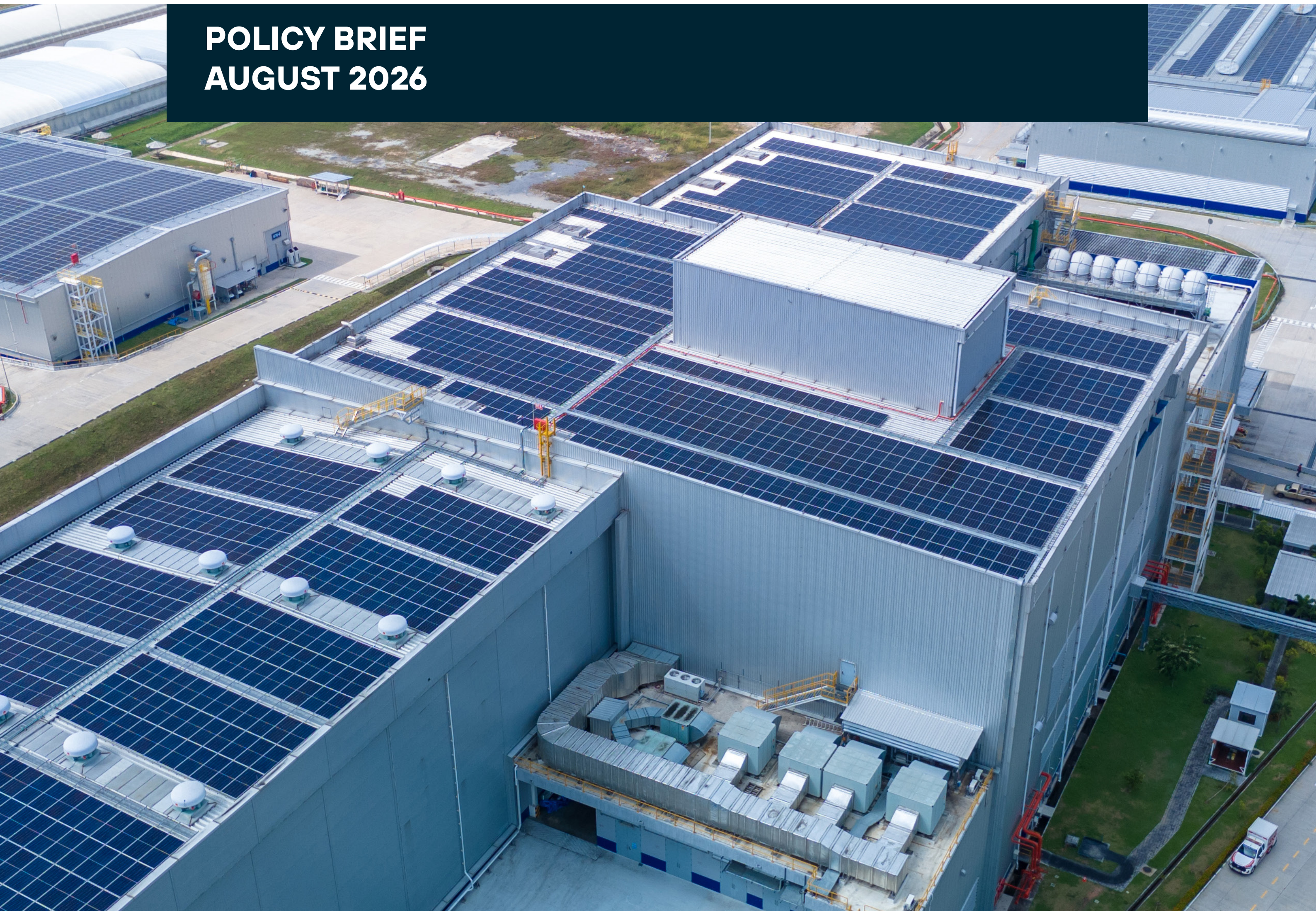
BELLONA EUROPA

Rue Breydel 42
1040
Brussels, Belgium

europa@bellona.org
eu.bellona.org

A criteria-based framework for effective industrial decarbonisation funding

POLICY BRIEF
AUGUST 2026



DISCLAIMER

Authors:
Francesco Lombardi Stocchetti
Mark Preston Aragonès

Content Editing & Design:
Rebecka Larsson

INTRODUCTION

The competitiveness of European industry is at the centre of the current policy debate and increasingly prominent in discussions on Europe's industrial and climate strategy. The proposal for the reform of the EU Emission Trading System (EU ETS) reflects the challenge at the centre of this debate: how to strengthen industrial competitiveness while maintaining the ambition of the transition towards climate neutrality. While views differ on the role and design of industrial support mechanisms, there is broad recognition that **industrial decarbonisation requires significant financial support**. This is also reflected in recent initiatives, including the proposal to strengthen industrial support through the Industrial Decarbonisation Bank, the Booster mechanism, and proposals to increase the share of ETS revenues directed towards industrial decarbonisation.

Bellona Europa has long advocated for the use of ETS revenues to support climate action, including industrial decarbonisation efforts, and has previously raised concerns about how these funds have been allocated by Member States. In 2024 alone, ETS auction revenues reached EUR 38.8 billion, representing a significant opportunity to drive the industrial transformation needed for European industries. While Article 10 of the EU ETS Directive outlines categories for Member States to spend these revenues, these remain broad and lack clear guidance on how funds should be directed to maximise climate impact, including on industrial decarbonisation.

With the proposal to increase the share of ETS revenues dedicated to industrial decarbonisation, alongside the development of new funding instruments such as the Industrial Decarbonisation Bank and the Booster mechanism, ensuring that public resources support effective and credible decarbonisation pathways is increasingly important. **Public funding should accelerate the transition towards climate neutrality, prioritising projects that deliver real emissions reductions, avoid locking in carbon-intensive pathways, and ensure that public support does not contribute to ineffective climate spending or greenwashing risks**.

To support this objective, Bellona has identified four key criteria to guide the allocation of public resources towards industrial decarbonisation:

1. Climate impact
2. System effect
3. Timing and scalability
4. Do no significant harm (DNSH) principle

These criteria are intended as a **practical framework for evaluating whether industrial decarbonisation projects supported through public funding are aligned with climate objectives and capable of delivering meaningful emissions reductions**. Rather than providing an exhaustive methodology or a rigid checklist for individual projects, the framework is intended to support discussions on how limited public resources can be prioritised to maximise climate impact. While not every project might fully satisfy every criterion, applying these principles together can help ensure that funding decisions are transparent, consistent and aligned with

Europe's industrial decarbonisation objectives. While they are particularly relevant for the allocation of ETS revenues, their application extends beyond ETS funding and can inform other public support mechanisms, including the future Industrial Decarbonisation Bank and other industrial decarbonisation programmes.

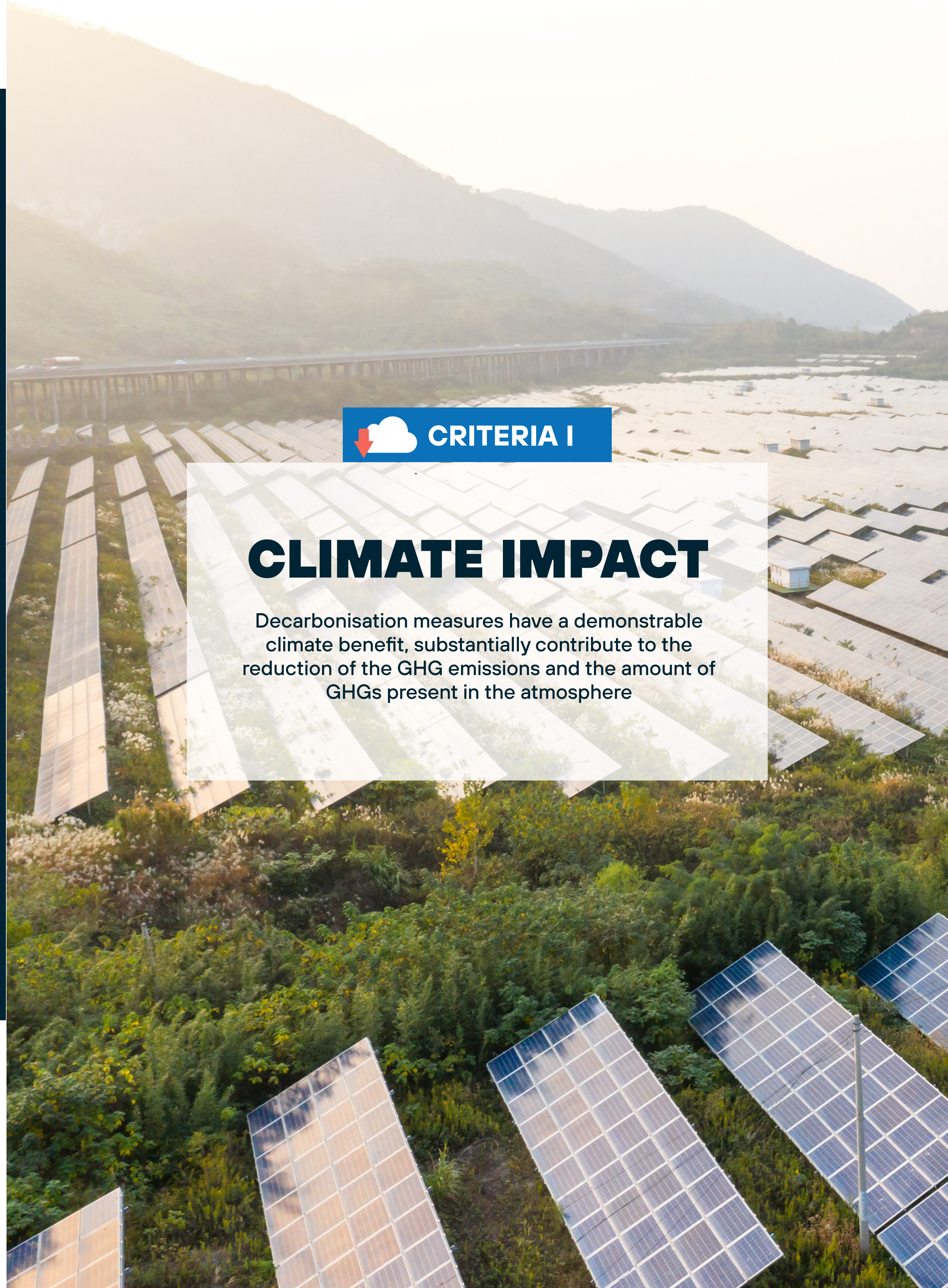
This policy paper further develops each criterion by explaining its **purpose and relevance**, identifying the **key elements** that should be considered in its assessment, outlining how it can be **implemented in practice** within public funding mechanisms, and providing **illustrative examples**[1] of projects that demonstrate alignment or misalignment with each criterion.

€38.8bn

ETS REVENUES GENERATED IN 2024

Europe has the resources to accelerate industrial decarbonisation.

The challenge is ensuring public funding backs projects that deliver genuine emissions reductions - not greenwashing or carbon lock-in.



CRITERIA I

CLIMATE IMPACT

Decarbonisation measures have a demonstrable climate benefit, substantially contribute to the reduction of the GHG emissions and the amount of GHGs present in the atmosphere

1 The examples presented are intentionally simplified and represent theoretical, illustrative scenarios to show how the criteria could be applied in practice. They are not based on existing investment plans and should not be interpreted as prescriptive pathways. Rather than providing a blueprint for investment decisions, the criteria are intended as a tool to guide regulators and industrial facilities towards better-informed decarbonisation investments. The overall aim is not necessarily to achieve these illustrative scenarios in practice, but to improve the effectiveness of industrial decarbonisation spending compared with current approaches.

Decarbonisation projects can be considered aligned with this criterion only when they demonstrate a clear and measurable climate benefit by substantially reducing greenhouse gasses (GHGs) emissions and contributing to lowering the overall concentration of GHGs in the atmosphere. Projects and their supported activities must deliver real, absolute emissions reductions over time, in line with a credible pathway to net zero. This **distinction between absolute and relative reductions is critical**: while relative reductions measure improvements against a benchmark (e.g. emissions per unit of output), they can obscure absolute increases in total emissions if the output increases faster than the emissions per unit. By contrast, absolute reductions reflect a genuine decline in total emissions in the atmosphere, also looking at the long-term benefits of the projects. Therefore, in the context of this criterion, **priority should be given to interventions that deliver measurable reductions in absolute emissions**, as these provide the clearest indicator of climate impact, unlike avoided emissions or improvements in emissions intensity, which do not necessarily translate into lower overall emissions.

Assessing climate impact

The climate impact of a decarbonisation project can be assessed through different aspects. In particular, Bellona identifies two major ones: life-cycle assessment (LCA), and alignment with net-zero pathways.

When assessing the climate impact of a project, the first consideration should be the LCA which evaluates **emissions across the entire system and compares the current baseline with the proposed intervention**. Emissions should be considered across all stages of the installation or value chain to ensure that reductions in one part of the process do not cause increases elsewhere; in practice, this requires applying a system effect criterion (further elaborated in page 11) within the same installation. As part of this assessment, it is important to consider all GHGs, not only CO_2, expressed in CO_2-equivalents. This includes gases such as methane, which has a significantly higher heat-trapping potential than CO_2 and can arise, for example, from fossil fuel extraction.

Furthermore, for a project to deliver meaningful climate impact, it should be embedded within a broader and credible pathway towards full decarbonisation. This approach is consistent with the "climate-neutrality plans" required under the EU ETS Directive. In practice, a project can meet the "climate impact" criterion in two ways: either by delivering substantial emissions reductions in the short to medium term, or by serving as an enabler of further decarbonisation efforts. In this context, "enabling projects" refer to projects, often infrastructure-related, that facilitate future emissions reductions without necessarily directly reducing emissions themselves and, in some cases, may even lead to higher emissions in the short term. Examples include electricity grid upgrades or CO_2 transport and storage infrastructure. While such projects may not deliver immediate emissions reductions, they are essential for achieving long-term decarbonisation, as they enable measures such as electrification and carbon capture and storage that would otherwise not be possible. Finally, projects must also avoid locking in carbon-intensive infrastructure or delaying the transition to low- or zero-carbon alternatives.

In short, a project demonstrates robust climate impact when the **LCA shows significant reduction in total emissions compared to the baseline** and **the reduction is sustained over time, or part of a wider decarbonisation strategy**.

Reductions vs. removals

A meaningful climate impact requires an overall reduction of GHGs in the atmosphere, but not all pathways to achieve this outcome are equivalent. Both emissions reductions and carbon removals can contribute to climate mitigation, yet their roles are distinct and not fully interchangeable. While the ultimate goal is to **reduce atmospheric GHG concentrations in the most cost-efficient way**, the challenge lies in ensuring that projects deliver real and measurable climate benefits.

In general, **emissions reductions should be prioritised** wherever technically and economically feasible, as they prevent emissions from entering the atmosphere in the first place, providing the most direct and immediate benefit to the climate. **Carbon removals** must play a complementary role, particularly to address residual emissions that cannot be eliminated through reductions. They may also be deployed alongside emission reductions to accelerate **net** reductions of emissions to the atmosphere before being used to counterbalance residual emissions.

Because removals are intended to complement, rather than replace, emissions reductions, projects should not rely primarily on external removals to demonstrate climate impact. When removals are considered for their long-term and quantitative contribution to GHG mitigation, **preference should be given to solutions within the value chain of the sector being decarbonised**, instead of relying on external offsets. Projects that depend primarily on external removals without achieving significant reductions in their own emissions, should not be considered as delivering a strong climate impact.

Against this background, a project's climate impact should ultimately be assessed based on its net effect on the atmosphere, namely the level of emissions remaining after the project is implemented. However, any net emissions claim should be supported by transparent reporting of both gross emissions and removals, allowing stakeholders to understand the underlying sources of emissions reductions and carbon removals. The LCA assessment and climate neutrality plans described above should provide this information in a consistent and transparent manner. This approach ensures visibility of residual emissions and prevents climate benefits from being overstated through avoided emissions, intensity improvements, or aggregated net figures alone.

Implementation of the climate impact criterion

The decarbonisation project respects the climate impact criterion if it...	The decarbonisation project does not respect the climate impact criterion if it...
Delivers substantial and measurable absolute reductions in GHG emissions over time, resulting in a genuine decrease in the amount of GHGs in the atmosphere.	**Relies primarily on relative emissions reductions**, avoided emissions, or emissions intensity improvements without demonstrating a reduction in total emissions.
Demonstrates a positive climate impact through a **robust LCA** that considers all relevant greenhouse gases, system-wide effects, and emissions across the entire value chain.	**Assesses only part of the emissions profile**, ignores relevant GHGs or system effects, or shifts emissions to another stage of the value chain.
Is consistent with a **credible pathway to net zero**, either by delivering significant emissions reductions or by enabling future decarbonisation (e.g. essential infrastructure), while avoiding carbon lock-in.	Locks in carbon-intensive infrastructure, delays the transition to low- or zero-carbon alternatives, or is **not aligned with a credible decarbonisation pathway**.
Prioritises emissions reductions and uses **carbon removals only as a complementary measure**, particularly for residual emissions or to accelerate net reductions, preferably within the project's value chain.	**Relies primarily on external carbon removals or offsets** to claim climate benefits without achieving substantial emissions reductions within the project itself.
Provides **transparent evidence** of its climate impact, including gross emissions, carbon removals (where relevant), and net emissions, supported by an LCA and a long-term decarbonisation strategy.	Makes net emissions claims **without transparent reporting** of gross emissions and removals or without evidence supporting the claimed climate benefits.

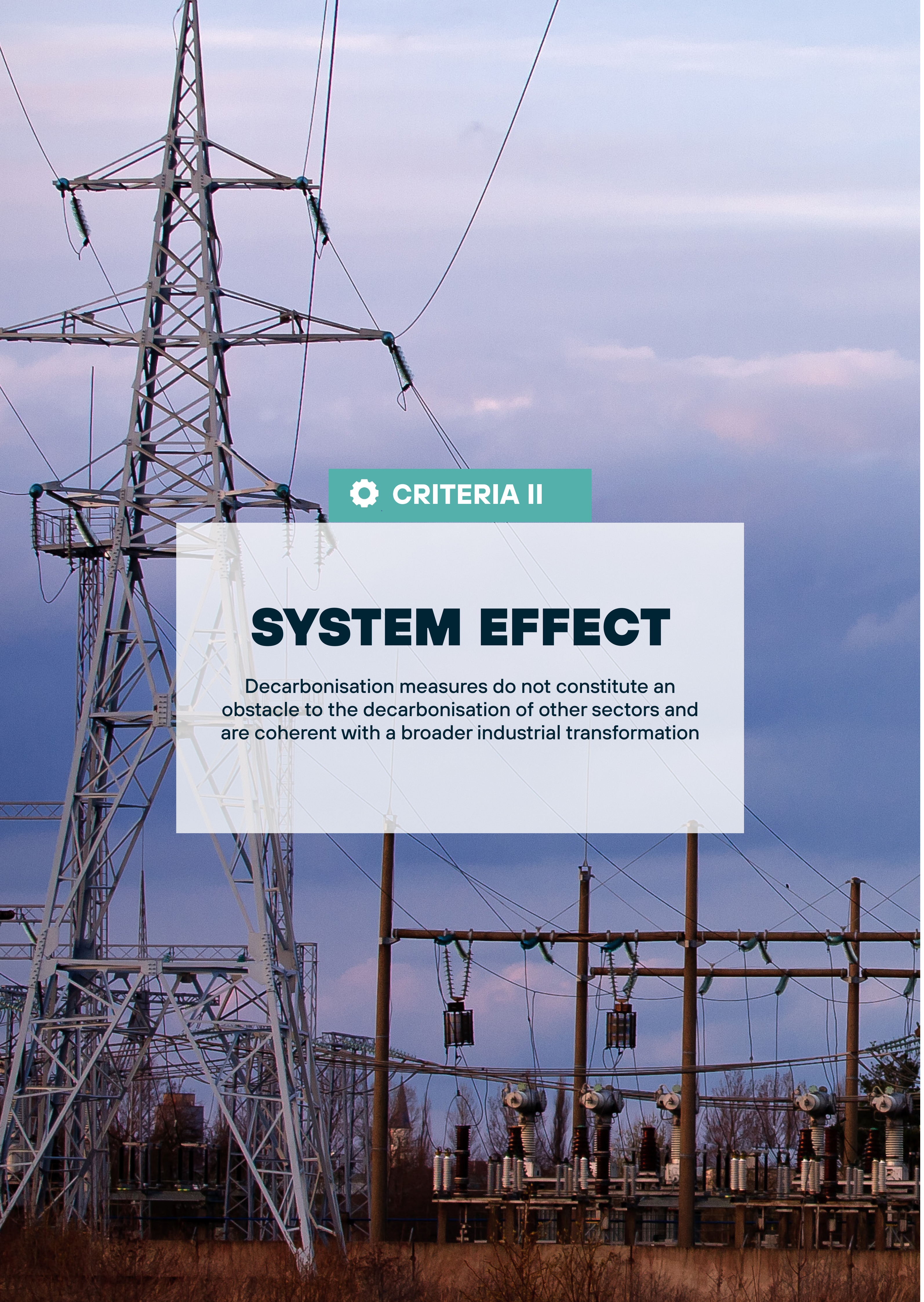
Illustrative examples:

Electrification of a steel plant

An industrial steel plant currently relying on coal-fired energy for production transitions to electrified production powered by renewable electricity. Before implementation, the project undergoes a comprehensive LCA covering all stages of the production process, including upstream fossil fuel extraction, raw material processing and all relevant greenhouse gases expressed in CO_2-equivalents. The LCA demonstrates a substantial reduction in absolute GHG emissions compared with the baseline such as the emission levels observed in previous years and confirms that emissions are not shifted elsewhere in the value chain. The project is embedded within a credible sectoral pathway towards net-zero steel production, avoids locking in carbon-intensive infrastructure, and transparently reports gross emissions, residual emissions and carbon removals.

Non-aligned steel plant decarbonisation project

An industrial steel plant upgrades the efficiency of its existing coal-fired production process, reducing emissions per tonne of steel while simultaneously increasing production, resulting in higher total GHG emissions than the emission levels observed in previous years. The project assesses only direct CO_2 emissions at the plant, without conducting a full life-cycle assessment or considering methane emissions and upstream fossil fuel impacts. It claims climate neutrality primarily through the purchase of carbon credits or removals generated by another entity external to the steel operator rather than reducing its own emissions, extends the lifetime of coal-based infrastructure without a credible pathway to net-zero production, and reports only net emissions, without transparently disclosing gross emissions, residual emissions or the contribution of carbon removals.



CRITERIA II

SYSTEM EFFECT

Decarbonisation measures do not constitute an obstacle to the decarbonisation of other sectors and are coherent with a broader industrial transformation

Industrial decarbonisation does not happen in isolation. **Every decarbonisation project has ripple effects across the broader systems**: from energy supply to transport networks, and other industrial sectors. To avoid negative trade-offs, all these interactions must be considered. A decarbonisation project with strong climate impact could still reduce overall efficiency or slow the transition if it strains electricity grids, increases demand for fossil-based inputs, or creates competition for scarce low-carbon resources.

At its core, the principle of system effect requires decision-makers to **apply a "systems thinking" approach**: evaluating how a project in one sector affects decarbonisation pathways in others, understanding opportunity costs, and ensuring that public funding supports interventions that advance the overall net-zero trajectory rather than creating bottlenecks elsewhere.

While this paper does not explicitly assess the cost-efficiency as a standalone criterion, the system effect one shows how cost-related considerations are somewhat implicit in this concept. The prioritisation framework is built around the efficient use of scarce resources and bottlenecks (e.g. clean electricity), recognising that resource efficiency and cost-efficiency are closely linked. In practice, prioritising options that maximise emissions reductions per unit of scarce resource also tends to maximise the climate mitigation achieved per euro invested.

Assessing system effect

Unlike the climate impact criterion, where compliance with the criterion falls primarily on industries aiming to receive fundings for decarbonisation, the assessment of system effect lies mainly with regulators and funding authorities. **Public support should only be directed to projects that are consistent with a broader, system-wide decarbonisation pathway and do not create bottlenecks or trade-offs across sectors**.

A central element of this assessment is prioritisation. Not all decarbonisation pathways are equally efficient or desirable from a system perspective. To carry out such assessment, Bellona suggests the following step-by-step approach.

1. **Electrification first:** In line with Bellona's approach, **direct electrification should be prioritised where it is technically feasible and delivers the most effective use of limited low-carbon energy resources from a system-wide climate perspective**. While electrification is often the most efficient and scalable pathway to reduce emissions, it should not be pursued if it leads to disproportionate electricity demand, creates excessive pressure on the power system, or displaces more efficient decarbonisation options in other sectors. Projects that improve energy efficiency or enable targeted electrification can reduce overall energy demand and ease system constraints, thereby supporting a more balanced and effective decarbonisation across sectors.
2. **Other decarbonisation options (CCS, hydrogen, CCU):** Here direct electrification is not technically feasible or cost-effective, alternative solutions may be necessary. However, their deployment should be carefully assessed from a whole-system perspective to ensure they contribute effectively to long-term decarbonisation and do not create un-

necessary costs or infrastructure lock-in. Bellona has published several analyses on this topic; a summary of the key considerations is provided below.

Hydrogen production via electrolysis is highly electricity-intensive, and if not paired with additional renewable capacity, it risks diverting clean electricity away from other uses, increasing reliance on fossil generation or resulting in higher emissions than current grey hydrogen production if the grid is not clean enough. In such cases, hydrogen does not reduce emissions at system level but shifts them elsewhere. Hydrogen should therefore be prioritised for hard-to-abate sectors and deployed only under conditions that ensure it contributes to, rather than undermines, overall decarbonisation.

Similarly, **carbon capture and storage (CCS)** should be assessed based on its relative value compared to alternative solutions. Bellona's CCS ladder highlights that CCS provides the greatest climate benefit in sectors with emissions unavoidably generated by chemical processes, such as cement and lime, while its relevance declines in sectors where electrification or other solutions become available over time. Public support should therefore prioritise applications where CCS is necessary, avoiding its use in sectors where it risks delaying more sustainable alternatives.

Carbon capture and utilisation (CCU), by contrast, in most cases does not deliver a net reduction in emissions, as the captured CO_2 is ultimately released into the atmosphere. As such, CCU can in some cases lead to a redistribution of emissions across sectors rather than a reduction, and should not be prioritised as a primary decarbonisation pathway.

Finally, system effect assessment must consider the availability of enabling **infrastructure**, including renewable electricity generation, grid capacity, and transport networks. Projects that depend on scarce system resources without contributing to their expansion risk slowing down decarbonisation elsewhere.

In sum, a project demonstrates a positive system effect when it aligns with a clear hierarchy of decarbonisation options prioritising efficiency and electrification, using scarce resources such as hydrogen strategically, and deploying CCS where it is most beneficial, while avoiding the displacement of emissions or the creation of new system constraints.

Implementation of the System Effect criterion

The system effect criterion should be implemented primarily through the design and governance of public funding schemes rather than through detailed system-level assessments carried out by individual project developers. Since the impacts of industrial decarbonisation projects extend beyond the boundaries of a single installation, the responsibility for assessing system interactions should primarily lie with funding authorities and regulators, which have the necessary overview of energy systems, infrastructure planning and sectoral decarbonisation pathways.

Implementation should therefore combine three elements: 1. clear strategic guidance defining preferred decarbonisation pathways, 2. proportionate information requirements for project applicants, and 3. assessment by funding authorities against broader system objectives.

1. **Funding programmes should establish a clear hierarchy of decarbonisation options to guide investment decisions**. In line with the principle of efficient use of limited low-carbon resources, energy efficiency and direct electrification should be prioritised where technically feasible and system-efficient. Other options, such as hydrogen and carbon capture technologies, should be supported where they provide the greatest climate benefit and where alternatives are not available or would result in less efficient use of resources. This approach allows public authorities to steer funding towards solutions that contribute most effectively to the overall net-zero pathway.

2. **Project applicants should provide the information necessary to enable this assessment**. This may include a justification of the selected technology pathway, an explanation of why higher-priority options are not technically or economically feasible where relevant, and information on key dependencies such as renewable electricity demand, hydrogen supply, CO_2 transport and storage infrastructure, or grid requirements. The purpose of these requirements is not to shift responsibility for system optimisation onto individual projects, but to ensure that funding authorities have sufficient information to evaluate potential system interactions.

3. **Funding authorities should assess projects against broader energy and industrial transition strategies, including relevant infrastructure plans, electricity system developments, renewable energy availability and sectoral decarbonisation pathways**. The assessment should consider whether a project creates bottlenecks, increases competition for scarce low-carbon resources, or risks delaying more efficient decarbonisation options in other sectors. This assessment can be conducted through existing planning frameworks and strategic assessments rather than requiring complex modelling for every individual project.

Finally, funding agreements should include appropriate **conditionalities to maintain alignment with system objectives over time**. These may include requirements related to sourcing low-carbon electricity, ensuring compatibility with planned infrastructure development, or demonstrating continued alignment with evolving decarbonisation pathways. Such conditions allow public authorities to manage uncertainty and ensure that funded projects continue to deliver system-wide climate benefits as energy systems evolve.

Project respects system effect criterion when	Project DOES NOT respect system effect criteria when
The project follows the prioritised decarbonisation pathway, applying **energy efficiency and direct electrification** where technically feasible and consistent with broader energy system constraints.	The project selects a decarbonisation option that **conflicts with the preferred pathway**, for example by avoiding feasible electrification or creating unnecessary demand for scarce low-carbon resources.
Alternative solutions such as **hydrogen or CCS** are used selectively in applications where they provide the **highest system-wide climate benefit** and where more efficient alternatives are not available.	**Hydrogen or CCS is deployed in applications where more efficient decarbonisation options exist**, risks delaying long-term transition, or creates additional pressure on scarce low-carbon resources.

The project does not create n**egative spillovers or bottlenecks** across sectors.	The project **creates significant negative spillovers**, such as increasing competition for renewable electricity, hydrogen or infra-structure capacity needed elsewhere.
Limited resources such as renewable electricity and low-carbon fuels are used **efficiently** for max-imal impact.	Scarce resources are allocated to applica-tions where they deliver limited system bene-fit or reduce the ability to decarbonise other sectors more effectively.

Illustrative examples:

Coordinated hydrogen deployment in industry

A steel producer transitions to hydrogen-based direct reduction, using renewable hydrogen sourced from dedicated, additional renewable electricity capacity developed as part of the project. The deployment is phased, starting with partial substitution of fossil fuels and scaling up in line with the expansion of renewable energy and hydrogen infrastructure.

The project is coordinated with regional planning to ensure that hydrogen supply does not constrain availability for other hard-to-abate sectors. It also includes investments in shared infrastructure, such as hydrogen transport and storage, contributing to the development of a broader hydrogen ecosystem.

In parallel, the steel plant implements energy efficiency measures and electrification where feasible, reducing overall energy demand and easing pressure on the energy system. The use of hydrogen is therefore targeted to processes where it provides the highest value and cannot be easily substituted.

By aligning with infrastructure availability, prioritising efficient use of resources, and contributing to system-wide capacity expansion, the project supports decarbonisation beyond its own boundaries. It avoids creating bottlenecks or diverting scarce resources and instead reinforces a coordinated transition across sectors.

Overall, the project demonstrates a positive system effect by combining targeted hydrogen use with efficiency and electrification, while supporting the development of enabling infrastructure and ensuring coherence with the broader pathway to climate neutrality.

Uncoordinated hydrogen deployment in industry

A steel producer based in an area with transitions to hydrogen-based direct reduction without assessing whether renewable hydrogen is the most efficient use of available low-carbon electricity or whether sufficient renewable capacity and hydrogen infrastructure exist. The project relies on hydrogen supply that competes with other hard-to-abate sectors and increases pressure on limited renewable electricity resources.

The deployment is pursued independently from regional energy and infrastructure planning, requiring new hydrogen infrastructure that is not coordinated with broader industrial needs. Rather than supporting system-wide capacity expansion, the project risks creating bottlenecks and diverting resources from applications where hydrogen provides greater climate benefits.

At the same time, the steel plant does not sufficiently implement energy efficiency measures or direct electrification options where they are feasible, increasing overall energy demand and reducing the efficiency of the transition. The use of hydrogen therefore extends beyond applications where it is necessary and creates avoidable pressure on the wider energy system.

Overall, the project does not demonstrate a positive system effect because it prioritises an individual installation's decarbonisation pathway over the broader optimisation of scarce low-carbon resources. By creating competition for renewable energy and hydrogen supply, and by failing to align with wider infrastructure planning, it risks slowing decarbonisation across other sectors

CRITERIA III

TIMING AND SCALABILITY

Decarbonisation measures can be deployed and make a positive contribution to climate action in a scalable and timely manner, while being consistent with reaching climate neutrality by 2050

Achieving climate neutrality by 2050 requires not only identifying effective decarbonisation solutions, but also ensuring that these solutions can be deployed at the necessary speed and scale. The climate impact of a technology depends not only on its long-term potential, but also on when it can deliver emissions reductions and how widely it can be implemented across the economy. Technologies that remain unavailable, immature, or difficult to scale within the required timeframe may provide limited contribution to near-term climate goals, even if they offer significant future potential.

Public fundings directed to industrial decarbonisation projects should therefore **prioritise solutions that are able to deliver substantial emissions reductions within a timeframe that is compatible with the EU's 2050 climate neutrality objective**. This means focusing primarily on proven technologies and approaches that are already available or expected to reach sufficient maturity within the timeframe required to achieve climate neutrality.

While developing new technologies is important, **the main challenge is accelerating the deployment, replication, and optimisation of effective solutions that already exist and can already achieve most emissions reductions already**, without the need to wait for new technologies to be mature. Reliance on future technological breakthroughs should not delay the implementation of available decarbonisation pathways. Projects that postpone emissions reductions while waiting for uncertain future solutions risk increasing cumulative emissions and reducing the likelihood of achieving climate targets.

Timing and scalability should therefore be assessed based on a technology's ability to contribute meaningfully to the transition within the available timeframe, considering technological readiness, deployment capacity, infrastructure requirements, and potential for replication across sectors. Public funding should support solutions that maximise real-world emissions reductions by combining innovation with rapid implementation and large-scale deployment.

Assessing timing and scalability

The assessment of timing and scalability should consider several interrelated dimensions: the speed of deployment, the potential for scale-up, technological readiness, and consistency with the overall decarbonisation pathway. For this to happen, four points need to be taken into account:

1. A first key consideration is **the speed at which emissions reductions can be achieved**. Projects that deliver immediate and substantial emissions reductions should be prioritised, as early action reduces cumulative emissions and eases the overall transition burden. In this context, readily available and cost-effective solutions, such as energy efficiency improvements and direct electrification, often provide the most impactful short-term contributions. Where a single intervention can reduce emissions across multiple processes or operations, it should be prioritised for its systemic effectiveness.
2. A second dimension is **scalability**. Scalability should not be understood as requiring every individual decarbonisation project to be replicated identically across all installa-

tions or sectors. Some projects can deliver substantial climate benefits due to their scale or the emissions they address, even where their application is specific to a particular industrial context. Rather, scalability refers to the ability of a decarbonisation pathway to contribute meaningfully to the broader transition within the timeframe required to achieve climate neutrality. Public funding should therefore prioritise solutions that can be deployed beyond isolated applications where relevant, supported by the necessary enabling conditions such as infrastructure, supply chains, skills, and resource availability.

3. A third critical factor is **technological readiness**, which can be assessed through Technology Readiness Levels (TRLs). Projects relying on low-TRL technologies, particularly those unlikely to reach commercial maturity in time to contribute to the EU climate targets, carry a significant risk of delayed impact. While innovation remains essential, public support for industrial decarbonisation should prioritise technologies that are already commercially available or close to deployment, especially when they can deliver immediate emissions reductions. Support for early-stage technologies should be targeted and justified by their expected long-term necessity within the transition.
4. At the same time, the assessment should recognise the role of **carbon dioxide removal (CDR)**. As the EU moves towards climate neutrality, and net-negative emissions thereafter, CDR will be necessary to address residual emissions and to drawdown global atmospheric CO_2 concentrations. Projects that contribute to the development and scaling of sustainable CDR solutions may therefore be relevant, provided they do not delay emissions reductions in the short term and are aligned with credible long-term needs. The timing of CDR deployment is crucial: while its large-scale role is expected closer to 2050, early investments are needed to ensure market readiness when required.

Ultimately, a project demonstrates strong performance on timing and scalability when it combines near-term impact with long-term relevance, delivering immediate emissions reductions while enabling broader transformation pathways in the future.

Implementation of the timing and scalability criterion

The timing and scalability criterion should guide the allocation of public funding towards projects that can deliver meaningful emissions reductions within the timeframe required to achieve climate neutrality. Since public resources are limited, support should prioritise solutions that combine strong climate impact with the ability to be deployed rapidly, scaled across sectors, and contribute to cumulative emissions reductions before 2050.

Implementation should combine eligibility requirements, prioritisation principles, and proportionate assessments of technology maturity. The objective is to ensure that public funding accelerates emissions reductions within the timeframe required to achieve climate neutrality, while avoiding the allocation of significant resources to solutions that are unlikely to deliver meaningful impact within the necessary timeframe. The four points explained in the above section could be implemented as follows:

1. The **timing dimension** can be implemented by requiring applicants to **provide credible information on expected implementation timelines**, including when emissions reductions are expected to materialise, the maturity of the proposed technology, and the key conditions required for deployment. The credibility of such information should be examined based on existing legal and financial commitments and infrastructure deployment. Funding authorities should prioritise projects that deliver early emissions reductions and avoid projects whose emissions reductions rely on uncertain future technological developments.
2. The **scalability dimension** should be **assessed at the level of the decarbonisation pathway** rather than requiring every individual project to demonstrate their ability to be replicated universally. A project may deliver significant climate benefits due to its size, sectoral relevance, or emissions profile even if its application is specific to a particular industrial context. However, **where public support is directed towards technologies or approaches with broader deployment potential, authorities should consider whether the solution can be expanded or replicated**, taking into account enabling conditions such as infrastructure availability, supply chains, skills, and resource requirements.
3. **Technological readiness should be integrated into funding decisions through an assessment of expected commercial maturity such as Technology Readiness Levels (TRLs)**. Projects based on mature or near-market technologies should generally receive priority for deployment-oriented funding, as they can deliver measurable emissions reductions within the timeframe required.
4. Finally, funding mechanisms should consider the specific role of CDR technologies. **Support for CDR development can be justified where it contributes to the long-term requirements of climate neutrality and net-negative emissions pathways,** provided that it does not substitute for immediate emissions reductions. Early support can help ensure that sustainable CDR solutions reach sufficient maturity and availability when they are needed at larger scale closer to 2050.

In practice, the criterion can therefore be implemented through prioritisation framework that rewards projects combining **near-term emissions reductions**, **realistic deployment timelines**, **appropriate technology maturity**, and alignment with broader decarbonisation needs. This ensures that public funding maximises climate impact while maintaining support for innovation where it is necessary to complete the transition.

The decarbonisation project respects the timing and scalability criterion if it...	The decarbonisation project does not respect the timing and scalability criterion if it...
The project delivers substantial emissions reductions within a **timeframe compatible with climate neutrality objectives** and has a realistic implementation timeline.	Delivers emissions reductions **beyond the timeframe** compatible with the climate neutrality objectives
The project relies on **mature or near-market technologies** that can be deployed at scale, while using innovation where it is necessary to address remaining decarbonisation challenges.	The project relies primarily on **immature technologies without a clear pathway to commercial deployment,** despite the availability of effective solutions that can deliver emissions reductions sooner.
Supports the development of necessary future solutions (e.g. CDR) without undermining near-term action	**Relies on future carbon removals** instead of reducing abatable emissions today
Is supported by **credible timelines** and deployment strategies	Lacks clarity on implementation timelines or scale-up potential

Illustrative example

Rapid deployment of a mature decarbonisation pathway

An industrial steel plant replaces a significant share of its fossil-based production process through direct electrification and energy efficiency measures, using commercially available technologies that can be implemented within the next few years. The project includes a clear deployment plan, identifies the required infrastructure and electricity needs, and demonstrates substantial emissions reductions shortly after implementation.

The project contributes to a broader decarbonisation pathway by relying on solutions that can be applied across similar industrial processes where relevant, while recognising that some elements may remain specific to the installation. The project focuses on delivering immediate emissions reductions rather than waiting for future technological developments.

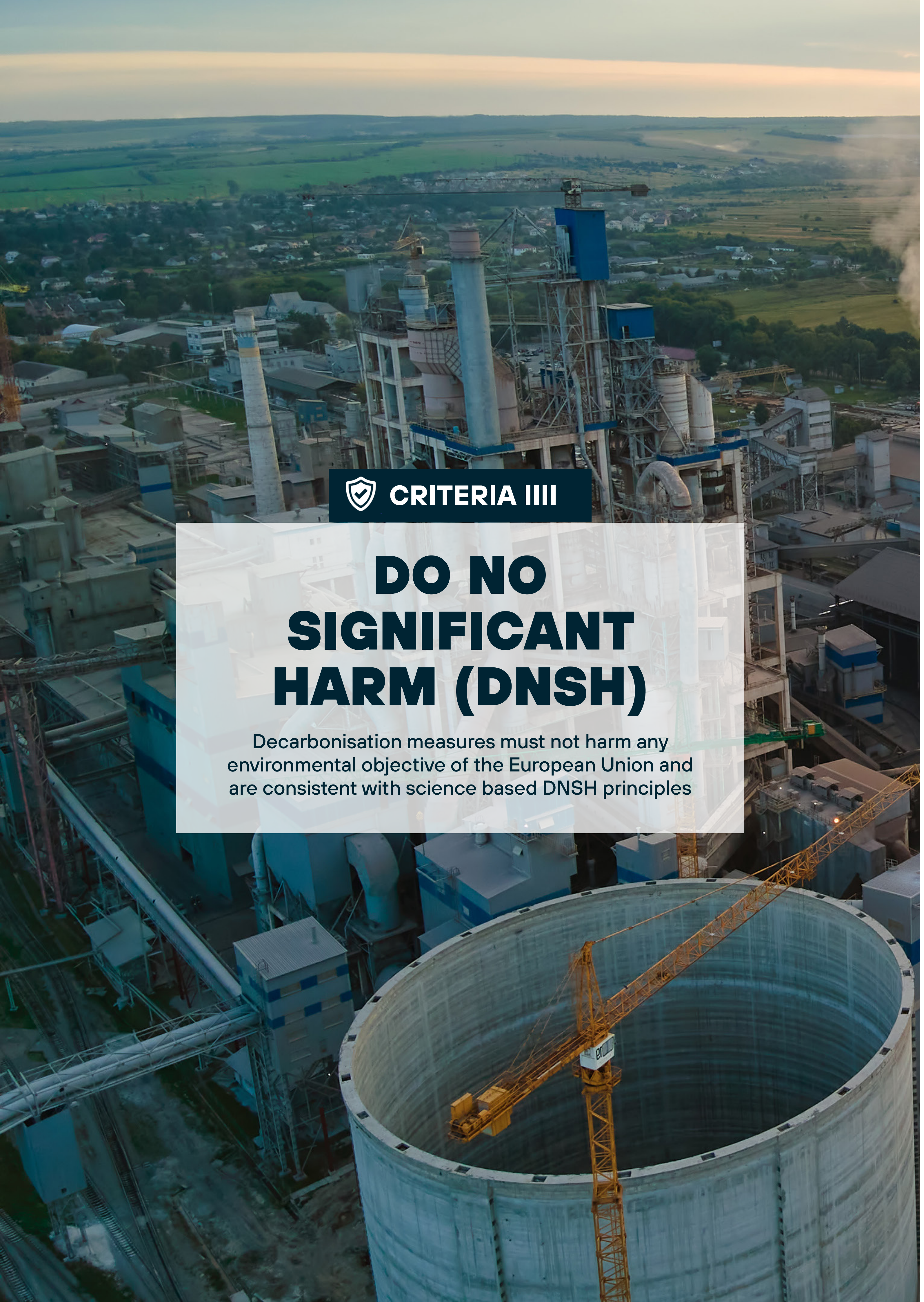
The project may also support the development of future solutions, such as through participation in demonstration activities for emerging technologies, but these do not replace the near-term emissions reductions achieved through currently available measures. By combining rapid implementation, mature technologies, and a credible pathway for wider deployment, the project contributes to climate neutrality within the required timeframe.

Delayed decarbonisation based on uncertain future solutions

An industrial steel plant continues operating with its existing fossil-based production process while investing primarily in an emerging low-TRL technology expected to become commercially available only in the later stages of the transition. The project does not include significant near-term emissions reductions and relies on the assumption that future technological breakthroughs will enable decarbonisation at a later stage.

The proposed solution lacks a clear deployment timeline, depends on infrastructure and supply chains that are not yet available, and has uncertain potential for implementation at the scale required. Instead of deploying available measures that could reduce emissions in the short term, the project postpones action while waiting for future technologies to mature.

The project therefore does not demonstrate strong performance on timing and scalability, as it risks increasing cumulative emissions and delaying the transition despite the availability of more mature solutions capable of delivering earlier emissions reductions.



CRITERIA IIII

DO NO SIGNIFICANT HARM (DNSH)

Decarbonisation measures must not harm any environmental objective of the European Union and are consistent with science based DNSH principles

DNSH principle is established by the EU Taxonomy Regulation. This principle requires that an economic activity which makes a substantial contribution to one of the environmental objectives must not cause significant harm to any of the other objectives, including pollution prevention, resource efficiency, circular economy, biodiversity, water, and climate adaptation. **Industrial decarbonisation projects supported through public funding should not achieve emissions reductions at the expense of other environmental objectives**.

Unlike criteria such as climate impact, system effect, and timing and scalability, which assess the overall contribution and effectiveness of a project, **DNSH functions primarily as a safeguard**. Its purpose is not to rank projects according to their environmental performance, but to ensure that projects receiving public support meet minimum environmental requirements and do not undermine broader sustainability objectives.

The DNSH principle is particularly relevant for industrial decarbonisation because reducing greenhouse gas emissions can involve wider changes in production processes, energy use, material flows, infrastructure needs, and resource consumption. Therefore, while a project delivers significant climate benefits on the one hand, on the other it may cause different environmental pressures when these aspects are not appropriately considered and handled.

Implementation of the DNSH criterion

The DNSH principle should be implemented through **eligibility requirements and environmental safeguards** integrated into public funding mechanisms. Rather than creating a separate assessment framework, funding authorities should build on existing DNSH approaches, including established methodologies and requirements such as those developed under the EU Taxonomy framework, where relevant.

Applicants should provide information demonstrating that the proposed **project does not create significant negative impacts on other environmental objectives and complies with relevant environmental regulations and safeguards**. The level of assessment should be proportionate to the nature, scale, and potential impacts of the project, and should be evaluated by the project's funders.

In practice, **the DNSH principle can therefore be applied as an eligibility requirement:** projects that contribute to decarbonisation while complying with relevant environmental safeguards should be eligible for support, while projects that create significant unmanaged environmental harm should not receive public funding.

The decarbonisation project respects the DNSH principle if it...	The decarbonisation project does not respect the DNSH principle if it...
Achieves emissions reductions while **addressing potential impacts on other environmental objectives** through appropriate safeguards and mitigation measures.	Reduces greenhouse gas emissions while creating significant **unmanaged environmental impacts** in other areas.
Complies with relevant **environmental regulations** and applicable **DNSH requirements.**	Fails to demonstrate compliance with relevant environmental requirements or relies on insufficient mitigation measures.
Minimises negative impacts related to pollution, resource use, waste, biodiversity, water, and ecosystem impacts.	Increases pollution, resource pressures, waste, or environmental damage without adequate management.
Uses a **decarbonisation pathway** that is consistent with broader environmental objectives.	Creates **environmental trade-offs** that undermine other sustainability objectives despite delivering climate benefits.

Illustrative example

Compliance with DNSH

An industrial plant electrifies its production process and significantly reduces greenhouse gas emissions as a consequence. The project also assesses potential impacts related to energy use, materials, waste, pollution, and resource consumption, implementing mitigation measures where needed. The project therefore delivers climate benefits while remaining consistent with broader environmental objectives.

Failure to comply with DNSH

An industrial plant reduces direct emissions by adopting a new production process that creates significant unmanaged environmental impacts, such as increased pollution, excessive resource consumption, or negative effects on ecosystems. Although the project reduces greenhouse gas emissions, it does not comply with the DNSH principle because it achieves climate benefits by creating significant harm elsewhere.

CONCLUSION

The transition towards a climate-neutral industry requires not only significant financial resources, but also a clear approach to ensure that these resources contribute to meaningful decarbonisation potential. As public funding for industrial decarbonisation increases, including through ETS revenues and new instruments such as the Industrial Decarbonisation Bank, ensuring that support is directed towards effective, credible, and timely decarbonisation pathways will be essential.

The four criteria analysed in this paper - climate impact, system effect, timing and scalability, and the Do No Significant Harm principle - provide a practical framework to guide funding decisions and assess whether projects are aligned with the objectives of the transition. Together, **they aim to ensure that public support contributes to the development of decarbonisation projects that deliver effective emissions reduction, in a way that supports -rather than preventing - broader systemic decarbonisation, on time for achieving decarbonisation targets and ensuring that the project does not create any negative consequence for other dimensions of environmental sustainability.**

The framework presented in this paper is intended to inform discussions on how public funding can be prioritised to maximise climate impact. It is not designed as an exhaustive methodology or a prescriptive scoring system, but as a structured set of guiding principles to support transparent and consistent decision-making. While in practice trade-offs will inevitably arise, and not every project might fully satisfy every criterion, framework helps relevant stakeholders identify where public resources are most likely to deliver the greatest contribution to industrial decarbonisation.

Applying these criteria does not mean limiting industrial transformation to a narrow set of technologies or excluding innovation. Rather, it means ensuring that public funding prioritises real-world climate impact: deploying effective solutions that are available today, supporting innovation where it is genuinely needed, and avoiding delays caused by reliance on uncertain future developments.

Ultimately, the effectiveness of industrial decarbonisation funding will mostly depend on whether public resources are directed towards projects that deliver measurable emissions reductions and contribute to a coherent pathway towards a climate-neutral European industry.

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

Contact

Francesco Lombardi Stocchetti
Policy Manager
Bellona Europa

Phone
Mobile
+32 (0) 473 903 973

Online
Email: francesco@bellona-europa.eu
Website: eu.bellona.org

Bellona Europa is an independent, non-profit organisation that meets environmental and climate challenges head-on. We are result-oriented and have a comprehensive and cross-sectoral approach to assess the economics, climate impacts and technical feasibility of necessary climate solutions. To do this, we work with civil society, academia, governments and polluting industries.