



## **Presentation of AQUACYCLE online in the "3<sup>rd</sup> Euro-Mediterranean Conference for Environmental Integration"**

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The Tunis International Center of Environmental Technologies (CITET) participated online in the **3<sup>rd</sup> Euro-Mediterranean Conference for Environmental Integration (EMCEI)** which took place in Tunisia from June 10 to 13, 2021. It is one of the largest international environmental science meetings organized by the Association for Computer Science Applied to Management in collaboration with Springer. It aims to provide a forum where scientists, especially early career researchers, can present their findings and discuss their ideas with experts in all fields of environmental science.

More than 810 abstracts were received from 72 different countries worldwide, gathering influential scholars and top scientists from all over the world.

The paper entitled: "**Towards Sustainable Wastewater Treatment and Reuse (WWTR) in the Mediterranean Region - AQUACYCLE Project: APOC System as an eco-innovative technology for WWTR of Bent Saidane rural locality - NE Tunisia**" was presented by Mrs. Safa CHAABANE through a recorded online presentation for the first section entitled: Engineering applications for environmental management.



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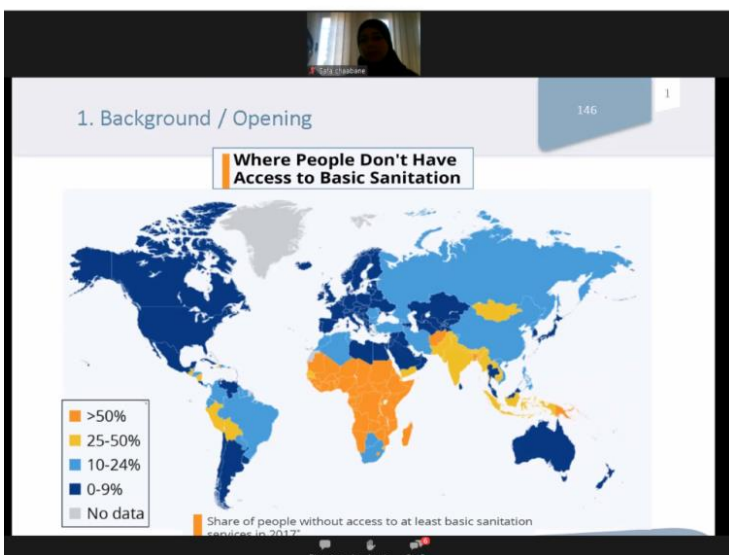


## Towards Sustainable Wastewater Treatment and Reuse (WWTR) in the Mediterranean Region- AquaCycle Project: APOC System as an eco-innovative technology for WWTR of Bent Saidane rural locality-NE Tunisia

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1. Direction of Transfer and Technological Innovation, Tunis International Center of Environmental Technologies (CITET), Boulevard of leader Yassar Arafat, ZI Charguia, 1080 Tunis-Tunisia

The presentation of CITET focused on the water resources in Tunisia which are subject to many pressures related to urbanization and anthropogenic activities, which will be exacerbated by climate change. These pressures jeopardize reaching the UN-Sustainable Development Goal 6 (SDG6) for clean water and sanitation. Reclaimed municipal wastewater is considered a valuable non-conventional water resource (NCWR) achieving improved sustainable water management. Unfortunately, rural areas in Tunisia do not benefit from sanitation services. To address these challenges, the idea of the AQUACYCLE Project, funded by the European Union under the ENI CBC MED Programme, is set to bring an eco-innovative APOC wastewater treatment technology (WWTT) consisting of anaerobic digestion (AD), constructed wetlands (CW), and solar photocatalytic oxidation (SPO) for cost-effective rural sanitation with minimal costs of operation, ensuring socio-economic benefits and environmental protection. The APOC system will be established in the locality of Bent Saidane (Governorate of Zaghouan, delegation El Fahs, North East of Tunisia) for municipal WWTR with a capacity of 5 to 25 m<sup>3</sup> /day. About one hectare will be planned for irrigation purposes with the treated wastewater. The AQUACYCLE project will change the paradigm of viewing wastewater as an unsafe effluent. As the APOC technology will permit the recovery of valuable substances from the TWW such as fertilizer and biogas, Sustainable WWTR in Bent Saidane rural locality is set to show a good example in relation to the transition to the circular economy.



1. Background / Opening

Urbanization

Wastewater treatment and reuse

Anthropogenic activities

Climate change

Agricultural expansion

6 CLEAN WATER AND SANITATION

SUSTAINABLE DEVELOPMENT GOALS

2. Goals

- ❑ Provide **research and development support for sustainable NCWR management** through **participatory governance** and **low-cost eco-innovative technology** to enhance **rural sanitation** in Mediterranean regions, especially for Tunisian rural localities.
- ❑ Implementation of the AQUACYCLE project **Bent Saidane WWTP APOC system** case study which will support rural sanitation facilities in Tunisia to achieving equitable and sustainable sanitation in rural areas.

AQUACYCLE


3. AQUACYCLE project sheet

Acronym	AQUACYCLE
<b>Title</b>	Towards Sustainable Treatment and Reuse of Wastewater in the Mediterranean Region
<b>Thematic objective</b>	<b>B.4</b> Environmental protection, adaptation and mitigation of climate change
<b>Priority</b>	<b>B.4.1</b> Water Efficiency: Support sustainable initiatives targeting innovative and technological solutions to increase water efficiency and encourage use of non conventional water supply
<b>Country</b>	Greece, Spain, Malta, Lebanon, Tunisia
<b>Total budget</b>	2,8 million € including 2,5 million € (EU Contribution)
<b>Funding</b>	ENI CBC Mediterranean Sea Basin Program <a href="http://www.enicbmed.eu/projects/aquacycle/">http://www.enicbmed.eu/projects/aquacycle/</a>
<b>Project duration</b>	36 month
<b>Partners</b>	CERTH, PSA-CIEMAT, IRMCo, UL, CERTE, CITEI,

4. Sites localization of Bent Saidane locality & APOC system

- ❖ El Fahs-Zaghouan- NE Tunisia
- ❖ Total area: 90.12 km<sup>2</sup>
- ❖ Wadi El Gouissate
- ❖ Bioclimate: Mediterranean semi arid
- ❖ Latitude: 9°57'24.6"
- ❖ Longitude: 36°15'52.6"
- ❖ Surface area of APOC: 1000 m<sup>2</sup>
- ❖ Surface area for TWW reuse tests: 1 ha

5. Raw wastewater quality characteristics



Parameter	Value	Tunisian Standards (DPH)
T (°C)	16	25
pH	7.5	6.5 – 8.5
SS (mg/l)	400-500	40
COD (mgO <sub>2</sub> /l)	1000-1500	160
BOD <sub>5</sub> (mgO <sub>2</sub> /l)	500-600	40
COD/BOD <sub>5</sub>	2-2.5	
Chlorides (mg/l)	220	700
Sulphate (mg / l)	300	600
Nitrates (mg/l)	< 0.5	50
Nitrites (mg/l)	0.12	0.5
TNK (mg/l)	70-200	5
Phosphorous (mg/l)	10-30	2
Total coliforms /100 ml	1-3×10 <sup>7</sup>	-
Feecal coliforms /100 ml	5-9×10 <sup>6</sup>	2000
Feecal streptococcus /100 ml	2-3×10 <sup>6</sup>	1000

