



Strategies for a Water-Resilient Clean Industrial Deal: A Policy Blueprint

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Executive Summary



The announcement of a ‘Clean Industrial Deal’ comes a critical juncture in balancing industrial competitiveness with environmental sustainability, facing global competition and internal challenges such as regional economic disparities and rising energy costs. Water management, crucial for industrial and environmental goals, is threatened by climate change, pollution, and inefficient practices, exacerbating water scarcity and degrading water quality. This poses significant risks to European competitiveness, citizens' health, and the EU's ability to meet its 2050 targets.

This policy brief recommends the Commission to incorporate the water dimension into its Clean Industrial Deal through:

1. The Creation of a New Circular Water Efficiency Framework;
2. Accelerating Innovation with the Clean Water Innovation Fund (CWIF);
3. Enhancing Digitalisation in Industrial Water Management with Advanced Monitoring Mechanisms.

These measures will enhance the EU's competitiveness, support decarbonisation efforts, and ensure sustainable industrial practices, positioning Europe as a global leader in green technology and water-efficient innovations. Public-private partnerships and regional targeting will make the initiative financially viable and secure broad political support.

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A photograph of an industrial refinery or chemical plant at dusk. The scene is filled with tall distillation columns, complex piping, and storage tanks. Many lights are on, creating a warm glow against the cool blue twilight sky. In the foreground, there's a large white storage tank on the left and a line of small evergreen trees. The overall atmosphere is industrial and serene.

Setting the scene



Introduction

The European Union (EU) is at a pivotal moment in its quest to harmonise industrial competitiveness with environmental sustainability. As global economic and political landscapes evolve, the EU faces increased competition in the race for clean technology leadership. Countries such as the United States and China have taken bold steps to dominate emerging green industries, creating pressure on Europe to adapt and innovate. At the same time, internal challenges - including regional economic disparities, rising energy costs, and dependencies on external resources - highlight the need for a unified strategy that advances the EU's industrial resilience and strategic autonomy. As the European Environmental Bureau (EEB) aptly puts it, "EU competitiveness and a resilient economy depend on accelerating the green transition."¹ This statement underscores the imperative for the EU to align industrial strategy with its environmental goals.

Against this backdrop, the European Commission's proposal for a "Clean Industrial Deal" aims to integrate industrial and environmental objectives into a cohesive framework which would position Europe at the forefront of the green industrial transformation while ensuring its global competitiveness.² The Institute for Climate Economics (I4CE) highlights that the success of the Clean Industrial Deal hinges on prioritising Europe's decarbonisation efforts as a central objective, positioning it as a cornerstone of the EU's industrial strategy.³ However, a critical risk lies in overlooking the essential role of a robust and sustainable industrial water management framework in achieving these goals.⁴ As the saying goes, "There is no green without blue." Europe cannot position itself as a leader in green technology without addressing the pressing challenges

¹ See The European Environmental Bureau, "Von der Leyen gets a second term, so does a weakened Green Deal...", Press Release [Online], 18th of July 2024. Available at: <https://eeb.org/von-der-leyen-gets-a-second-term-so-does-a-weakened-green-deal/>

² As announced by Ursula von der Leyen, *Europe's Choice. Political Guidelines for the Next Commission Mandate 2024 - 2027*, European Commission [online], 18th of July 2024. Available here: https://commission.europa.eu/document/download/e6cd4328-673c-4e7a-8683-f63ffb2cf648_en?filename=Political%20Guidelines%202024-2029_EN.pdf

³ See Ciarán Humphreys, *Making a Success of the Clean Industrial Deal. A step forward for green industrial policy, or another stumbling block?*, Institute for Climate Economics (I4CE) [Online]. Available at: <https://www.i4ce.org/wp-content/uploads/2024/09/Making-a-Success-of-the-Clean-Industrial-Plan.pdf>

⁴ For instance, the energy industry today is the largest abstracter of water. See Eurostat, "Annual freshwater abstraction by source and sector", last update on the 5th of July 2024. Available at: https://ec.europa.eu/eurostat/databrowser/view/env_wat_abs_custom_10412334/default/table

of increasing water scarcity, stressing the need for optimised management practices across all economic sectors.⁵

Identifying the Problem: Water as a Critical Challenge for Industry

Water, a too-often-overlooked cornerstone of industrial systems, epitomises the resource challenges inherent in the EU's green transition. As a critical input for industrial processes - ranging from manufacturing and cooling to transport and cleaning - water is fundamental to Europe's industrial and economic systems. However, climate change, pollution, and inefficient management practices have worsened water scarcity and degraded water quality across Europe, posing a threat to European competitiveness, its present - and future - industrial resilience, citizens' health, and the Union's ability to meet its 2050 targets.⁶

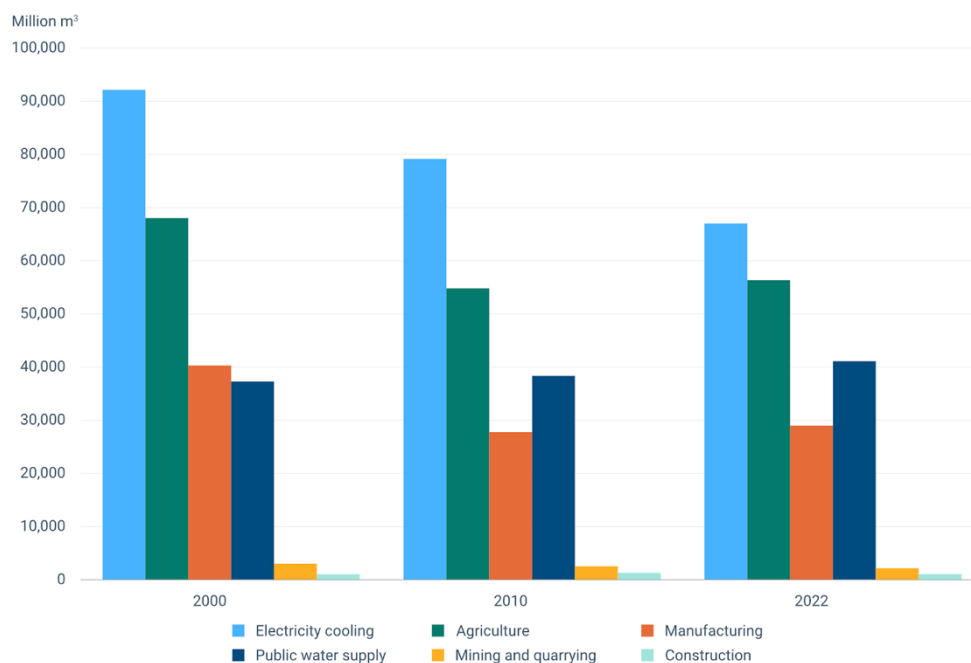


Figure 1: Water Abstraction by sector in the 27 EU Member States, 2000 - 2022. *Source:* EEA

In its first Climate-Risks Assessment, the European Environmental Agency highlighted that water management is one of the most pressing challenges facing Europe.⁷ The growing frequency of extreme weather events underlines the escalating unpredictability of water availability, exposing critical vulnerabilities in existing industrial practices and inefficiencies in

⁵ See Kira Taylor, "Green Transition Impossible Without 'Blue Economy', EU says", *Euractiv* [Online], 6th of May 2021. Available at: <https://www.euractiv.com/section/energy/news/green-transition-impossible-without-blue-economy-eu-says/>

⁶ See European Commission, "2050 long-term strategy. Striving to become the world's first climate-neutral continent by 2050", European Commission's website [Online]. Available at: https://climate.ec.europa.eu/eu-action/climate-strategies-targets/2050-long-term-strategy_en

⁷ See European Environmental Agency, *European Climate Risk Assessment* [Online], 11th of March 2024. Available at: <https://www.eea.europa.eu/publications/european-climate-risk-assessment>

water resource management. Aging infrastructure, fragmented governance, and inconsistent regulatory frameworks compound these challenges, undermining the EU's ability to meet its broader environmental and industrial goals.

Addressing Current Legislative Gaps: Integrating Quantity and Efficiency into Management Practices

While significant legislative progress has been made to ensure water quality through the Water Framework Directive, a robust management framework targeting water quantity and efficiency remains a notable gap. As recently noted by environmental engineers and policy experts such as Dr. Pierre Strosser and Prof. Sarah Hendry, this gap has become increasingly incongruent with Europe's environmental realities.⁸ This disconnect has significant implications for water-intensive sectors such as chemicals, semiconductors, and pharmaceuticals, which play a vital role in the EU's industrial and technological strategies.⁹

Moreover, while the EU's Water Framework Directive (2000/60/EC) establishes the basis for managing water quality, its failure to comprehensively address water quantity management reflects a significant policy gap.¹⁰ This implicit assumption of water abundance is increasingly misaligned with realities in water-stressed regions across Europe.

⁸ See Pierre Strosser, Thomas Dworak, Pedro Andrés Garzon Delvaux, Maria Berglund, Guido Schmidt, Jaroslav Mysiak, Maggie Kossida, Iacovos Iacovides, Victoria Ashton, *Gap Analysis of the Water Scarcity and Droughts Policy in the EU*, European Commission [Online], August 2012. Available at: https://www.researchgate.net/profile/Pedro-Andres-Garzon-Delvaux/publication/308652435_Gap_Analysis_of_the_Water_Scarcity_and_Droughts_Policy_in_the_EU/links/57ea468608aef8bfcc99014a/Gap-Analysis-of-the-Water-Scarcity-and-Droughts-Policy-in-the-EU.pdf and Sarah Hendry, "The EU Water Framework Directive – Challenges, Gaps and Potential for the Future", *Journal for European Environmental & Planning Law* [Online], 14 (3-4), pp.249 – 268, 6th of December 2017. Available at: https://brill.com/view/journals/jeep/14/3-4/article-p249_249.xml

⁹ See Thomas Dworak, Maria Berglund, Cornelius Laaser, Pierre Strosser, Josselin Roussard, Benoit Grandmougin, Maggie Kossida, Ismini Kyriazopoulou, Julio Berbel, Solveig Kolberg, Juan A. Rodríguez-Díaz, Pilar Montesinos, *EU Water Saving Potential. Part 1 – Report*, Ecologic – Institute for International and European Environmental Policy [Online], 19th of July 2007. Available at: <https://helvia.uco.es/bitstream/handle/10396/8756/berbel2.pdf?sequence=1> and Claire Hoolohan and Alison L. Browne, "Reimagining Spaces of innovation for Water Efficiency and Demand Management: An Exploration of Professional Practices in the English Water Sector", *Water Alternatives* [Online], 11 (3), pp.957 – 978, 2018. Available at: <https://www.water-alternatives.org/index.php/alldoc/articles/vol11/v11issue3/472-a11-3-25/file>

¹⁰ See Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, European Union Law [Online]. Available at: <https://eur-lex.europa.eu/eli/dir/2000/60/oj>

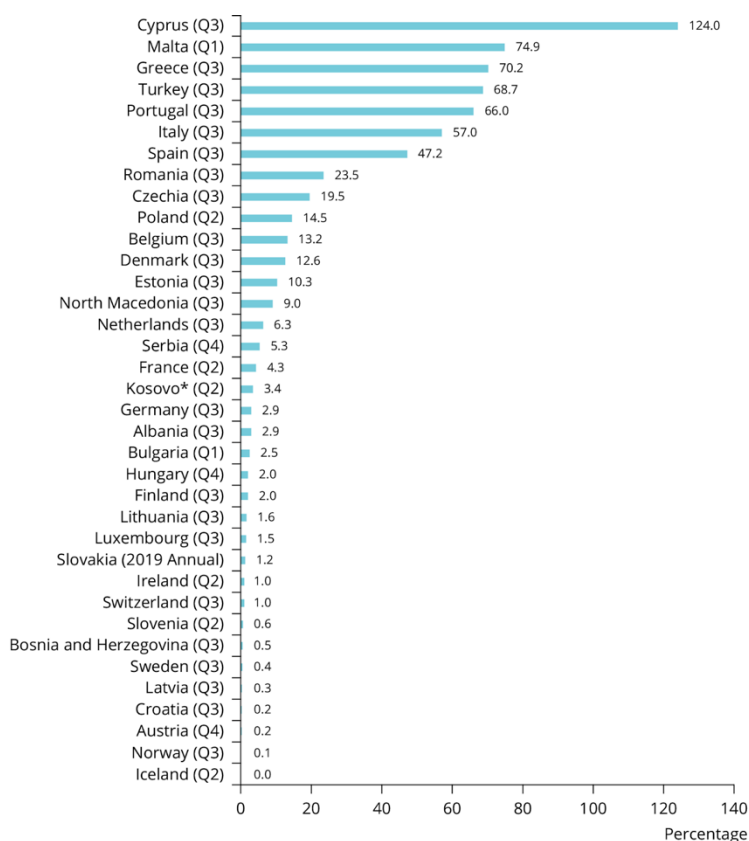


Figure 2: Seasonal water scarcity conditions for European countries in 2019. Water Exploitation Index (WEI) of more than 20% indicate water scarcity, when 40% means severe water scarcity. Source: EEA.

Addressing these legislative inadequacies requires a holistic approach that integrates both quality and quantity dimensions of water management into the Clean Industrial Deal. Such an approach should establish enforceable efficiency targets, mandate the adoption of advanced water reuse and recycling technologies, and introduce stringent regulations on water abstraction in resource-scarce regions.¹¹ Furthermore, embedding water considerations into sector-specific policies - also addressing emerging sectors such as batteries, semiconductors, hydrogen and datacentres - would

ensure a future alignment of water management strategies with the Union's broader decarbonisation and circular economy agendas¹². Establishing a cohesive framework for the Clean Industrial Deal will require leveraging mechanisms such as a Cleantech Investment Plan - led by the European Investment Bank and the Innovation Fund - and exploring fiscal flexibility through reallocating unused funds from the Recovery and Resilience Facility.¹³

The escalating pressures on water resources - driven by climatic shifts, economic competition, and historical mismanagement - calls for a systemic re-evaluation of water's role in industrial policy. Without an integrated approach to water management, the green transition will remain incomplete, thereby undermining the Union's ambition to lead in green technologies. A blue gap will ultimately compromise the Union's decarbonisation objectives, exacerbate regional

¹¹ See David R. Kanter, Olivia Chodos, Olivia Nordland, Mallory Rutigliano & Wilfried Winiwarter, "Gaps and opportunities in nitrogen pollution policies around the world", *Nature Sustainability* [Online], Vol.3, pp. 956 – 963, 6th of July 2020. Available at: <https://www.nature.com/articles/s41893-020-0577-7>

¹² See Sara Amoroso and Roberto Martino, "Regulation and technology gap in Europe: The role of firm dynamic", *European Economic Review* [Online], Vol. 129, October 2020. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0014292120301811>

¹³ For more information, see the European Innovation Fund on the European Commission's website: https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/innovation-fund_en

disparities, and leave key sectors vulnerable to resource constraints, ultimately jeopardising Europe's global industrial competitiveness.



Policy Recommendations

Policy recommendations

1. A New Circular Water Efficiency Framework

Although the Industrial Emission Directive (IED) establishes benchmarks for water usage, it does not encompass key-industries such as the emerging industries, nor does it incorporate binding provisions on circularity in water management, leaving significant potential for improvement in addressing water efficiency and resilience in the EU's evolving industrial landscape.¹⁴

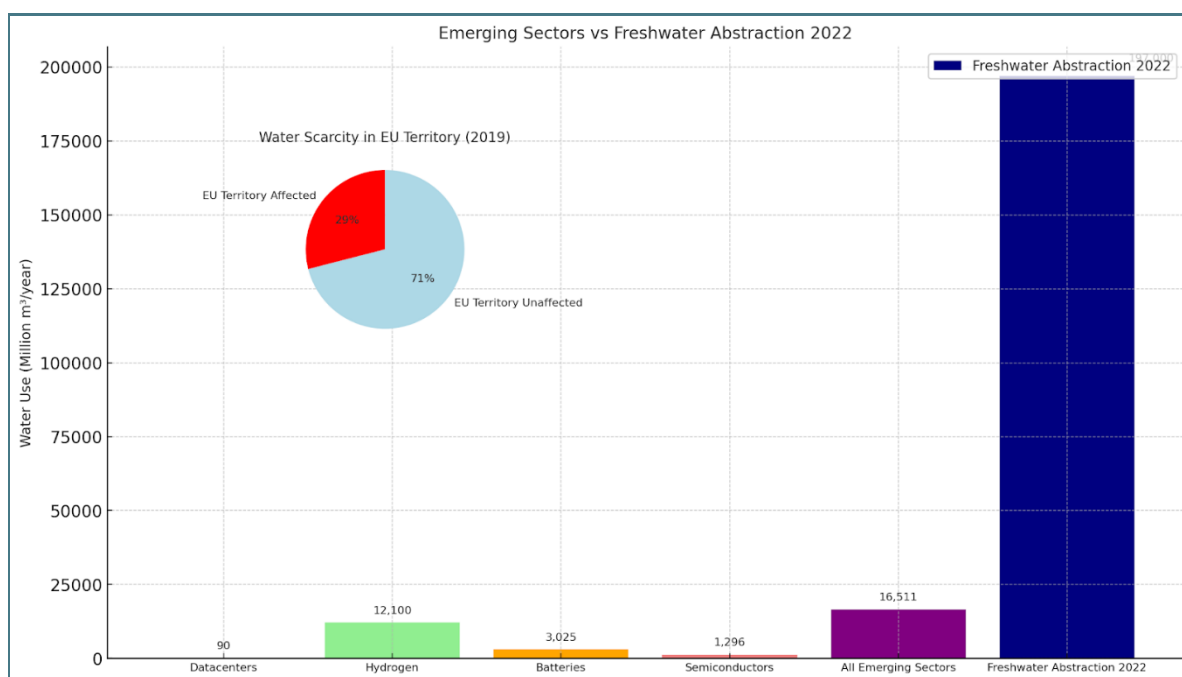


Figure 3 - The projected water use of four emerging sectors by 2050 (data centres, hydrogen, batteries, semiconductors). These constitute about 8% of the total 2022 freshwater abstraction (198,000 million m³/year).¹⁵

Since 29% of the EU territory is currently affected by water scarcity, filling this gap is quintessential for industrial competitiveness, employment rate and citizen health (see **Figure 6**). The cost of inaction is five times higher than the required investment to address water-related issues in industry.¹⁶ There is a need for a new framework that should

¹⁴ Emerging industries being hydrogen, data centres, semiconductors for instance. For reference regarding the IED, see Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on Industrial Emissions (integrated pollution, prevention and control), Available at: <https://eur-lex.europa.eu/eli/dir/2010/75/oj>

¹⁵ Data extracted from Water Europe and WSP, "Socio-Economic Study on the Value of the EU Investing in Water", *Water Europe* [Online], 14th of October 2024. Available at: <https://watereurope.eu/wp-content/uploads/2024/10/Water-Europe-Socio-Economic-Study-1.pdf>

¹⁶ According to CDP, "A Wave of Change. The role of companies in building a water-secure world", *CDP Global Water Report 2020* [Online], 1st of March 2021. Available at: https://cdn.cdp.net/cdp-production/cms/reports/documents/000/005/577/original/CDP_Water_analysis_report_2020.pdf?1617987510

address context-specific challenges, particularly in water-stressed regions such as Romania, Spain, Italy, Portugal, Greece, Turkey, Malta, and Cyprus. It should also establish tiered reduction targets tailored to each region, with milestones set for the short, medium, and long term. These measures aim to ensure steady progress towards resilience. It is urgent for the Clean Industrial Deal:

- **To build upon the existing industry-specific water use benchmarks under the IED to create a novel water efficiency framework** for the industrial sector reflecting context-specific challenges, especially for water-stressed regions (Romania, Spain, Italy, Portugal, Greece, Turkey, Malta and Cyprus), while establishing tiered, regionally tailored reduction targets with short-, medium-, and long-term milestones to ensure steady progress towards resilience. Include emerging industries such as semiconductors, data management centres, batteries, and hydrogen production in the scope. China is already working on a water efficiency metric to increase its industrial's water productivity.¹⁷
- **To establish binding circularity targets on water reuse and develop a Best Available Techniques (BAT) reference document** with a focus on water efficiency technologies. Such requirements should be implemented immediately to minimise freshwater withdrawal along with provisions on mandatory implementation of economically feasible water-saving technologies (e.g., closed-loop water systems) for large enterprises. Not only will this allow water efficiency in industry, but it will trigger nutrient extraction from industrial wastewater which

¹⁷ See Feng Hu, Debra Tan, Yuanchao Xu, *Yangtze Water Risks, Hotspots and Growth. Avoiding Regulatory Shocks from the March to a Beautiful China*, China Water Risks (CWR) [Online], August 2019. Available at: <https://www.chinawaterrisk.org/wp-content/uploads/2019/09/CWR-Yangtze-Water-Risks-Hotspots-Growth.pdf>

will in turn benefit agriculture while fostering the application of the Urban Wastewater Directive (UWWD).¹⁸

- **To establish provisions on investments in satellite data and digital water metering to track industrial water withdrawals and discharges firstly targeting larger enterprises (>€50 million turnover).**
- **To expand the remit of the European Environment Agency (EEA) to oversee industrial compliance across Member States** and enable EEA to use satellite data and digital water metering to track industrial water withdrawals and discharges.

2. Accelerating Innovation with the Clean Water Innovation Fund (CWIF)

As the Letta’s report stated, Europe needs not to be a mere market but a globally competitive platform for innovation.¹⁹ This can be achieved through a dedicated €8 billion Clean Water Innovation Fund (CWIF) under the EU Innovation Fund or the Recovery and Resilience Facility (RRF).²⁰

Box 1: Interview made with the EESC's Consultative Commission on Industrial Change

For almost two years now, the EESC through its Consultative Commission on Industrial Change has been working on promoting an [European Blue Deal](#). This aims to recognise the vital role of water, incentivising farmers, industries and other crucial water users to adopt new technologies and practices to support the sustainable use of water.

Based on this fight, they “note that the EU can take leadership in water technologies” and believe that “water should be made a strategic priority in the next Multiannual Financial Framework (MFF)”. It is now time for the Clean Industrial to pave the way to the upcoming Water Resilience Strategy recognising the vital role of water and thus remove legislative obstacles at regional, national and EU level, hindering the uptake of water-efficient technologies in industry. They also highlights the need for a “human (skills, lifelong learning) approach”.

¹⁸ See Allan Buckwell and Elisabeth Nadeu, *Nutrient Recovery and Reuse (NRR) in European Agriculture. A Review of the issues, opportunities, and actions*. Rural Investment Support for Europe (RISE) Foundation [Online], 2016. Available at: https://www.organicseurope.bio/content/uploads/2020/06/2016_RISE_NRR_Full_EN_compressed.pdf?dd

¹⁹ See Enrico Letta, *Much More than a Market*, Consilium Europa [Online], April 2024. Available at: <https://www.consilium.europa.eu/media/hy3j24sm/much-more-than-a-market-report-by-enrico-letta.pdf>

²⁰ See European Commission, *Recovery and resilience facility (RRF)*, European Commission’s website [Online], 11th of December 2024, from https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility_en and European Commission, *Innovation fund*, European Commission’s website [Online], 1st of December 2024. Available at: https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/innovation-fund_en

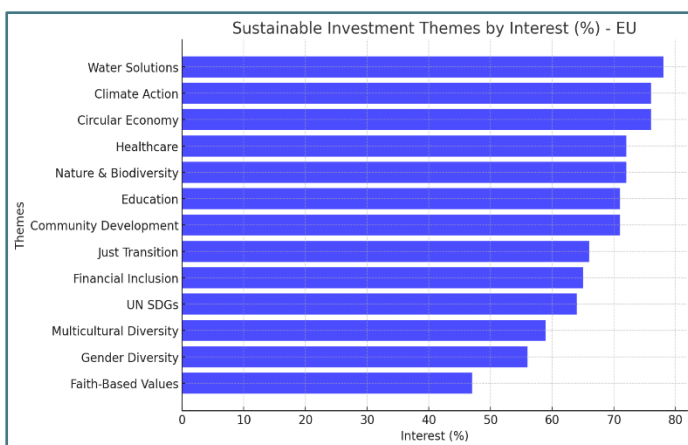


Figure 4: Sustainable Investment Themes by Interest (%). Note that water solutions rank highest. Source: Morgan Stanley Institute for Sustainable Investing

The creation of a dedicated Clean Water Innovation Fund (CWIF) under the EU Innovation Fund or the Recovery and Resilience Facility (RRF) can accelerate the development, scaling and deployment of advanced water reuse, recycling, and treatment technologies. By utilising blended finance mechanisms, the CWIF will attract significant private capital to

scale solutions, mitigate water stress, and ensure sustainable industrial practices across Europe. By offering first-loss guarantees, the EU will absorb initial losses in projects to mitigate risks for private investors.

Additionally, concessional loans at below-market rates will be offered to reduce financial barriers for innovative technologies. Alongside these efforts, result-based financing will be used to tie disbursements to the achievement of measurable outcomes related to water reuse and water efficiency. The implementation steps may look as follows:

Do you currently have any investments in the following sustainable investment themes?
No, I am interested but don't know how to invest in this theme

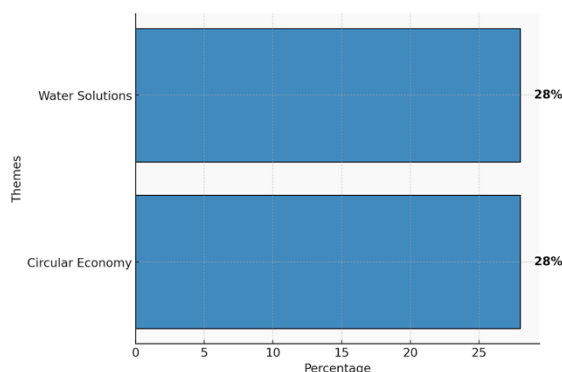


Figure 5: Poll conducted by the Morgan Institute for Sustainable Investment

- **Through the CWIF, an initial €6–8 billion will be allocated as seed funding** to reduce risk for private investors through guarantees, concessional loans, or co-financing mechanisms. This approach targets a leverage ratio of 1:3, thus aiming to attract €18–30 billion in private investments by partnering with institutional investors, asset managers, and corporate players in water-intensive sectors.²¹

²¹ See Methodological Appendix.

- **High-potential projects would be selected in three rounds (in year 2025, 2030 and 2035) by using a competitive call-for-proposals system**, inspired by the EU's current funding programme Horizon Europe (see *figure 6*). This will drive innovation in water reuse and efficiency technology in direct alignment with The Circular Economy Action Plan.
- **Co-create innovative, tailored financing solutions to pipeline projects** through collaboration with industrial leaders, technology innovators, and asset managers. Additionally, convene workshops to share best practices and attract investors.
- **The European Investment Bank will manage the fund** and provide key insight into the structuring of blended finance and public-private partnerships (PPPs).

Data Source: Morgan Stanley Institute for Sustainable Investing (2024)

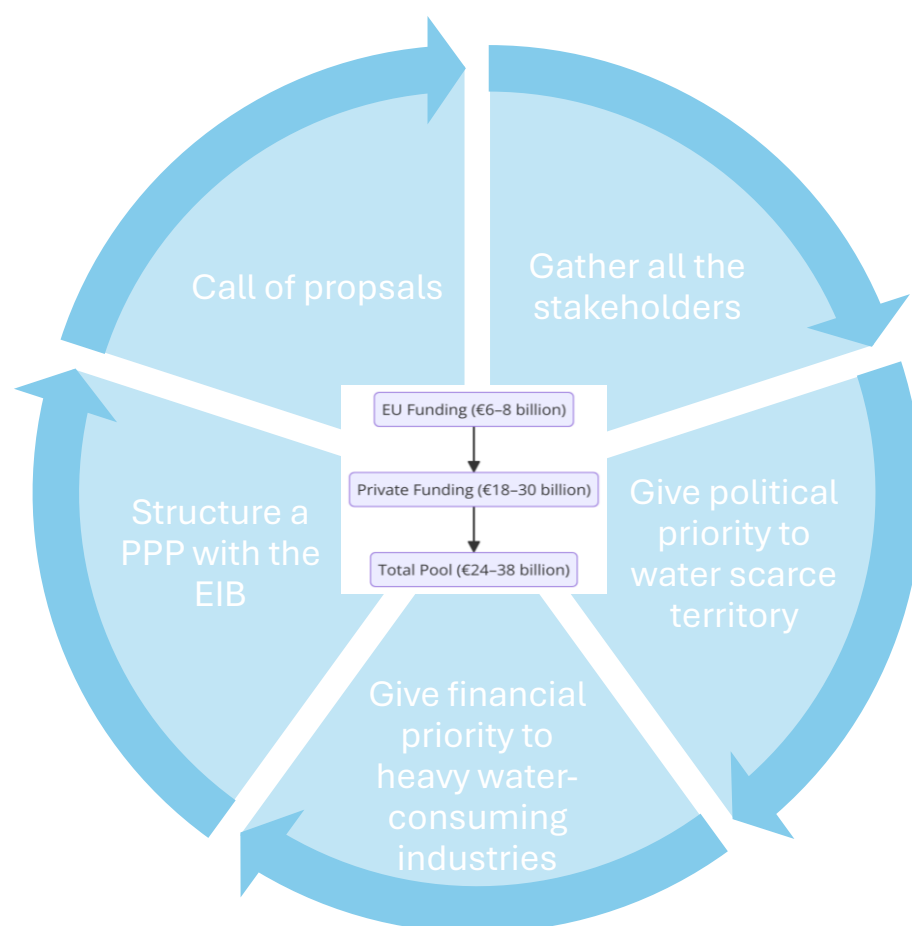


Figure 6 : CWIF mechanisms and objectives

3. Enhancing Digitalisation in Industrial Water Management with Advanced Monitoring Mechanisms

In order to incorporate the blue transition in depth, the ‘green and digital future’ must benefit European water resources management in industry. This would encourage the framing of a water productivity metrics into the Clean Industrial Deal’s performance indicators. This is essential for **aligning industrial activities with the EU's decarbonisation and resilience objectives**. This will help industries track and optimise their water use in relation to energy consumption and the EU drive innovation in water-efficient technologies and ensure that industries achieve measurable outcomes.

- **Deployment of smart measuring devices from spring to sea** to collect comprehensive data, enabling industries to implement resilient management strategies. Precise monitoring would provide accurate and actionable insights, significantly supporting EU-funded projects like iMermaid (see **Box 2**).²² This approach highlights how regional actions can drive impactful global outcomes.
- **Development of sector-specific “water-energy nexus” key performance indicators (KPIs)**, such as water consumption per megawatt-hour (MWh) for hydrogen production or cooling efficiency for data centres. These metrics should draw from best practices established in global research (e.g., International Energy Agency studies on hydrogen production efficiency)²³.

²² For more information, see European Commission, *Innovative solutions for Mediterranean Ecosystem Remediation via Monitoring and Decontamination from Chemical Pollution (iMERMAID)*, European Funding and Tenders portal [Online]. Available at: <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/how-to-participate/org-details/999999999/project/101112824/program/43108390/details>

²³ International Renewable Energy Agency (IRENA), *Green hydrogen: A guide to policies and technology costs*, IRENA [Online], 2020. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Nov/IRENA_Green_Hydrogen_breakthrough_2021.pdf

- **Setting conditionalities for subsidies and grants from the EU**, requiring industries to report water-energy metrics and demonstrate compliance with water-energy optimisation benchmarks (e.g., achieving 20% improvements in water use efficiency by 2030).

Case Study: Best Practice from EU-Funded Projects iMermaid

iMermaid is an EU funded project that aims at monitoring pollution from the ends of pipes to the sea. It is a transnational Mediterranean ambition to depollute the sea, but most importantly preventing Contaminants for Emerging Concerns (CoEC) from reaching the sea in the first place. This is made possible by precise monitoring of water throughout its users such as industries or agriculture.

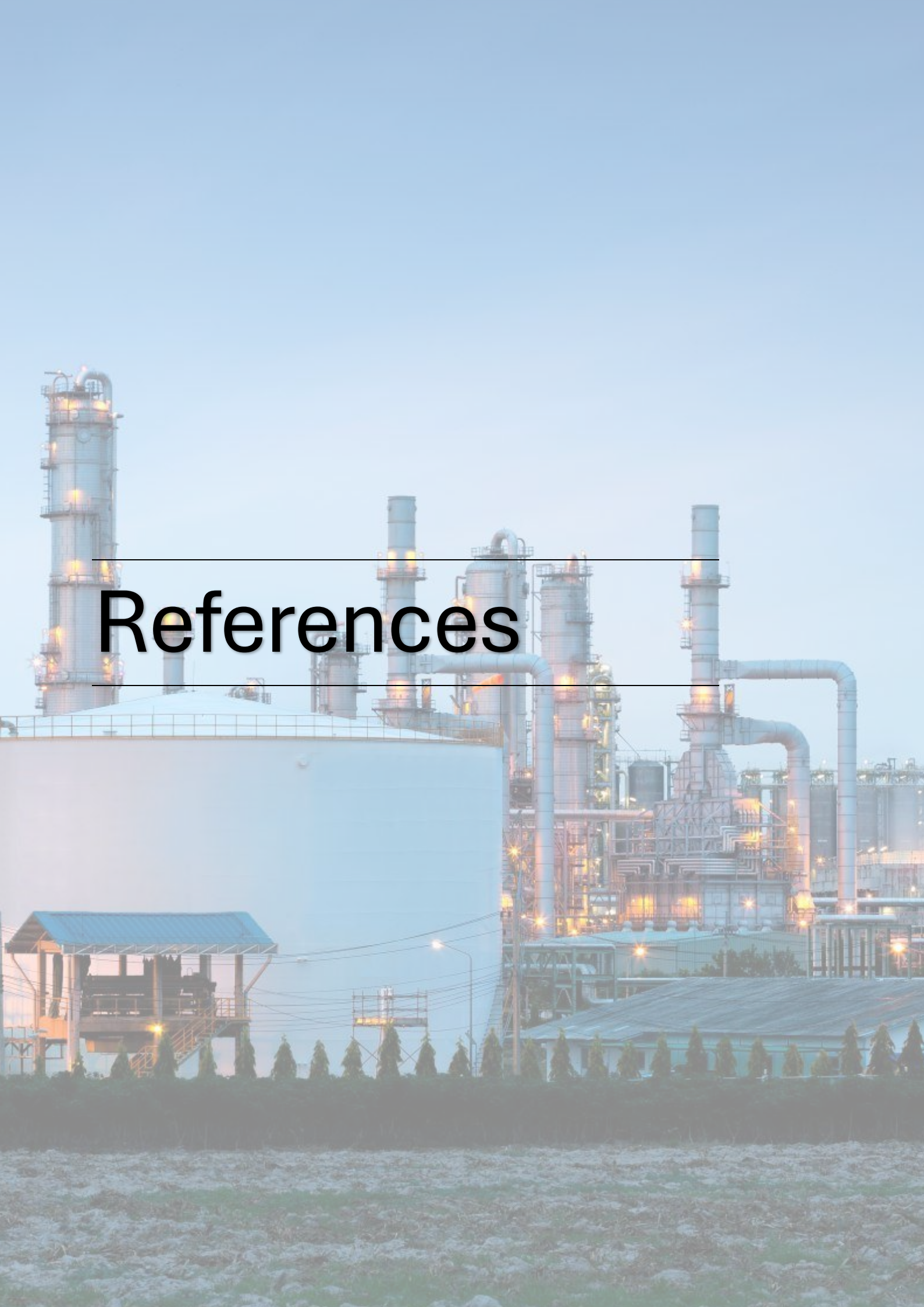


Box 2 : Case Study: EU-Funded project iMermaid

Viability and Feasibility of the Policies

	Economic Viability	Political Feasibility
Setting Water Efficiency Assessment in the Clean Industrial Act to enhance water management in industry	→ Protecting industries from water scarcity → Foster EU competitiveness → Bring energy prices down → Cost of inaction five times higher	→ Already experimented by global leaders → Built on the EEFPP → Experimented by EU-funded projects
Accelerating Innovation with the Clean Water Innovation Fund (CWIF)	→ Generate up to €20 billion in combined public-private financing. → Showcase best-practices examples → Position the EU as a global leader and exporter of water-efficient technologies	→ Built on regulatory frameworks → Allows for the compliance of EU targets with a minimal additional administrative burden → Encourage PPPs
Bolster the digitalisation of water management in industry	→ Encourage digital innovation → Allow more predictability regarding environmental uncertainties	→ Aligns with the EU Green Deal's goals, → Strengthening Europe's position as a global leader in clean technology and agenda setter

Table 3: Viability and feasibility of the abovementioned recommendations



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