THERESA Open Market Consultation

On-site treatment of hospital wastewater

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INDEX

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House rules

This event will be recorded. Participants who do not wish to appear are kindly requested to switch off their camera and use the chat function.

Please, write your questions in the chat. We will answer as many as possible during the session, and a Q&A document will be published afterwards.

The recording and presentation will be made available on the project's website.

The list of participants in this webinar will not be disseminated.

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Welcome and introduction

Welcome and thank you for joining this Open Market Consultation final event for the THERESA Pre-Commercial Procurement.

We appreciate your interest and participation in this **dialogue with the market!**

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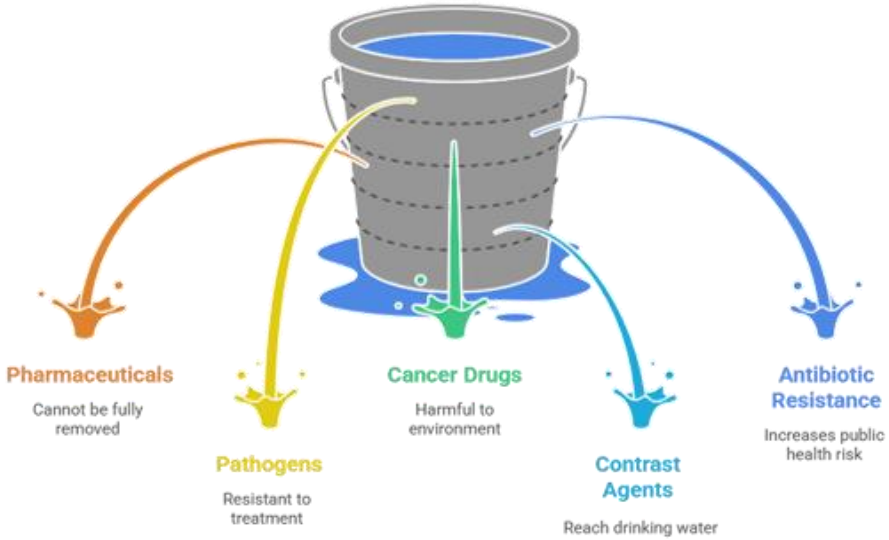

What is THERESA?

THERESA is an European Pre-Commercial Procurement (PCP) project through which public organisations collaborate with the market to develop and test innovative solutions **not yet available commercially.**

THERESA will invest €2.9 million through this process.

The challenge

Conventional treatment plants cannot remove many of these substances, which then reach rivers, soil and ultimately food and drinking water.

This is becoming an **increasing environmental and public-health concern across Europe.**

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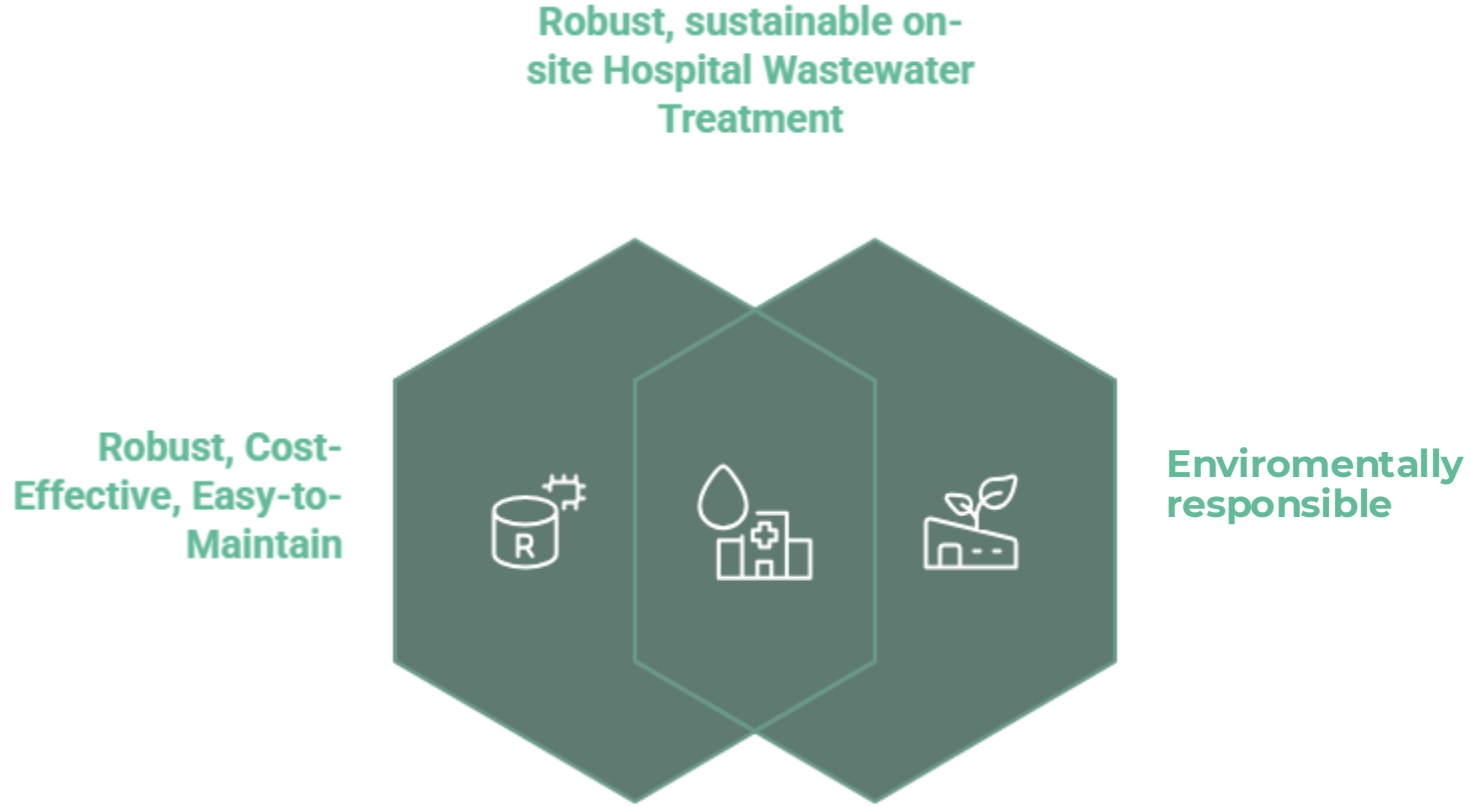
The goal

THERESA is seeking pre-treatment solutions that are:

- **Modular.**
- **Interoperable.**
- **Adaptable** to a variety of hospital settings.
- Should target all the **priority contaminant groups.**
- Must demonstrate **technical feasibility, cost-effectiveness and readiness for integration into real-world infrastructures**



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The Public Buyers Group

BUYERS GROUP

Junta de Andalucía

Regionaalhaigla

CHV CONSORCI HOSPITALARI DE VIC

ZAS

Maastricht UMC+
Maastricht University

NAVARRABIOMED
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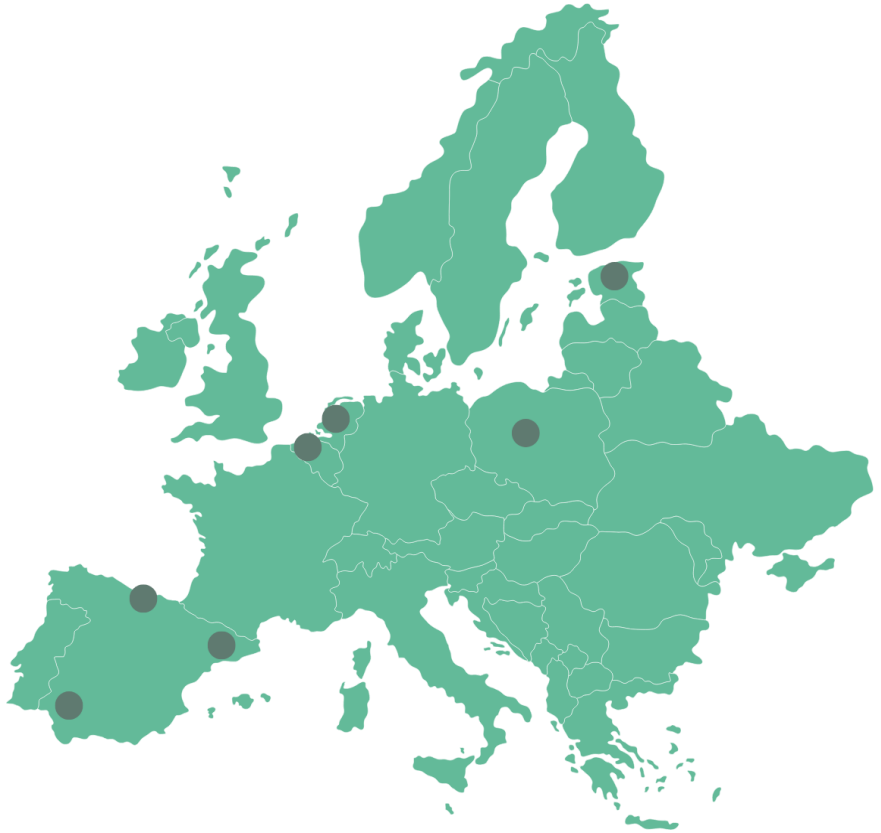

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Theresa PCP partners

COORDINATOR

NAVARRABIOMED
FUNDACIÓN MIGUEL SERVET

BUYERS GROUP

Junta de Andalucía
Consejería de Sanidad, Presidencia y Emergencias

Regionaalhaigla

CHV CONSORCI HOSPITALARI DE VIC

ZAS

Maastricht UMC+
Maastricht University

WOJEWÓDZKI SZPITAL SPECJALISTYCZNY W OLSZTYNIE

Bringing together a strong European consortium to seek green innovative solutions for hospital wastewater treatment

SUPPORTING PARTNERS

Junta de Andalucía
Consejería de Sanidad, Presidencia y Emergencias

SILO
Science & Innovation Link

Health Care Without Harm

CORVERS

ticbiomed

SunInn consulting

IETU
Instytut Ekologii Terenów Uprzemysłowionych

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PCP Phases and progress

Phase 1 - Perform research to:

1. Elaborate the solution design and determine the approach to be taken to develop the new solutions and
2. Demonstrate the technical, financial and commercial feasibility of the proposed concepts and approach to meet the procurement need

Phase 2 - Develop, demonstrate and validate prototypes in lab conditions. For phase 2 the prototype **validation** is expected to be done at **CHV** and **SAS** premises.

Phase 3 - Original development and field-testing of a limited set of first services in 4 **testing** sites located in 4 EU Member States.

Discretion to transfer leftover budget from one phase to the next in case offers with lower price are received. Contracts will be financed until the remaining budget is insufficient. The number of contracts finally awarded will depend on the prices offered and the number of tenders passing the evaluation.

PCP Phase	Contractors	Duration	Budget per contractor	Total Budget
Phase 1	5	3 months	20.000 €	100.000 €
Phase 2	3	10 months	500.000 €	1.500.000 €
Phase 3	2	10 months	450.000 €	900.000 €
			Total	2.500.000 € + 400.000 € for the adaptation of infrastructure

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SUMMARY OF THE OMC PROCESS AND KEY FINDINGS

Overview of the overall OMC programme

Key technical and functional findings of OMC

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Why an OMC?

- To **open a dialogue** about scope, budget, functionalities, requirements, business model, IPR... of the future PCP.
- To **inform the market** about THERESA PCP opportunities and process
- To **encourage possible suppliers to participate** in the future PCP tender.
- To facilitate **matchmaking** among suppliers

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What does the OMC offer?

For suppliers

- To know needs and priorities from Theresa's procurers.
- Obtain information about future PCP.
- Making your entity known to the procurers and potential collaborators.

For procurers

- To cross-check and clarify their assumptions for the Call for tenders.
- Obtain new information from the market.
- To make potentially interested bidders aware.

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Overview of the overall OMC programme

National events attendance rate

227 people registered, 188 finally attended

35 different companies (public and private) attended

14 company pitches in total

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Overview of the overall OMC programme

Q&A

Most frequent questions topics:

- **Difference Phase 2 and Phase 3**: in **Phase 2**, suppliers will be developing the prototype in SAS and CHV premises. Phase 2 **prototypes have to demonstrate in lab conditions** their capacity to remove the toxic substances specified in the requirements from the hospital wastewater, that will be described in the tender documents. In **Phase 3** we will test the 2 final solutions in 4 different hospitals, 2 hospitals per solution, **real-world validation**.

- **Hospitals constraints and limitations**: in each event session, the **local hospitals have presented their particular cases, recordings are in the THERESA website repository**. This will be further detailed in the to-be-published tender documents.

- **Consortium formation**: if your solution requires collaboration with another partner for meeting the requirements, you will need to submit a joint proposal to the tender. From matchmaking or your own network.

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Overview of the overall OMC programme

RfI questionnaire (EUSurvey responses) and matchmaking tool

- 13 different companies fully answered the RfI questionnaire in the EUSurvey tool and 12 different annexed documents (so far). It ends on February 28th.
- 12 different companies are registered in the matchmaking tool

Bilateral meetings

- 9 different companies have been called to the bilateral meetings
- **Key market findings**:
  - While individual treatment technologies demonstrate high maturity (TRL 8-9) in industrial or municipal applications, their integration as **complete systems specifically for hospital wastewater remains at experimental stages** (TRL 5-6)
  - Suppliers mainly adopt two fundamentally different approaches (Source separation and "End-of-Pipe"), which is excellent as each offers distinct advantages that may be more suitable depending on the specific needs of each hospital. Both approaches can effectively compete in the PCP.
  - While all THERESA priority contaminants can be addressed, solutions need technology adaptations or further research and development to fully meet requirements.

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Key technical and functional findings of the OMC

What can the market deliver?

The OMC confirms that the market already offers **technically viable solutions** for hospital wastewater treatment targeting pharmaceuticals and antimicrobial resistance.

- Individual components are generally **mature (TRL 8–9)**.
- Integrated solutions are mostly at **intermediate maturity (TRL 5–6)**.
- Most suppliers rely on **pilot studies, partial validation, or literature**, with limited full-scale hospital deployment.

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Key technical and functional findings of the OMC

About treatment performance

A) Contaminant Removal
Based on surveys and bilateral discussions:

Most high-performance claims are linked to **hybrid systems combining different kinds of treatments.**

⚠️ Many values come from pilots or controlled studies rather than continuous hospital operation.

⚠️ None of the participating suppliers identified any of the target contaminants as unmanageable, confirming that viable treatment pathways exist across the full priority list.

B) Performance Structure
Three consistent performance tiers emerge:

- **Baseline systems:** ~80–90% removal
- **Advanced hybrid systems:** ~90–95%
- **Targeted/segregated streams:** ~99–100%

⚠️ Higher removal is systematically associated with higher energy and operating costs.

Contaminant group	Market range
Antibiotics	>90–95%
Cytostatics	>80–95%
General CECs	Up to 95%
Contrast agents	Up to ~95%
Resistant bacteria	Up to 4-log (99.99%)
ARGs	≥2-log
Organic matter	90–95%

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Key technical and functional findings of the OMC

Energy consumption

Energy data clusters around the following ranges:

⚠ Advanced oxidation is consistently identified as the **main energy driver**.

⚠ Also, the energy consumption is directly linked to the percentage of removal.

System Type	Typical Energy Use
Basic / capture	<0.3 kWh/m³
Biological + membranes	0.5–1.5 kWh/m³
AOP-intensive	1.5–3.5 kWh/m³
Integrated hybrids (avg.)	~0.3–0.4 kWh/m³

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Key technical and functional findings of the OMC

Cost signals from the market

A) Capital Costs (CAPEX)

Indicative ranges per hospital site:

System Type	Typical CAPEX
Full modular plants	€500k – €2M+
Nature-based/hybrid	€400k – €800k
Point-source capture	€10k – €100k
Digital platforms	€20k – €300k

B) Operating Costs (OPEX)

Reported ranges:

System Type	Annual OPEX
Simple systems	€1k – €10k
Biological	€20k – €80k
Advanced	€50k – €150k+

Cost per treated volume:

- Modular systems: **€0.20–0.25 / m³**
- Integrated solutions: **€0.50–1.50 / m³**
- Service-based: **~€2 / m³**

Energy often represents **30–50% of OPEX**.

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Key technical and functional findings of the OMC

Monitoring and Digital Capabilities

Three maturity levels are clearly identified:

LEVEL 1: Laboratory-based

- Manual sampling
- External lab analysis
- Low cost, low responsiveness

LEVEL 2: Online monitoring

- pH, TOC/UV254, conductivity, turbidity, ORP
- Dashboards and basic analytics

LEVEL 3: Predictive/AI-based

- Pharmacy and occupancy data
- Spectroscopy, biosensors, metagenomics
- Early-warning systems, digital twins

⚠️ Real-time monitoring of complex compounds remains immature.

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Key technical and functional findings of the OMC

Key Technical Constraints Identified

Across bilaterals and surveys,the same constraints recur:

Solids Management

- Performance drops sharply without proper solids separation.

System Integration

- Heterogeneous equipment + hospital IT = major risk.
- API availability is decisive.

Scale Effects

- Small installations are CAPEX-intensive.
- Serial deployment could reduce costs by ~50%.

AMR Treatment

- Antibiotics and ARGs remain the least mature area.
- Require intensive processes and long validation.

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Key technical and functional findings of the OMC

Business and delivery models

Observed models:

- SaaS (monitoring/asset management)
- Service-based (5-year contracts typical)
- Equipment + O&M
- Hybrid amortisation

Scale-up almost always depends on industrial partners

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Key technical and functional findings of the OMC

Main risks and gaps

Consistently highlighted:

- Limited full-scale hospital validation
- Monitoring limitations for advanced compounds
- Solids/by-product handling
- IT integration complexity

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Key technical and functional findings of the OMC

To summarize

1 The market can already achieve:
- ≥90–95% removal for priority antibiotics
- ≥80–90% for cytostatics
- Up to 4-log AMR reduction

2 Higher removal = higher energy + OPEX.

3 Main weakness is not technology,

but **lack of long-term hospital-scale evidence**.

4 Monitoring and integration are becoming as important as treatment itself.

5 PCP is well aligned to de-risk:

- Integration
- Performance stability
- Scalability
- Economic viability

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WHAT IS NEXT?

PCP call timeline

Final recommendations (practical tips, consortia formation, etc...)

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Key dates

22 December 2025 –
28 February 2026

May 2026

January 2027–
March 2027

July 2027–April
2028

August 2028–
May 2029

Open Market Consultation
Events
Questionnaire
Matchmaking

Tender Publication

Evaluation of bids

Contract award

Phase 1.
Solution Design

Phase 2.
Prototype development

Phase 3.
Validation in real operational en vironment

OMC

Tendering

Execution

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Final recommendations

Reminders:

1. **Consortium formation is the key for success. Water treatment+monitorization.**
2. **Website repository (**Repository – Theresa PCP**)**
3. **THERESA newsletter**
4. **RfI extended until February 28th**
5. **Survey is not tender participation**

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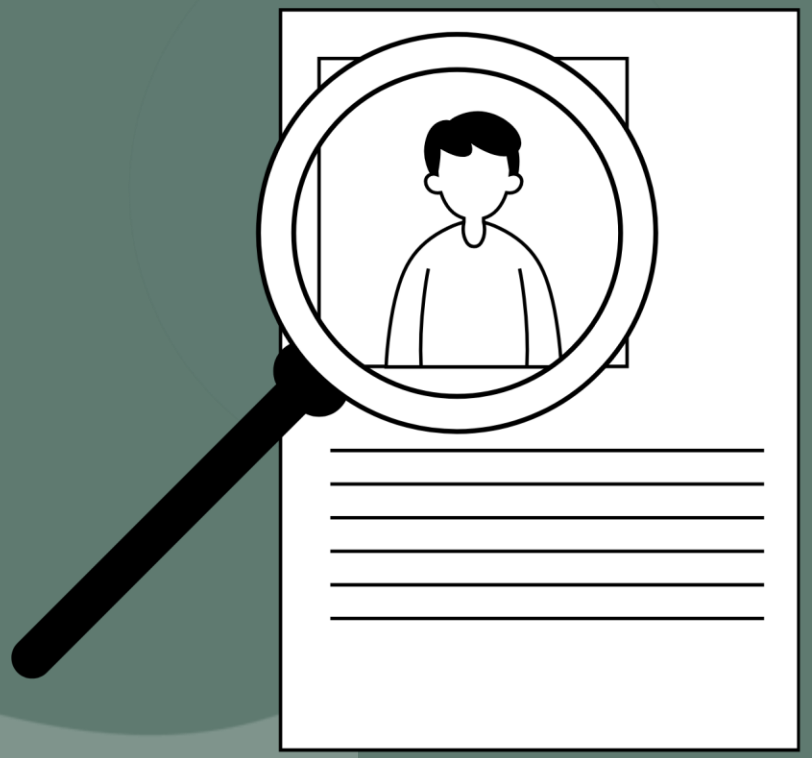
Evaluation (preliminary KPIs) and ETV + sustainability assessment framework to collect feedback

Poll to collect feedback of the market



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Q&A

Ask away!

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