THERESA Open Market Consultation

On-site treatment of hospital wastewater

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INDEX

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Welcome and introduction

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

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

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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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Maastricht University Medical Center

Opnamen per jaar	Dagbehandelingen per jaar	Verpleegdagen per jaar	Dagen gemiddelde verblijfsduur
23.580 (23.190 in 2023)	24.715 (23.528 in 2023)	163.681 (163.911 in 2023)	5,1 (5,8 in 2023)

Bedden	Operationele operatiekamers	Poliklinische consulten excl. SEH en op afstand	Consulten spoedeisende hulp (SEH)
546	15	393.283 (396.672 in 2023)	31.529 (30.767 in 2023)

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What is the Green Deal Sustainable Healthcare 3.0

5 pillars

Signed on November 4, 2022 by the NFU, on behalf of all UMCs

Other Green Deal participants :

- Cure & care
- Government
- Health insurance
- Financial institutions

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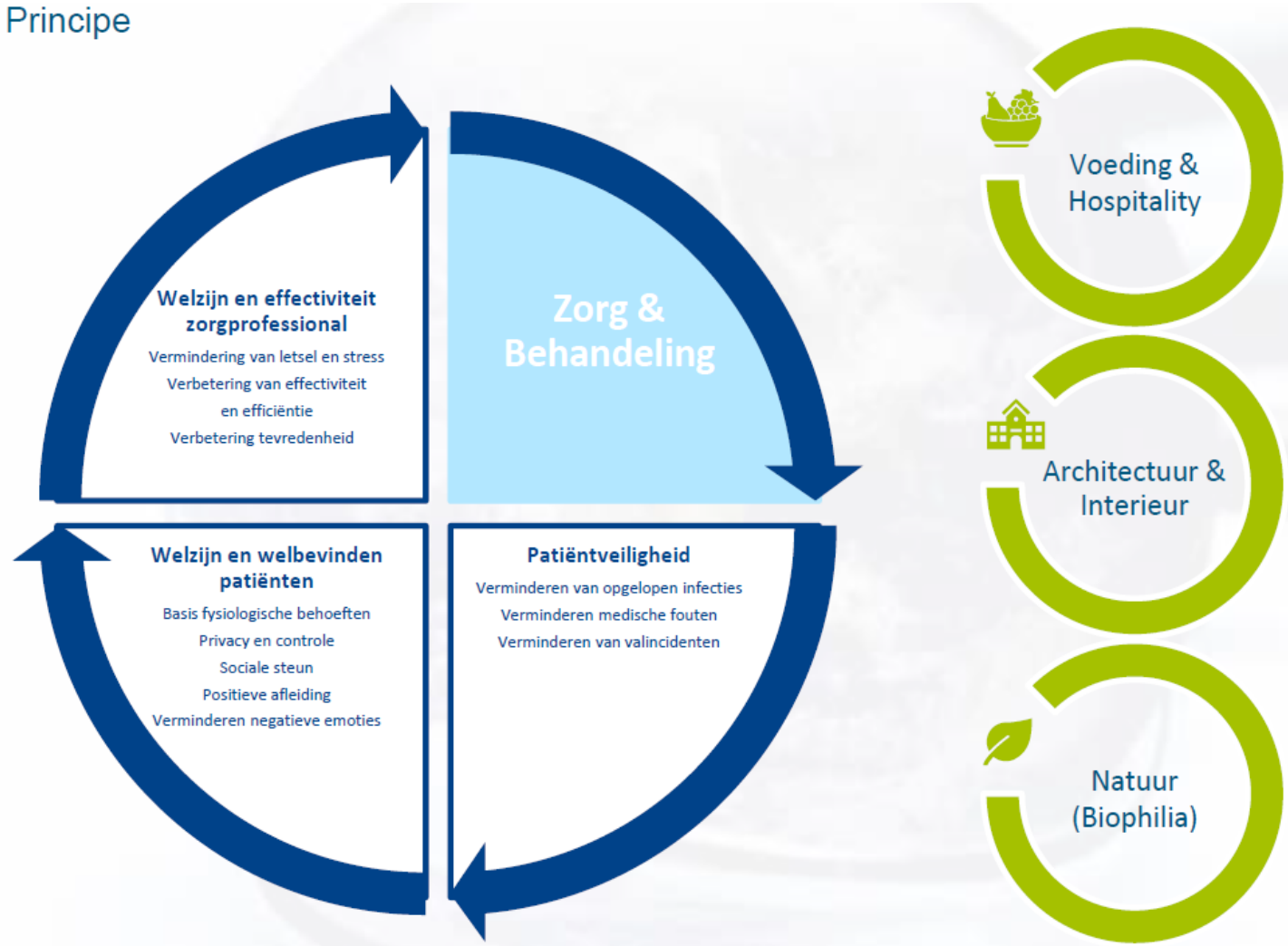
Pillar 1: Promoting health (well-being)



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Pillar 2: Promoting awareness and knowledge

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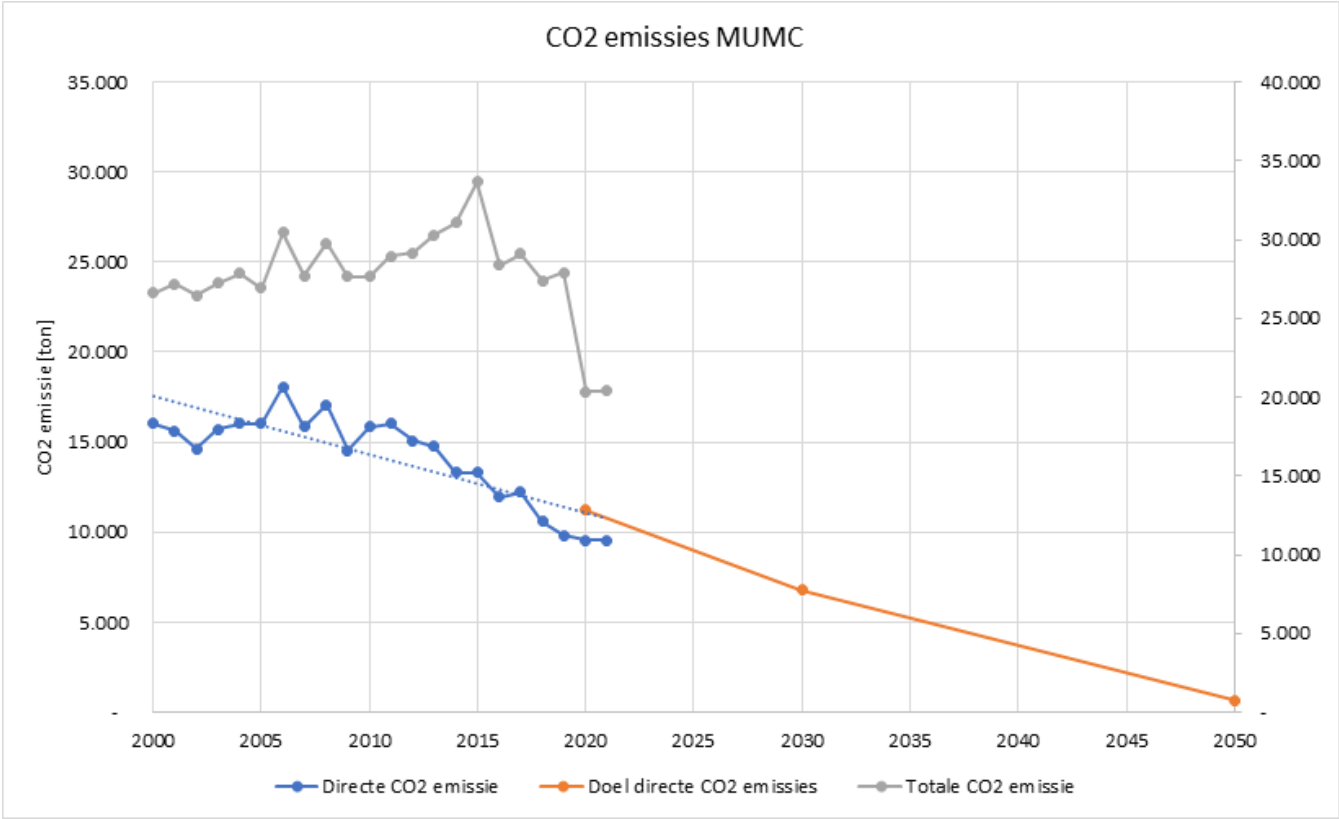
Pillar 3: Reducing CO2 emissions from buildings, energy and transport

Reducing CO_2 emissions from the healthcare sector

- 55% by 2030
- 95% by 2050



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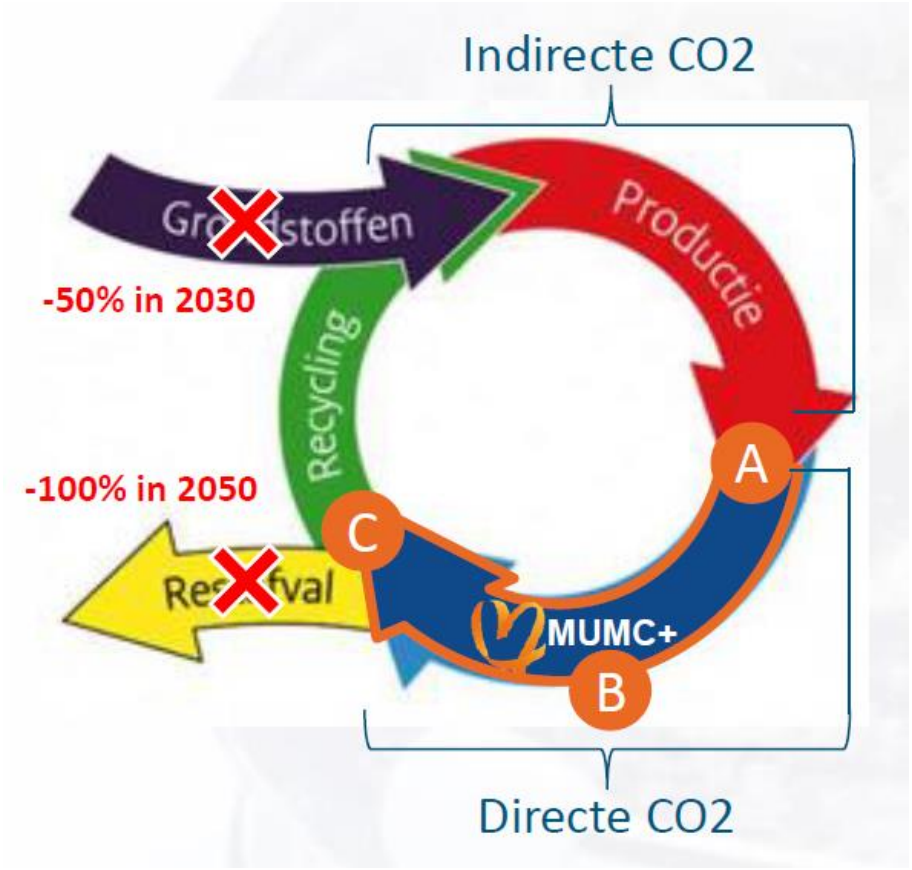
Pillar 4: Circularity



Maastricht UMC+:

- Less use of renewable raw materials (bio-based)
- Longer, more intensive use
- Closing the cycle

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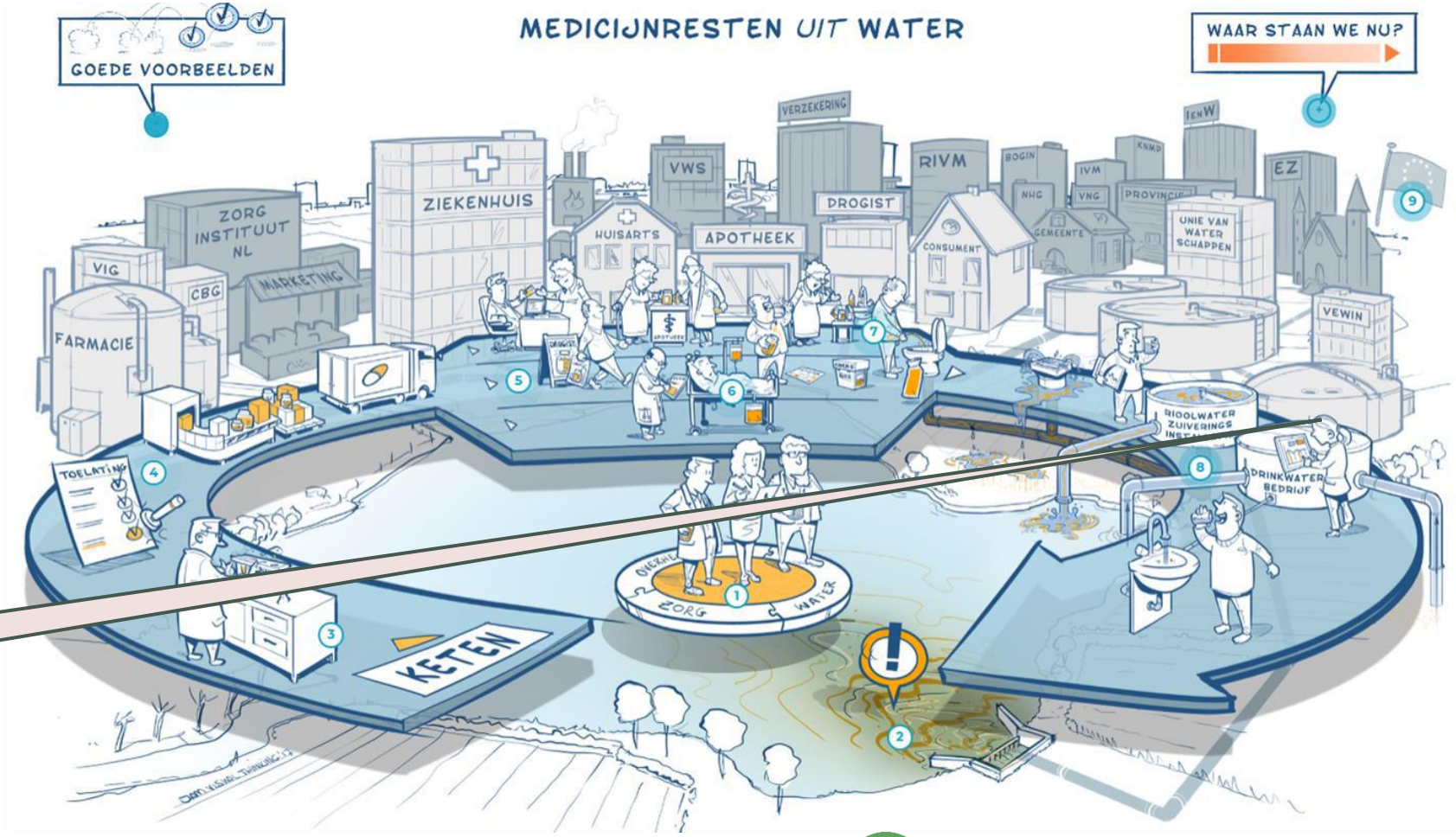
Pillar 5: Reducing the environmental impact of medication (use)



3,5% hospitals
90% residential areas

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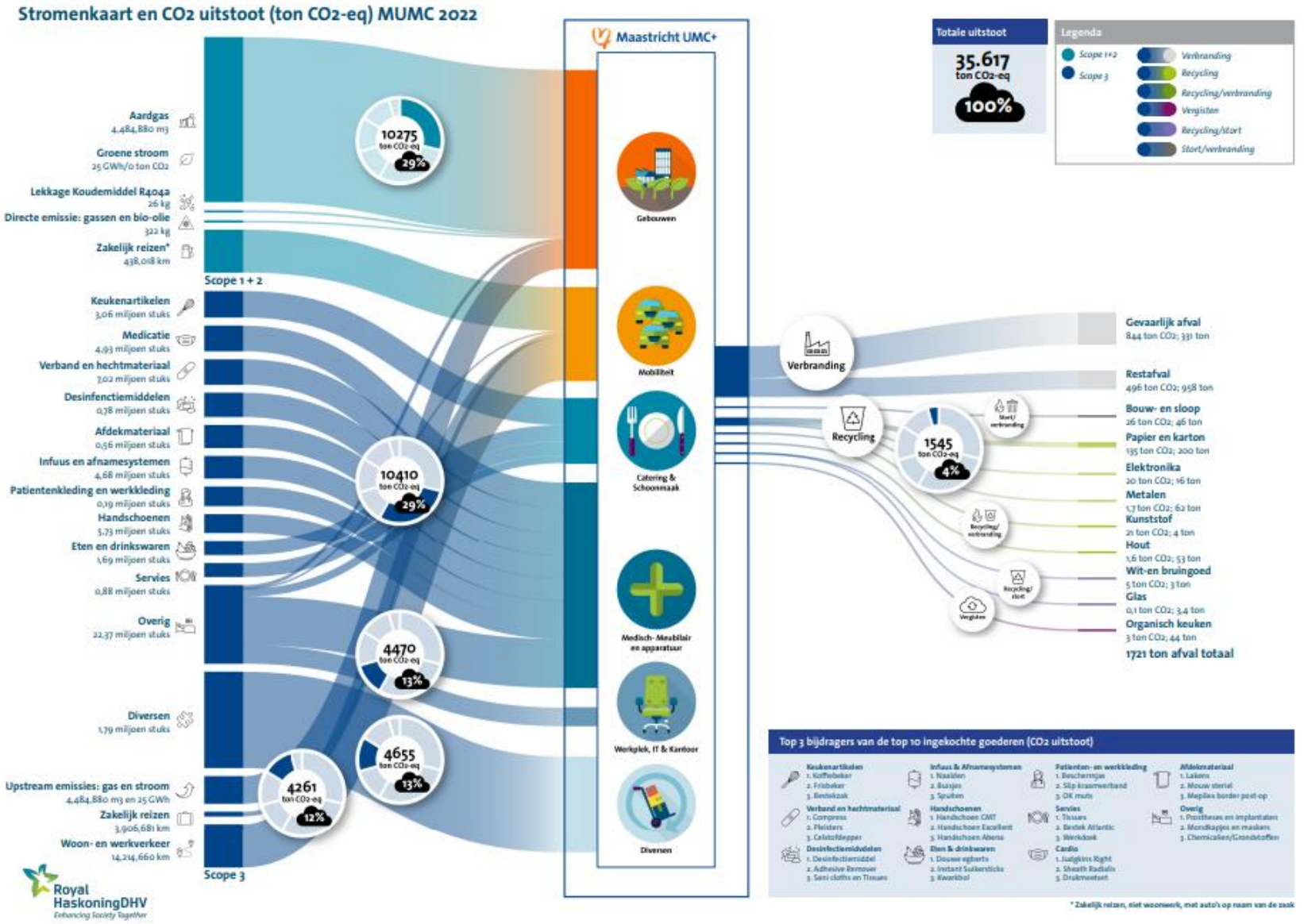
Maastricht UMC+

CERTIFIED ISO 14001

Sustainability Maastricht UMC+

CO_2-footprint (2022)



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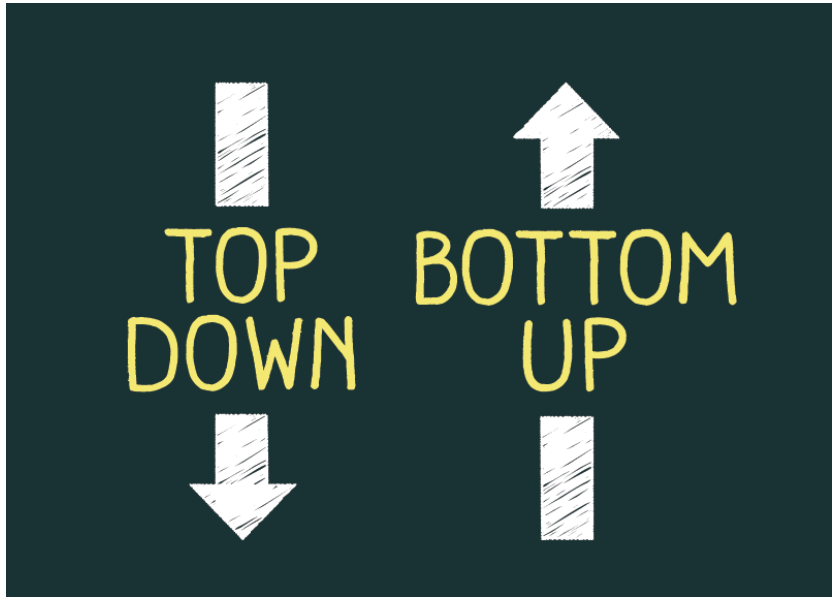
Organization MUMC+

Steering group & project groups



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Green Teams

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Steering group & project groups

Steering group sustainability MUMC+

- Promoting health (well-being)
- Promoting awareness and knowledge
- Reducing CO2 emissions from buildings & energy
- Reducing CO2 emissions from transport
- Circularity
- Reducing the environmental impact of medication (use)






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WHAT THERESA IS AIMING FOR?

What is THERESA?

The Challenge

The goal

The Public Buyers Group

THERESA PCP partners

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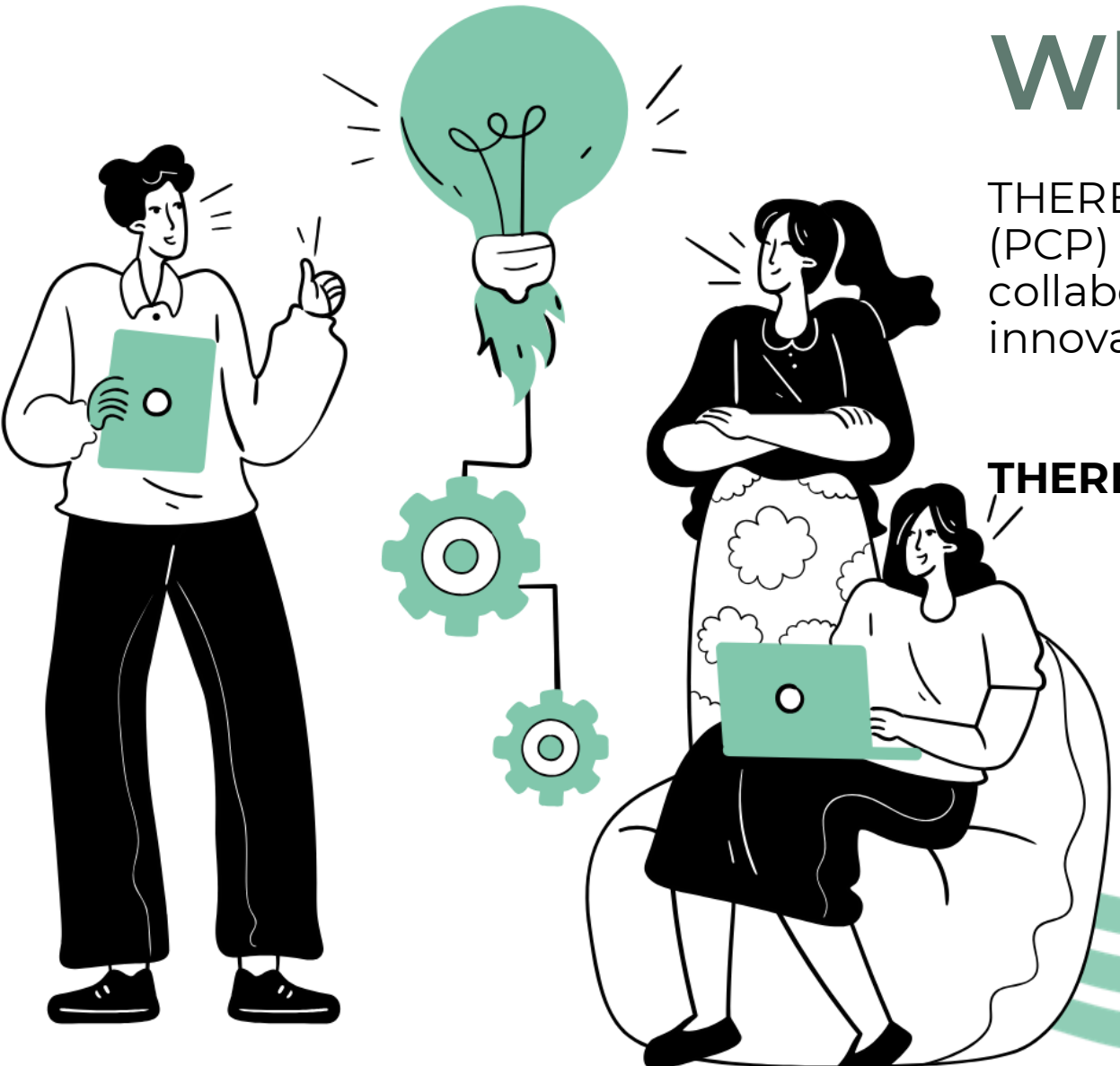

What is THERESA?

THERESA is an Eropean 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.

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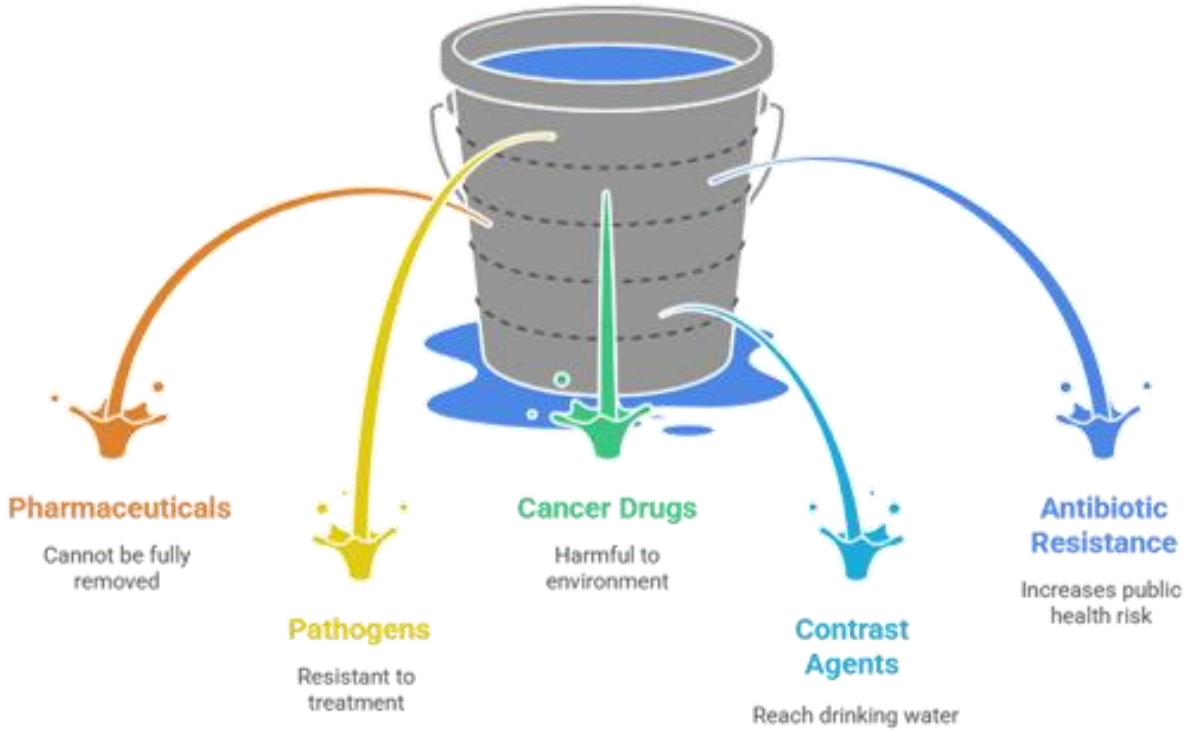
The challenge

Hospitals release:



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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Adressed Contaminants:

Cytostatics

- e.g., Fluoroacil, Methotrexate, Ifosfamide, Cisplatin

X-Ray contrasts agents

- Iodinated, Watersoluble, nephrotropic, low osmolar X-ray contrast media
- Paramagnetic contrast media

Antibiotics

- **Third generation cephalosporins, Carbapenems**, Penicillins, Macrolides, Fluoroquinolones (e.g.)

Antibiotic Resistant Bacteria and Genes

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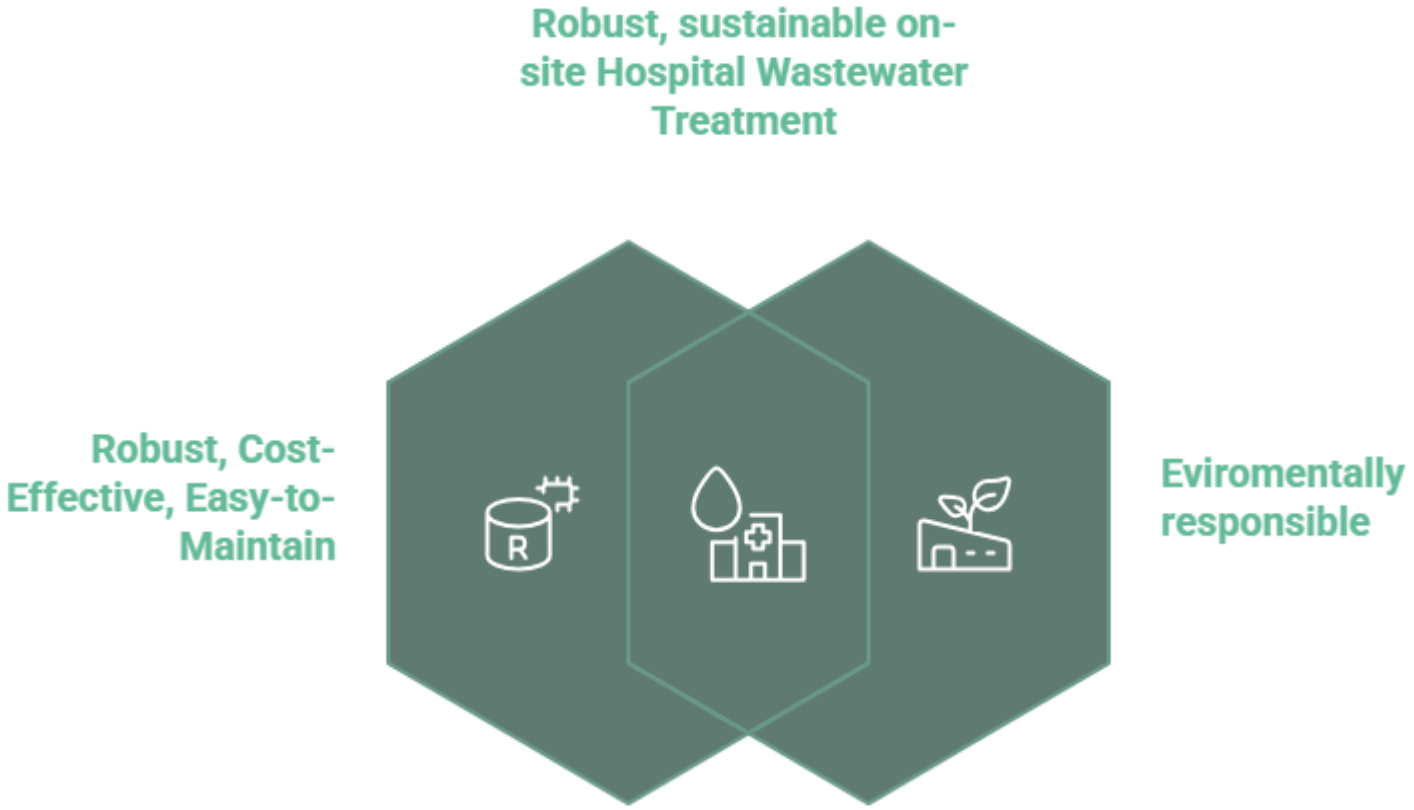
The goal

THERESA is seeking pre-treatment solutions that are:

- **Modular.**
- **Interoperable.**
- **Adaptable** to a variety of hospital settings.
- Should **target** 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 Goup

BUYERS GROUP

Junta de Andalucía
Consejería de Sanidad, Presidencia y Emergencias

Regionaalhaigla

CHV CONSORCI HOSPITALARI DE VIC

ZAS

Maastricht UMC+
Maastricht University

NAVARRABIOMED
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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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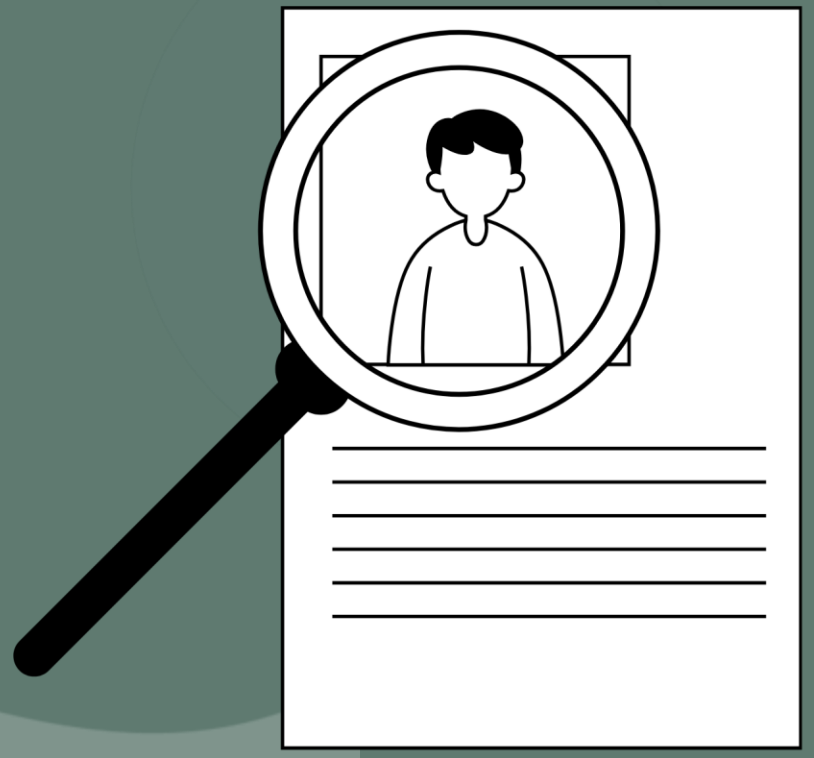
TECHNICAL ASPECTS: THE NETHERLANDS

Sustainability and life cycle considerations

Technical verification approach

Exploitation and adoption strategy



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Sustainability Assessment

What this is based on?

- Life-cycle thinking aligned with ISO 14040/14044 principles
- Evidence from peer-reviewed LCA/LCC + social sustainability literature on (hospital) wastewater treatment
- Emerging harmonisation efforts for HWW treatment assessment (incl. recent reviews)
- Preliminary hospital inputs (no final agreement made yet)

Evaluation design is co-developed with hospitals and will be finalised in the next phase

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Baseline conditions at pilot hospitals

Common baseline

⟶ Predominant routing: discharge to municipal sewer

Existing stream-specific controls (examples)

- High-risk streams managed separately in some sites (e.g., radioactive streams; specific lab streams externally handled)
- Some sites report screening/filters (e.g., solids screening)

Implication for suppliers

- Most social/environmental impacts assessed will arise only once on-site units are introduced
- Solutions must fit hospital realities

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Environmental dimensions to consider

Criterion / Aspect	What it captures / why it matters
Energy use	Strong driver of climate emissions & cost
Climate relevance (GHG intensity)	Linked to electricity consumption
Resource / material use	Durability, Consumable replacement frequence
Water efficiency	Water use performance of the technology/process
Water recovery potential	Ability to recover/reuse water (circularity potential)
Chemical / reagent use	Toxicity-related impacts, safety & cost
Waste / sludge generation	Treatment residues requiring handling and management
Formation of hazardous byproducts	Known formation of potentially hazardous treatment byproducts
Ecotoxicity relevance	Reflects presence of hazardous pharmaceuticals (ecotoxic load)

Trade-off to flag

Higher removal performance can come with higher energy/ chemical/ material burdens

→ assessment is meant to help compare these transparently

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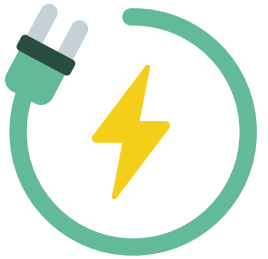
Energy use is the dominant life-cycle hotspot in advanced HWW treatment



Across LCAs, the use phase electricity demand is consistently identified as the largest contributor to environmental impacts (across advanced technologies like oxidation, UV/AOPs, membrane systems).

Pilot hospitals highlight energy efficiency as a sustainability priority. Some sites already operate / plan to expand on-site renewables (e.g., solar).

Do you have insights on what is the minimum energy intensity solutions can achieve (kWh/m³) while still meeting high removal performance?

Based on literature:
Low energy: ≤0.5 kWh/m³
Moderate energy: 0.5–1.0 kWh/m³
High energy: ≥1.0 kWh/m³

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Social sustainability is mainly about safe, acceptable, low-burden operation

- Social evaluations in HWW treatment are limited; indicators are often qualitative + context-specific

What are we looking at here?

1. Worker safety + training needs
2. **Workload and operational complexity (maintenance frequency, monitoring burden, troubleshooting)**
3. Social acceptability in hospital settings (Noise / odour, footprint / siting constraints)
4. Public health contribution (e.g., reduced release of ARB/ARG and hazardous residues) framed as expected contribution, not epidemiological proof
5. Responsible business conduct / human rights due diligence (supply chain expectations)
6. Gender / inclusion (exploratory: inclusive design and training)

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Costs vary widely; affordability is a feasibility gate

How do we approach cost?

CAPEX: investment in treatment equipment & installation

OPEX: cost of electricity, routine maintenance, etc.

What are economic drivers?

- Energy demand
- Consumables & media replacement (carbon, membranes, reagents)
- Maintenance + staffing time
- High-cost components can dominate (e.g., ozone generation equipment + electricity)

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Costs vary widely; affordability is a feasibility gate

Across pilot sites, hospitals indicated that higher cost is among the least acceptable trade-offs.

Technology / System	Literature OPEX (€/m³)	Context / Scale	Main cost drivers (from literature)	Reference
UV disinfection	**0.016–0.06**	Denmark	Electricity + lamp replacement	Høibye et al., 2008
Ozonation (O_3)	**0.016–0.08** (hospital)	Denmark	Electricity for ozone generation + oxygen supply	Høibye et al., 2008
GAC / PAC	**0.10–0.30**	Spain (full-scale)	Replacement of carbon / filter media	García et al., 2021
PAC–MBR	**up to 1.0**	Spain (pilot/full-scale)	Carbon dosing + membrane operation/cleaning	García et al., 2021
SMBR + UF	**~2.5**	Italy (hospital-scale)	High energy demand + membrane operations	Verlicchi et al., 2010

Does this look realistic to you? Share thoughts!

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Burden–benefit thinking to guide assessment

Advanced treatment can improve removal of pharmaceuticals and bacteria, but may increase:

- energy demand
- chemical/reagent use
- maintenance workload
- waste/sludge / residues
- cost (CAPEX + OPEX)

We are aware of trade-offs! Such as…

- High removal performance ↔ higher energy/chemical burden
- transformation products / unintended by-products
- On-site operation ↔ staff burden vs outsourcing dependency

Where do you see the biggest performance–burden trade-offs you foresee?

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Technical verification approach

- Establishes the conditions for the evaluation of the solutions in Phases 1, 2 and 3.
- For PCP phase II and III it will be based on the ISO 14034 ETV (Environmental Technology Verification) process that will provide third party, objective evidence for the consortium partners to verify that the prototypes being built at PCP Phase II meet technical/functional and environmental requirements specified in Key Performance Indicators (KPIs).

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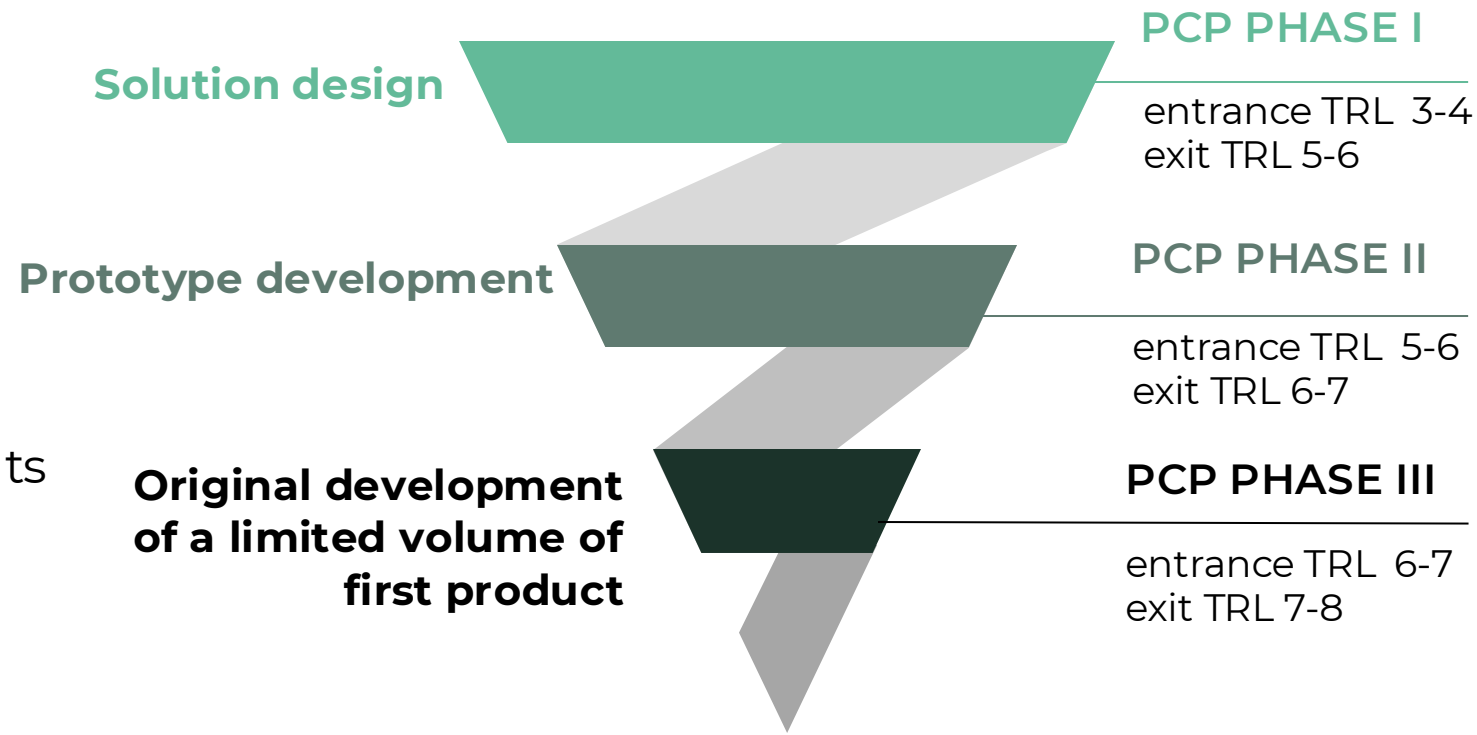
THERESA PCP PHASES

For each of the 3 PCP phases:

- Timelines
- TRL levels (enter/exit)
- Scope
- Objectives
- Testing environment/requirements



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PCP Phase I: Duration 3 months

Objective

Assess the technical, economic and organisational feasibility of innovative solutions and select the most robust designs for prototyping.

Scope

- Complete system architecture and design, including detailed blueprints, components, processes, algorithms, expected environmental impacts.
- Defined monitoring and measurement concept (operational parameters- technology specific, effluent quality, quality of water for reuse, removal of THERESA PCP target contaminants).

Solutions are evaluated on their ability to credibly progress to prototyping and feasibility to meet THERESA PCP KPIs.

Testing

- no testing at this stage, however data incl. test data to substantiate the feasibility of the system design to deliver the claimed performance may be essential.

Exit TRL 5-6 : technology components are integrated with realistic support elements (complete system design feasible to perform to meet KPIs)

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PCP Phase II: Duration 10 months

Objective

Develop and experimentally validate functional prototypes and demonstrate measurable technical performance under controlled conditions.

Scope

- Prototype development based on Phase 1 designs including monitoring concept.
- Performance to be tested against a verification plan and test protocols using the agreed KPI framework and criteria incl. QA/QC testing requirements.

Solutions (prototypes) are evaluated in particular on their performance (technical/functional, environmental) and interaction with realistic conditions/operational environment

Testing

- prototype laboratory testing of performance based on test plans and KPIs with QA/QS assurance at SAS premisses - Hospital Virgen de la Macarena (Spain) in controlled/simulated conditions representative PCP THERESA hospitals conditions .
- assessment of integration potential with operational environment

Exit TRL: 6-7 Prototype system demonstrated in an operationally relevant environment

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PCP PHASE III: Duration 10 months

Objective

Validate final solutions in real hospital environments in order to verify their performance, robustness and confirm readiness for deployment/market uptake and procurement.

Scope

- real-world testing under diverse hospital specific conditions to verify the performance claims compliant to ISO 14034 ETV process, prove the environmental, economic and social added value
- demonstrate full integration capability with the operational environment of the hospitals (incl. system control and monitoring)

Solutions (PILOTS) in their FINAL FORM (complete system) and under defined conditions of application are evaluated for the actual achievement of their declared technical/functional/environmental performance based on independently produced test data under real conditions of application and for meeting end users needs (economic, social, integration with operational environment)

Testing

- Deployment and validation of **2 solutions in 4 hospitals**: Hospital Universitario de Navarra (ES), Maastricht University Medical Center (NL), Põhja-Eesti Regionaalhaigla (ES), Wojewódzki Szpital Specjalistyczny in Olsztyn (PL). All subsystems must be integrated in the real-world operational evironments of the hospitals.
- Performance verification based on technology specific verification plans and test plans with KPIs integrated. All test data must be generated compliant to ISO/IEC 17025 and related to on-site conditions.
- Performance verified by third party **according to ISO 14034 ETV** standard.

Exit TRL: 7-8 Pilot system demonstrated in real-word environment

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Why ETV in TERESA PCP?

ETV ISO 14034
ENVIRONMENTAL TECHNOLOGY VERIFICATION

ETV consists in proving in an **impartial and credible way** that the **claims about an environmental technology performance** made by providers **are true and based on sound scientific data**

Verification under ISO 14034 ETV

ISO 14034 standardised

ETV follows:

- Robust and transparent verification procedures based on **ISO 14034 standard: *Environmental Management: Environmental Technology verification***
- EU and globally recognised

Quality & impartiality assured

ETV uses recognised quality and impartiality frameworks and therfeore can be trusted

- Performance test data must be generated compliant to **ISO 17025** requirements
- Verification Bodies performing ETV are accredited for compliance **to ISO 17020** for type A inspection bodies which means full impartiality in professional judgements

Fit for early market innovations

ETV allows to verify what is most important to showcase the benefits for users/buyers

- Provides flexibility in the choice of parameters to be verified
- Enables proving performance claims of innovations which fall outside existing regulations, standards or labelling schemes

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Why ETV in TERESA PCP?

1. Defines the terms of **environmental technology** at global level
2. Defines the term of **environmental added value** as indicator determining if a technology results in reduced environmental impact compared to alternatives currently used is similar situations
3. Allows to verify in an independent way performance parameters **of new, even disruptive technologies** demonstrating unique technical, functional, environmental performance features not covered by existing schemes (**flexibility: the verification process is robust but the parameters/performance claims to be verified are adjusted to the technical/functional characteristics of the technology**)
4. Defines a process for performance claim verification and the claimed environmental benefits considering the **assessment of technology maturity, innovation, assumptions, constraints and limitations for its application and its scalability,**
5. Defines requirements for **ensuring quality, credibility and impartiality of performance verification:** provides transparency of the process generating information and data.

Central elements of ETV

PERFORMANCE CLAIM

Performance claim means **a set of technical specifications** that are representative of the technical and environmental performance of a technology in a specified application and under specified conditions of testing or use.

TEST DATA ON PERFORMANCE

The verification of the performance of a technology is based on the assessment of test data that is :

- independently generated
- quality assured and quality assessed (meets requirements of ISO 17025)
- relevant, sufficient and valid for the claim i.e.:
  - generated for a specific application of the technology consistent with the intended use as in the claim
  - include concrete and defined operational conditions of technology use
  - taking into account all measurement uncertainties and other assumptions

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Implementation of ETV in THERESA PCP

PCP PHASE II

ELEMENTS OF ETV:

- Definition of intended application of the technology,
- basis for assessment of the environmental added value (environmental impacts),
- definition of the initial performance claim and its alignment with users needs,
- Definition of technology constraints and limitations
- specification of performance parameters to be verified (technical/functional, environmental, operational,
- Common testing requirements based on ISO 14034 QA/QC requirements for testing and THERESA PCP KPIs

- **Common approach to technology description**
- **Verification protocols /testing protocols for PCP II for quality data generation enabling assessment and benchmarking against KPIs**

PCP PHASE III

FULL ETV PROCEDURE

- Definition of intended application of the technology (matrix characteristics, clearly defined purpose, assumptions and limitations)
- Assessment of the environmental added value based on available data
- Definition of the final performance claim and specification of performance parameters to be verified based on THERESA PCP KPIs/requirements– technology tailored(technical/functional, environmental, operational)
- testing according to ISO 14034 requirements (independent, compliant to ISO 17025)
- Verification of performance based on test data

- **Technology specific Verification Protocols including test design/testing requirements**
- **Detailed testing protocol and test report for each technology**
- **3rd party testing compliant to ISO 17025**
- **Verification Report, Statement of Verification**

KPIs: operational validation

Categories (initial snapshot for indicative purposes only)

Technical and Functional Performance KPIs

- Removal efficiency of PCP THERESA target pollutants
- Effluent quality parameters (e.g. pH, temperature, flows, BOD, COD, TSS, conductivity…)
- Treatment capacity and flow-rate stability
- Robustness under variable influent loads
- Equipment reliability and downtime frequency
- Scalability/modularity

Environmental Performance/Sustainability Relevant KPIs

- Energy consumption (kWh/m^3 wastewater treated)
- Chemical consumption (kg/m^3)
- Water consumption
- Environmental trade-offs (e.g., air emissions, odours, noise, emissions to soil, waste generation incl. hazardous waste + other sustainability related aspects to consider)

Operational KPIs

- Footprint (m^2) relative to hospital constraints
- Ease of operation and maintenance requirements
- Automation level
- Monitoring capacity
- Safety considerations for staff

Economic KPIs

- CAPEX per installed system
- OPEX per m^3 treated wastewater
- Cost efficiency
- Cost predictability under different operating scenarios

Regulatory and Compliance KPIs

- Alignment with discharge limits
- Compliance with regulatory expectations

Quality related KPIs

- Test data quality, traceability, relevance, completeness

Exploitation and Adoption Strategy

"Risk-benefit sharing under market conditions' refers to the PCP approach in which procurers share with suppliers at market price the risks and benefits related to the intellectual property rights (IPR) resulting from the R&D."

Background info: IPR allocation

PCP procurements:

Beneficiaries retain IPR they generate and give each other and other participants (including PCP/PPI providers) access to their background needed for project

PCP providers retain IPR they generate and buyers group obtains:

- License free rights to use the results for their own use
- Right to require the PCP providers to grant, or to grant themselves, non-exclusive licenses to exploit the results for the procurers under fair and reasonable conditions, without right to sublicense
- Call back right: If PCP provider uses results to the detriment of the public interest, including security interests, or fails to commercially exploit the results within a specified period after the contract, then – after having consulted the PCP providers on why this happened – the procurers can require the PCP provider to transfer the IPR ownership to the procurers

(*) wp-13-general-annexes_horizon-2021-2022_en.pdf

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Exploitation and Adoption Strategy

The goal is to develop a **comprehensive action plan that supports the final adoption** of the solution, combining tailored strategies for both procurers and suppliers to ensure successful exploitation and long-term sustainability.

Exploitation strategy approach for suppliers

1 Early Engagement and Orientation (Jan 2027 onwards)

Webinar on business modelling, funding opportunities, and go-to-market strategies.

2 Validation and Tailored Support (Jan 2028 onwards)

In phase 2, provide individual follow-up sessions to refine exploitation plans, strengthen business models, and prepare funding applications.

3 Consolidation and Market Adoption (April 2029 onwards)

Finalize business strategies with tailored guidance, ensuring funding access and readiness for commercialization.

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WHAT IS AN OMC? OMC STRUCTURE AND EVENTS

Why an OMC?

Who can participate?

Engaging mechanisms

How to provide feeback?

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Why an OMC?

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

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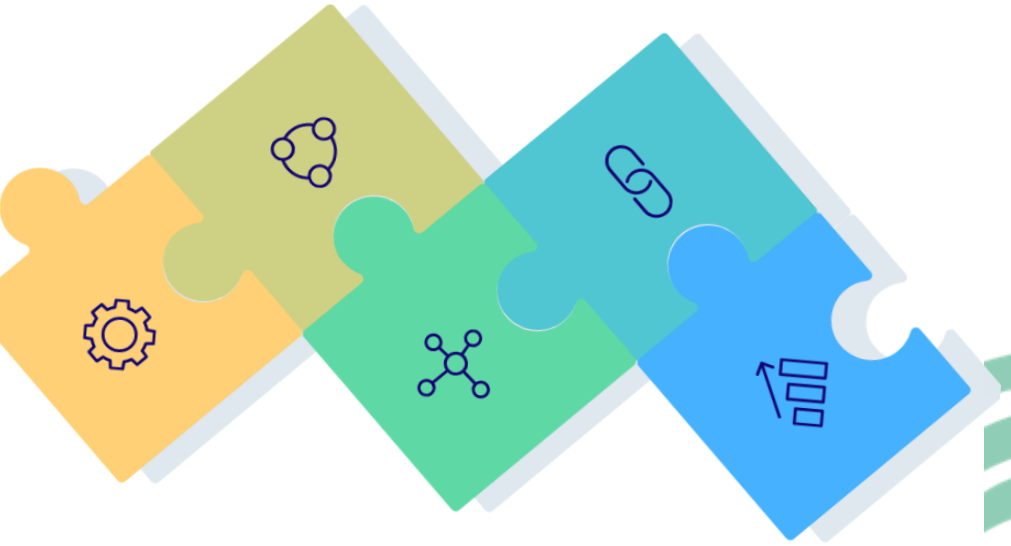
Who can join?

Participation is **open to all organisations** with an interest in the wastewater treatment, environmental technology, digital monitoring, automation, sensing, or hospital infrastructure sectors.

This includes, but is not limited to:

- Technology providers (SMEs, large industry, start-ups).
- Research institutions and universities.
- Environmental and water-sector organisations.
- Hospitals, utilities, and wastewater authorities.
- Intermediaries supporting innovation procurement.



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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.
- To influence the preparation of the coming tender

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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Events and engaging mechanisms

Events	Dates	Topic
Spain	January 08	General presentation
Estonia	January 13	Introducing to PCP and tendering
Poland	January 19	SOTA, Functional & Technical Requirements
Belgium	January 23	Legal, Ethical & Interoperability Aspects
The Netherlands	January 26	Verification, Validation and Exploitation
Wrap-up event	February 26	Wrap up of OMC findings, main messages

Matchmaking tool

At THERESA PCP's web

Pitch sessions

At the end of the events

Bilateral meetings

Between 6-24 February

Questionnaire

Submission deadline:

24 February

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How to provide feedback?

1. Company Pitches

Benefits:

- Visibility among potential partners
- Presentation of capabilities

2. THERESA OMC *Questionnaire*

Benefits:

- Structured way to share detailed feedback
- Informs tender design
- Required for pitching and bilateral meetings

3. Q&A Platform

Benefits:

- Transparent, everyone sees the same answers
- Continuously updated throughout the OMC
- Permanent record for future reference

4. Matchmaking Platform

Benefits:

- Find the right partners early
- Build balanced, competitive consortia
- Increase your chances of success

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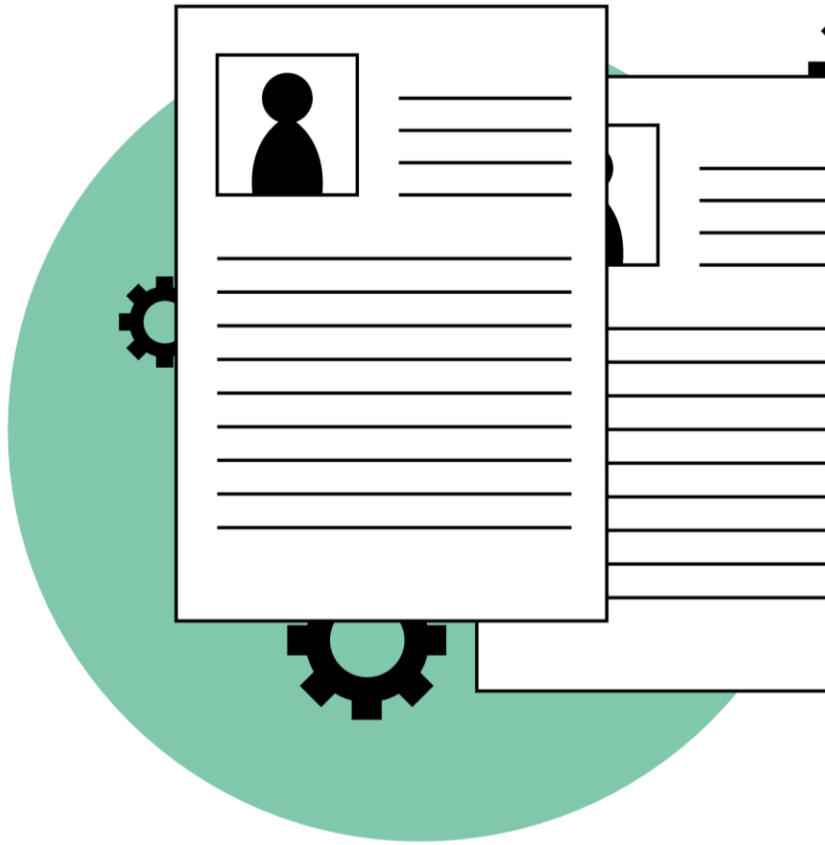
Confidentiality Clause

The contracting authority may not disclose any technical or commercial information that may have been provided by the participants, which they have designated and reasoned as confidential.

The suppliers must identify the documentation or the technical or commercial information that they consider to be confidential, and it is not permissible for them to make a generic declaration or declare that all documents or all information is confidential. Participants may designate some of the documents submitted as confidential.



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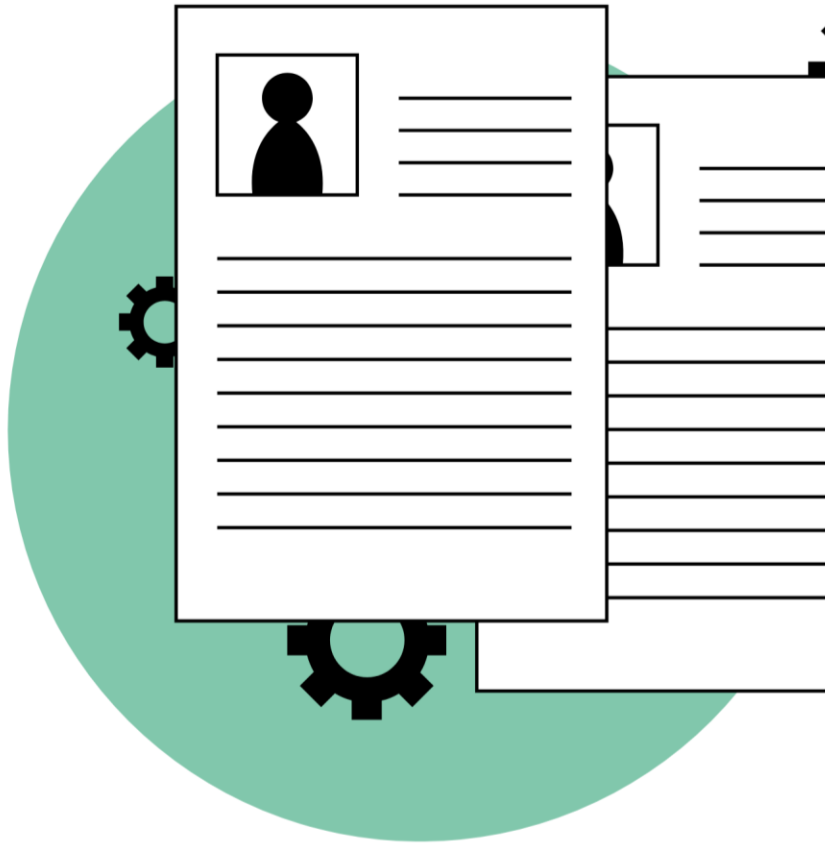
Non-binding consultation and equal treatment

Participation in this Open Market Consultation **does not constitute a condition for participation in any subsequent procurement procedure** and shall not result in any advantage, preferential treatment, or prejudice in the context of any future tender or contract award



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HOSPITAL PARTICIAPTING CONTEXT: MUMC+

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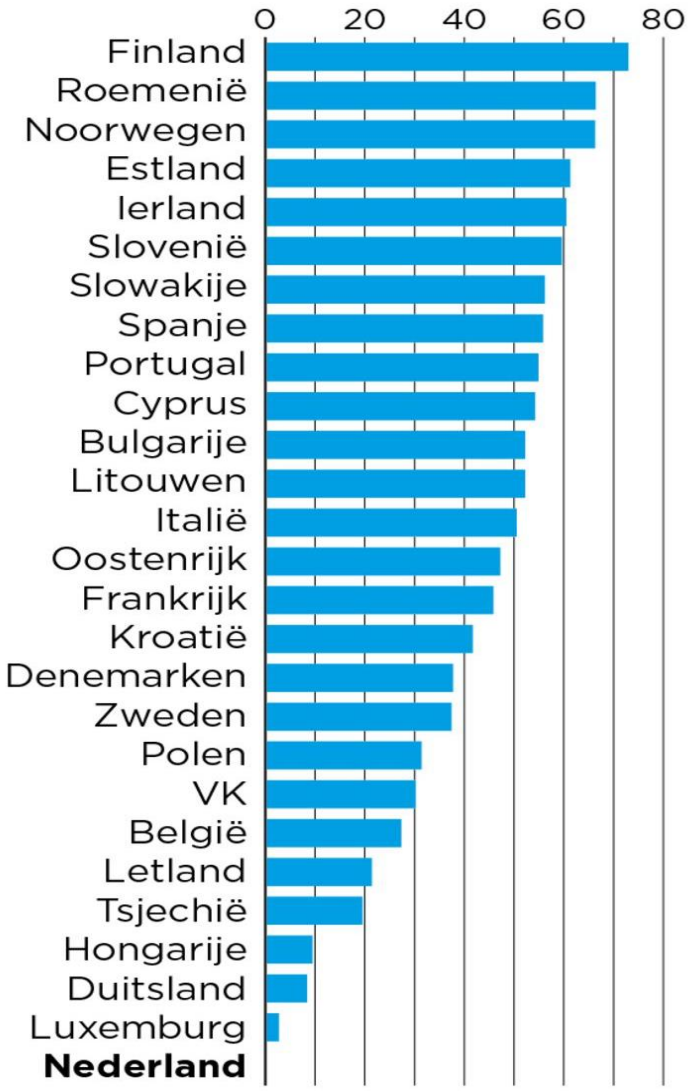
Fresh water bodies with good quality (%)



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RIWA - Maas annual report 2023

40% of the drinking water in the NL is generated from surface water.

7.000.000 people get their drinking water from the Maas!

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Monitoring of water quality in the river the Maas

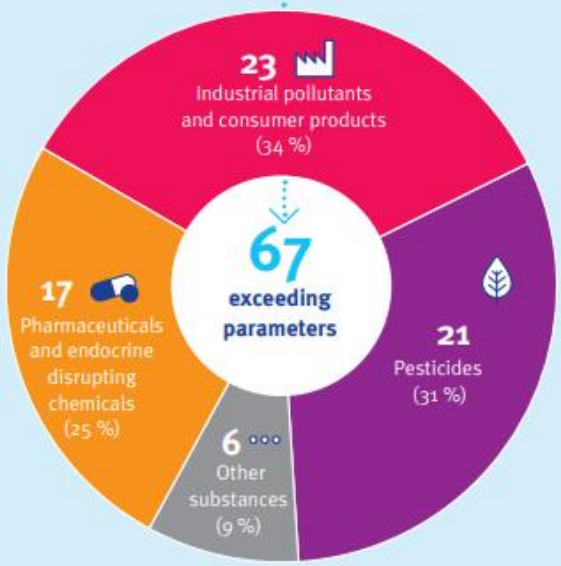
RIWA-Meuse assesses the water quality of the Meuse according to the target values of the European River Memorandum. Surface water that meets the ERM Target Values can be used to sustainably produce drinking water, making use of natural purification technologies.

104.470 measurements

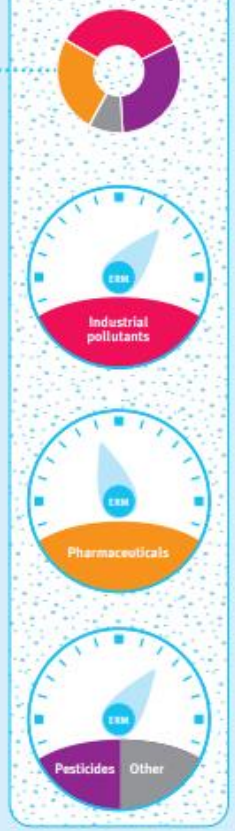
73.392 verifiable measurements

648 parameters

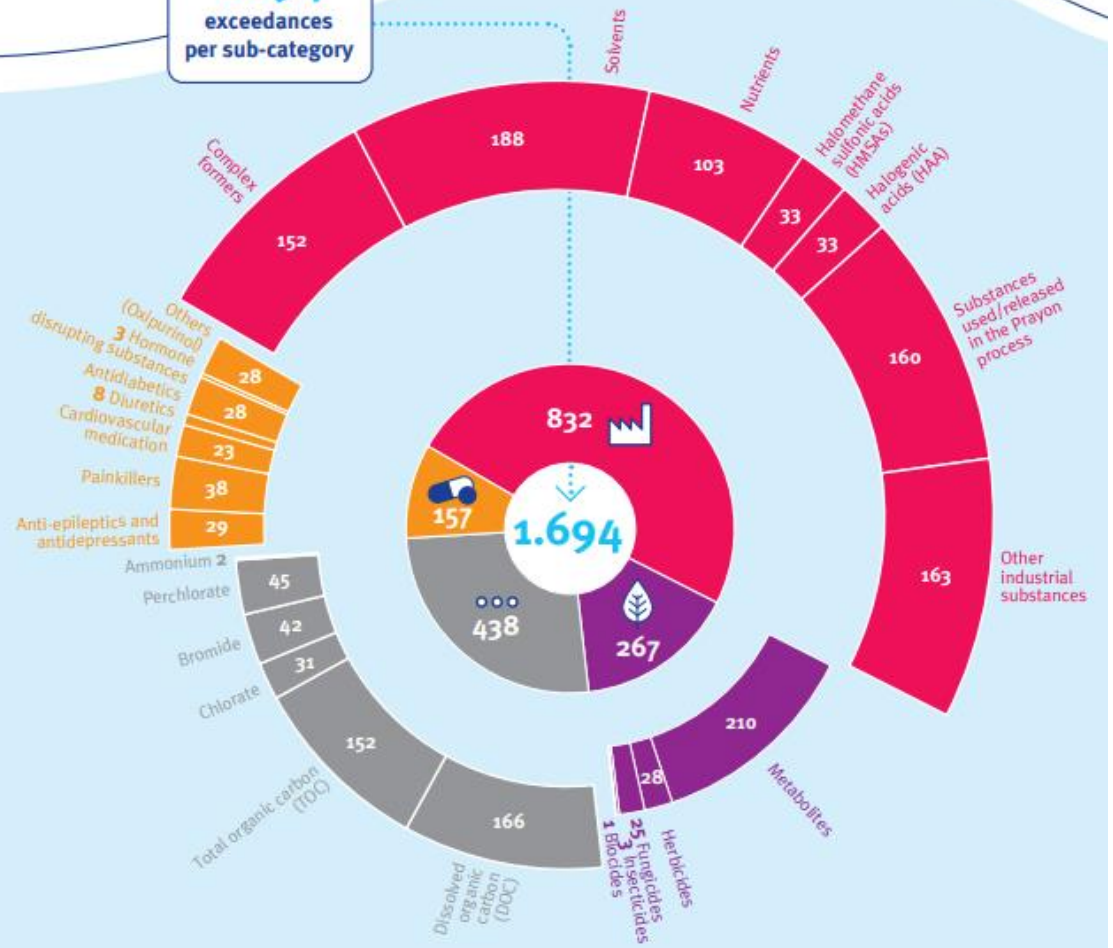
Proper monitoring and data management are crucial to safeguard the water quality of the Meuse as a source of drinking water.



67 exceeding parameters



1.694 exceedances per sub-category



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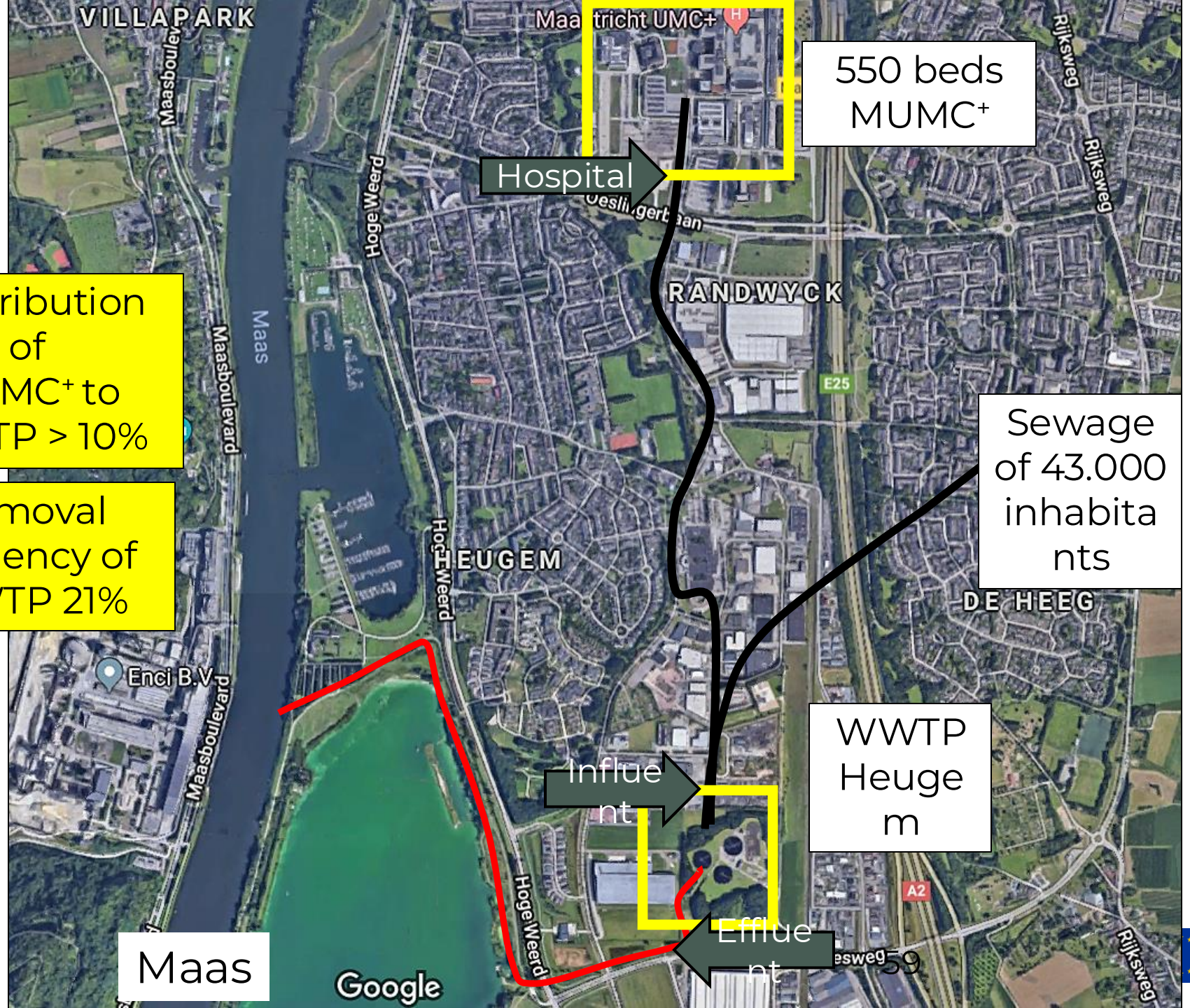
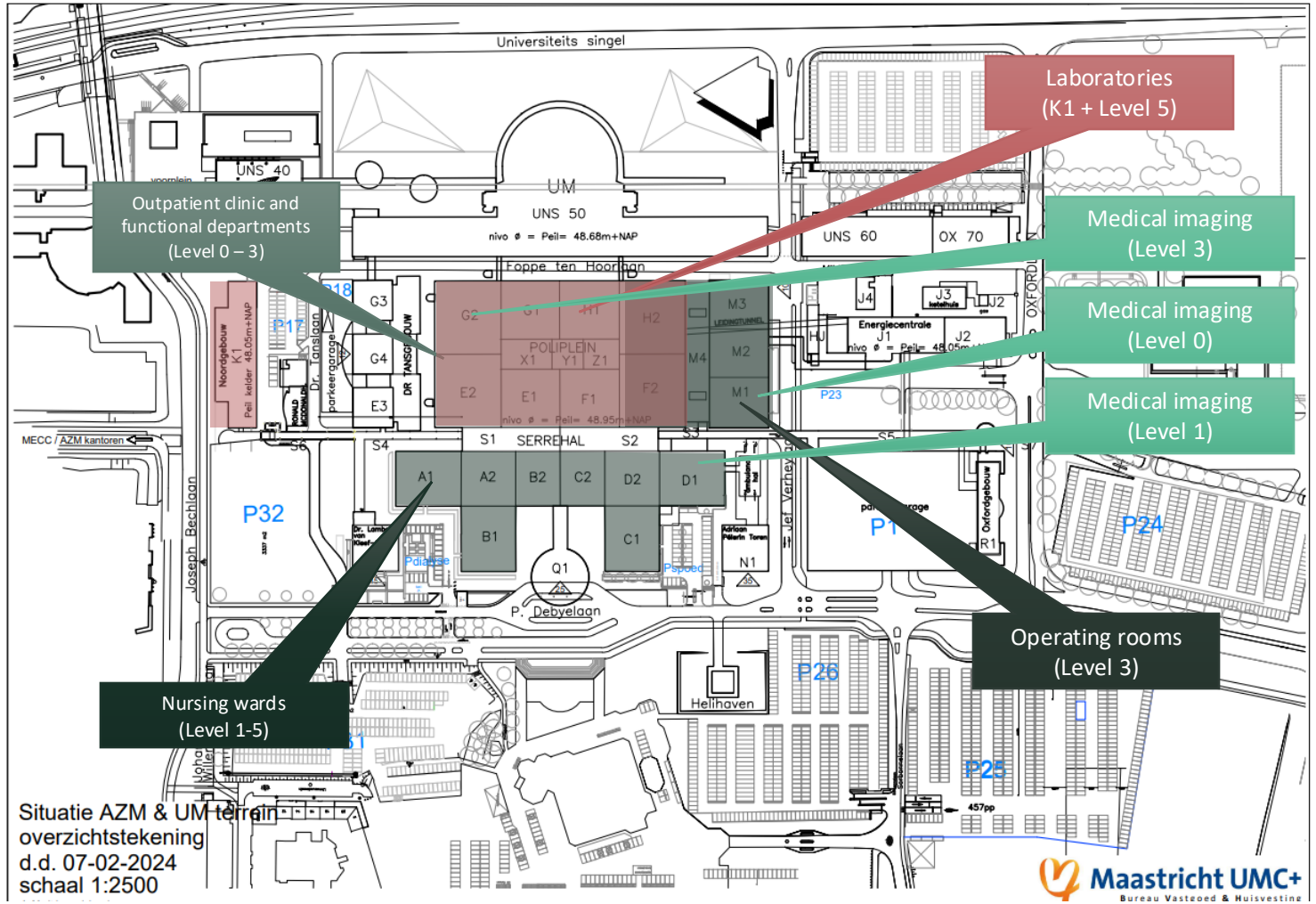
Watch List

benzotriazoles
amisulpride
azitromycine
candesartan
carbamazepine
citalopram
claritromycine
diclofenac
furosemide
gabapentine
hydrochloorthiazide
irbesartan
metoprolol
propranolol
sotalol
sulfamethoxazol
trimethoprim
venlafaxine

B.Janssen, unpublished





MUMC has limited space for central solutions

Looking for indoor decentral solutions at high impact departments
- Radiology
- ICU
- Oncology

Solution → testcase before rebuilding of some parts of the MUMC+

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Participating Hospital context The Netherlands

The Netherlands is represented in THERESA PCP by **Maastricht University Medical Center+ (Maastricht UMC+, also referred to as AZM – Academisch Ziekenhuis Maastricht)**, one of the leading university hospitals in the country. Maastricht UMC+ provides comprehensive tertiary care and serves as a regional referral center for Limburg province and surrounding areas. The hospital faces unique wastewater management challenges due to its size, high cooling water demand, and advanced medical services.

Key Characteristics of Maastricht UMC+:

- Annual water consumption: Approximately 160,000 m^3/year, with significant summer increase due to cooling systems
- Estimated sewage flow: ~120,000 m^3/year (~75% of water input)
- Hospital size and specialization: Large university hospital (~550 beds) providing oncology, surgery, intensive care, research, diagnostics, maternity, and advanced medical procedures
- Wastewater characteristics: Highly diverse contaminants due to comprehensive services, including cytostatics (oncology), antibiotics (ICU, surgery), contrast agents (radiology), and radioactive isotopes (nuclear medicine)

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Hospital participants context The Netherlands

Why Maastricht UMC+?

Maastricht UMC+ is strategically important for THERESA because it represents **large-scale, research-intensive hospital environments** with specific challenges:

- **High wastewater volume:** 330 m^3/day places Maastricht UMC+ among the largest wastewater generators in THERESA, requiring **scalable, high-capacity treatment solutions**.
- **Cooling-related seasonal variability:** Summer increases in water consumption (and wastewater) due to cooling systems create **variable hydraulic loads** that treatment systems must accommodate.
- **Segregated radioactive wastewater:** Maastricht UMC+ operates **holding tanks** for radioactive streams (nuclear medicine, PET scans), demonstrating existing infrastructure for partial segregation. This creates opportunities for **targeted treatment approaches** (radioactive streams handled separately; remaining mixed HWW treated centrally).
- **Full BMS integration (24/7):** Maastricht UMC+ has a **comprehensive Building Management System** that monitors all utilities, HVAC, energy, and water systems in real-time. Treatment solutions can be integrated into this existing digital infrastructure.
- **Severe outdoor space limitation: 6×8 m near main sewage pit,** among the most constrained outdoor spaces in THERESA. Suppliers must design **extremely compact, vertically stacked, or indoor-deployable systems**

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What suppliers need to know about Maastricht UMC+?

- **Wastewater Infrastructure:**

Maastricht UMC+ discharges through **one main discharge point** plus **two auxiliary points**, with **no centralized pre-treatment** beyond grease traps, plaster traps, and amalgam separators (localized, not centrally managed). The hospital **does not segregate most wastewater streams**, except for radioactive wastewater from nuclear medicine, which is held in decay tanks before discharge.

- **Space limitations:**

Maastricht UMC+ faces the **most severe outdoor space constraint** among all THERESA hospitals:

  - **Available outdoor space:** 6×8 m near main sewage pit (48 m^2 total)
  - **Implications:** Treatment systems must be extremely compact, vertically stacked (multi-story reactors), or deployed indoors (basement, utility room).
  - **Alternative:** Containerized systems (e.g., 20-foot shipping container with integrated treatment modules) could fit within 6×8 m footprint

- **Operational and Maintenance Capacity:**
  - **Staffing:** 50 FTE facility staff, with supervision available but all specialized work outsourced to contractors.
  - **Maintenance strategy:** Hospital staff can perform routine checks (visual inspections, basic alarm acknowledgment), but complex tasks (membrane cleaning, UV lamp replacement, chemical refilling) handled by external contractors.
  - **Training requirements:** Treatment systems must include clear, intuitive HMIs (touch-screen interfaces with icons, automated alerts) and comprehensive training for both hospital staff and external contractors

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What suppliers need to know about Maastricht UMC+?

Dutch Regulations:

- **RIVM (National Institute for Public Health and the Environment) Guidance:** "Pharmaceuticals in the environment – monitoring and risk assessment" (extensive reports on pharmaceutical contamination and AMR risks).
- **Waterbesluit (Water Decree):** Discharge limits negotiated between hospitals and regional water authorities (no standardized national pharmaceutical limits yet).
- **ARB/ARG focus:** National surveillance programs track antibiotic resistance in wastewater; hospitals may face future requirements to reduce ARB discharge.
- **EU Drivers:** Revised Urban Wastewater Treatment Directive (2024/3019), Water Framework Directive, One Health Action Plan Against AMR.

Water Reuse Potential:

The Netherlands is a **global leader in water reuse research and policy**. Studies show that treated WWTP effluents could reduce freshwater abstraction by up to **17% nationally** if advanced post-treatment (microfiltration + ultrafiltration) is applied, or **13% if reverse osmosis** is used for high-purity water recovery.

THERESA solutions that enable non-potable water reuse (irrigation, toilet flushing, cooling towers) are particularly relevant for Maastricht UMC+, given the hospital's high cooling water demand.

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Next steps

IF YOU ARE A POTENTIAL SUPPLIER, PLEASE:

- **SIGN UP FOR THE FOLLOWING ONLINE EVENTS: JANUARY 13/19/23/26 AND FEBRUARY 26**

- **PROVIDE FEEDBACK VIA:**
  - QUESTIONNAIRE
  - Q&A

- **SEARCH FOR POTENTIAL PARTNERS**
  - PITCH IN THE FOLLOWING EVENTS
  - USE OUR MATCHMAKING TOOL

- **SHARE THE PROJECT AND THE OMC WITH STAKEHOLDERS OF INTEREST**

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Key dates

22 December 2025 –
28 February 2026

Open Market Consultation
Events
Questionnaire
Matchmaking

May 2026

Tender Publication

Evaluation of bids

Contract award

January 2027–March 2027

Phase 1.
Solution Design

July 2027–April 2028

Phase 2.
Prototype development

August 2028–May 2029

Phase 3.
Validation in real operational environment

OMC

Tendering

Execution

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...AND REMEMBER!

Events	Dates	Topic
Spain	January 08	General presentation
Estonia	January 13	Introducing to PCP and tendering
Poland	January 19	SOTA, Functional & Technical Requirements
Belgium	January 23	Legal, Ethical & Interoperability Aspects
The Netherlands	January 26	Verification, Validation and Exploitation
Wrap-up event	February 26	Wrap up of OMC findings, main messages

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Q&A

Ask away!

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