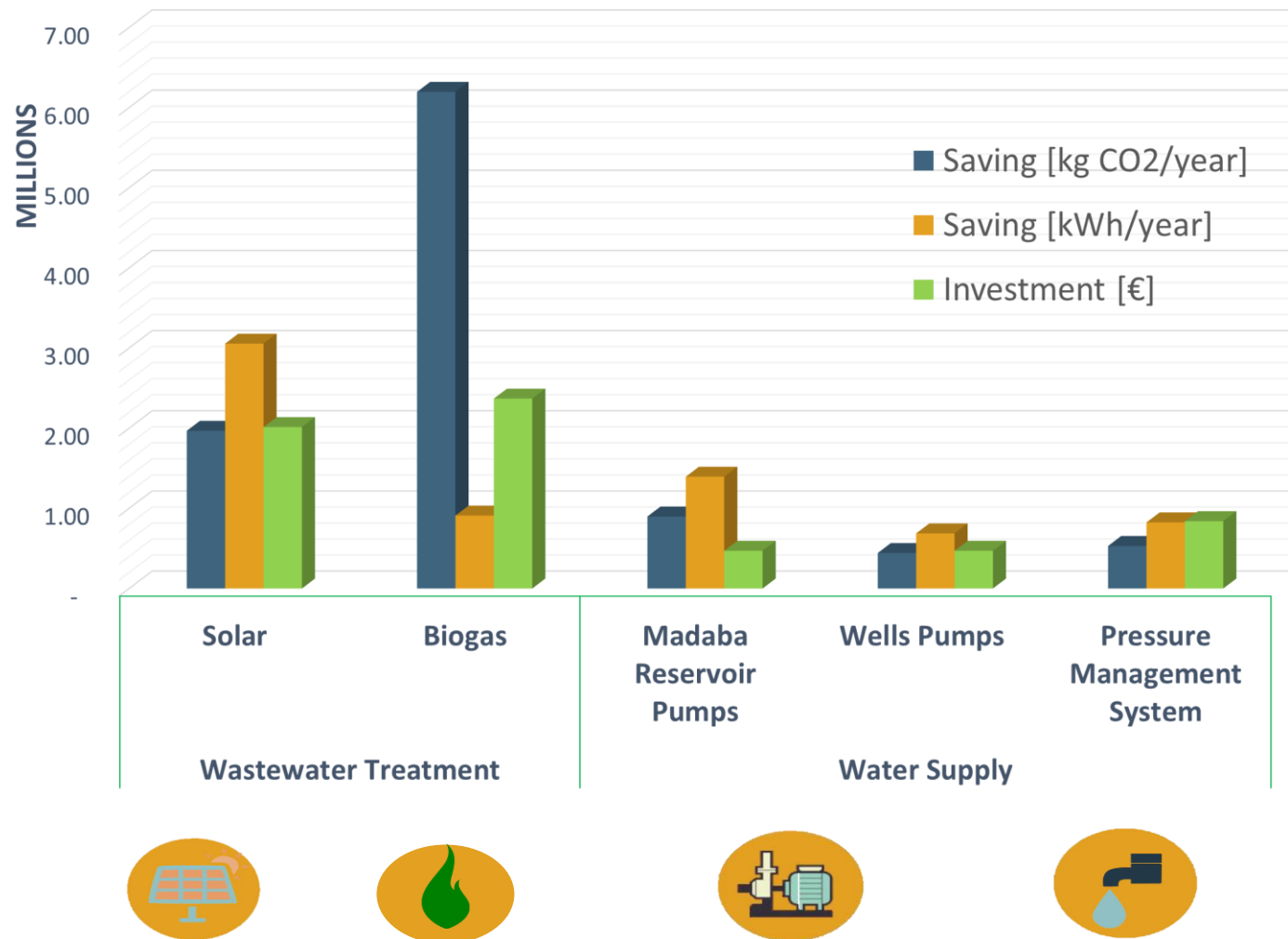
## GHG reduction opportunities



# WaCClIM Pilot Utility in Madaba, Jordan

## GHG reduction opportunities

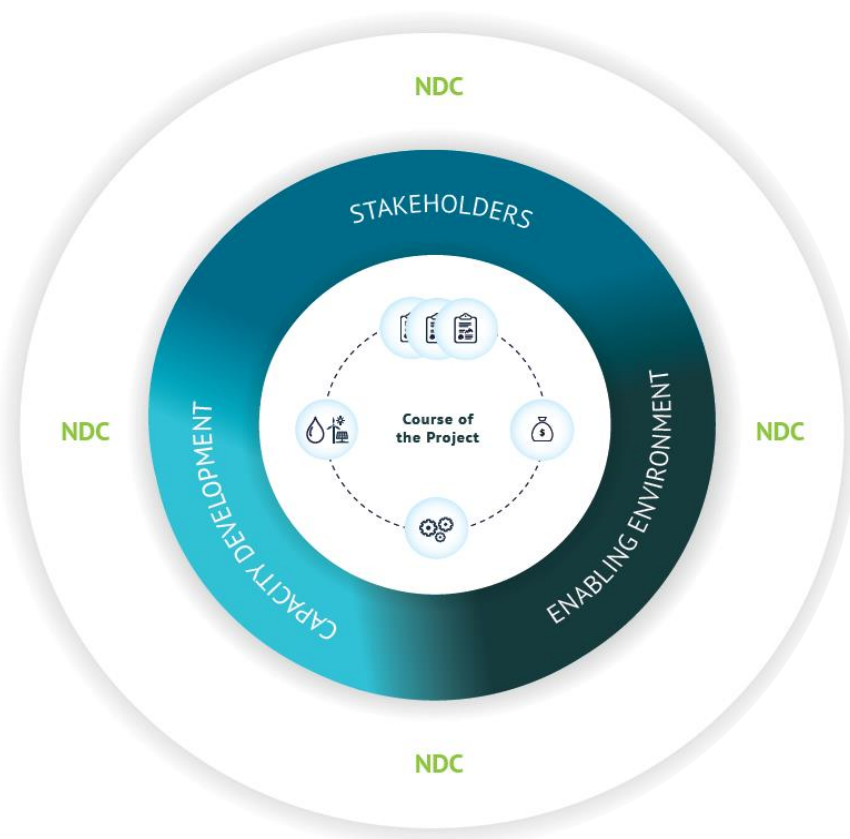
Main Options identified



# WaCCliM Up-Scaling and Support to Jordan NDCs

1. **Development of GHG Reduction Policy** for the Water Sector (entire urban water cycle)
2. **Development of Financing Mechanism** for the Water Sector
3. Identify and develop **NAMA projects (i.e. biogas, energy efficiency)** in water sector while contributing to **water security**

## Project Pipeline Development



# Our Partners

This project is part of the International Climate Initiative

On behalf of:



Federal Ministry for the  
Environment, Nature Conservation,  
Building and Nuclear Safety

of the Federal Republic of Germany



Ministry of  
Water & Irrigation



Ministry of Environment



Implemented by:



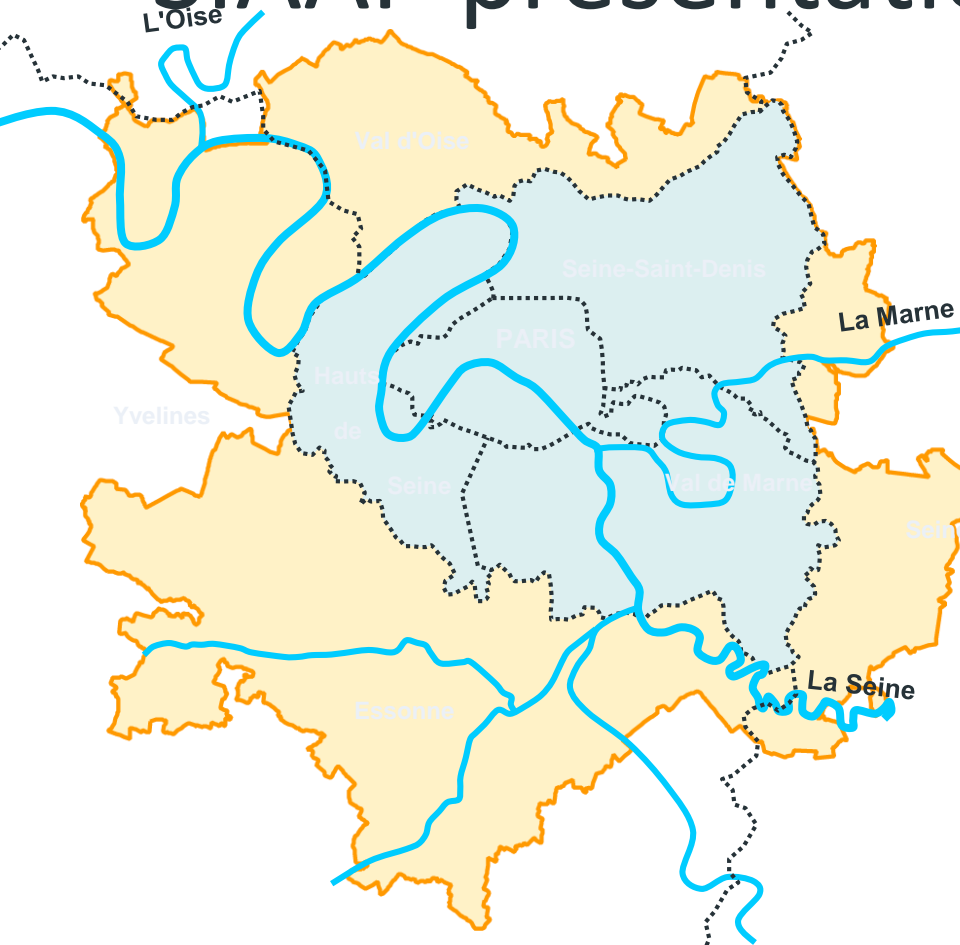
[www.wacclim.org](http://www.wacclim.org)



# Sanitation and wastewater management in Paris - from an adaptation and mitigation perspective

Jean- Didier Berthault – Councillor of Paris City, board of SIAAP

# SIAAP presentation



## The formally SIAAP

- 4 *départements* (administrative divisions of France)

### The SIAAP Board (33 elected members)

- 124 municipalities
- 6.7 M inhabitants

## Extended SIAAP limits

- 178 municipalities
- 2.3 M inhabitants

## SIAAP :

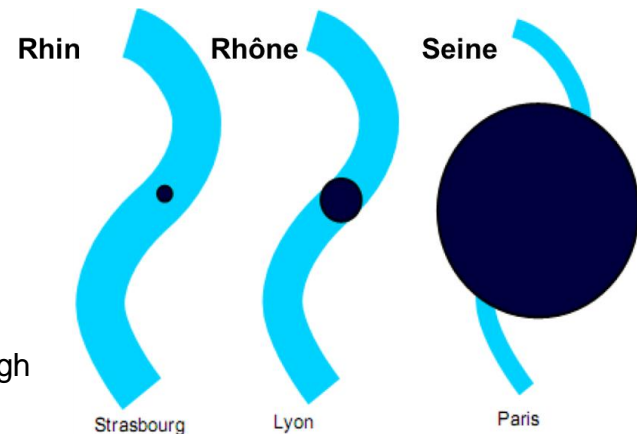
- 284 municipalities
- 9 M connected inhabitants
- 400 industrial companies
- 15 000 km of municipal sewers

- 1820 km<sup>2</sup>
- 2 400 000 m<sup>3</sup>/d
- Mainly a combined sewer system
- Outer suburb : separate system

# Attachment



Seine: A small river under a high anthropogenic pressure



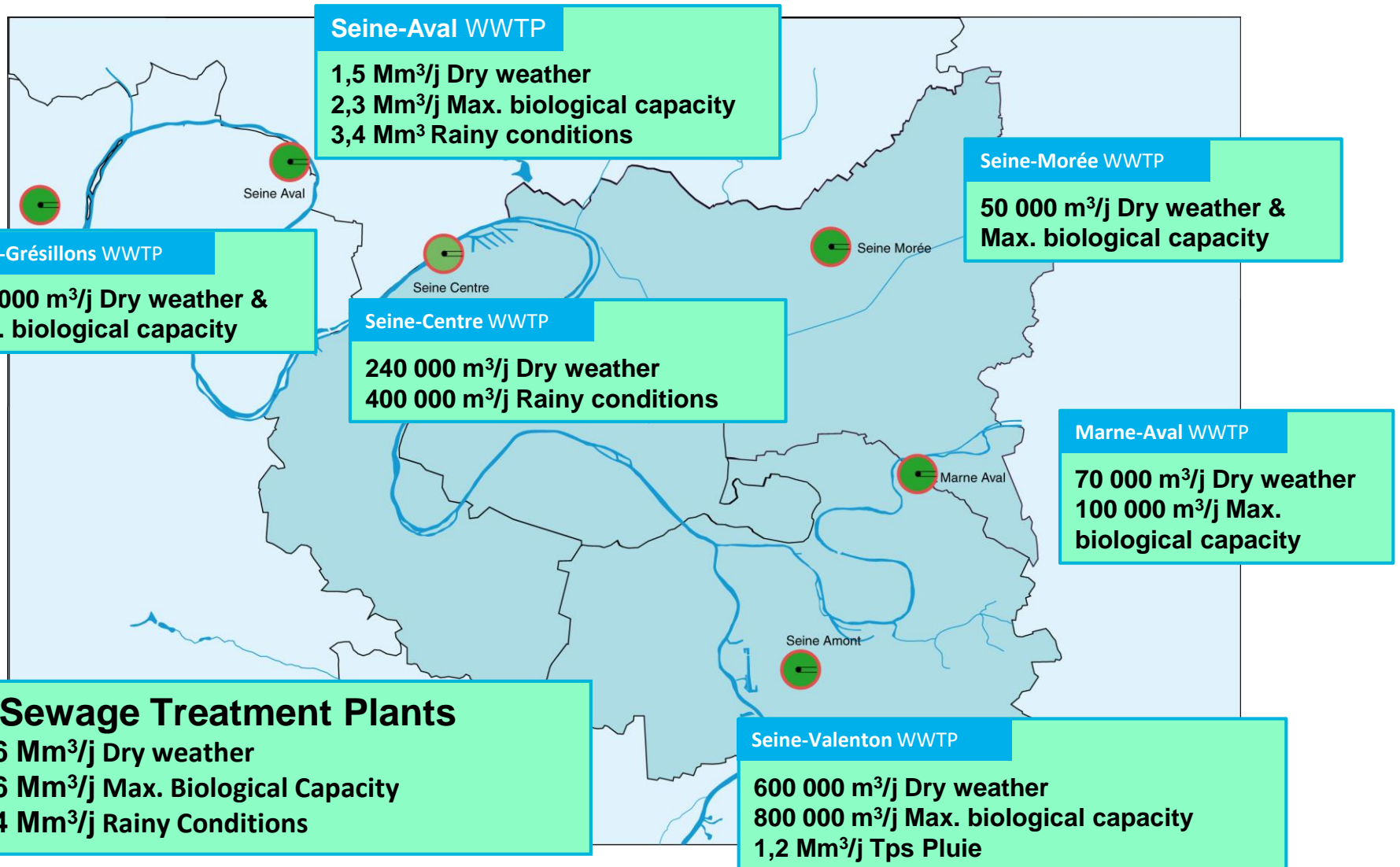
m <sup>3</sup> /d/inhabitant	65	18	1,2
------------------------------	----	----	-----

What has been already done to  
preserve the ressource?

# What has been done



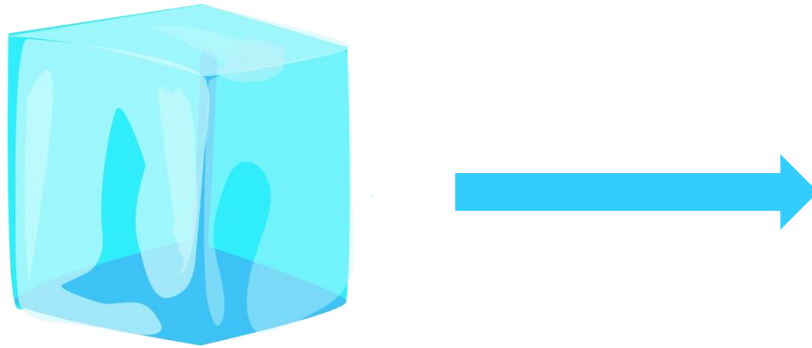
Ensure a medium flow of the Seine River managing  
**6 reservoir dams**





# The key role of sanitation for Mitigation ... the easiest part

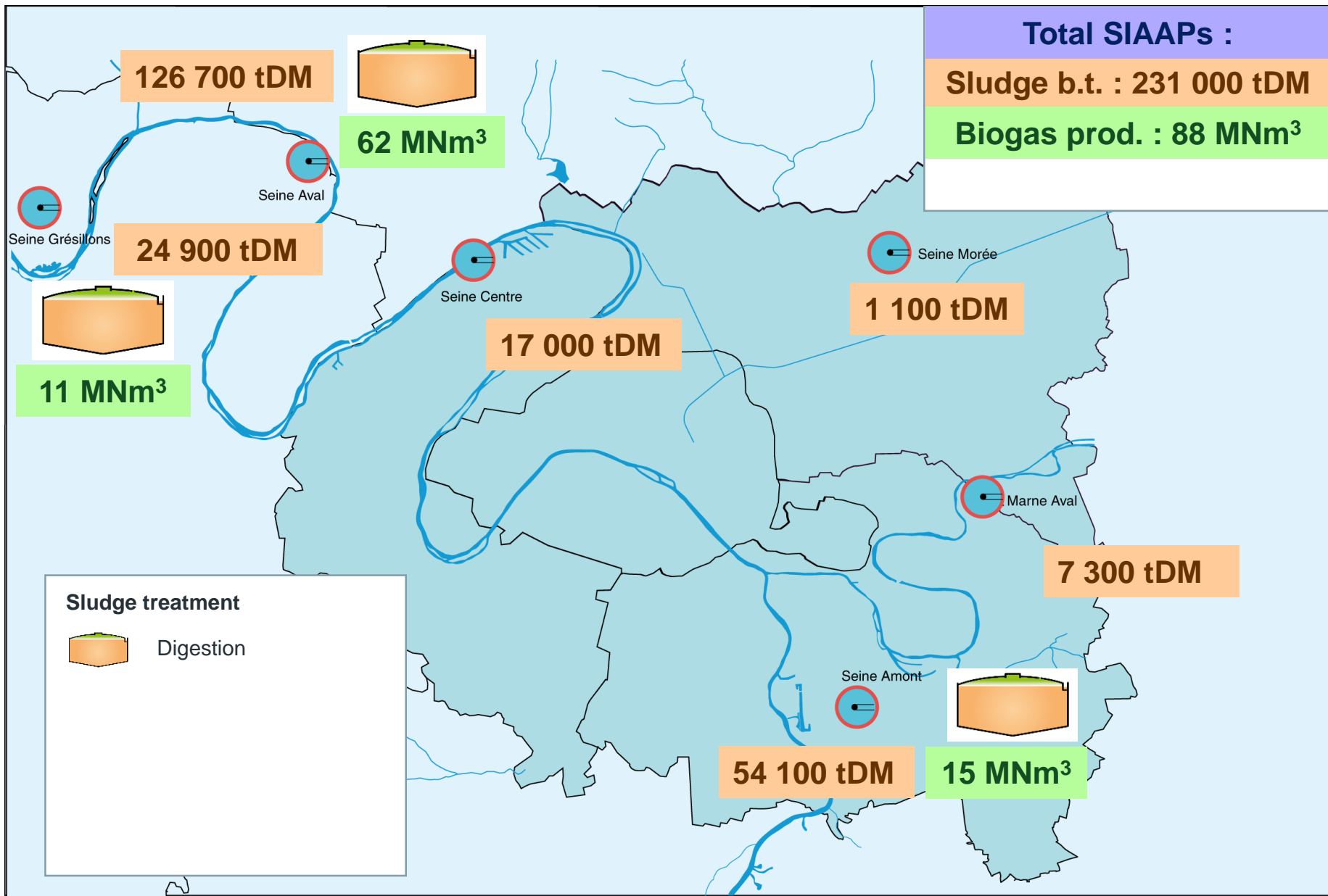
# Wastewater as a resource



**Energy**  
**For the treatment of**  
**1 m<sup>3</sup> of wastewater**  
**= 1.25 kWh**

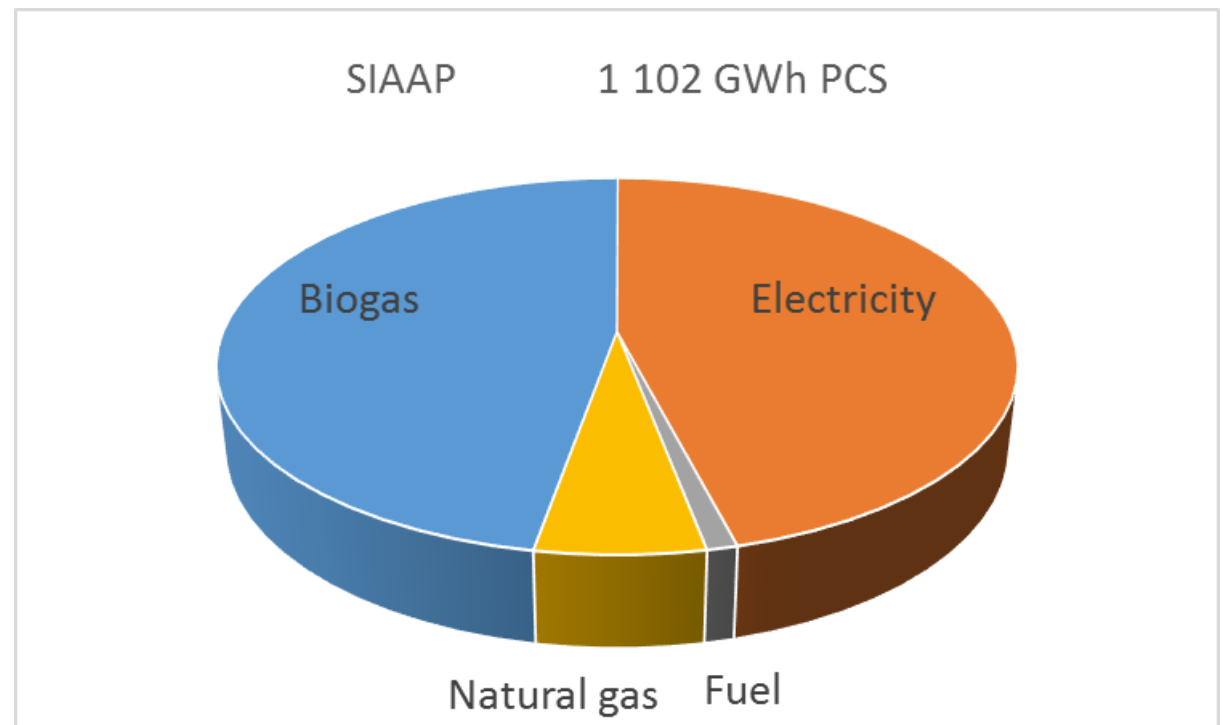


**Energy SIAAP is able to**  
**produce**  
**1 m<sup>3</sup> of wastewater**  
**= 1.1 kWh**



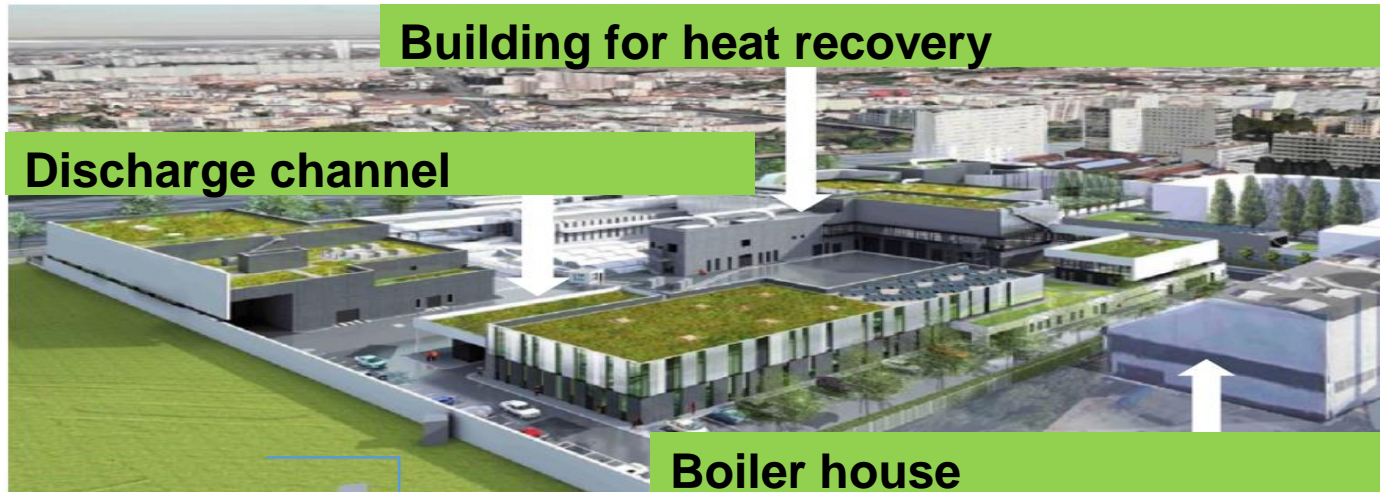
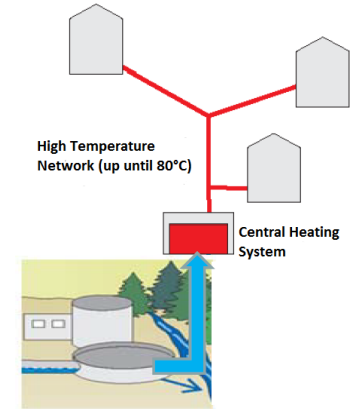
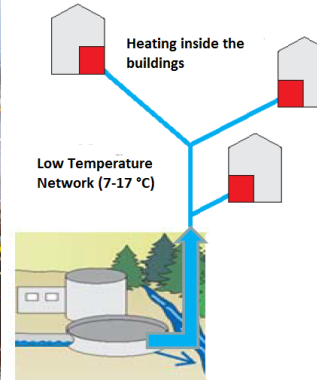
# SIAAP energy balance

## WWTP and sewage network energy balance



# Heat recovery projects

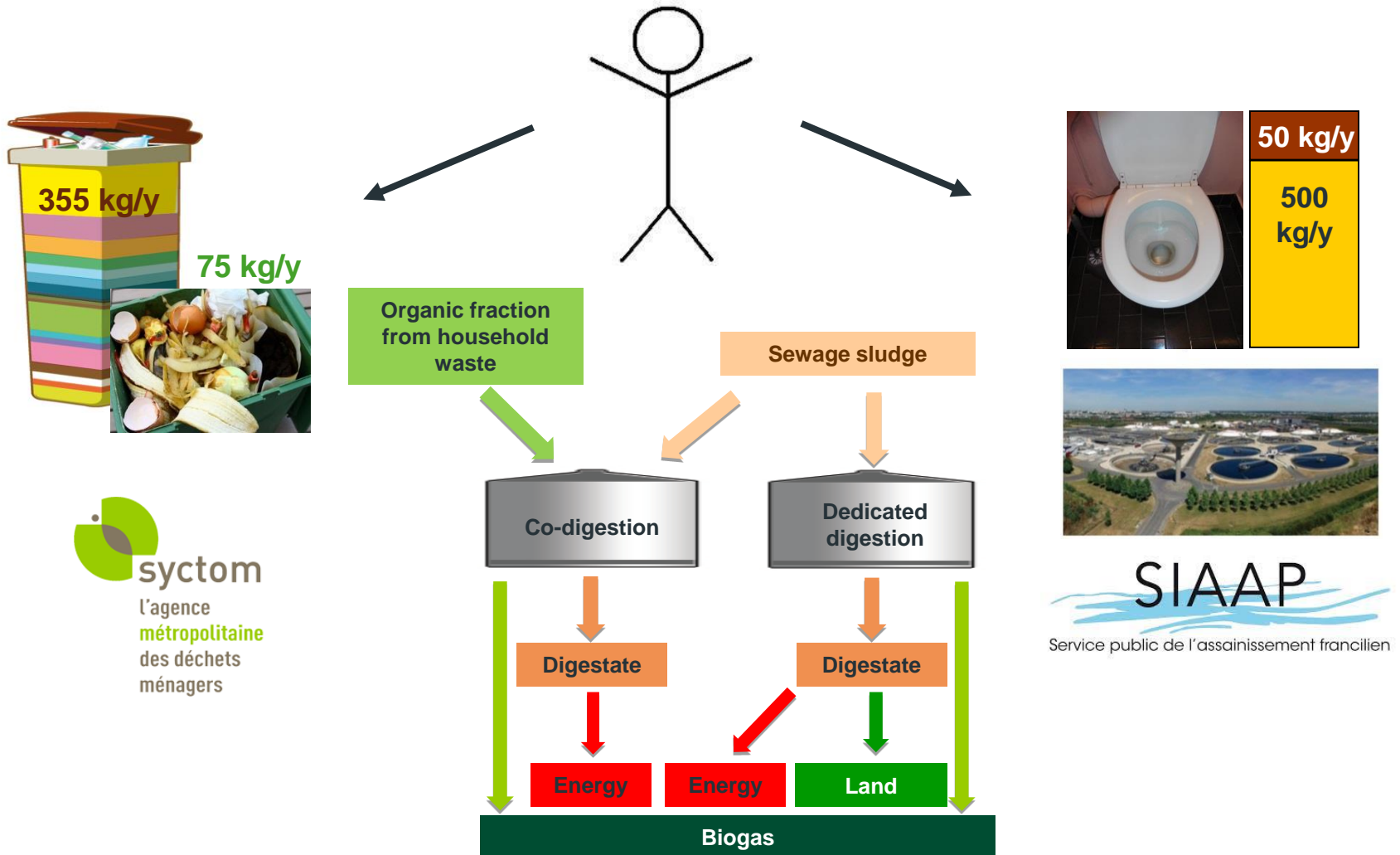
- Recovery from wastewater
  - WWTP outlet
  - Sewage network



2022  
63 GWh/an

# Co-digestion project

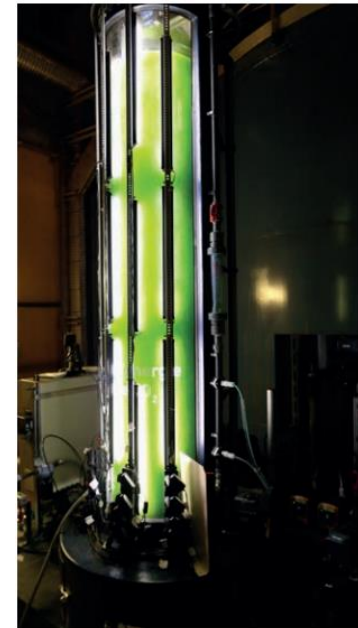
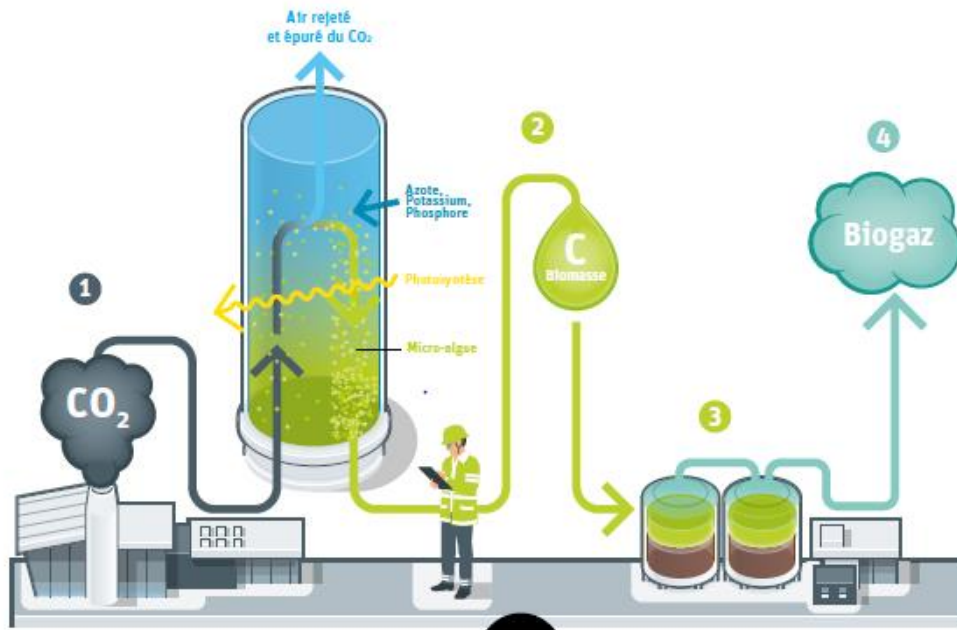
## ❑ Innovation Partnership for combined digestion of organic matters





# Other innovative projects

- ❑ **Carbon sink** : CO<sub>2</sub> capture in incineration flue gas with microalgae : Demonstrator siting on the « Seine centre » WWTP



# BioGNVAL project

❑ **Demonstrator siting on the « Seine Amont » WWTP at Valenton**

**Integrated biogas upgrading and liquefaction technology**

BioLNG : Bio Liquid Natural Gas for vehicles



## What about the treatment capacities of SIAAP in 2030 ?

### An issue: the treatment of nitrogen compounds ?

Nitrogen, a sensitive parameter :

Difficult to treat

Declassifying for good condition



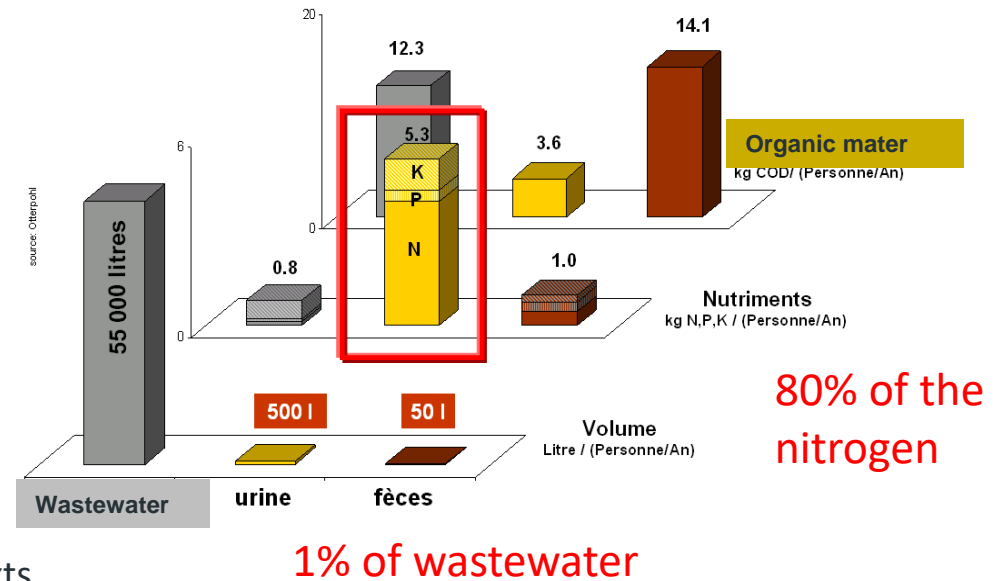
What potentialities, which difficulties?

Technical aspect : transport, storage,  
collection, treatment

Regulation aspect : link with current regulation texts

Environmental aspect : impact compared to conventional sanitation

Social aspect : user acceptability



Next challenges?

# More Adaptation means a change



Being a key actor in Paris Region  
sustainable development

Bringing a holistic vision of Paris region  
sanitation

Developping local partnership for a  
sustainable development

**Circular economy : reduce, reuse, recover**

**Break silos : solid waste, urban planners, cities builders,  
citizens... and so on ...**

**GREEN CITIES**

**BLUE CITIES**

# Financial challenge

- Investment : 579 M€
- Operating expenses : 579 M€
- The basement of the system : the Water Bill
- The principle : Water pays for Water



Are citizens willing to pay more to live in Green and sustainable cities ?



# Sanitation Financing

- Average water price (Incl. VAT) : 3,83 €/m<sup>3</sup> (2016)
  - 1,29 €/m<sup>3</sup> for water supply
  - 2,54 €/m<sup>3</sup> for sanitation including 1,104 €/m<sup>3</sup> for SIAAP

Thanks for your attention



# Raising the questions:

- *Think, write, share*
- *Within the group, decide on 2 or more key questions you want to ask the panel*

# The contribution of sanitation to the Paris Agreement - *What is stopping us?*

Aug 28, 2018 | World Water Week, Stockholm



Empowered lives.  
Resilient nations.



sustainable  
sanitation  
alliance