A MANIFESTO FOR EU LEADERS

EUROPE 3.0: MODERNISE TO THRIVE

SOLARIMPULSE FOUNDATION

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Contents

THE WAY FORWARD TO A COMPETITIVE, RESILIENT AND JUST EU

In addition to the escalating ecological crisis, Europe is grappling with a multitude of challenges: high energy prices, conflict at its doorstep, soaring inflation, boosted competition from other geopolitical players, and increasingly polarised societies, amongst others.

Climate action, traditionally presented and perceived as a costly, sacrificial process, appears today as an unexpected rescuer.

Indeed while there is no silver bullet, the Green Deal – if implemented effectively, efficiently, and fairly – can address many of these interconnected challenges. But the way we portray its implementation will be essential to harness its potential. Creating a desire for change through the benefits it may afford us, rather than through a narrative of urgency and fear. Recognising that what is possible today was not possible even a decade ago. Emphasising the opportunity to improve quality of life on Earth as the way to overcome resistance to change. Highlighting concrete flagship projects, shedding light on pioneers who have the courage to go against what has always been done.

The time has come to change paradigm and build a society based on efficiency, where our needs are met using fewer resources.

Shifting gear to roll-out the Green Deal is an opportunity to lift Europe towards a whole new model. To chart Europe on a different, needed course, bringing benefits that span way beyond the environmental field.

Let's face it: we live in an economic model that is no longer fit for purpose, driven by a quest for quantitative growth that is nonsensical, wasteful and ultimately unsustainable.

The time has come to change paradigm and build a society based on efficiency, where our needs are met using fewer resources. Where the economy thrives not by consuming more but by consuming better, harnessing the thousands of solutions that exist today. Where prosperity stems not from the quantity of production but from the quality of efficiency. A society where social welfare, economic competitiveness and environmental sustainability are mutually reinforcing, and where decarbonisation is no longer the end goal, but becomes a consequence of a modernisation process, one that creates jobs and economic activity.

In essence, a qualitative economy. This is the Europe 3.0 we at the Solar Impulse Foundation are calling for.

To achieve this qualitative economy, the EU needs a massive EU-wide investment plan, making investment the next chapter of the Green Deal, fostering efficiency and renewable solutions, while creating the enabling environment for local and circular production and consumption schemes. In addition, demand needs to be boosted and behaviors accompanied, thanks to modern regulations and carbon markets. Finally, innovation will be central to find alternative, and efficient, ways of producing and consuming.

This is crucial if the EU wants to remain in the global cleantech race and make the Green Deal an industrial and social success.

It is also time for the EU to concretely propose a long-term strategy to gradually phase out fossil fuels, while preserving our quality of life. Combining less energy demand thanks to efficiency measures and decisive increase in renewables, a net-zero qualitative economy by 2050 requires no or almost no fossil fuels in our systems. Together with oil & gas industries, it is essential to start planning their gradual phase out and diversification, in line with the recent COP 28 agreement.

The European project of a modernised economy and society can be a unifying project, across the whole political spectrum.

Our societies are increasingly polarised – politically, socially, economically – making it ever more challenging to solve complex problems. Failure to find common ground will prevent us from resolving these issues, capturing the benefits of the ecological transition, and ultimately puts at risk the very fabric of our democracies.

The European project of a modernised economy and society can be a unifying project, across the whole political spectrum, as the positive spillover effects are manyfold and fulfilling various political interests – from increased well-being and qualitative jobs to security and resilience, from lowered CO_2 emissions to competitiveness.

Our EU Manifesto seeks, in its first part, to present this unifying vision of the Green Deal that can appeal to a wide range of political perspectives. This is how we will build a modern Europe that federates and brings people together. Just because saving resources, and therefore money, is common sense. Common sense can and should appeal to whoever wins the next European elections. The second part of the document proposes realistic policy recommendations to accelerate and strengthen the implementation of the Green Deal, in a concrete and pragmatic way.

Europe can be the trailblazer. It has everything it needs: technology, innovation, creativity, and unparalleled *savoir-faire*.

And as Europe takes the lead, the rest of the world is poised to follow.

Dr. Bertrand Piccard
Founder and President of the
Solar Impulse Foundation

PARADIGM SHIFTS: BRINGING EFFICIENCY AT ALL LEVELS

Efficiency?

The world we live in is stuck in the past. The technologies allowing us to exploit resources have remained largely unchanged since the industrial revolution. Our economy is characterised by waste and inefficiency. Consider that internal combustion engines lose more than two thirds of the energy we create, and more than a quarter of our drinking water is lost every year due to preventable and treatable leaks in the distribution network.[1] Or consider that a third of the food we produce is thrown away – wasting not just the final product but all the energy and resources needed to produce it and get it to where it is meant to be.

We can do so much better.

A modernised economy based on efficiency is a qualitative economy that has as a key driver the continuous optimisation of resources.

The fundamental goal is to achieve heightened efficiency in various sectors, prioritising sustainable practices and minimising waste. Basically, accomplishing more (and better) with fewer resources, thereby contributing to a reduced environmental footprint. Decarbonisation is no longer the end goal, but becomes a consequence of a modernisation process, one that creates jobs and economic activity.

The Solar Impulse Foundation has identified and labelled more than 1,500 existing solutions that can make this paradigm shift a reality, in virtually any sector of society. They are available today, open source, on www.solarimpulse.com. These are just a few among the many already existing, showing that the shift we are calling for is realistic and at reach. A sample of these solutions is available in the last chapter of this document.

The qualitative economy places a premium on sustainable development, social responsibility, and ethical business practices. It seeks to create value through the effective use of resources, fostering a resilient and balanced economic landscape that aligns with environmental stewardship. In such a framework, **success is measured not only in economic terms but also by the positive impact on the environment and society, emphasising the interconnectedness of economic, social, and environmental well-being.**

In essence, a qualitative economy can be truly sustainable as it promotes economic, environment and social objectives.

It allows to improve Europe's security and competitiveness thanks to more efficient infrastructures and processes, and competitive energy costs.

It respects the boundaries set by nature by reducing our resources and energy needs.

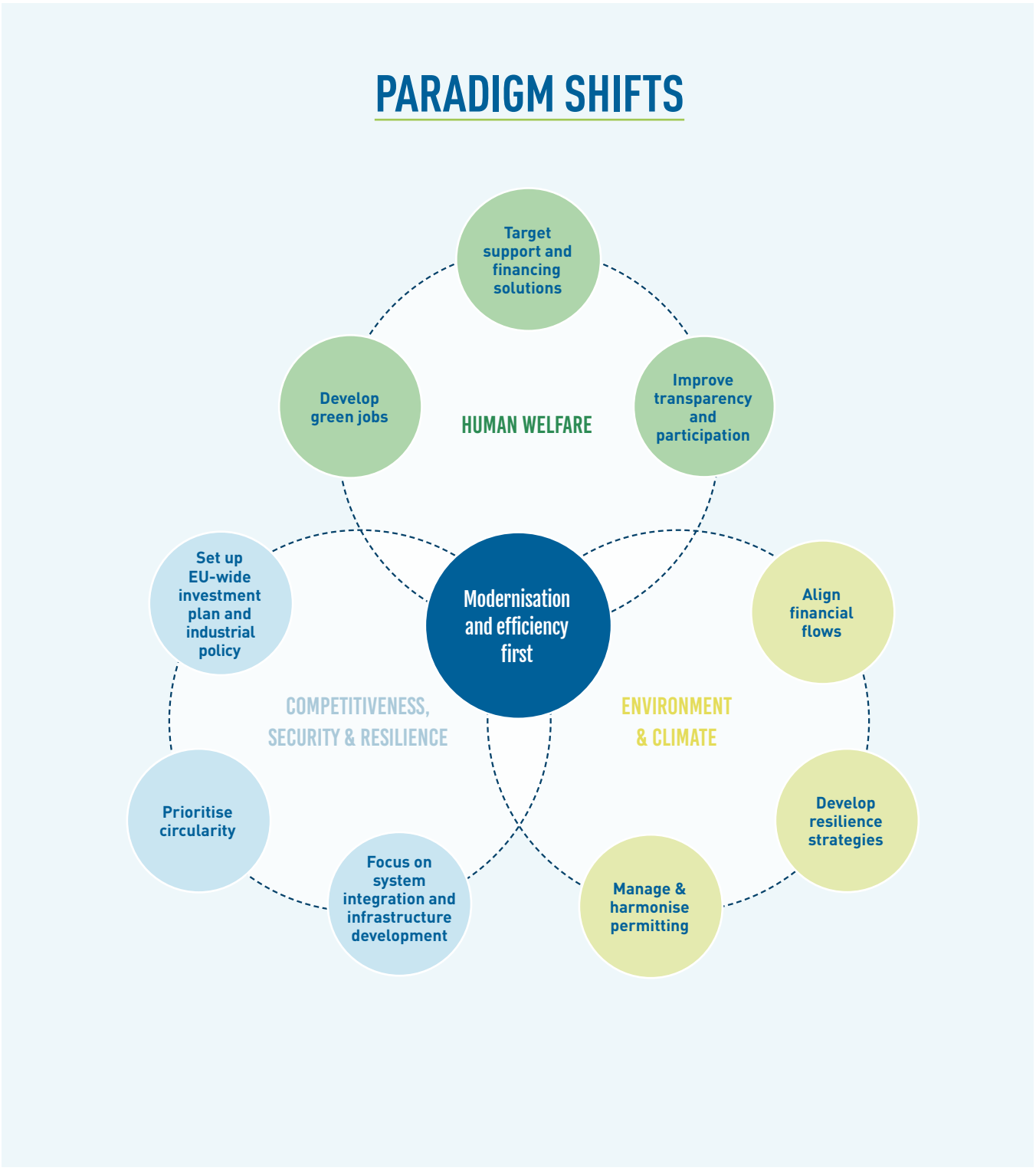
It puts humanity back at the centre of our societies by providing stable energy and resources prices and by creating jobs that people can be proud of.

How to get there?

To achieve this sustainable Europe, **the EU must take decisive steps, and take them now**. Let's not forget it is in times of crisis that the EU has made the greatest steps forward.

The adoption of the Green Deal is a major step in the right direction, giving us the right tool to act. Efficiently rolling it out, focusing on the most leverageable aspects, is what can and will make the difference.

But more attention should be put on the following aspects to ensure a competitive, secure, sustainable and social Europe.



COMPETITIVENESS, SECURITY & RESILIENCE

- **Assume massive public investment today, even if creating debt**, to modernise our economies. The return on investment will pay off. The amount of public funding supporting these investments needs to be substantially increased, if the EU wants to maintain its position of major global player. An ambitious European climate investment plan should not create structural debt, and should instead be the occasion of deep fiscal reforms in EU countries.
- Achieve the positive feedback loop enabled by serious investments in efficiency and renewables. In essence, the opportunity is to **set in motion a self-reinforcing cycle of three key benefits involving the cleantech[2] sector and the overall economy**. Here's how the process could work:

  – **Investing in Renewables and Efficiency leads to lower energy prices**: The initial investment in renewable energy sources and efficient technologies helps in reducing energy costs for households and industries alike.[3]

  – **Competitive energy prices favours development of an EU Cleantech industry**: With the decreased costs associated with additional efficiency and renewables, more individuals, businesses, and industries are incentivized to adopt and integrate these technologies into their operations. This increased adoption further stimulates innovation and development in the efficiency and renewable energy sector.

  – **A strong EU Cleantech industry leads to higher economic and environmental benefits**: the deployment of an EU cleantech industry is creating qualitative jobs and growth, while decarbonisation is a positive effect of this virtuous circle.

  Competitive energy prices alone may not incentivise economic actors to change behaviour and could lead to a rebound effect, to be avoided at all costs. It is therefore paramount, in parallel, **to keep a high CO_2 price and have appropriate regulations in place** – such as technology specific tenders and green public procurement – pushing behavioural change.
- **Promote local and circular production and consumption** by developing mechanisms that enable the recycling of materials, by exploring alternative and non-conventional sources of critical raw materials and improving circularity mechanisms in industries, including in the agri-food industry where the potential is immense.
- **Integrate systems.** Maximise synergies between sectors, energy sources, energy carriers, infrastructures, and consumption sectors. Planning is central to enhance these synergies and should be fostered at EU and local levels. Policies should be thought in an integrated manner and a 'multi-directional' system in which consumers play an active role should be fostered.
- **Developing infrastructure** will be key to ensure a modernised economy. Energy infrastructure (upgraded grids, storage capacity, CO_2 trading, etc) and infrastructure that favours circular economy and efficient material and resources use should be massively deployed.
- **Set up an EU-wide Industrial policy**. Building European manufacturing of strategic technologies can secure the achievement of climate goals, maximise the benefits in terms of employment and innovation, and position the EU at the forefront of the global race. The Net-Zero Industry Act proposed by the European Commission, can be a game-changer, if ambition is kept and backed by sufficient investment. To be a success, such a strategy should be coordinated at EU level. The initial proposal, already rejected by some Member States, of creating an EU-wide investment tool would yet reply to this challenge.[4]

ENVIRONMENT & CLIMATE

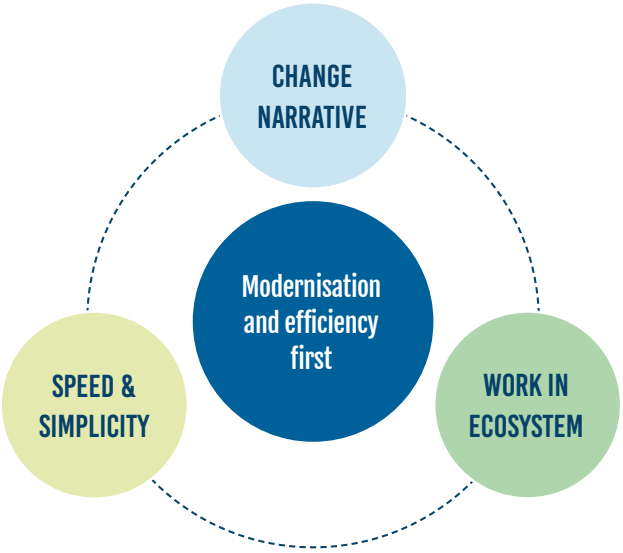
- **Align financial flows with the fight against the climate and biodiversity crises.** The EU should exclude any possibility of using EU funds for new fossil fuel investments and infrastructure projects in Europe which increase fossil fuel use. Public and private funding should be leveraged to reverse the climate and biodiversity crisises.
- **Accelerate permitting** for cleantech projects by promoting an acceleration based on **scientific siting with low biodiversity and social conflict**. An EU-wide harmonised permitting procedures would also encourage investments and reduce the administrative burden from one country to another.
- **Improve resilience** by adopting relevant policies and building action plans. An EU-wide Adaptation policy based on nature-positive and equitable projects, integrating climate and socio-economic aspects would help making our ecosystems and economies more resilient.

HUMAN WELFARE

- **Target support and financing solutions towards vulnerable households and regions.** The Social Climate Fund and EU carbon market revenues can be blended to provide targeted support for low and middle-income households. Social climate plans are a major opportunity to map energy and mobility poverty and ensure that the transition happens first for the most vulnerable groups. Special attention should be paid to technical and administrative support to empower groups that are not likely to reach out for public support. Implementing a progressive and permanent windfall profits tax on fossil fuel companies can be a strong political signal in favour of more social equity[5], supporting the transition of the most vulnerable groups in society.

  Prioritise investments in declining industrial regions for the location of strategic net-zero technology manufacturing linked to the European Green Deal Industrial Plan can be an opportunity to reindustrialise affected regions through the transformation of the economy. Additional public funding could be offered to reskill the workforce and support the establishment of factories in these areas.[6]
- **Develop green jobs: education, re and up-skilling.** Advance the just transformation and make the European Green Deal the engine for creation of new jobs, re-skilling and up-skilling. Education should also be at the centre of the Green Deal to ensure behavioural shift for the generations to come.
- **The democratic functioning of the EU should improve** to overcome institutional deadlocks, including through enhanced citizen and stakeholder participation to decision-making. This could be done through institutionalised deliberative democracy and multi-stakeholders' exchange platforms closely tied to the decision-making process at all levels of government (see below).[7]

More details on the orientations urged for in this section are provided in the next chapter – Policy recommendations for upcoming EU leaders.



Change the way we do things!

In addition to outlining WHAT we should be doing to ensure a competitive, secure, sustainable and just European society in 2030, it is equally crucial to innovate on HOW we do things.

CHANGE NARRATIVE – UNLOCK RESISTANCE

Create the desire for change rather than imposing it.

Despite the efforts undertaken since the Earth Summit in 1992 to protect the environment and fight against climate change, the situation has continued to worsen. Not only is it difficult to mobilise the public, businesses, and political decision-makers around these causes, but today we see ever more environmental detractors who directly oppose the necessary measures, when they're not simply denying the reality of the problems.

What we are calling for is no less than a revolution in the way we speak about climate action. Recognising that what is possible today was not possible even a decade ago. Emphasising the opportunity to improve quality of life on Earth as the way to overcome resistance to change. Here are key tools that should help recraft the climate action narrative, encompassed into "The New Climate Narrative", issued by the Solar Impulse Foundation at COP28[8].

- Speak of Solutions, not just problems
- Showcase how climate action is a vector for business opportunities and new markets
- Frame decarbonisation as a consequence of modernisation, not as the end objective
- Highlight savings and returns on investment, not costs and sacrifices
- It's not about future technologies but existing ones
- Start with what is easy and profitable
- Efficiency over sobriety and degrowth
- Specify which degrowth you speak about
- Quality versus quantity
- New professions versus lost jobs
- Diversification versus endangered sectors
- Why embark in the transition if big actors continue to pollute? To gain a competitive advantage!
- It's about humanity, not the planet
- Acting on climate is to protect the current generation, not just the future one
- Setting legal limits to irresponsible behaviours, in the environment space as in any other
- Carefully choose how you name and speak about your policies
- Showing is better than saying
- Making the Transition as an advantage to all – from North to South
- Climate urgency or economic imperative?
- It's not only about climate change

SPEED & SIMPLICITY

- **Simplify administrative procedures to access EU funds.** Find the right balance between speed and control of funds granted. This is even more important as we are calling for massively scaling up the amount of EU funds available to the transition.
- **Streamline EU funding programmes** per thematic and improve visibility on all existing funds and support programmes.
- **Simplify sustainability report obligations.** Reporting requirements are key to set harmonised standards, help preventing greenwashing, establish transparency and comparability. But they should not undermine the competitiveness of European companies, given that non-EU competitors will not be subject to the same level of reporting obligations. It is important to simplify requirements to requirements that are fully reflecting a business engagement and achievements on sustainability.
- **Accompany smaller businesses** in their reporting obligations as they do not have the same ability to spend resources on this.

WORK IN ECOSYSTEM

Current policy-making practices across the EU are often siloed, even unintentionally. Not only should different services responsible for policy-making adopt a more horizontal working model to ensure coherence and prevent counterproductive measures, but policymakers themselves should also embrace a more democratic approach to consulting stakeholders, foster co-creation and consequently stronger stakeholder engagements.

Working within an ecosystem means convening around the same table, from the outset of the policy-making process, diverse stakeholders from various sectors, including corporations, start-ups, financial institutions, cities or territories, civil society, public authorities, and academics. Diversity in people's profile is also key. These stakeholders exhibit varied approaches and behaviours regarding policies and regulations, as well as different time horizons. Therefore, having a neutral and trusted third party to moderate and lead these diverse stakeholder groups is crucial.

This collaborative approach offers several advantages, including the early involvement of all stakeholders in the policy-making process, fostering co-creation. It ensures vision-sharing, transparency, the development of common policy implementation scenarios, and, most importantly, it ensures building the necessary trust between policy makers and stakeholders.

Finally, it results in higher acceptability by all stakeholders, leading to a smoother and quicker implementation process. This process may appear time consuming in the first stages but, in the end, it is a time-saving mechanism because of better policymaking, as a result of co-creation, and a greater acceptability by all stakeholders.

Working in ecosystem also entails following an efficient and structured process, that consists of the following steps:

1. Share a common vision on what has to be done.
2. Build together the most efficient scenario to reach the common vision.
3. Detect domains of opportunity in this chosen scenario: quick wins, mid-term and long-term societal gains and shared value creation.
4. Prototype regulation for each opportunity domain.
5. Test with all stakeholders and, why not, have pilot projects in smaller territories. Evaluate impact. Learn.
6. Propose regulation and related fundings.

This process has been validated within the sustainable mobility industry[9] to innovate in ecosystem. We propose to extend it to policymaking.

POLICY RECOMMENDATIONS FOR EU LEADERS

IMPROVING THE ENABLING ENVIRONMENT

Setting objectives and targets

Rather than a pause on environmental legislation, as proposed by some EU leaders, we need to make sure we have clear objectives for 2040, the last milestone before 2050. We also need to make sure the paths to get to 2050 are realistic and achievable and that the objectives of the Paris Accord will be met.

Fortunately, the technologies needed to make this a reality already exist.

Today, there are still insufficient demand signals for clean technologies that can help de-risk investments in both development and deployments of cleantech. As many of the regulatory provisions impacting the wide deployment of cleantech will not be implemented before a couple of years, the EU can accelerate the deployment of cleantech through a variety of mechanisms such as setting binding targets for cleantech manufacturing and deployment, supporting private off taking schemes, and direct public procurement to create lead markets for innovative technologies.

- **The definition of the EU climate targets should be based on assessments aiming to meet the 1.5°C goal with the highest chance possible.**
- **Ensure technological assumptions reflect realities:**
  - > The technological assumptions used to develop the different pathways and policy options need to reflect the latest available data on estimated costs and efficiency – especially with how quickly the terrain is changing. Relying on outdated data risks creating a bias in the modelling results, and therefore in the resulting ambition levels, by overestimating the costs and underestimating the benefits of green technologies.
- **The multiple benefits of renewable energy and energy efficiency from a societal perspective must be correctly reflected and adequately valued.**
  - > This means considering benefits such as energy security, GDP growth, creation of local jobs, alleviation of energy poverty, environmental benefits, reduced health costs, etc. in impact assessments.
- **Maintain and extend the binding targets (GHG emissions reduction, renewable energy and energy efficiency) to 2040 as it provides certainty to investors, consumers, and industry and is vital to ensuring delivery of the 2030 target.**
- **Fully embrace and prioritise energy savings and energy efficiency as resources for the energy system and enablers for an affordable energy transition.**
  - > They will ensure a smaller, and more flexible, energy system with fewer stranded assets.
  - > They will reduce the cost of energy per kWh for businesses and consumers by shaving peak demand.

Considering the energy system as a whole

Decarbonisation of our energy system is still dealt with in a fragmented way. Too often, energy supply and demand policies are drafted by different departments and ministries, and as a result measures are taken in silos. This leads to counter-productive measures that nullify each other. The recent crisis with farmers illustrates this incoherence.

The current energy transition requires innovation in infrastructure and in policy-making. Therefore, the decarbonisation and decentralisation of our pan-European energy system compels us to carefully examine the different sources of energy to find synergies and practical energy efficient solutions.

Efficiency in regulating the energy market should be strongly promoted.

- **Uphold the "energy efficiency first principle" when conducting policymaking. We should ensure that:**
  - Only the energy really needed is produced
  - Investments in stranded assets are avoided
  - Demand for energy is reduced and managed in a cost-effective way
- **De-construct policy-making and adopt a holistic approach:**
  - Ensure departments within each Member State exchange to ensure consistency, coordination and complementarity of actions to support clean energy production, energy efficiency, and decarbonisation.
  - Priority should especially be given to integrating heating and cooling, electricity and transport needs.
  - Furthermore, energy efficiency and renewable energy production are two sides of the same coin – they should always be considered in unison.
- **Prioritise self-consumption and decentralised renewable energy generation, to increase the resilience of the energy system and the cost-effectiveness of the transition.**
- **Promote a truly integrated energy system by supporting the development of:**
  - Batteries and other storage options such as thermal storage- with a special emphasis on supporting alternatives to lithium-ion batteries to de-risk and ensure a wide variety of options.
  - Hybridization – combination of multiple renewable sources and technologies – including for the purposes of a back-up supply of energy.
  - Reinforced frameworks to facilitate coordination between district heating and cooling operators and electricity transmission system operators (TSO) and distribution network operators.[10]
- **Grids: The successful integration and deployment of a massive power infrastructure build-out will depend heavily on the availability of transmission and distribution networks.**
  - Investigate the potential of Vehicle-to-grid technology.
  - Repurposing gas pipelines: the most flexible way to transport renewable hydrogen is through using existing gas pipelines. However, currently there are both technical and legal challenges hindering this transport.
  - Deploy new-generation and efficient district heating networks supplied by renewable heat sources.

Mobilising adequate finance

It's clear that the transition, even if it makes good business sense, will demand massive investment both from the private sector and the public sector. Europe has long had a problem with mobilising just such private investment, and is especially true in the cleantech sector; In the last half-decade, while 22% of global cleantech seed venture capital (early-stage) came to Europe, it was a destination for only 9% of global cleantech growth capital, compared to 49% for North America.

This needs to change quickly if European industry wants to avoid missing the boat as clean energy technologies are expected to be worth USD 650 Billion a year by 2030 – a tripling from today's levels.[11] It will require targeted investment in key strategic objectives with a recent assessment indicating that to build the needed economic structures to achieve net-zero by 2050 the EU needs additional investments of €28 trillion – or € 933 billion per year.[12]

Beyond private investments, a real public signal is needed; the transformational innovation required, especially when dealing with a public good like climate, is not one the market can lift by itself.

- **Put more money in the envelope for cleantech. Here are a few potential ways to achieve this:**[13]
  - Provide existing EU funding instruments (e.g. the EU Innovation Fund) with more budget and increase call-frequency, including for more mature technologies.
  - Map and connect EU and Member States-level funding instruments to break silos and provide greater alignment and transparency to innovators.
  - Provide greater flexibility in the Stability and Growth Pact for Member States who increase their public investment in cleantech.
  - Provide guidelines for Member States to quickly invest under-spend in MFF, #NextGenerationEU and from national ETS revenues in climate innovation.
- **Facilitate capacity-building and greater reach of existing EU funding instruments with more human resources and technical/ project development assistance programmes.** To address the high administrative costs of accessing EU funding for cleantech innovation, and grow the number of applicants, a higher amount of project development assistance should be made available and targeted at a "fertile" group of organisations in segments which need to upscale and grow the number of cleantech innovators to deliver the EU's competitive sustainability.[14]
- **Stop subsidising pollution and activities harming the energy transition.**[15] **Here are a few immediate policy changes which can level the playing field for climate innovation:**
  - Ensure all public funding meets a "Do No Harm" to the climate transition and nature. This may include a DNSH criteria for all public funding instruments.
  - Pledge to provide 2€ to climate innovation for each 1€ of fossil subsidy – and grow the multiple over time.
  - Accelerate the speed of alignment with EU Taxonomy of European investors and lenders.
- **Make public support more predictable.**[16] The US IRA support or price support mechanisms (eg. Contracts for Difference) are predictable and long-term in nature (minimum ten years). With increased resources, the EU can avoid fraud and ensure proper process while making funding more accessible and tailored to the user. There is also a global competitive dimension to providing state funds which has changed dramatically over the last decade.
- **Address the need to scale up innovation.** It should proactively accompany them throughout their scaling journey, unlocking funding, sites and demand.

- **Promote the implementation of Mortgage Portfolio Standards (MPS) by financial institutions (FIs).**[17]
  - > Mentioned in the EPBD recast,[18] MPS is a regulatory mechanism where FIs pledge to work with their clients to increase the energy performance of the buildings which back their mortgages along a science-based trajectory for their portfolio. Implementation of MPS will enable FIs to align the properties they mortgage with EU decarbonisation policies such as the Renovation Wave strategy, and the objectives of the Paris Agreement.
  - > MPS will help ensure that all mortgage issuers will get ready to respond and provide millions of European households with affordable EU Renovation Loans[19] (also mentioned in the EPBD recast)[20] to upgrade their homes.
- **Introduce de-risking instruments to break down barriers to the widespread deployment of cleantech:**
  - > Doing so will reduce high upfront costs and risks, fast tracking first movers and helping private investors fund innovative technologies.

Enabling multi-level governance

Executing the ecological transition is an operation that requires concerted action at all levels. Whilst the direction of travel needs to be indicated from up on high, realising these objectives needs to occur by and within communities to ensure the measures are fit for purpose. Further, these communities must be resourced appropriately to meet these goals.[21]

Capacity building at local level should be fully recognised as a resource-intensive priority, requiring a significant financial envelope. For example, civil servants currently lack the knowledge and skills to design or handle green tendering procedures. The same is true for access to funding. Overall, 30% of the EU's budget will be spent on climate change and the priorities of the European Green Deal. This budget is made available to communities in a variety of ways that are complex to navigate, and many civil servants do not have the capacity to monitor and assess the relevance of the different funding and financing opportunities as they become available, let alone put together a competitive proposal.

- **Local capacity enhancement to ensure local authorities remain at the heart of the implementation strategies.**
  - > Recognize local specificities: EU institutions should acknowledge the diversity of local conditions and resources, tailoring capacity-building initiatives to address unique challenges and opportunities in different cities and regions.
  - > Set up regional hubs to facilitate ongoing policy dialogues, knowledge exchange within the existing initiatives, and feedback loops between local governments and EU institutions on the Green Deal implementation. These hubs can act as intermediaries, addressing local needs while promoting cross-border collaboration
- **Financial support and Cohesion Policy funds:**
  - > Localised funding allocation: Establish mechanisms within cohesion policy funds that allocate a significant portion directly to local governments or businesses, enabling them to initiate and sustain Green Deal projects that address local needs and priorities.
  - > Financial instruments should also be broadened in order to leverage more private and public capital for local and regional authorities, linking the financial support to tangible targets, rather than the result of time-consuming procedures of calls for proposals.
  - > Capacity is also needed to develop pipelines of bankable projects to increasingly attract private investments and loans to reach the scale of investment needed for larger infrastructural transformations.
  - > Increase the size of the funds (such as from the European Investment Bank) dedicated to procurement of clean technologies to accelerate the time to market.
  - > Investigate the possibility for the EC to engage in financial agreements directly with cities or to provide direct funding to cities (a single city or groups of cities).

- **Develop a centralised framework for disclosure to help communities manage their environmental risks and opportunities.**
  - > By using a standardised approach, communities can measure impact and share their progress with peers, citizens, businesses, investors, and the global community.
  - > Better connect Governance of the EU to national and local levels (direct reporting from local levels to the Commission?)
- **Integrate local businesses into a communities sustainability agenda:**
  - > Public authorities typically only control between 15-30% of the emissions generated on their territory, with business being responsible for the rest. By engaging the private sector early and on a consistent basis it becomes possible to coordinate actions within the city and benefit from the assets and knowledge of each actor as well.
  - > This can help to use available funding to de-risk investments and do joint procurement between multiple entities.

Public procurement is a domain where local authorities can bear significant impact on the decisions taken. Each year, public authorities in Europe spend around 14% of GDP (€2 trillion per year) on the purchase of services, works and supplies. That makes it a powerful market force for public authorities to stimulate investment in clean solutions. So-called Green Public Procurement (GPP) requires that selection criteria be aligned with European and community sustainability objectives to maximise its effectiveness. A number of different steps can be taken to make this happen, including:

- **Greening of public procurement processes:**
  - > Investigate the possibility of legally mandating the use of environmental criteria in procurement decisions, including qualitative criteria and whole life cost. This could start with a mandatory portion of the budget, increased gradually, to spend through these criteria.
  - > EU-wide, harmonised, mandatory and standardised GPP criteria should be adopted.[22]
  - > Enhance the Energy Efficiency First principle so that it leads to a systematic application of the principle in national policies and the consideration of energy demand reduction measures on an equal footing with supply-side resources.[23]
  - > Promote Circular Procurement that looks at life-cycle economics and has this combined with carbon as decision criteria. Circular procurement would also encourage and favour modular upgradeable – circular – products and repair and reuse of components and materials.
- **Better exploit innovation procurement:**
  - > Support public authorities traditionally inexperienced in engaging SMEs and the broader innovation ecosystem to identify the state of the art as well as new solutions.
  - > Support collaborative procurement to reduce risk, increase the purchasing power of buyers, and save time by enabling elements of the procurement process to be done together. By enabling groups of buyers to rapidly adopt innovative solutions, collaborative procurement can also help SMEs scale up quickly.

Re-skilling and up-skilling Europe's labour force

The green transition will profoundly impact Europe's labour markets. For example, more ambitious climate targets alone could lead to a net increase of up to 3.5 million jobs by 2030[24]. This is positive, considering that entire industries may be left behind. However, on a regional basis, the job impact of the green transition will be unevenly spread: a few regions will be exposed to job losses in fossil fuel-based sectors, like coal mining and manufactured fuels, due to the need to promote alternative fuels. Other regions will see new jobs in renewable energy and the circular economy.

In order to ensure all communities can benefit from the ecological transition, it is vital that up-skilling and re-skilling are both well-resourced and targeted. A report on the future of green jobs indicated, contrary to popular perception, that the transition will provide jobs for much more than just highly-skilled professionals. In fact, it will keep generating demand for low- and medium-skilled roles in the renewable energy sector, with 75% of employees expected to be manual workers and technicians in 2050.[25]

- **Ensure training in technical skills required for the ecological transition are promoted:**
  - Map needs in cleantech skills and ensure that these are aligned with the priorities within Net Zero Industry Academies. Ensure that it is geographically and contextually appropriate given local needs and opportunities.
  - Attract young generations and professionals in other sectors in the strategic sectors of the energy transition. For example, it has been estimated that 3 to 4 million construction workers across various occupations will need upskilling in the fields of energy efficiency and renewable energy.26
  - Upskill current professionals to cater for the variety of new skills requirements. For example, the renovation sector requires a wide range of new skills: elementary, middle- and high-skilled profiles , from vocational trainers to environmental lawyers and architects.
  - Favour a technical "multi-skills" approach, offering training for several technologies.
  - As mentioned in the previous chapter, provide training and education for civil servants to design or handle green tendering procedures.
- **Help Member States analyse skills needed per sector, develop strong national plans on green skills and overcome deployment bottlenecks caused by a lack of skilled labour.**
  - National and local governments, trade unions and employer associations, and civil society all have significant experience that can help define the approach in specific local contexts.
  - Better coordination between industry and educational authorities would also help facilitate work placements and boost employability levels for graduating students. Create public-private partnerships for green upskilling: engaging public and private partners in practice- and outcome-oriented initiatives.
  - Establish a clear regulatory pathway for investments in skills, with specific requirements for skills development at national level.
  - Strengthened certification schemes to create trust and ensure continuous implementation of the latest standards. Requiring practitioners to be formally certified in order to deliver publicly-funded projects to boost such training.
- **Build on leadership in certain sectors.**
  - For example, establish an EU Centre of Excellence for heat pumps to support manufacturers and encourage collaboration to overcome joint problems and lower costs, e.g. around manufacturing efficiencies, non-fluorinated refrigerant development and control systems.

- **Education on the ecological transition at school but also for professionals, especially linked to employability within associated sectors:**
  - > Education programmes should include basic knowledge about energy and climate issues.
  - > Education programmes should help change mindsets about technical education and careers at the earlier stages. Technical education should be better valued.
  - > Measures should support lifelong learning opportunities for professionals, especially targeted to contexts which will dramatically change profile as a result of the ecological transition.
  - > Carry out EU-wide and national level marketing and awareness raising campaigns.

Digitalisation and data sharing

Studies have found that by 2030, digital technologies have the potential to help other industries save 20% of global CO_{2e} emissions.[27] Digitalisation can and should play an important role and is intimately linked to the transition, to the extent that the concept of "twin transition" has been coined. While much progress is being made both digital and climate-wise, in reality we see that these two dimensions are too often considered in isolation, not reaping the benefits of such twin transition. **Five sectors have been identified, where digital technology can play an important enabling role in decarbonisation: construction and buildings, manufacturing, energy, agriculture, and transport.**[28]

- **Promote smart buildings** with the deployment of technologies like building automation control systems, building information modelling, and of metrics like the smart readiness indicator. Appliances and IoT devices should be connected and interoperable, allowing the building as a whole to flexibly respond to grid signals, allowing the reduction of energy prices for consumers and emissions.
- Tap into the **potential of digitalisation** for both **efficiency and flexibility.** Digitalised processes can very accurately measure and manage energy consumption and integrate intermittent renewables, allowing increased optimisation in buildings or in industry. Digitalisation can also help providing thermal inertia to residential and non-residential buildings, therefore supporting decarbonisation of infrastructure.
- **Reap the benefits of digitalisation to reduce water and lighting consumption.** Digital technologies offer hardware, software and equipment infrastructure to enable more connected, intelligent, efficient and responsive water systems and services. Same for lighting by installing LED lighting systems and connecting those systems to other building control systems can further reduce energy consumption and costs.
- **Promote smart agriculture** to increase the efficiency of food production, with precision farming for example. The World Economic Forum estimates that, if 15-25% of farms adopted precision agriculture, global yield could be increased by 10-15% by 2030, while greenhouse gas emissions and water use could be reduced by 10% and 20%, respectively.[29]
- Create a **dedicated Twin Transition Fund,** a new dedicated financing instrument targeting twin transition technologies, such as digital twins, industrial data spaces, and virtual worlds for industrial manufacturing.
- **Promote data cooperation** to enhance access to and use of sustainability data.[30] In order to make intelligent decisions and cut our energy usage, technologies like AI and the Internet of Things (IoT) rely on access to high-quality and interoperable data. The EU's plan for common European data spaces is a unique opportunity to promote the pooling of sustainability data.

POLICY RECOMMENDATIONS FOR EU LEADERS

FOCUSING ON KEY SECTORS TO MAKE THE DIFFERENCE

Modernising buildings and construction

The EU construction industry alone is worth around 9% of EU GDP and employs more than 16 million Europeans. A focus on the deep energy renovation of buildings across the EU will kickstart our economies from the ground up. It will provide large-scale local employment while reinvigorating demand in those industries that supply the construction industry. A study revealed that €1 million invested in the energy renovation of EU buildings can create upwards of 18 jobs.[31]

However, the annual deep renovation rate in the EU is around 1%. In order to achieve the objectives of the Renovation Wave, the deep renovation rate needs to reach 3% by 2030.[32]

In addition, while EU legislators are giving greater attention to the energy performance of buildings, the construction phase and the products used during construction and renovation should also be subject to decarbonisation objectives. Embodied carbon of construction contributes approximately 5-12% of EU CO_2.[33] Governments are introducing new regulations and frameworks to decarbonize the construction industry. This sustainability trend transforms the industry in a way to build carbon neutral buildings with recycled material and reduce the total amount of material used with higher performant construction materials.

To accelerate the transition of the construction and building sectors, a couple of issues should attract attention of the policy-maker:

- Introduce a **'whole life carbon' analysis and targets** for buildings and infrastructure projects. As mentioned in the EPBD,[34] introducing requirements on whole life-cycle emissions will spur innovation in industries and the creation of value, with a boost in the use of circular and natural materials.
- Enact **stronger regulatory requirements for advisory services** to better match demand and supply for renovation projects and simultaneously push for more **One-stop-shops** that have an important role to play in supporting the introduction of Minimum Energy Performance Standards (MEPS) in the buildings directive (EPBD) and in driving the uptake of renovation measures implemented through the National Recovery and Resilience Plans, Cohesion and other EU funding as well as public programmes.
- **Improve access to EU funding:**
  - To support deployment and upscaling of advisory services
  - To develop innovative breakthroughs, demonstrators
  - To support large CAPEX investments to deploy innovative solutions
- Promoting the **implementation of Mortgage Portfolio Standards (MPS)** by financial institutions, and the offering of EU Renovation Loans (ERL) (see above section on Financing). Both MPS and the ERL can assist millions of Europeans to access adequate finance to conduct renovation works.

- **Support industrial renovation production facilities.** They are a credible option to mass produce high performance prefab and decrease the cost of energy renovations.
- **Include sustainability and circularity criteria in public procurement tenders**, in order to send a signal to the market and promote the growth and acquisition of sustainable and circular construction abilities. This can be done by including requirements for certain building standards, certificates, or credentials in tenders.[35]
- Introduce climate, environmental and sustainability performance **requirements to construction products.**
- Address the issue of long-standing backlog in the citation of **standards for construction products**, via short-term and interim solutions.[36]
- **Improve technical building systems**, requiring that when key parts of the building or electrical installation are replaced, the replacement should be more efficient than what came before, unless it is already best-in-class.
- **Introduce requirements for upgrade of lighting installation in all upcoming building renovation.** In fact, 50% of all existing light-points in Europe are still old 'conventional' technology ('bulbs and tubes'). If these light-points would be upgraded, it would free up large amounts of needed electricity, equivalent to the electricity that can power 47 million heat-pumps or charge 55 million electric vehicles for a year.

Increasing efficiency and decarbonising Heating and Cooling

Heat is half of the energy consumption in Europe, as well as the main driver of Russian fossil fuel demand, with obvious implications in terms of energy security, competitiveness, and resilience. Decarbonisation and security of supply in the heating and cooling sector must become a top priority at European level.

There are already many well-established and proven technologies (solar thermal, geothermal, heat pumps, district heating, biomass, etc), which are available today and can often work in combination. As electrification progresses to decarbonise many sectors, direct heating solutions and a system efficiency approach will be key to reduce the overload on the grid and the need for costly interventions to expand it, making the transition more cost-effective and increasing the resilience, security, and flexibility of the whole energy system.

- Devote **greater political capital and visibility** to heating and cooling.
- **Accelerate the decarbonisation of heating and cooling, using all available means:**
  - > Direct renewable heat options and district heating
  - > Electrification – Analyse and assess which sectors should be electrified in priority and where direct heat is more relevant
  - > Assess the potential and reap the benefits of excess/waste heat
- Introduce **binding and more ambitious national targets** for decarbonising the H&C sector and clarify the definition and status of waste heat.
- **Empower local actors and incentivise strategic H&C planning.**[37]
- Address the potential **higher investment** costs and investigate how to set regulations and/or fiscal/VAT incentives supporting the upfront costs of such long-term investment. A long-term investment horizon is required considering the long payback periods of H&C infrastructures, technologies, and measures.
- **Encourage stakeholders' involvement** in strategic H&C planning – The transition of the H&C system requires coordination between different sectors and governance levels to enable all stakeholders to cooperate.[38]

- **Pursue the reform and extension of the ETS system to buildings and transport** – clarify its functioning, and reinforce income distribution schemes. A well-functioning and well-designed combination of an ETS2 and the use of its revenues in the Social Climate Fund will contribute to achieving the decarbonisation target for buildings without risking increased rates of fuel poverty or other negative social impacts. Further considerations are needed regarding the income distribution of the ETS2, the equal taxation of energy and the predictability of the ETS2 price.[39]

Accelerating clean transport

Transport (including international shipping and aviation) emitted 32% of the EU's greenhouse gas in 2019, up from 24% in 2000.[40]

Today, the European Union must make use of dedicated policy measures in order to make transport more resilient, sustainable, accessible and equitable.[41] Effective transport decarbonisation will not only allow for the creation of sustainable alternatives to traditional, fossil fuel-powered transport modes: new mobility options can also improve citizens' access to opportunities, e.g. by alleviating congestion and providing more and cheaper alternatives to private vehicle use, and better account for, and reduce, the many externalities of transport activity. Policy measures should be well assessed and designed for such potentials to materialise.

The EU transport sector has to satisfy the growing demand for passenger and commercial transport, to continue unleashing economic growth, to ensure connectivity, and safety while it has to reach the EU's own objective of reducing the transport emission by 60% by 2050.

- **Invest in and mandate the required infrastructure**
  - > Governments must directly build the electric vehicle charging infrastructure in public locations, especially along trucking routes.
  - > In privately owned car parks, governments must mandate the installation of sufficient EV charging points. With the expectation that all new cars will be electric, this will become a basic necessity for offices and apartment complexes; we cannot allow lack of investment to become an economy-wide bottleneck.
  - > Ports are key transport hubs, with most of the continent's imports and exports travelling by sea. As the post-pandemic phase revealed, it is also a fragile bottleneck capable of slowing the economy if disrupted. The modernisation and digitalisation of port infrastructure is long overdue.
  - > Rail continues to receive only a fraction of the public support that motorways do despite being a more efficient and more climate friendly way of moving freight.
- **Trigger behavioural change:** Through improved communication on the wider benefits of transport decarbonisation to ensure citizens' acceptance and involvement.
  - > Launch public awareness campaigns highlighting the environmental benefits of sustainable transportation choices, such as walking, cycling, and using public transit.
  - > Introduce educational programmes in schools and communities to promote sustainable transportation habits from an early age.
- **Facilitate multimodal transport:**
  - > Promote sufficiency and modal shift towards shared and more sustainable transport means, while addressing the issue of individual freedom.
  - > Integrated Ticketing Systems: Develop integrated ticketing systems that allow users to seamlessly switch between different modes of transportation using a single ticket or app.
  - > Transport Hubs: Create efficient transport hubs that connect various modes of transportation, making transfers between them convenient.
  - > Respect technology openness and allow for all available solutions to play their part in decarbonising the transport sector.[42]

- **Lean on public transport:**
  - > Scale investment in public transit: Allocate funding for the expansion and improvement of electric and low-emission public transportation networks, including buses, trams, and trains.
  - > Incentivize the use of public transport.
  - > Empower local authorities to take transport decarbonisation actions that correspond to local specificities.
- **Modernise regulations and standards:**
  - > Ensure a holistic and inter-sectoral approach. Decisions in one mode of transport will have an impact on the others. Individual optimization can hamper the best global compromise.
  - > Reduce regulatory uncertainty through transparency and collaboration. Less uncertainty enables bolder decisions, for instance to embrace new technologies and business models that can achieve deep and timely emission cuts.[43]
  - > Put in place a regulatory framework that enables the deployment of innovative digital solutions likely to contribute to greater fleet energy efficiency (combustion engine and electric vehicle).
  - > Implement regulations to enable the decarbonisation of the existing fleet can be achieved through retrofit solutions, better vehicle maintenance or the use of components that emit less CO_2.

Spotlighting water

Availability of clean water is a precondition for human life but is also crucial for industrial development. **The value of water for our economy, society, and biodiversity needs to be recognised to ensure water security, sustainability, and resilience**. Unlike other critical resources, fresh water cannot be easily transported. **All available water sources must be managed so that water scarcity and pollution are avoided:** water and resource loops must be largely closed to foster a circular economy and optimise resource efficiency; the water system must be resilient against the impact of climate and demographic change; and all relevant stakeholders – including local level – are engaged in guaranteeing sustainable water governance.[44]

As the impacts of climate change become more pronounced and populations continue to grow, the urgency of effective water management has never been clearer. In the context of the European Union's commitment to environmental preservation and sustainability goals, crafting comprehensive policy measures for water management must rise to the forefront of the policy agenda, to achieve a Water-Smart Society.[45]

Studies show that the net annual electricity consumption for urban water management represents 30 to 50% of local authority's electricity consumption,[46] and 5.5% of the total amount of electricity consumed by households in just one year in Europe. In addition, water produced and "lost" before reaching the customer is on average 23% of total net water produced in the EU.[47]

- **Step up communications: No policy can succeed without the support and understanding of the public.** Education campaigns that step up water consciousness and a sense of shared responsibility can help ensure the success of water management measures.
  - > Increase awareness of water issues and bring water to the forefront of policy-making with a European Water Strategy.
  - > Put a focus on water-related issues in public education and research circles. Developing new technologies will enable both peoples' and society's ambitions to save and reuse water, and of increased water efficiency in the water consuming sectors.

- **Cross-sectoral collaboration:**
  - > Promote effective water management and evaluate consequences of new legislation (intended for other sectors) on water quality and quantity.
  - > Collaboration between agriculture, energy, transportation, and urban planning is crucial to ensure that water is used judiciously and efficiently.[48]
  - > Promote real-life demonstration and implementation instruments, like for example Water-Oriented Living Labs (WOLLs)[49] that bring together public and private institutions, government, civil society, and academia to jointly build structured grounds to develop, validate, and scale-up innovations that embrace new technologies, governance, business models, and advancing innovative policies.
- **Update the current legal and policy framework:**
  - > Obtain reliable scientific data to determine the state of fresh water availability and sustainability limits per water basin.
  - > Improve existing regulations related to water quality by addressing the issues of industrial and agricultural discharges, investigating the potential for water reutilisation, and imposing a compulsory systematic assessment of Nature-Based solutions[50].
  - > Address the issue of water scarcity by investigating re-use of domestic grey water and the remaining infrastructures needed to do so, for example through boosting water management technologies demand. By investigating the potential for smart irrigation of agricultural lands, addressing the issue of water infrastructures leakages or diversifying the water supply (eg: desalination, rainwater, storm water, and reclaimed wastewater) at the same time ensuring that water is produced with a quality fit for purpose.
- **Mobilise appropriate funding:**
  - > EU Cohesion Funds should be made available to accelerate implementation of current mandatory water regulations.[51]

> Transforming industry

The industry sector is one of the largest energy consumers in the EU, accounting for about a fourth of the final energy consumption. **European industries have made important progress to improve their energy efficiency and switch to renewable and low carbon energy sources; however, opportunities for saving energy still remain in most enterprises.**

Technology is a key enabler for decarbonising industrial heat, with fuel switching, energy efficiency, material efficiency, enhanced recycling, feedstock decarbonisation, and carbon capture, utilisation, and storage (CCUS)— all offering pathways to decarbonise industrial processes.

- **Two policy areas will be key in achieving decarbonisation of EU industries.**[52]
  - > Using **energy performance thresholds** for industrial equipment to encourage procurement of lower carbon intensity industrial equipment and to progressively remove higher carbon intensity equipment from the market.
  - > **Carbon markets and carbon border taxes**, to influence behaviours and create a level playing field for EU industries, as well as pushing the rest of the world in the same direction.

- **Promote efficiency** in industry through a mix of demand-pull and technology-push policies to incentivize industries to switch to cleaner and more efficient solutions.
- Take a **systemic approach,** to ensure systemic emission reductions and address multiple environmental and social crises simultaneously, seeking synergies between issues.[53]
- **Accompany Member States[54] in developing:**
  - > Partnerships with business and sector associations to ensure they work towards meeting the long-term climate and energy objectives.
  - > Support programmes to facilitate the uptake of cost-effective measures.
  - > Support for green products markets, including through green public procurement.
- Keep contributing to **R&D investments in improving energy efficiency of manufacturing processes,** where solutions for deep decarbonisation are not yet commercially available.[55]
- Keep contributing to **developing innovative business models** which facilitates the market uptake of energy efficiency measures and renewables within SMEs in the industry and services sectors.[56]
- Implement a strong and simple governance framework to **monitor progress, define the targets and roadmaps, establish systems for evaluation and reporting, and support access to information and transparency** for civil society and the private sector. It is crucial to send a strong signal to industrial and manufacturing sectors on what will be expected from them by setting concrete and ambitious milestones for industrial "ecosystems" on their contribution to achieving European Green Deal goals.

Addressing the agri-food sector

The global food system is a major driver of climate change and biodiversity loss, accounting for nearly one-third of greenhouse gas emissions, 90% of tropical deforestation and 70% of water use globally.[57]

On the other hand, our food system is vulnerable, as illustrated by COVID-19 and the invasion of Ukraine. Paired with unchecked financial speculation in food commodities and the rising frequency of extreme weather events due to climate change, these shocks have resulted in food prices hitting their highest levels in over a decade. Once again, it is those who suffer most from food insecurity who are bearing the brunt of this crisis.

However, it is not the trade disruptions affecting our import of phosphate fertilisers from Russia or of grain and oilseed for livestock feed from Ukraine that threaten EU food security in the long term. **The biggest threat to food security in the EU is the impact our food system has on the environment and on the biodiversity and ecosystem services that food production depends upon**.[58]

A new study by FAO estimates that the hidden environmental, social and health costs of agri-food systems are as high as $12 trillion globally in 2020.[59] These amounts should be redirected to investments in favour of a regenerative and sustainable food system, that will gradually reduce these hidden costs, and ensure a long-lasting food system.

The EU should therefore act to ensure that the food system does not impinge on planetary boundaries, provides fair incomes and dignified working conditions to all those employed in it, and makes sustainable and healthy options the default choice for European consumers.[60]

Recommendations include:

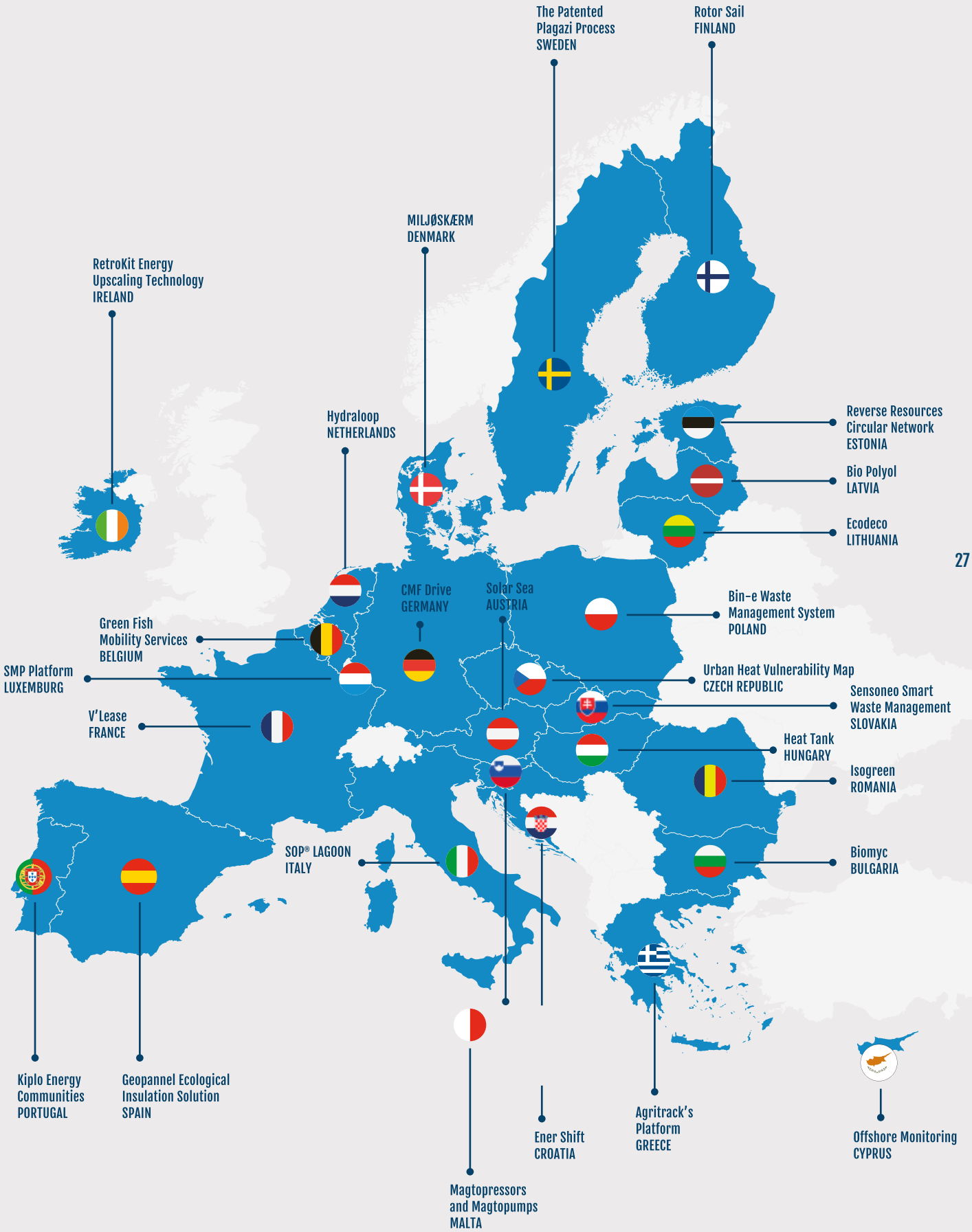
- Establish a common **governance system and methodologies for carbon farming schemes.** Boost the use of public funding under the CAP to channel public money towards biodiversity and climate by rewarding farmers and developers whose activity benefits the environment and climate. Only so can it ultimately reward farmers for "real" climate action.[61]
- Accompany Member States to **align their CAP Strategic Plans with the new LULUCF and ESR targets** to provide clear incentives for farmers to prioritise carbon farming and wider farm practices that will reduce emissions and increase carbon sequestration in soils, trees, hedges, and wetlands.
- **Define and promote regenerative agriculture.**
- Support the **diversification of protein production and consumption** to non-animal sources and **prioritise high quality livestock production** against industrialised systems.
- **Reduce EU's dependence on chemical fertilisers** by expanding organic farming and developing EU's organic fertiliser production.
- **Leverage innovation.** The pricing of carbon will be a key component in supporting farmers to fund the negative emission solutions needed to achieve Net Zero.
- Engage consumers and **accelerate behavioural change** by promoting a shift in dietary patterns through transparency and information on food products.
- Address the **social and environmental harm caused by industrialised food production.** The food supply chain, particularly the middle of the supply chain (retailers, advertisers, processors, and the food service sector) has been characterised by increasing power concentration over the past three decades. Farmers get squeezed by bigger players, are forced into a price-taking position and have therefore no capacity to switch to sustainable practices.[62]
- Develop a scientifically **robust and standardised approach related to data, life cycle analysis and measure, report and verification processes.** Without this, it is impossible to establish baseline measurements, robustly and reliably compare data, and establish the success and impact of interventions over time – which in turn, is vital for behaviour change by the farming community and society.[63]
- **Tackle the issue of food inequalities.** The EU is split between general overconsumption and the reality of over 36 million citizens not being able to afford a quality meal every second day.
  - > Tackle the issue of food waste. Globally, approximately a third of all food produced for human consumption is lost or wasted.[64]
  - > To tackle food waste in primary production, promote the development of databases and digital tools that allow farmers to anticipate harvests and gain insights into market trends and demand. It should facilitate the distribution of surpluses across the Single Market and beyond, encourage the consumption of local and seasonal products, and assist farmers in transitioning from crops prone to oversupply to those for which EU production remains insufficient.[65]
  - > To tackle food waste at household level, enforce regulations requiring food retailers to provide consumers with clear information on proper storage requirements, accurate expiration dates and recommended portion sizes. It should also actively promote more responsible consumption habits among citizens, and foster the development of mechanisms for collecting and reusing food, since unsuitable foodstuffs for human consumption are still suitable for animal feed production.[66]

ANNEXE

EUROPEAN SOLUTIONS EXIST, IT'S ALL ABOUT CREATING THE ENABLING ENVIRONMENT

The Solar Impulse Foundation has been gathering and labelling solutions that are good for the climate and economically realistic. All solutions can be found, open-source, on the Solar Impulse Website Solutions Explorer. Other solutions, covering specific needs or geographical requirements, can also be scouted by Solar Impulse Foundation Team. Do not hesitate to get in touch!

This list of 27 solutions, among the 1,600 labelled, shows that solutions exist in each Member State and in all sectors.


The Patented Plagazi Process SWEDEN
Rotor Sail FINLAND
MILJØSKÆRM DENMARK
RetroKit Energy Upscaling Technology IRELAND
Hydraloop NETHERLANDS
Reverse Resources Circular Network ESTONIA
Bio Polyol LATVIA
Ecodeco LITHUANIA
CMF Drive GERMANY
Solar Sea AUSTRIA
Bin-e Waste Management System POLAND
Green Fish Mobility Services BELGIUM
SMP Platform LUXEMBURG
Urban Heat Vulnerability Map CZECH REPUBLIC
Sensoneo Smart Waste Management SLOVAKIA
V'Lease FRANCE
Heat Tank HUNGARY
Isogreen ROMANIA
SOP® LAGOON ITALY
Biomyc BULGARIA
Kiplo Energy Communities PORTUGAL
Geopannel Ecological Insulation Solution SPAIN
Magtopressors and Magtopumps MALTA
Ener Shift CROATIA
Agritrack's Platform GREECE
Offshore Monitoring CYPRUS

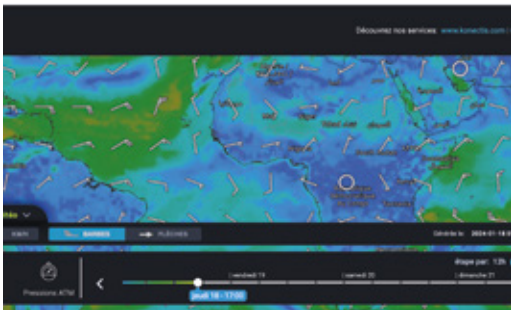
AUSTRIA
Sector: Energy
> Solar Sea
Solar Sea tackles diesel generators dependence by providing solar panels designed for seas and oceans.

BELGIUM
Sector: Mobility
> Green Fish Mobility Services
By using an engineering-based approach, Greenfish Mobility Services relies on extensive audits and on analytical data to assess and compare the different viable options to optimise fleets' mobility in terms of costs and CO_2 emissions.

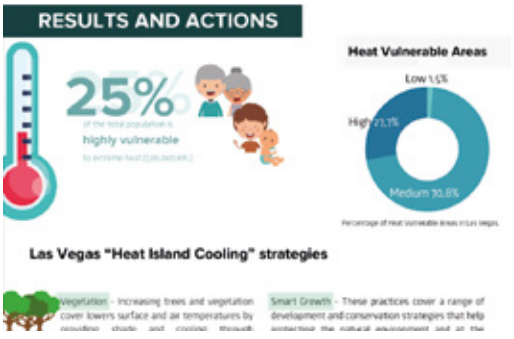
BULGARIA
Sector: Industry
> Biomyc
Biomyc designs next-generation products and packaging from innovative eco-materials and renewables.

CROATIA
Sector: Energy
> Ener Shift
Ener Shift proposes an online platform where, with just a click, anyone can invest in renewable energy, and not only help the environment but also make a huge profit out of it.

CYPRUS
Sector: Freight
> Offshore Monitoring
Offshore Monitoring proposes systems that calculate optimized routes for ships, reducing their overall fuel consumption.



CZECH REPUBLIC
Sector: Infrastructure
> Urban Heat Vulnerability Map
The Urban Heat Vulnerability Maps are able to identify hottest areas of a city and locate where the most vulnerable people live in the city.



DENMARK
Sector: Infrastructure
> Solution: MILJØSKÆRM
MILJØSKÆRM proposes a manufacturing process for acoustic and thermal insulation products from recycled wind turbine blades. This solution constitutes a new contribution to the circular economy by replacing virgin materials with upcycled waste products that in addition may be recycled several times.

ESTONIA
Sector: Industry
> Reverse Resources Circular Network
Reverse Resources acts as an intermediary between garment factories, recyclers and global fashion brands in order to close the loop of consumption in the textile industry. It proposes high-end fibre-to-fibre recycling and circular economy for the fashion industry.

FINLAND
Sector: Freight
> Rotor Sail
Rotor Sails is an auxiliary wind propulsion system that reduces the fuel consumption of commercial shipping vessels.

FRANCE
Sector: Mobility
> V'Lease
V'lease is a turnkey solution for employers willing to move to green professional mobility with ebikes. It provides individual mobility to all employees at the cost of public transport subscription.

GERMANY
Sector: Mobility
> CMF Drive
CMF Drive helps upcycling of old diesel buses into clean, efficient buses powered 100% by renewables.

GREECE
Sector: Food & Agriculture
> Agritrack's Platform
Agritrack's Platform is a post-harvest automation platform that optimises perishable food value chains such as fish & dairy, improving food quality, reducing costs, and securing traceability compliance.

HUNGARY
Sector: Building

> Heat Tank
Heat tank is an optimal energy storage for solar collectors and data centers. It can store the energy in a more concentrated way, reducing storage volume by 90%, enabling energy savings of at least 20-50%, with a total return on investment of 3 to 5 years.

IRELAND
Sector: Waste & Pollution

> RetroKit Energy Upscaling Technology
RetroKit is a cloud-based digital platform dedicated to upscaling energy retrofit in housing as a key step to decarbonising Europe's energy system and eliminating fuel poverty.

ITALY
Sector: Food & Agriculture

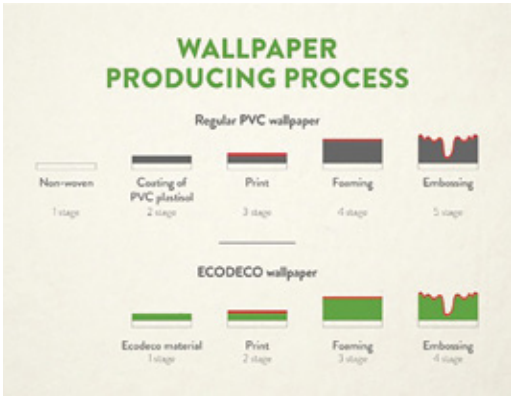
> SOP® LAGOON
This solution reduces the formation and emission of odors, ammonia and GHGs from the stored manure, as well as that spread on the fields, and improves the fertilizing properties of the liquid manure.

LATVIA
Sector: Industry

> Bio Polyol
Polylabs Bio Polyol is made from sustainable and renewable resources: Rapeseed and tall oils. It can help companies produce rigid polyurethane products with reduced CO_2 emissions and increased bio carbon content.

LITHUANIA
Sector: Buildings

> Ecodeco
Ecodeco wallpaper category is a sustainable solution for the production of traditional structural wallpapers. Replacement of plasticised PVC in wallpaper production brings several benefits: odourless and healthier final product for end-users, better recycling of waste, saving of energy during the production and reducing CO^2 footprint.



LUXEMBURG
Sector: Freight

> SMP Platform

The Sustainability Management Platform (SMP) identifies the carbon footprints of transports, products, and companies from any sector. The solution provides comprehensive analyses using real-time data to provide companies from any industry, reliable information and pave the way towards a more sustainable economy.

MALTA
Sector: Infrastructures

> Magtopressors and Magtopumps

The Solution aims at enabling billions of homes, businesses and vehicles worldwide to lower significantly the environmental footprint of their compression, pumping, heating, cooling and refrigeration needs through the use of a new, ultra-high efficiency linear compressor and pump technology.

NETHERLANDS
Sector: Water

> Hydraloop

Hydraloop offers a full product range of stand-alone and concealed water recycling devices for residential and commercial real estate. Hydraloop purifies the water from showers, baths, and washing machines as well as condensation water from tumble dryers, heat pumps and air conditioning units. Hydraloop water can be re-used for toilet flushing, washing machines, garden irrigation, and topping up swimming pools.

POLAND
Sector: Waste

> Bin-e Waste Management System

Bin-e optimizes waste management in any facility, allowing to save costs, time and labour. It ensures precisely sorted raw material through automatic recognition and segregation.

PORTUGAL
Sector: Energy

> Kiplo Energy Communities

The solution is a modular, interoperable and localized cloud-based Operating System designed to manage energy communities around the world, managing the energy flows and trades, as well as distributed energy assets to increase collective self-consumption, provides aggregation of flexible assets for balancing markets participation, and it can also aggregate generation to participate in energy markets.

ROMANIA
Sector: Freight

> Isogreen

ISOGREEN FCH 100 cellulose fibre insulation has exceptional technical qualities for roof insulation, interior wall insulation, sandwich wall insulation of wooden houses, sound insulation of walls and floors, and for insulation and ventilated facades. It has the ability to insulate various cavities in walls thus providing perfect protection.

SLOVAKIA
Sector: Waste

> Sensoneo Smart Waste Management

Through its smart waste management technology, Sensoneo is redefining the way waste is managed. It develops and provides enterprise-grade smart waste management solutions that enable cities and businesses to manage their waste efficiently, lower their environmental footprint and improve their quality of service.

SLOVENIA
Sector: Water

> PlanetCare Microfibre Filter

Microfibres from washing are a major contributor to microplastic pollution. PlanetCare Microfibre Filter is a filter that attaches to the washing machine and captures microfibres before they enter the drain. It improves the quality of our waters by preventing the microfibres from being discharged into sewage and oceans and thus entering our environment. The dirty cartridges are being cleaned and reused and the mash caught recycled.

SPAIN
Sector: Buildings

> Geopannel Ecological Insulation Solution

Geopannel Ecological Insulation Solution are insulation panels made from 80% recycled textile fibers and are 100% recyclable. They have a long service life and pass the most stringent tests for thermal and acoustic insulation, tensile strength, abrasion, mold formation, toxic emissions, and reaction to fire.

SWEDEN
Sector: Energy

> The Patented Plagazi Process

The patented process, which converts all types of waste into green hydrogen through plasma gasification, is energy self-sufficient, fully enclosed, and environmentally friendly by not producing any dangerous by-products.

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