



ENERGY  
TECHNOLOGIES



MATERIALS AND PROCESS  
TECHNOLOGIES



TÜBİTAK  
MAM



CLIMATE AND LIFE  
SCIENCES



POLAR RESEARCH  
INSTITUTE

**TÜBİTAK** Marmara Research Center  
Climate and Life Sciences

RESOURCE EFFICIENCY AND  
CLEAN ENERGY RESEARCH GROUP

Location: Kocaeli, Türkiye

# About TÜBİTAK

- TÜBİTAK is the leading agency for the management, funding, and conduct of scientific research in Türkiye (~2000 employees)
- TÜBİTAK was established in 1963 with a mission to advance science and technology, conduct research, and support Turkish researchers
- TÜBİTAK acts as an advisory agency to the Turkish Government on science and research issues and is the secretariat of the Supreme Council for Science and Technology, the highest S&T policy-making body in Türkiye

## MAM (MRC)

Energy Technologies  
Climate and Life Science  
Materials and Process Technologies  
Polar Research Institute

## BILGEM

Advanced Technologies Research Institute  
Artificial Intelligence Institute  
Cyber Security E.  
Information Technologies E.  
National Electronics and Cryptology Research E.  
Software Technologies Research Institute

## R&D Convenience Units

Bursa Test and Analysis Laboratory (BUTAL)  
National Academic Network and Information Center (ULAKBİM)

## R&D Units

Basic Sciences Research Institute (TBAE)  
Clean Energy, Climate Change and Sustainability Research Institute  
Defense Industry Research and Development Institute (SAGE)  
National Metrology E. (UME)  
Rail Transportation Technologies Institute  
Space Technologies Research E. (SPACE)  
TEKSEB & TEKNOPARK  
Turkish Industrial Dispatch and Administration E. (TÜSSİDE)



# About TÜBİTAK MRC

- Energy Technologies, Climate and Life Science, Materials and Process Technologies, and Polar Research Institute (~600 employees)



# About Our Research Group (Resource Efficiency)

- Resource Efficiency and Clean Energy Research Group
- **Resource Efficiency** – we develop strategies that reduce the number of raw resources consumed and protect the ecosystem
- We optimize the use of resources and products and reduces waste generation with product/process-based environmental impact analysis
- We develop processes related to the recovery of wastewater and wastes
- We evaluate the current situation of enterprises with cleaner production audits and identify opportunities for improvement
- LCA analysis (creating Türkiye's own database)

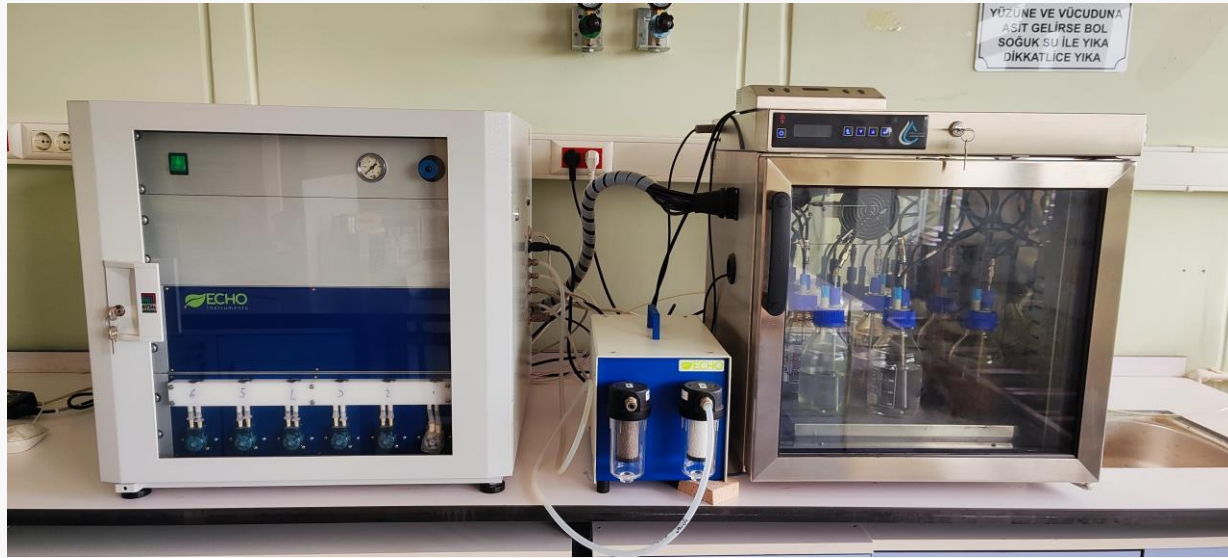
8 PhD, 1 M.Sc.  
Environmental Engineering&Chemical Engineering





# Instruments

## Biogas Production Technologies-Biodegradability Test-BMP Test



Hybrid cavitation reactor developed by TUBITAK MRC – patented technology

## Anaerobic Digester



# Ongoing International Projects

**BioINSouth** - Supporting regional environmental sustainability assessment for the BIO-based sectors to improve Innovation, Industries, and INclusivity in SOUTH Europe



**BioINSouth**  
Supporting regional environmental sustainability assessment for the BIO-based sectors to improve Innovation, Industries, and INclusivity in SOUTH Europe

**OUR MISSION**  
The BioINSouth project supports decision-makers in integrating ecological limits into regional bioeconomy strategies, focusing on circular bio-based activities. Coordinated by SPRING cluster and co-funded by the EU and CBE JU, it brings together fifteen partners from nine countries towards forming engaged Multi-Actor Regional Groups from the QH, upon which eight Regional HUBs will be created for the promotion and implementation of circular bioeconomy principles.

**8 MARGs**  
QH based Multi-Actor Regional Groups

**8 HUBs**  
Regional HUBs established

**1 Toolkit**  
Set of multiple SSB assessment tools

• Mobilise the bio-based sector of the Mediterranean South  
• Support the regional aim for European!  
• Sustainable, Innovative, Inclusive!  
• Impactful Bio-based and Circular ecosystems

**Project coordinator**  
Spring - Italian Circular Bioeconomy Cluster

**Partners**  
15  
Countries  
9  
Months  
36  
Million € Budget  
3

**Partners:** Frederick University, ASINCAR, P-BIO, LEITAT, INNOVATION ENGINEERING, TUBITAK

**Funded by:** the European Union and supported by the Circular Bio-based Joint Undertaking and its members under Grant Agreement No 101019749. Views and opinions expressed are however those of the author(s) and do not necessarily reflect those of the European Union or the CBE JU. If the European Union or the CBE JU can be held responsible for them.

**SUSTEPS: Sustainable, Secure and Competitive Energy Through Scaling Up Advanced Biofuel Generation**



**SUSTEPS**

**SUSTEPS first Grand Assembly in Türkiye**

On the 22<sup>nd</sup> and 23<sup>rd</sup> of January, we convened for our first in-person meeting, the Grand Assembly, which took place at TÜBİTAK MAM, our coordinator.

Alongside technical discussions about sustainable production of biofuels from microalgae, participants had the opportunity to visit TÜBİTAK premises for biocrude upgrading and BOUN for microalgae cultivation.

**Funded by the European Union**

Date starting : september 2023  
Project duration : 48 months  
Project budget : 3 millions euros

**Energy and Raw Material Recovery from Treatment Sludge as a Conceptual of Zero Waste-ANSO**



Project Duration: 36 Months  
Budget of MRC: 150,000 \$



# Ongoing National Projects

S-ATP-Increasing the Biogas Generation Potential of Agricultural Wastes and Evaluating Them as Soil Improvers

Ultrasound Pretreatment Reactor  
(Solid waste disintegrator)



LIGNONANO-Controlled nutrient release with micro/nanostructures and nanoformulations



Zero Waste Approach for Recovery of Sludge from MUSKİ Wastewater Treatment Plant



# Completed Projects

Zero Waste  
Implementation Project  
for Erzurum WWTP  
Sludge

Increase of Biogas  
Production and Residue  
Evaluation in Duzce  
Biomethanization Plant

Feasibility Study for  
Nutrient (Struvite)  
Recovery from Çiğli  
WWTP Sludge

Rhodium Recovery from  
Rhodium Plating Baths as  
an Industrial Waste

Determination of Improvements for  
the Manufacturing Industry in the  
Scope of Green Transition (iron&steel,  
textile, food & drink, ceramic, etc.)

ZERO BRINE - Re-designing the value and  
supply chain of water and minerals: a circular  
economy approach for the recovery of  
resources from saline impaired effluent (brine)  
generated by process industries (salt and water  
recovery from textile brine and reuse in textile  
dyeing processes)



# International Collaborations

- Conducts joint projects with leading global research institutions
- Engaged in zero-waste initiatives and sustainable waste recovery studies with international partners
- Member of Horizon 2020
- Water Europe
- ERVO
- RECPnet
- APO
- CTCN
- Alliance of International Science Organizations (ANSO)
- INWRDAM-Inter-Islamic Network on Water Resources Development and Management

# THANK YOU



0262 677 20 00



[www.mam.tubitak.gov.tr](http://www.mam.tubitak.gov.tr)



[mam@tubitak.gov.tr](mailto:mam@tubitak.gov.tr)



Barış Mahallesi Dr. Zeki Acar Caddesi No:1 41470 Gebze/Kocaeli