

Life-Remembrance: materiali innovativi da scarti di membrane polimeriche per la purificazione dell'acqua

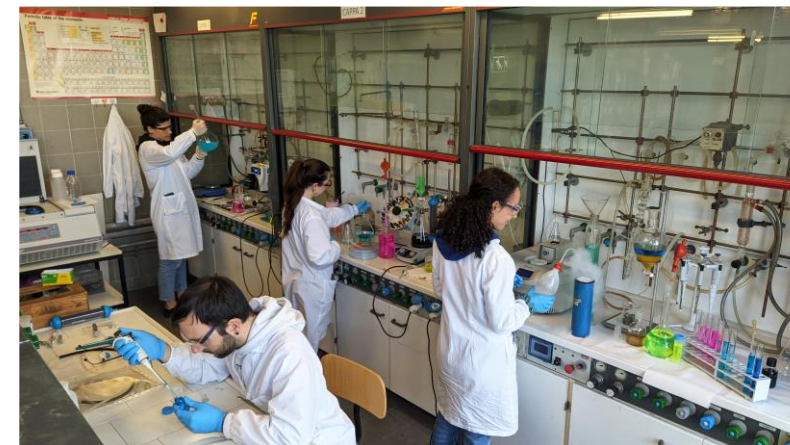


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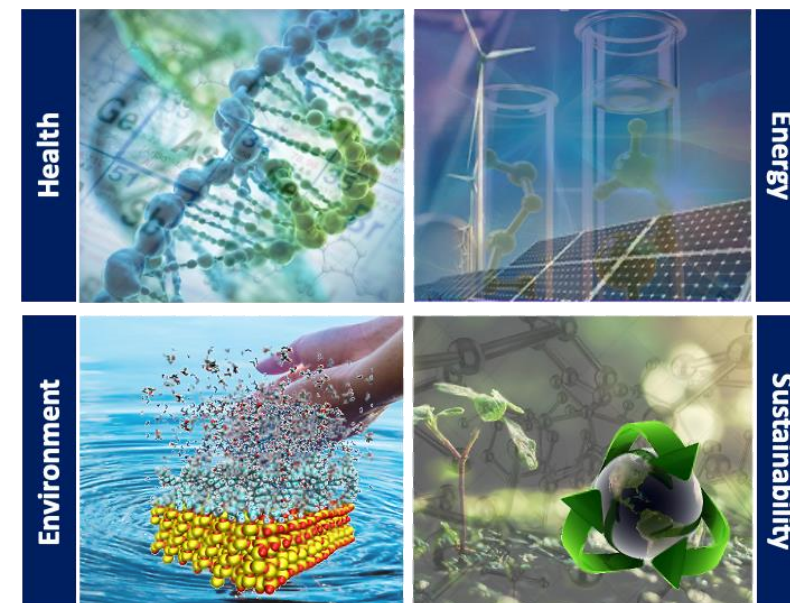


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THE INSTITUTE FOR ORGANIC SYNTHESIS AND PHOTOREACTIVITY OF CNR



Chemistry and Materials



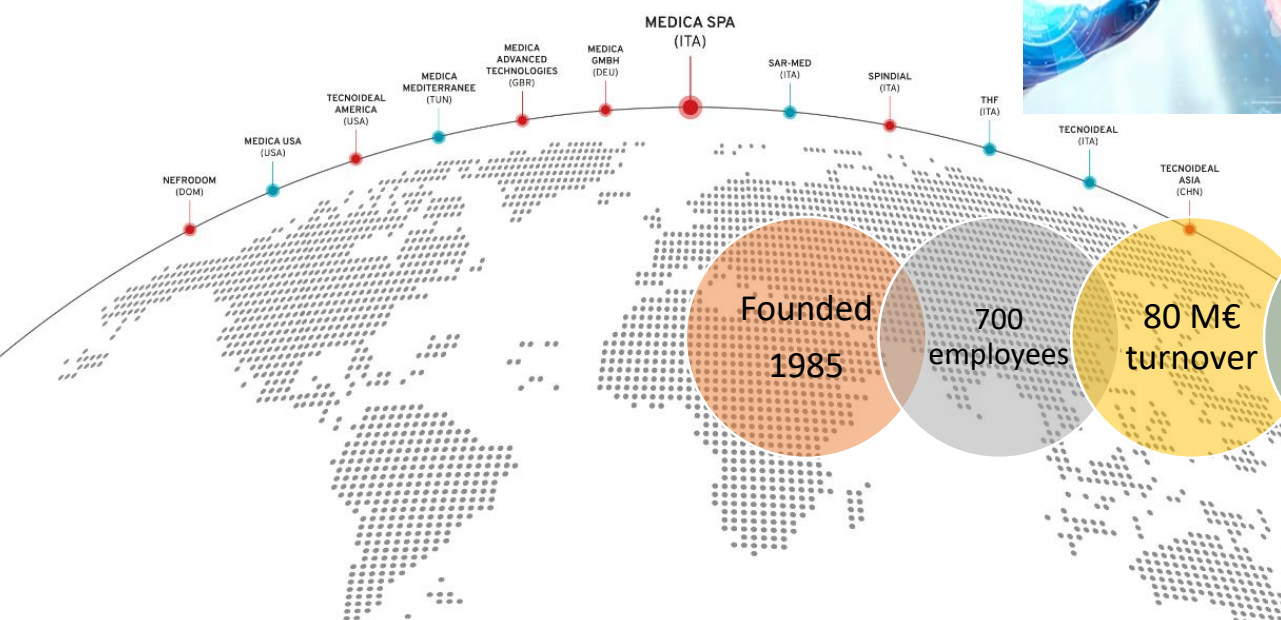
MEDICA

SEAMLESS INNOVATION FOR LIFE QUALITY



Development and manufacture of cutting-edge Technologies for Water and Blood Purification

Medica is an ideal global solution provider for healthcare and water purification players.



Founded
1985

700
employees

80 M€
turnover

14
patents'
families

Sales in >
60
countries
worldwide

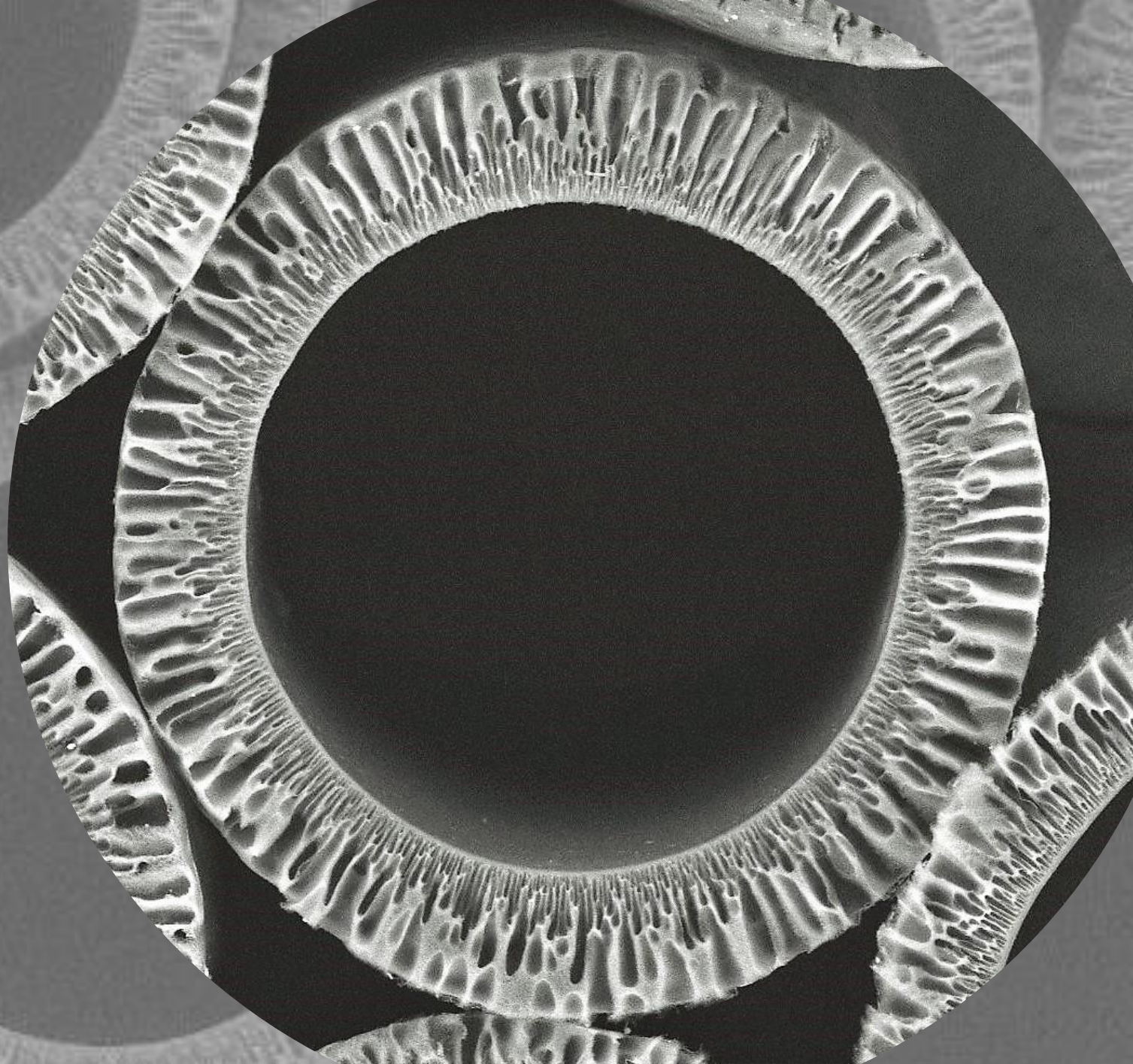
ISO 9001
ISO
13485

R&D

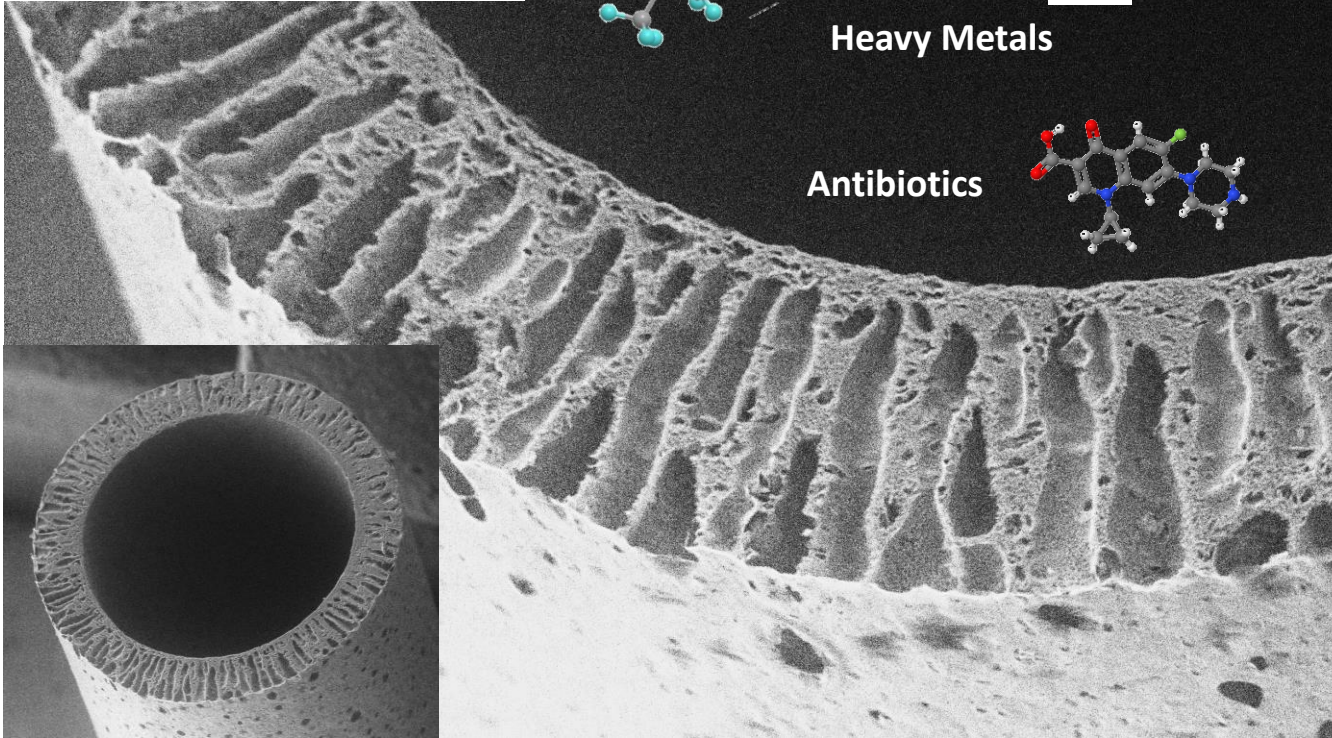
5
production
sites at
elevated
automation

4000
sqm. of
ISO8
cleanroom





A new type of polysulfone-graphene composite: Graphisulfone



nature water

Graphisulfone is a Joint CNR-Medica SpA Trademark

<https://doi.org/10.1038/s44221-025-00427-6>

Production and filters scale up timeline



GRAPHENE
FLAGSHIP



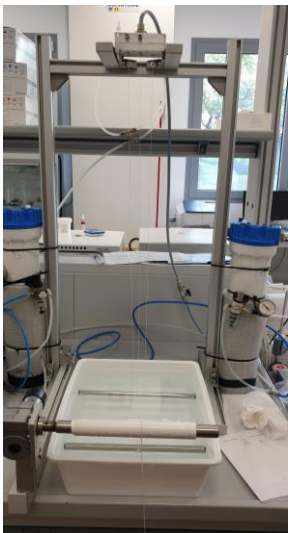
Funded by
the European Union



Lab. scale membrane fabrication

Pilot scale, 500 Km/year

Production Spinning Line, 200.000 Km/year



M. Zambianchi et al, *Chem. Eng. J.*, 2017



~ 200 modules tested ~ 2500 analysis ~ 5000 L tested

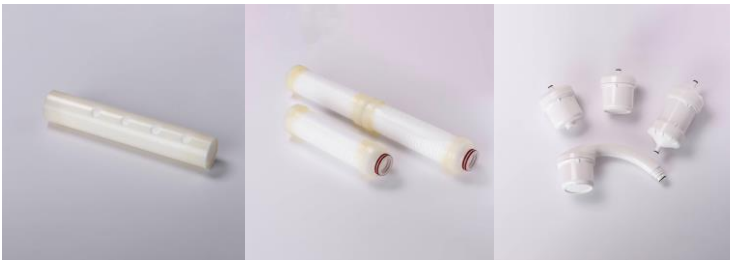
2016

2020

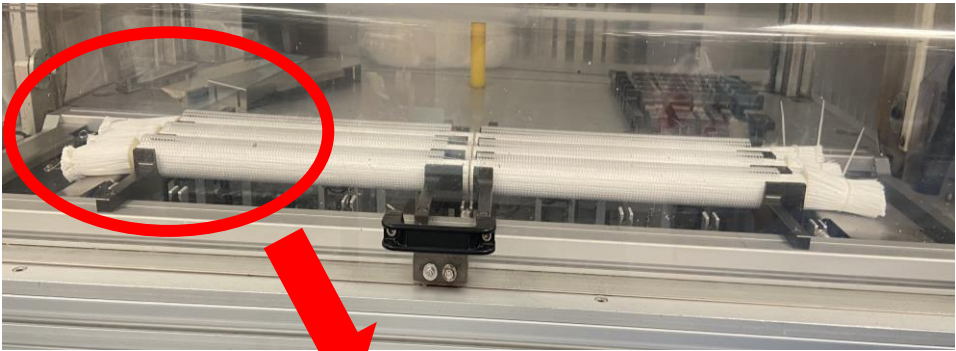
2024



Side products of industrial production
The idea: converting scraps into granular sorbents



Hot wire cut



Scraps



10% w/w of total industrial production of membranes (>2 tons/yr) to be disposed and incinerated

Granules



EP3208241- POROUS GRANULES OF POLYSULPHONE OR DERIVATIVES THEREOF FOR THE REMOVAL OF ORGANIC MOLECULES FROM A FLUID

M. Zambianchi et al, *Adv. Sust. Syst.* **2017**, 1700019, *ACS Omega* **2019**, 4839, *ChemPlusChem* **2019**, 1299, *Nanoscale* **2019**, 22780
Other Patents: EP3208241, PCTIB2019058300, EP3257573

The proof of concept

FULL PAPER

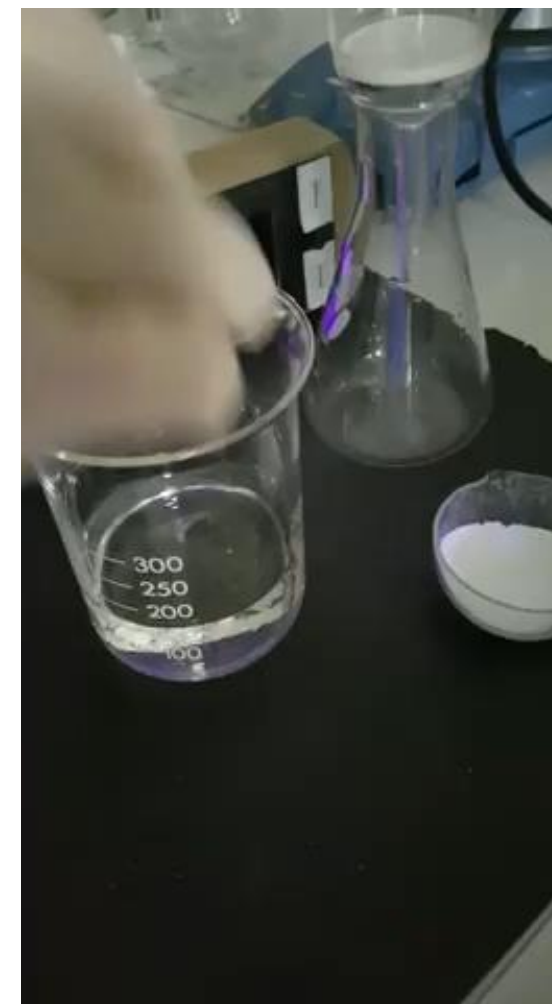
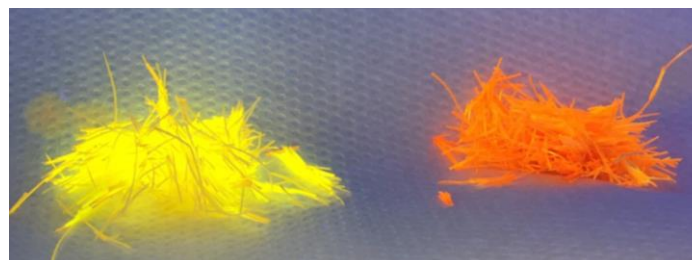
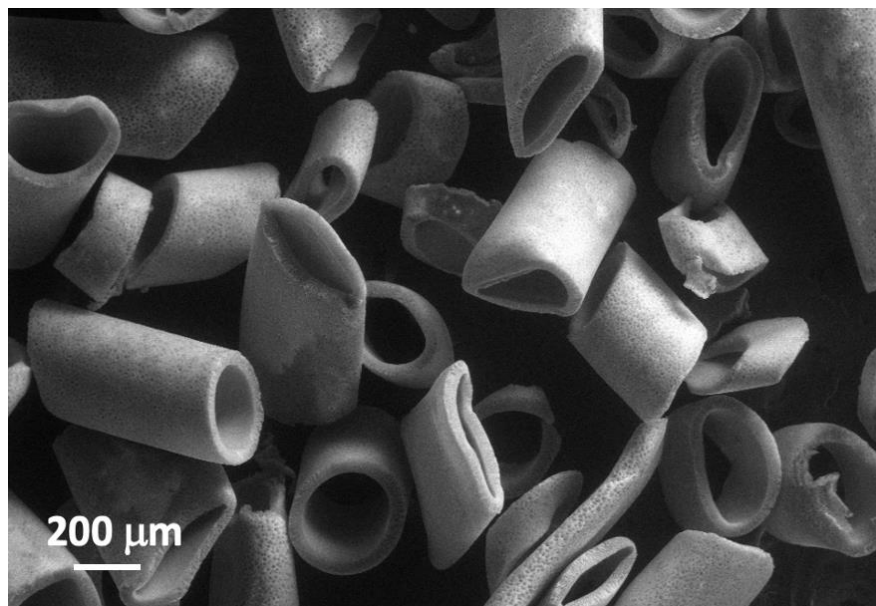
Adsorbents

ADVANCED
SUSTAINABLE
SYSTEMS

www.adv-sustainsys.com

Polysulfone Hollow Porous Granules Prepared from Wastes of Ultrafiltration Membranes as Sustainable Adsorbent for Water and Air Remediation

Massimo Zambianchi, Annalisa Aluigi, Massimo Luigi Capobianco, Franco Corticelli, Ivan Elmi, Stefano Zampolli, Francesco Stante, Letizia Bocchi, Franco Belosi, Maria Luisa Navacchia, and Manuela Melucci*

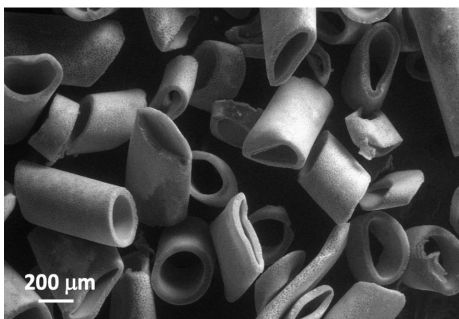


M. Zambianchi et al., *Adv. Sust. Syst.* 2017

Give plastic wastes from the production of hollow-fibre membranes a second life

MEDICA
SEAMLESS INNOVATION FOR LIFE QUALITY

ISOF
CNR



- PRODUCTION SCALE UP
- DEMONSTRATION IN PILOTS
- VALIDATION IN REAL ENVIRONMENT
- REPLICATION
- TRANSFERABILITY



LIFE REMEMBRANCE



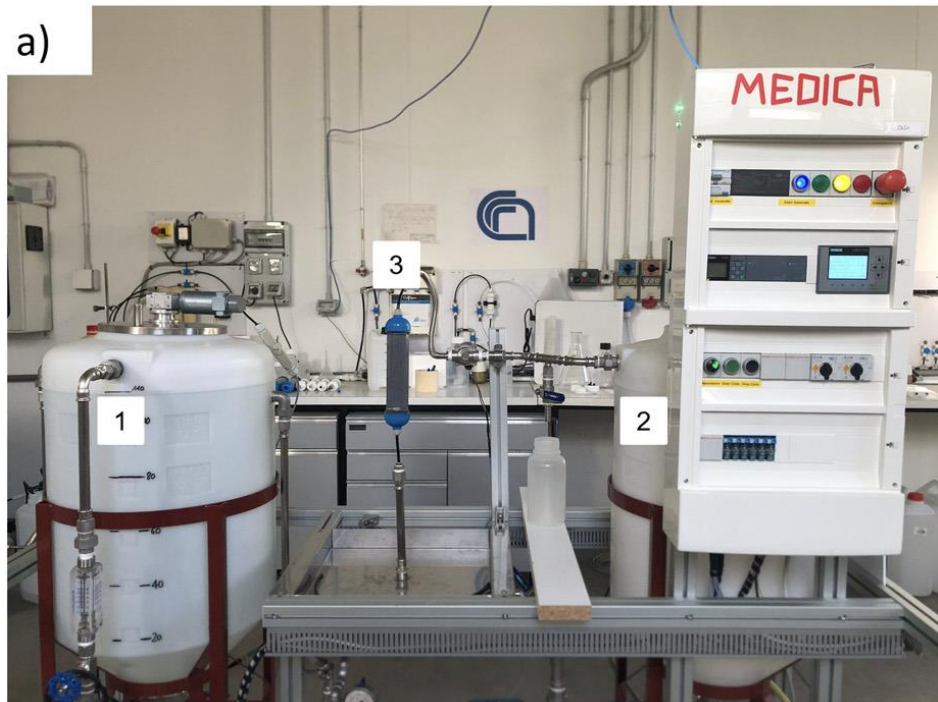
You are the cream of EU projects. We believe you really make the difference on climate issues. We know this will not be a magic. This will be matter of hard work and big efforts
(Life20 Welcome meeting, Angelo Salsi (Head of Dept CINEA))



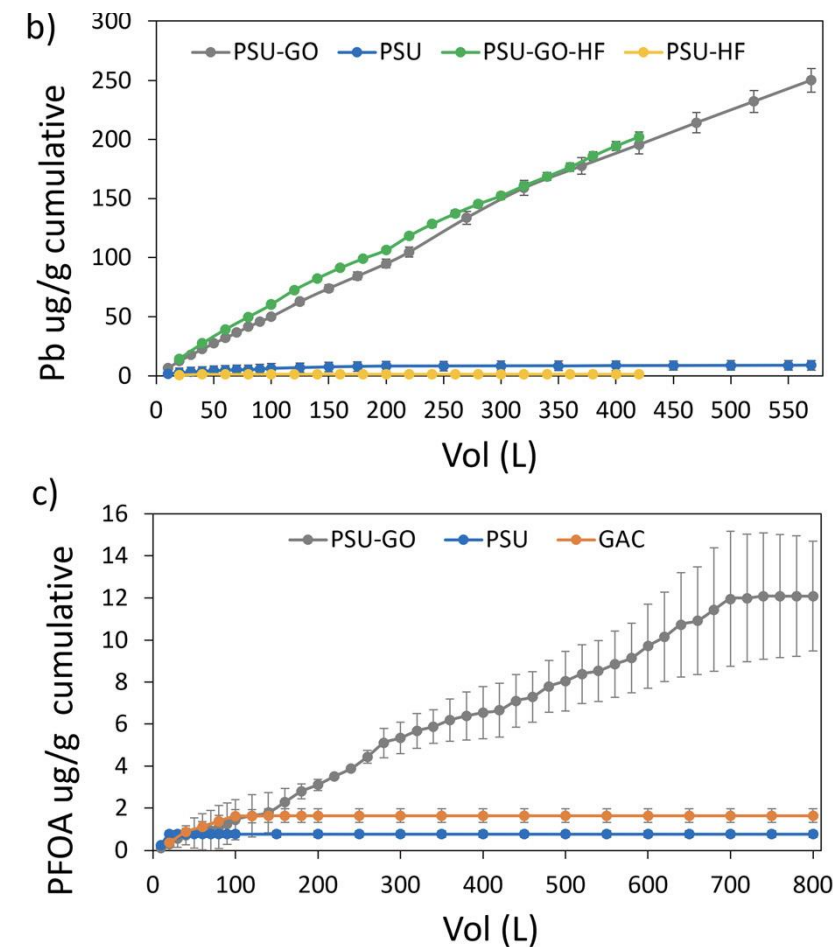
LIFE REMEMBRANCE project goals: production scale up



Validation: pilots for testing on real water with limited water consumption

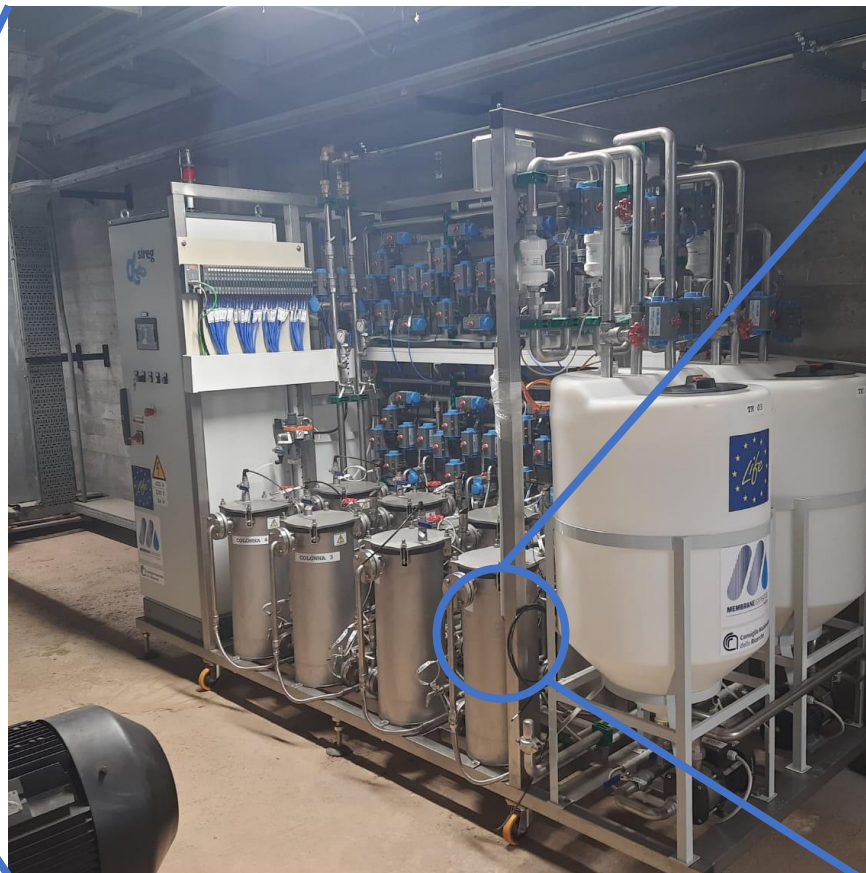


S. Kahliha et al., *Environ. Sci.: Water Res. Technol.*, 2024



Validation: cofunded pilots for potabilization plant (Water Living Lab)

Municipal Potabilization plant
1.000 L/s; 250000 citizens



HERA, Po river source, Ferrara, Italy



Purification and monitoring of coastal areas

LIFE REMEMBRANCE

Monitoring of PFAS, PCB and heavy metals



Dissemination @ School

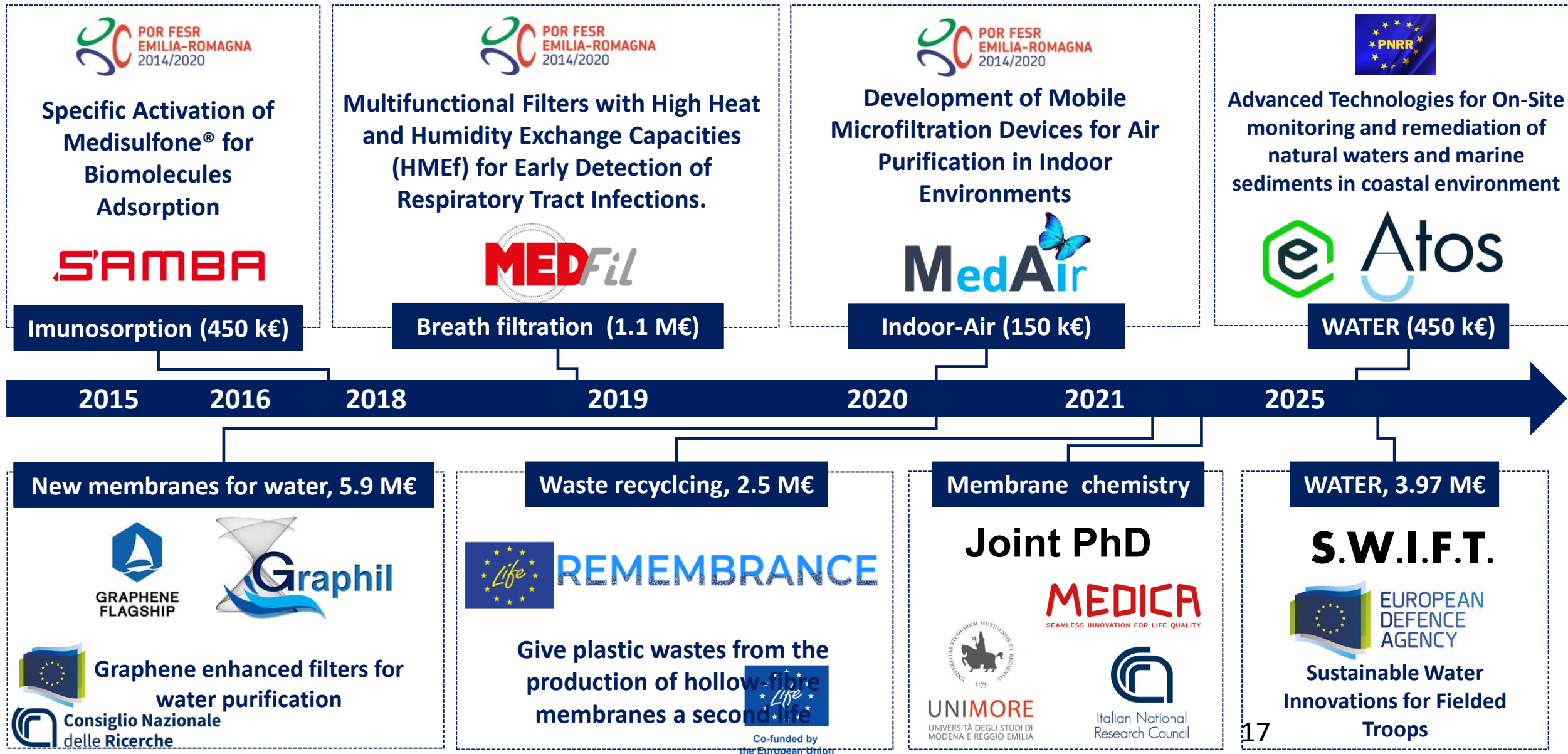


Forum and exhibitions



THANK YOU!







2015

2025

14 projects EU proposals

6 funded projects (Horizon, 1 Life, 1EDF, 3 Regional, 15 M€)

4 International patents

1 Joint Trademark, Graphisulfone

2 TEDx Talk

1 Joint PhD

7 Papers (1 Nature Water)

Equipment for water analysis (>200K€)

2 Joint Pilots

Joint Living Lab. (municipal potabilization plant)