

Jordan: Linking Water and Climate



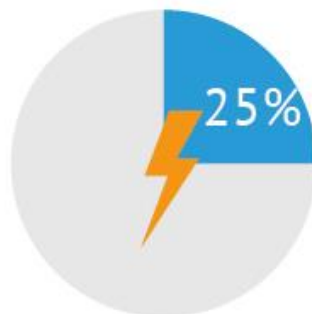
Key Facts

- Most water stressed country in the world
- 14 % of national energy consumption attributed to water abstraction

2015

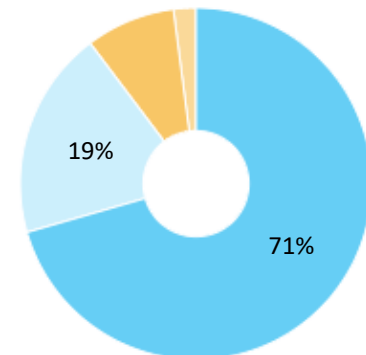


BAU 2030

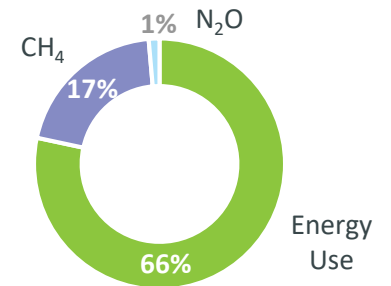
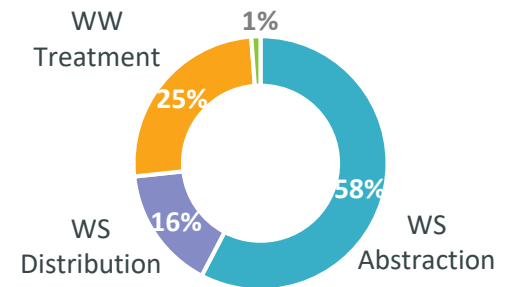
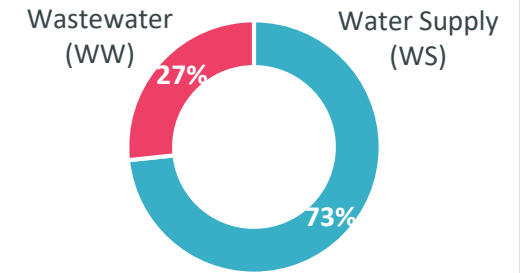


Energy consumption (30,375,000 kWh)

- Abstraction
- Distribution
- Treatment
- Discharge/Reuse



Pilot Utility in Madaba

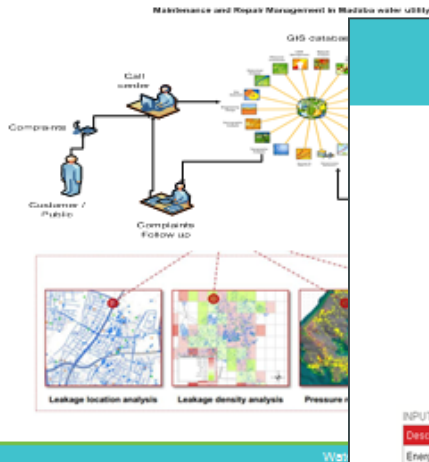


Madaba Utility: Baseline
28,000 t CO₂e/a; 70 % attributed to water supply

ECAM: Baseline Study and Mitigation Options

Detailed Assessment- Water Supply

Non Revenue water Assessment



ORIGINAL	FREQUENCY	FREQUENCY	FREQUENCY
Complaints	2014	2015	2016

Detailed Assessment- Wastewater

Wastewater Treatment

INPUTS	OUTPUTS — Energy performance
Description	
Energy consumed from the grid (kWh)	Electricity
Volume of treated wastewater (m ³)	Effluent BOD5
Influent BOD5 load (mg/L)	Effluent BOD5 load
Effluent BOD5 load (mg/L)	BOD5 mass removed
BOD5 mass removed (kg)	

Wastewater Discharge

INPUTS
Description
Energy consumed from the grid (kWh)
Volume of treated or untreated discharged (m ³)
Energy recovered during wastewater discharge

GHG and Energy Projections

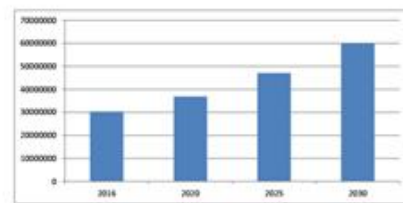


Figure 23. Electricity Consumption projection in kWh for Madaba

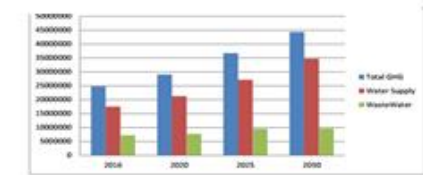
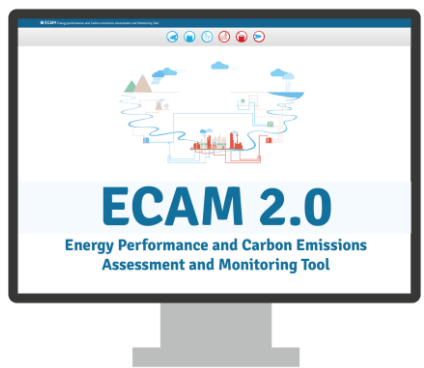
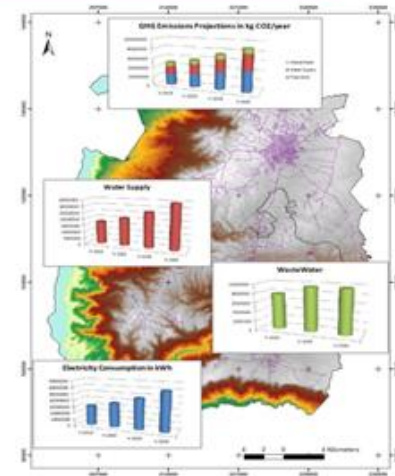


Figure 22. GHG Emissions Projections in kg CO2eq/year for Madaba



ECAM: Baseline Study and Mitigation Options

Detailed Assessment- Water Supply

Abstraction- Well Field Management Options

- SCADA system
- Pumps Efficiency
- Hydraulic wells rehabilitation

Detailed Assessment- Water Supply

Abstraction- Solar Energy Option

- Average annual solar radiation in Madaba is 2050 kWh/m²/year
- The best solar panel technology is approximately 20%
- This gives a savings of 1000 kWh/m²/year

1	Self-generation
2	Develop-B (DBOT)
3	Self-generation (Financing)
4	DBOT 10-year

Biogas Option

The cost of construction of two digesters is estimated to be **2,820,000 USD**.
The electricity selling/saving income depends on the Feed in Tariff prices (**133 USD/ MWh**).
analysis can be done

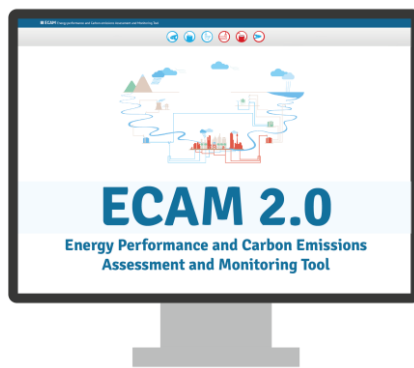
- Simple
- Discount

Treated wastewater management

Using treated wastewater in irrigation:

A total amount of 6640 cubic meter treated wastewater flow out daily from Madaba WWTP.
This amount of water is used to irrigate Alfalfa and Maize crops.

A total area of 1300 Dunum receive this amount of water daily with an average amount of :
 $6640/1300 = 5.1$ cubic meter/ dunum.day



Madaba, Jordan: Mitigation Actions

Energy efficient pumps in reservoir

Optimised wastewater treatment

Photovoltaics in wastewater handling

Identifying and preparing optimal project design & accessing climate funds

12,000 t/a 

4 Mio. \$ 

8.4 GWh/a 

200,000 

Challenges and Opportunities

1. Knowledge and Learning

A. Benefit from global project

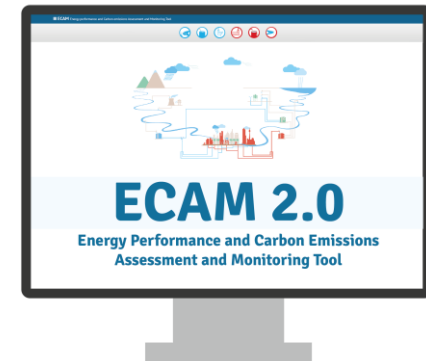
- Exchange on implementing effective planning & policy
- Development of global tools (Carbon accounting - ECAM)

B. Benefit from building the capacity of national entities

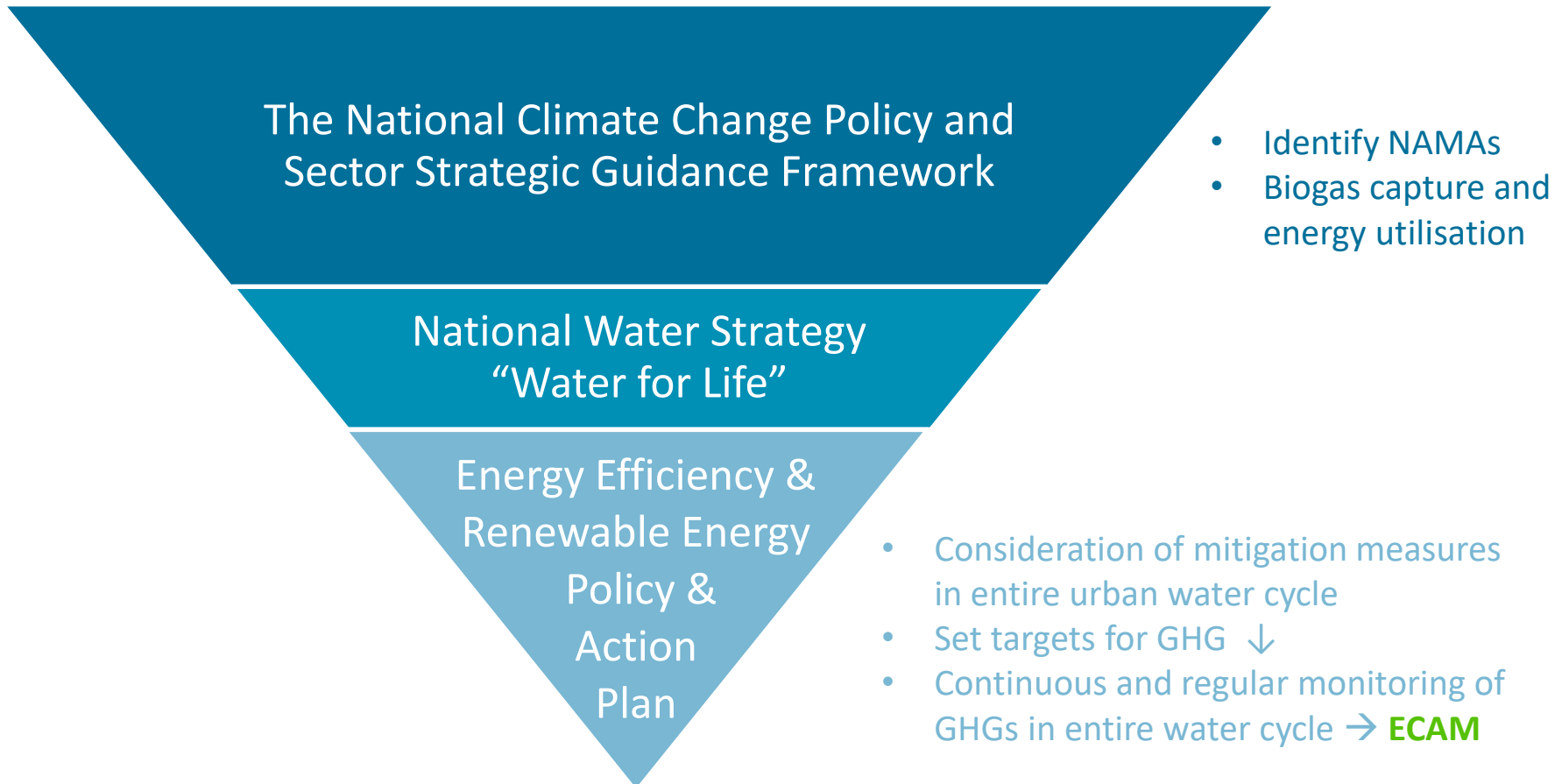
- National - International research consortium
- Better understanding of local context

2. Challenges

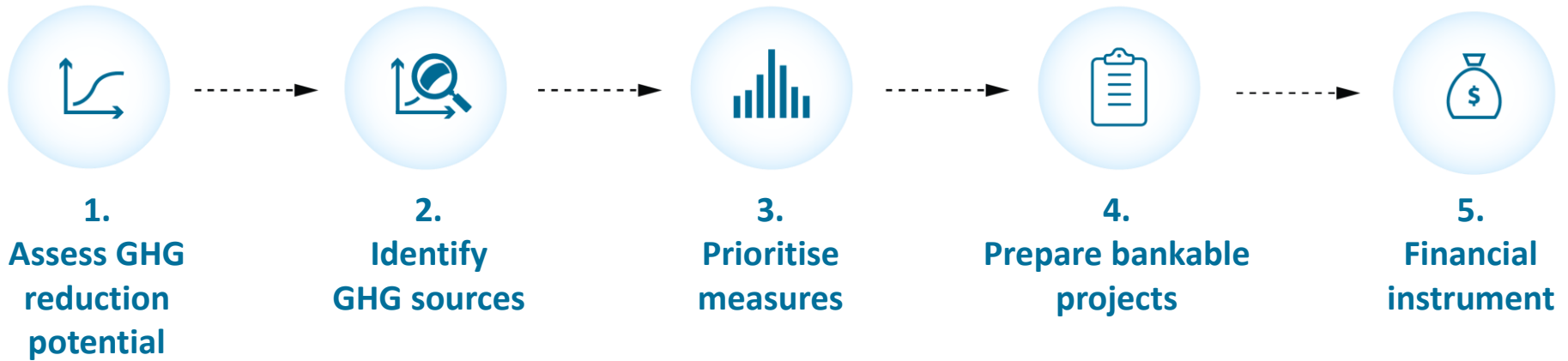
- Data collection, accuracy and integrity
- Limited budget for implementation



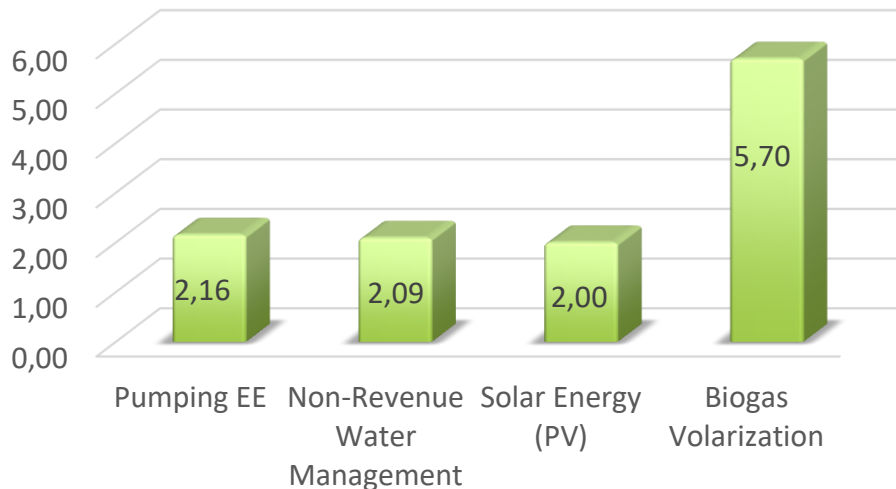
Jordan: Creation of an Enabling environment



Steps in Project Pipeline Development



Emission Reduction Potential (1000 tCO₂)



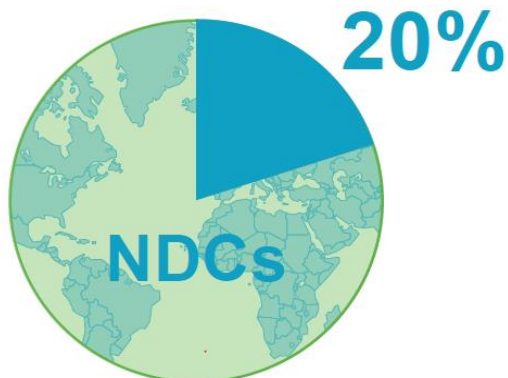
Bankable Project

Minimum Charge (diagnostic): £ 30				
Estimated Labour Hours: £ 10 x 1				
Additional options: £ 80				
Deposit: £				
Item	Price	Quantity	Quoted	Accepted
			<input type="checkbox"/>	<input type="checkbox"/>
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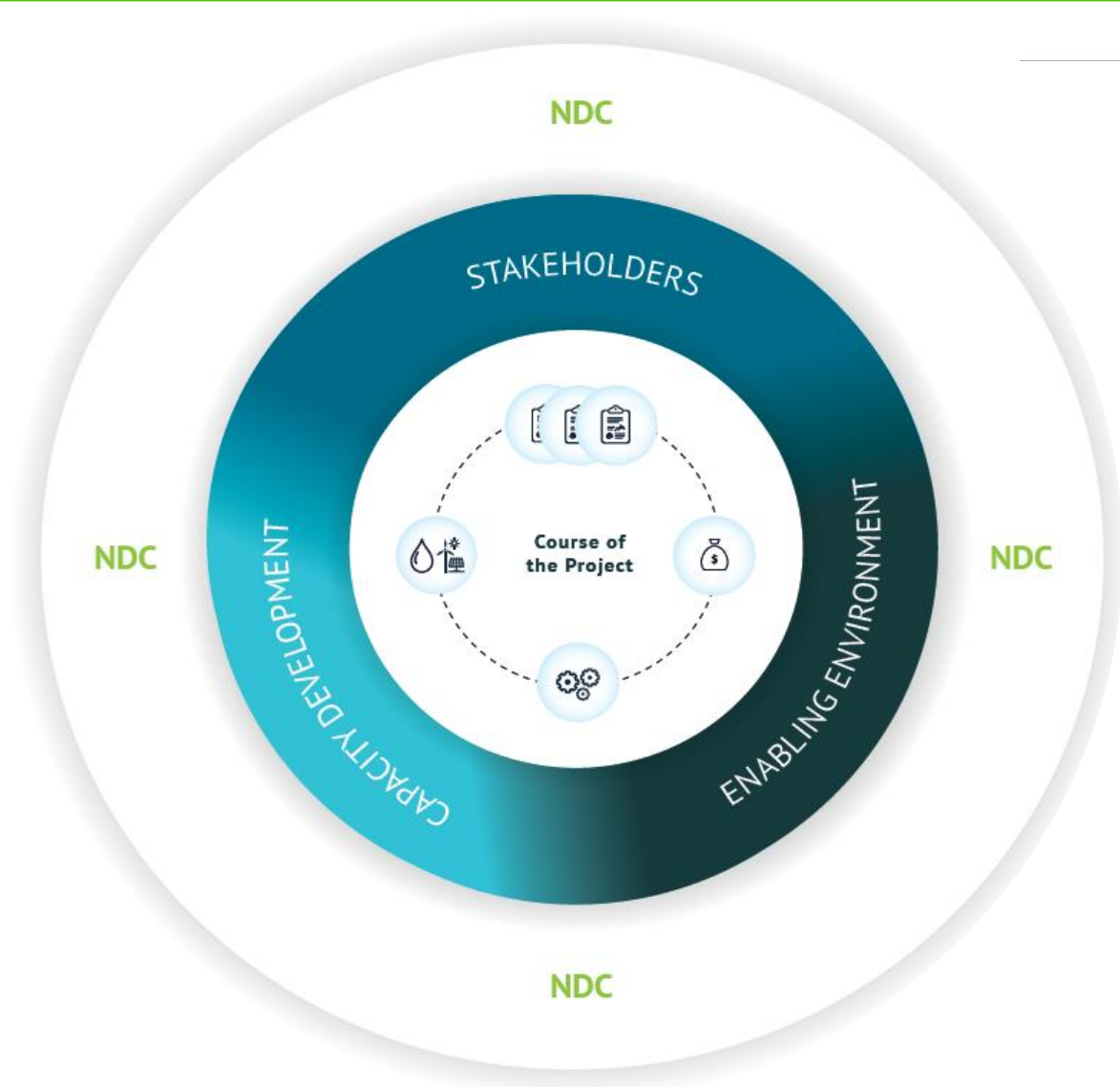
- GHG emissions impact
- Feasibility study
- Costs Benefit Analysis
- Co-Benefits
- MRV

Next Steps for Up-Scaling

1. **Development of GHG Reduction Policy** for the Water Sector that considers the entire water cycle (supply and reuse)
2. **Development of Financing Mechanism / Strategy** for the Water Sector
3. Support Jordan's **NDC implementation** and identify and further develop **NAMA projects** in water & wastewater sector while contributing **to water security**
 - Biogas capture & energy utilization utilities
 - Long-term options for electricity generating systems
 - Energy efficiency



Up-Scaling and Implementing NDCs



Our Partners

On behalf of:



Federal Ministry for the
Environment, Nature Conservation,
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Implemented by:

