Department of Environmental Engineering and Management

Laboratory of Analysis and Control of Environmental Factors

Cristofor Simionescu Faculty of Chemical Engineering and Environmental Protection

Gheorghe Asachi Technical University of Iasi

EDUCATION, RESEARCH & INNOVATION COLLABORATIONS

Professor Carmen TEODOSIU, MSc, PhD

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North-East Climate Awareness Day, October 5, 2021

EDUCATION AND RESEARCH ACTIVITIES

DEPARTMENT OF ENVIRONMENTAL ENGINEERING AND MANAGEMENT

Educational programmes:

- **Environmental Engineering BSc studies**: Offering diploma of engineer after 4 years of study, with specialization on *Engineering and Environmental Protection in Industry* (started in **1992**)
- **Master of Science Programs :** Offering M.Sc. diploma in *Environmental Management*
    - **M.Sc. Program *Environmental Management***, daily courses (started in 1999)
    - **M.Sc. *Environmental Management and Sustainable Energy (in English,*** started 2010***)***
    - **M.Sc. *Waste management, treatment and valorisation*** (started in 2018)
- **Ph.D. and Post-doc Programs** within the following fields:
    - Environmental Engineering
    - Chemical engineering
- **Post-university courses and tailored specialization programs** in: *Environmental management, Project Management, Waste management, etc*

RESEARCH DIRECTIONS

- **Water and wastewater treatment processes & technologies up-grade**
- **Integrated water resources management**
- **Waste management, treatment& valorisation**
- **Environmental impact & risk assessment, environmental auditing**
- **Integrated pollution prevention and control studies**
- **Environmental management, Life Cycle Assessment (LCA), Water footprint, Carbon footprint studies**
- **Eco-Materials science and engineering**
- **Circular economy for wastewater and waste recycling**
- **Integrated monitoring and control of environmental components**
- **Modeling, simulation & optimization in environmental protection**

Some of the most important directions of Romanian & EU environmental priorities for Sustainable Development, Climate change and Circular Economy !!!

ACCREDITED RESEARCH INFRASTRUCTURE *LACMED*

Laboratory for Analysis and Control of Environmental Factors

- Founded in 2013 in TUIASI, coordinated by Prof.dr. Carmen Teodosiu
- **Accredited under SR EN ISO/CEI 17025/2018 by the Romanian Accreditation Association - RENAR, on 18.03.2015, Certificate no. LI 1054/2020 (www.renar.ro; www.lacmed.ro)**
- **Servicies for research- environmental analysis- design- consultancy:**
- ***Pollution prevention and control:***

✓ Monitoring, process analysis, water& wastewater treatment
✓ Design/ upgrade/ modernization of water and wastewater treatment plants
✓ Study of advanced wastewater treatment processes for wastewater recycling and reuse
✓ Waste management, treatment and valorisation.

- ***Environmental performance evaluation of processes, products and services:***

✓ Integrated assessment of environmental impacts and risks
✓ Water and Carbon footprint assessments
✓ Life cycle assessment

RENAR accreditation (www.renar.ro)

ASOCIAŢIA DE ACREDITARE DIN ROMÂNIA - RENAR

Bucureşti, Calea Vitan nr. 242, sector 3, cod 031301
CIF RO 4311980

RENAR este semnatar al EA-MLA pentru încercări.

CERTIFICAT DE ACREDITARE
Nr. LI 1054

Asociaţia de Acreditare din România – RENAR, fiind recunoscută ca Organism Naţional de Acreditare prin OG 23/2009, prin prezentul certificat atestă că organizaţia:

UNIVERSITATEA TEHNICĂ "GHEORGHE ASACHI" DIN IAŞI

Iaşi, B-dul Prof. Dimitrie Mangeron nr. 67, judeţul Iaşi

prin

Laborator de Analiză şi Control Factori de Mediu - LACMED

îndeplineşte cerinţele **SR EN ISO/IEC 17025:2018** şi este competentă să efectueze activităţi de **ÎNCERCĂRI,** aşa cum se detaliază în Anexa la prezentul certificat de acreditare.

Această acreditare este menţinută cu condiţia îndeplinirii în mod continuu a criteriilor de acreditare stabilite de Asociaţia de Acreditare din România - RENAR.

Prezentul certificat este însoţit de Anexa nr. 1/09.11.2020 (2 pagini), parte integrantă a acestuia.

Certificatul de acreditare este un document de acreditare esenţial, care poate fi revizuit şi emis periodic de către RENAR. Cea mai recentă versiune a certificatului de acreditare este disponibilă pe website-ul RENAR, www.renar.ro.

Data acreditării iniţiale: 18.03.2015
Data reînnoirii acreditării: 18.03.2019
Data actualizării: 09.11.2020
Data expirării acreditării: 17.03.2023

DIRECTOR GENERAL AL STRUCTURII EXECUTIVE	PREŞEDINTE AL CONSILIULUI DE ACREDITARE
Alina Elena TAINĂ	dr. ing. Dumitru DINU

Certificatul de acreditare nu exonerează OEC de obligaţia de a obţine toate aprobările şi autorizaţiile necesare pentru funcţionarea sa conform legii.

Reproducerea parţială a prezentului certificat este interzisă.

Anexa nr. 1 la Certificatul de Acreditare nr. LI 1054
Data emiterii Anexei nr. 1: 09.11.2020

UNIVERSITATEA TEHNICĂ "GHEORGHE ASACHI" DIN IAŞI

prin **Laborator de Analiză şi Control Factori de Mediu - LACMED**

Iaşi, Bdul Prof. Dimitrie Mangeron nr. 73, Facultatea de Inginerie Chimică şi Protecţia Mediului „Cristofor Simionescu", et. 1, Laboratoarele 110, 116 şi 120, judeţul Iaşi

Încercări efectuate în localuri permanente

Nr. crt.	Domeniul de activitate / Tehnica de lucru / Denumirea încercării	Material / produs / obiect supus încercării	Documentul de referinţă
	Metode electrochimice		
1.	Determinarea pH-ului	Apă uzată Apă de suprafaţă Apă subterană	SR EN ISO 10523:2012 PSA-LACMED-01
	Metode gravimetrice		
2.	Determinarea conţinutului de materii în suspensie	Apă uzată Apă de suprafaţă Apă subterană	SR EN 872:2005 PSA-LACMED-03
3.	Determinarea reziduului filtrabil la 105 °C	Apă uzată Apă de suprafaţă Apă subterană	STAS 9187-84 (cap. 6) PSA-LACMED-04
4.	Determinarea conţinutului de substanţe extractibile cu solvenţi	Apă uzată Apă de suprafaţă Apă subterană	SR 7587:1996 PSA-LACMED-10
	Metode volumetrice		
5.	Determinarea consumului chimic de oxigen (CCO-Cr)	Apă uzată Apă de suprafaţă Apă subterană	SR ISO 6060:1996 PSA-LACMED-02
6.	Determinarea conţinutului de sulfuri	Apă uzată Apă de suprafaţă Apă subterană	SR 7510:1997 PSA-LACMED-13
7.	Determinarea consumului biochimic de oxigen	Apă uzată Apă de suprafaţă Apă subterană	SR EN ISO 5815-1:2020 SR EN 1899-2:2002 PSA-LACMED-17
8.	Determinarea conţinutului de oxigen dizolvat	Apă uzată Apă de suprafaţă Apă subterană	SR EN 25813:2000 SR EN 25813:2000/C91:2009 PSA-LACMED-16
	Metode prin spectrometrie de absorbţie moleculară		
9.	Determinarea conţinutului de amoniu	Apă uzată Apă de suprafaţă Apă subterană	SR ISO 7150-1:2001 PSA-LACMED-05
10.	Determinarea conţinutului de azotiţi	Apă uzată Apă de suprafaţă Apă subterană	SR EN 26777:2002 PSA-LACMED-07
11.	Determinarea conţinutului de azotaţi	Apă uzată Apă de suprafaţă Apă subterană	SR ISO 7890-3:2000 PSA-LACMED-06
12.	Determinarea indicelui de fenol	Apă uzată Apă de suprafaţă Apă subterană	SR ISO 6439:2001 PSA-LACMED-14
13.	Determinarea conţinutului de fosfor	Apă uzată Apă de suprafaţă Apă subterană	SR EN ISO 6878:2005 PSA-LACMED-09

Anexa nr. 1 la Certificatul de Acreditare nr. LI 1054
Data emiterii Anexei nr. 1: 09.11.2020

Nr. crt.	Domeniul de activitate / Tehnica de lucru / Denumirea încercării	Material / produs / obiect supus încercării	Documentul de referinţă
14.	Determinarea agenţilor de suprafaţă anionici prin măsurarea indicelui de albastru de metilen MBAS	Apă uzată Apă de suprafaţă Apă subterană	PSA-LACMED-11 Ed. 3, Rev. 0
15.	Determinarea detergenţilor neionici	Apă uzată Apă de suprafaţă Apă subterană	PSA-LACMED-12 Ed. 2, Rev. 0
	Metode prin combustie catalitică cu detector de chemiluminescenţă		
16.	Determinarea conţinutului de azot total	Apă uzată Apă de suprafaţă Apă subterană	SR EN 12260:2004 PSA-LACMED-15
	Metode prin spectrometrie de absorbţie atomică – sistem de atomizare cuptor de grafit		
17.	Determinarea metalelor (Cr, Cu, Fe, Mn, Ni, Pb) prin spectrometrie de absorbţie atomică cu cuptor de grafit	Apă uzată Apă de suprafaţă Apă subterană	PSA-LACMED-18 Ed. 1, Rev. 1

Sfârşit document

DIRECTOR GENERAL AL STRUCTURII EXECUTIVE
Alina Elena TAINĂ

LACMED
Laborator de Analiză şi Control Factori de Mediu

www.lacmed.ro

LACMED PARTNERS IN RESEARCH COLLABORATIONS

Private companies, public companies, governmental agencies, city halls

- BORG WARNER ROMANIA SRL
(S.C. DELPHI DIESEL SYSTEMS ROMANIA S.A.)
- S.C. APAVITAL S.A.
- SC AQUATIM S.A.
- S.C. URBAN SERV S.A.
- S.C. SALUBRIS S.A.
- S.C. ADISS S.A.
- S.C. ECOREC RECYCLING S.A.
- SC TADECO CONSULTING SA
- S.C. CERAMICA S.A. IASI
- S.C. PROEXROM S.R.L.
- S.C. EUROCASTING S.R.L.
- S.C. COMPLET SERV S.R.L.
- S.C. MECANEX S.R.L.
- S.C. PANIFCOM SR.L.
- S.C. VEF S.R.L.
- PRIMARIA ORASULUI ROMAN
- S.C. GARTECK S.R.L.
- S.C. BRIKSTON CONSTRUCTION SOLUTION S.A.
- S.C. BMTECH S.R.L.
- S.C. LATINI COM S.R.L.
- S.C. INTERAGROALIMENT S.R.L.
- S.C. PROCESS ENGINEERING S.R.L.
- S.C. MAX JUNIOR PROJECT S.R.L.
- S.C. RECIPLAST JUNIOR S.R.L.
- S.C. ESPINA OBRAS HIDRAULICAS S. A.
- S.C. MARCOMIUS S.R.L.
- S.C. UTI GROUP SA
- SC COMPLEX HOTELIER UNIREA SA
- SC EDIL INDUSTRY SRL
- SC MAJUTEX SRL
- SC ROM-PAPER 2000 SRL, **etc**

PARTNERSHIPS IN RESEARCH PROJECTS

"INTEGRATED SYSTEM FOR REDUCING ENVIRONMENTAL AND HUMAN – RELATED IMPACTS AND RISKS IN THE WATER USE CYCLE", 2012- 2016, PN II Collaborative Research Project, contract 60/2012

WATUSER PROJECT

Coordinator:"*Gheorghe Asachi*" Technical University of Iaşi
Project Director: Prof.dr.ing. Carmen Teodosiu

Partner 1: *Politehnica* University of Timişoara
Partner group leader: Prof.dr.ing. Florica Manea

Partner 2: SC AQUATIM SA Timişoara
Partner group leader: General Manager, Dr.ing. Ilie Vlaicu

Partner 3: SC APAVITAL SA Iaşi
Partner group leader: Dr.ing. Dan Popovici

WATUSER project objectives and research directions

- Development and implementation of an **integrated system of innovative technologies and management instruments** for reducing environmental impacts and associated human health risks caused by water quality issues over the whole water use cycle

Research Directions

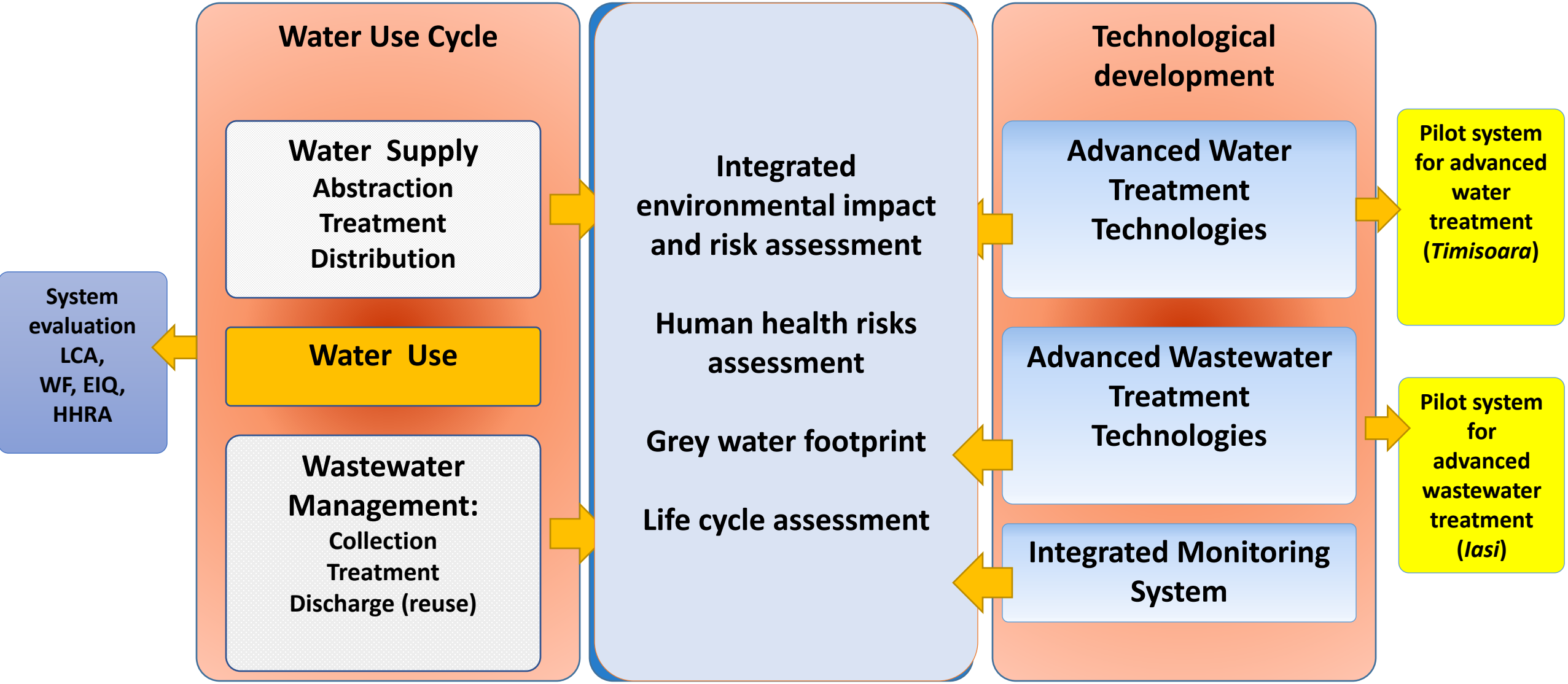
Management instruments
(*identification and quantification*)

- **Environmental Impacts& Risks**
- **Human Health Risks**

Innovative Technologies

- **Water Treatment**
  (*nitrites, nitrates, NOM*)
- **Wastewater treatment**
  (*Priority organic pollutants*)

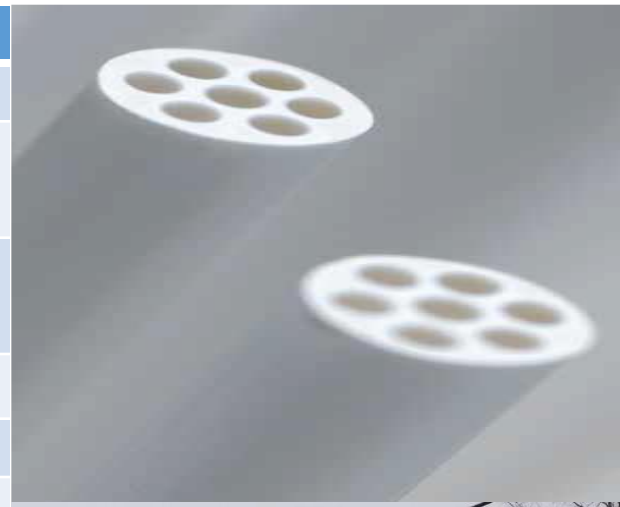
WATUSER- Project concept and activities



WATUSER PROJECT PILOT SCALE PHASE (2015- 2016)

Utrafiltration Pilot Plant for wastewater reuse within APAVITAL SA Regional Operator

Parameter	Value
Membrane Surface,	0.9 m^2
Maximum Permeate Flux,	45 L/m^2*h
Average permeate flux (netto)	37.5 L/m^2*h
Membrane Productivity	82.92%
Continuous filtration time	55 minutes
Permeated Backwash time	45 sec
Backwash Flux	230 L/m^2*h
Design flow	180 L/h
Average inlet flow	170 L/h
Average permeate flow	150 L/h
Average backwash flow	10 L/h
Average chemical cleaning flow	10 L/h
Total cleaning flow	Avg.20 L/h



Complex project in research, development & innovation at institutional levels: SUSTENVPRO

"INTEGRATED AND SUSTAINABLE PROCESSES FOR ENVIRONMENTAL CLEAN-UP, WASTEWATER REUSE AND WASTE VALORIZATION" – *SUSTENVPRO*, 2018-2021

Contract no. 26PCCDI/2018; Value: 5.287.500 Lei (1,125,000 Euro)

- **Coordinator:** Gheorghe Asachi Technical University of Iasi
  Project Director: Prof.dr.ing. Carmen TEODOSIU — North - East Region

- **Partner 1:** "Politehnica" University of Bucharest
  Responsible: Prof.dr.ing. Cristian PREDESCU — București-Ilfov Region

- **Partner 2**: "Petru Poni" Institute of Macromolecular Chemistry Iaşi
  Responsible: Dr. Habil., CS II Mihai Marcela — North - East Region

- **Partner 3:** "Alexandru Ioan Cuza" University of Iasi
  Responsible: Prof. univ.dr. habil. biol. Mircea NICOARA — North - East Region

- **Partner 4**- "Politehnica" University of Timisoara
  Responsible: Prof. univ.habil.dr.ing. Florica Manea — West Region

- **Partner 5 -** National Research and Development Institute for Environmental Protection Bucharest
  Responsible: Dr. CS I Deak GYORGY — București-Ilfov Region

SUSTENVPRO project objectives and research directions

Project objective:

- Increase of institutional performance in the Environmental field of a consortium of **5** public research organisations with tradition/recognised research performances and **1** R&D institute under consolidation, through an integrative approach which supports/develops the existent research competencies and transfer capacities of results with applicative and innovative potential.

Research directions:

1. Complex evaluations of priority pollutants present in various water matrixes and risk identification on the ecosystems and human health
2. Water treatment processes optimization and development of innovative materials for the priority pollutants removal
3. Valorisation of biomass resources for the development of innovative processes for wastewater treatment and priority pollutants removal
4. Metallic waste valorisation for innovative wastewater treatment process development and removal of priority pollutants
5. Sustainability assessments of water/ wastewater treatment and waste valorization processes based on life cycle assessment

SUSTENVPRO Project concept

SUSTENVPRO characteristics

❖**Integration into Circular Economy objectives** (recycling, waste recovery/valorisation)

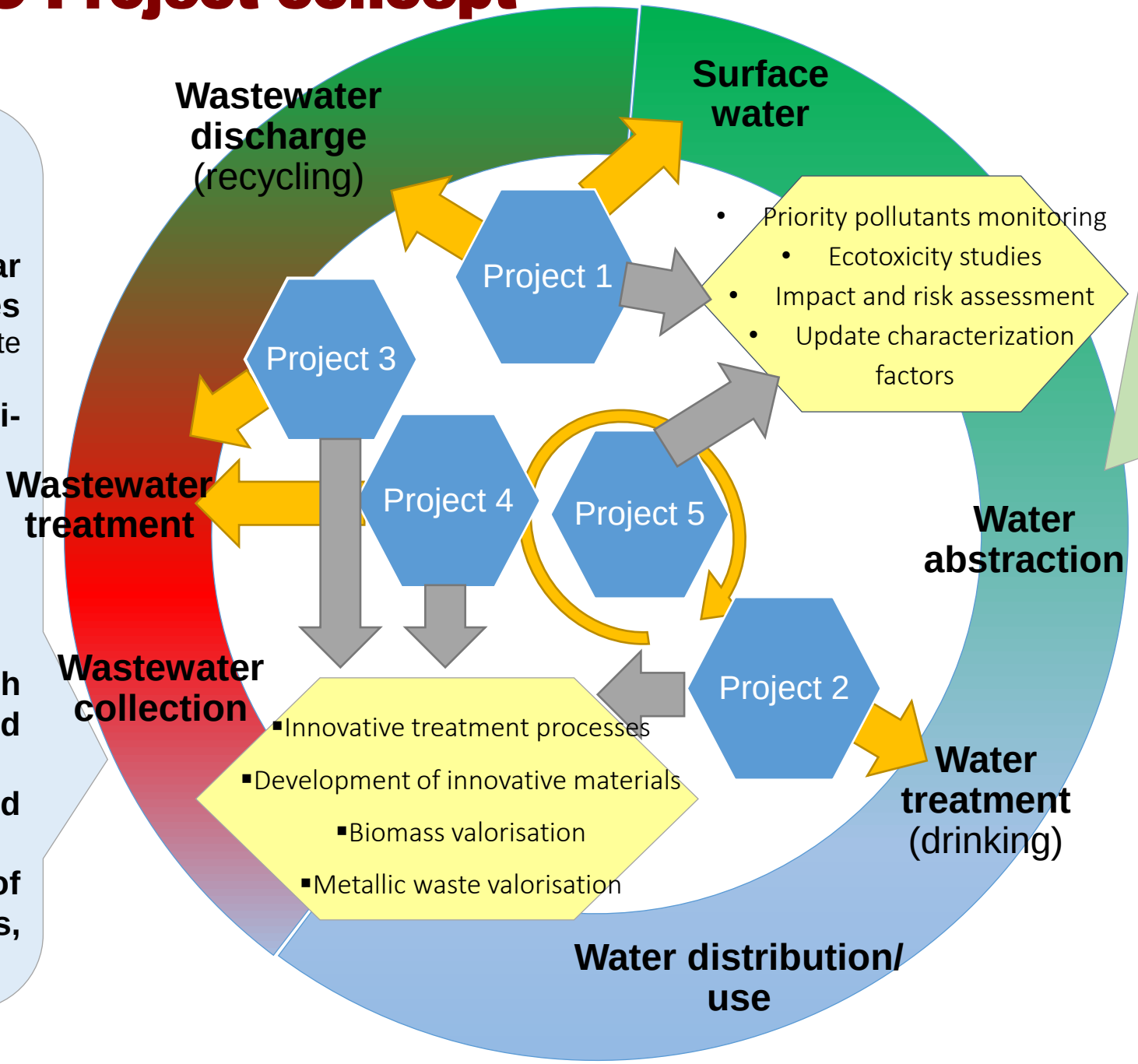
❖**Inter- and multi-disciplinarity**

❖**Complementarity and scientific and institutional synergy** (research infrastructures, human resources)

❖**Integration of research topics, objectives and scientific activities**

❖**Originality and scientific novelty**

❖**Common approach of new research directions, innovation activities**



Expected results and impacts

- Young& Senior researchers development
- Strengthen of the innovation capacity
- Strengthen of the research capacity
- Strengthen of institutional capacity and sustainability
- Intensifying inter-institutional cooperation and development of viable collaboration with economic environment
- Valorization/common dissemination of research /innovation results
- International visibility

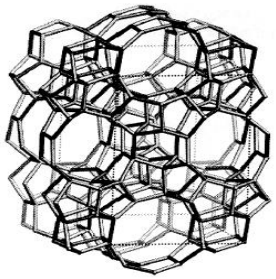
Component Projects *(research in partnership)*

PC1: Complex evaluations of priority pollutants present in various water matrixes and risk identification on the ecosystems and human health (TRL 1/ TRL 3)

PC2: Water treatment processes optimization and development of innovative materials for the priority pollutants removal (TRL 2/ TRL 4)

PC3: Valorisation of biomass resources (***Rapeseed waste***) for development of innovative wastewater treatment processes & priority pollutants removal (TRL 2/ TRL 4)

PC4: ***Metallic*** waste valorisation for innovative wastewater treatment process development and priority pollutants removal (TRL 2/ TRL 5)

PC5: Sustainability assessments of water/ wastewater treatment and waste valorization processes based on life cycle assessment (TRL 2/ TRL 3)

Va multumesc pentru atentie!
Thank you very much for your attention !