



Opportunities of post COVID-19 European recovery funds in transitioning towards a circular and climate neutral economy

KEY FINDINGS

Despite current challenges, the **COVID-19 crisis presents an once-in-a-lifetime opportunity for the EU**. History shows that large-scale crises force us to significantly rethink and create opportunities to rebuild better. Large rapid absolute reductions of resource use and greenhouse gas (GHG) emissions cannot be achieved through observed decoupling rates, hence **decoupling needs to be complemented by sufficiency-oriented strategies** and strict enforcement of absolute reduction targets. In determining whether the **EU is recovering successfully from COVID-19, the evolution of the quality of life and well-being of people**, as well as **GHG emissions and loss of nature** should be monitored. Gross Domestic Product (GDP) is a means to an end, not an end. The EU should present a forward-looking, ambitious vision for an economy geared to the UN Sustainable Development Goals. **Successful examples in the fields of energy, industry, food and health** illustrate how transitioning towards circular and climate neutral economies can be fostered. Specific green economic recovery measures that stabilise livelihoods, creates jobs and reduce biophysical impact include:

- clean **physical infrastructure investment** in the form of renewable energy assets, storage (including hydrogen), grid modernisation,
- building efficiency spending for **renovations and retrofits** including improved insulation, heating, and domestic energy storage systems,
- investment in **education and training** to address immediate unemployment from COVID-19 and structural shifts from decarbonisation,
- **natural capital investment** for ecosystem resilience and regeneration including restoration of carbon-rich habitats and climate-friendly agriculture, and
- clean R&D spending.

These measures are more effective, when accompanied by the following: **full carbon pricing, prioritising investment in green infrastructure and innovation, phasing-out of subsidies and tax exemptions for emissions-intensive activities, and promoting green finance**. Although COVID-19 has reduced GHG emissions in 2020, the overall impact will be driven by investment choices. **In the current economic climate, public investment is a key driver of the transition to a more sustainable economy**. **Regulations** are effective in steering investments into areas that are socially desirable. After focussing on **SME survival** in the short term, policies need to shift towards a more structural and longer-term approach based on promoting their renewal and growth through **innovation**, internationalisation and networking. Healthy, green and just recovery increases **overall health, preparedness and resilience** in the face of future pandemics.



Background

At the end of 2019, the European Commission adopted a green growth strategy as part of the [European Green Deal \(EGD\)](#)¹. The EGD responds to the escalating climate crisis by achieving net-zero GHG emissions from the EU by 2050. Additionally, the EGD aspires to “protect the health and well-being of citizens from environment-related risks and impacts” and establish a toxic-free environment, deliver healthy and sustainable diets, and protect biodiversity. The European Parliament (EP) supports the EGD with requests for higher ambition, notably a 60% emissions reduction target by 2030².

To EGD with the crisis situation triggered by COVID-19, European leaders agreed on 21 July 2020 on a package worth €1,824 billion. It combines the EU’s 2021-2027 budget amounting to €1,074 billion and a new Next Generation EU of €750 billion. The [Next Generation EU recovery plan](#)³ “aims to address the damage caused by the pandemic and invest in a green, digital, social and more resilient EU”, as well as reducing risks of further EU fragmentation. [EU’s Recovery and Resilience Facility \(RRF\)](#)⁴ is “the key recovery instrument at the heart of NextGenerationEU which will help the EU emerge stronger and more resilient from the current crisis”. The RRF will provide loans and grants in frontloaded financial support for the crucial first years of the recovery. For the core component of these grants, Member States will need to prepare national recovery plans pledging to reform their economies in order to unlock their allocated share of this funding, which will be distributed from 2021 to 2023. The EP favours investment in projects that offer a green dividend, which include energy-efficient buildings or adapting an infrastructure to climate change. The Environment, Public Health and Food Safety (ENVI) committee in the EP voted on 13 October 2020 to back the use of the EU Taxonomy criteria for ensuring that only sustainable activities will be financed and that at least 37% of the RRF to be directed to financing climate actions and 10% towards biodiversity.

The transition to a sustainable and climate-neutral economy will pose a significant challenge to all Member States and in particular territories that are **strongly reliant on extractive industries** and **carbon intensive industries**. **The Member States need support to restructure and/or diversify their economy, maintain social cohesion**, and (re)train the affected workers and youth to prepare them for **future jobs**, which is what the [Just Transition Mechanism](#)⁵ facilitates. The EP calls for more resources to be allocated to the Just Transition Fund⁶.

The timing of the majority of payments from the RRF casts doubt on their suitability as primarily **countercyclical fiscal policy**. The EU funds could also be part of a **medium-term strategy focused on quality spending and future-oriented investments**. While the design of the recovery fund, with its predominant focus on the RRF, puts national governments in charge, clear conditions are crucial for achieving a green economy and the sustainable development goals. To boost this agenda recovery funds could focus on future-oriented investments in the education system, digitalisation and climate goals. The new EU funding is a unique opportunity to provide an incentive for genuine structural reforms. To ensure that the interests of the EU as a whole are taken into account and the objectives are achieved, the EP could insist on receiving regular and detailed reports from the Commission and could hold hearings with the Commissioner involved in order to achieve transparency and public accountability⁷.

In the recent [State of the Union address](#)⁸ Commission President Ursula von der Leyen spoke among others of fragility and necessary community response. “A virus a thousand times smaller than a grain of sand exposed how delicate life can be. It laid bare the strains on our health systems and the limits of a model that values wealth above wellbeing. It brought into sharper focus the planetary fragility that we see every day through melting glaciers, burning forests and now through global pandemics”. This reframing is helpful for achieving post-COVID-19 recovery in the transition towards a circular and climate neutral economy as (absolute) decoupling of GHG emissions from GDP remains elusive⁹.

General overview

At a time when governments are allocating massive resources to mitigate the economic and social impact of COVID-19, it is essential to seize the opportunities offered by gearing the European Recovery Funds towards a circular and climate-neutral economy. **Past experience** shows that policy responses to major disasters, such as the 2008 global financial crisis and the millennium drought in Australia tend to focus on

stabilising established industries, technologies and practices rather than seizing the opportunity for structural reform and sustainability transformation¹⁰. During the COVID-19 pandemic, we have seen how **lockdowns across the world have reduced air pollution and GHG gas emissions** due to reduced transport, electricity generation and industrial production. This shows how closely economic activities and fossil fuels are intertwined and reinforces the need to take the impact of climate change into account in economic recovery plans. The **direct effect of the pandemic-driven response GHG emissions and air pollutants will be negligible**, with a cooling of around 0.01 ± 0.005 °C by 2030 compared to a baseline scenario that follows current national policies. Conversely, choosing a pathway with strong green stimulus assumptions (~1.2% of global gross domestic product), including climate policy measures, has a good chance (~55%) of keeping global temperature change above pre-industrial within the 1.5 °C limit, saving around 0.3 °C of future warming by 2050¹¹. Mobilising transformative actors and regulation can promote the necessary change in economic structures and social practices. However, more than designing policy instruments and activating decision makers is necessary, notably a **paradigm change. Monitoring and managing well-being directly rather than indirectly through GDP can facilitate the transformation.** The COVID-19 crisis has opened a **window of opportunities for change and for “bouncing forward”** through adaptation and transformation¹². For example, **new concepts of human well-being** are being discussed which include the strengthening of local value chains, social and ecosystem **resilience** and at the same time the reduction of social and economic vulnerabilities¹³. In the EU, the economy of wellbeing has been endorsed by the [Council of the EU](#)¹⁴ in October 2019 and by the [European Economic and Social Committee \(EESC\)](#)¹⁵ in January 2020. If achieving ambitious climate and sustainability targets should be reconciled with continued GDP growth, an **absolute decoupling of GDP from the use of biophysical resources and/or emissions** is a logical necessity. A recent systematic review of the evidence on decoupling of GDP, resource use and GHG emissions finds that **“large rapid absolute reductions of resource use and GHG emissions cannot be achieved through observed decoupling rates, hence decoupling needs to be complemented by sufficiency-oriented strategies and strict enforcement of absolute reduction targets”**¹⁶. Sufficiency-oriented strategies mean ‘the direct downscaling of economic production in many sectors and parallel reduction of consumption’¹⁷, and include restrictive supply-side policy instruments targeting fossil fuels (instead of relative efficiency improvements), redistribution (of work and leisure, natural resources and wealth), a decentralisation of the economy or new social security institutions (that complement the growth-oriented welfare state), “moratoria on resource extraction and new infrastructures (e.g. coal power plants, highways, airports), bans on harmful activities (e.g. fracking, coal mining), the reduction of working hours and redistributive taxation, instead of just putting a price on resources and emissions”¹⁶. “Studies in sustainable consumption increasingly argue that a decisive turn towards ‘**strong sustainable consumption governance**’, that is, a clear focus on reducing the volume of the materials and energy resources consumed while maintaining levels of well-being, will be a key required for deep decarbonisation.”¹⁸. **New forms of solidarity** (e.g. crowdfunding, crowdsourcing, hackathons) have emerged together with new forms of social/technological/work infrastructures¹⁹.

The **health co-benefits outweigh the policy cost** of achieving the target associated with the Paris Agreement. In some of the mitigation strategies, the median co-benefits were double the median costs at a global level. The ratio of global health co-benefit to mitigation cost ranged from 1.4 to 2.45, depending on the scenario. In the European Union for a 1.5°C-policy scenario up to 84% of the costs of reducing GHG emissions could be compensated with the health co-benefits²⁰.

The **international context for green recovery** is also shifting. **China’s pledge to reach “carbon neutrality”** before 2060 could cut global warming this century by 0.25°C and raise the country’s GDP. Besides the EU, **South Korea** has also pledged for carbon neutrality by 2050 and has communicated an overarching package with a deliberate focus on green recovery. Germany and France as individual countries, and the EU as a whole, are [planning for a green recovery](#)²¹ in which the benefits to the climate and nature outweigh the negative impacts. There is a **real danger** that some governments use the pandemic recovery to roll back climate and environmental legislation and undertake ‘red’ (carbon intensive) interventions, such as bailing out the fossil fuel industry.

For **small and medium enterprises (SMEs)** the situation is mixed. While some governments hand out large liquidity support and bailout for corporations, SMEs in a range of country benefit temporarily from deferred tax payments and social security contributions, and the suspension of bankruptcy proceedings. Generally the recovery measures do not aim to favour SMEs over larger companies. The ILO estimates the impact of COVID-19 to result in a rise in global unemployment of between 5.3 million ("low" scenario) and 24.7 million ("high" scenario), signalling that 'sustaining business operations will be particularly difficult for SMEs'²². The policy mix in response to COVID-19 will need to shift from its initial focus on the survival of European SMEs in the short term, towards a more structural and longer-term approach based on promoting their renewal and growth through **innovation, internationalisation and networking**²³.

Examples

The following sections contain concrete examples of specific economic sectors where green recovery measures have been implemented and where further opportunities can be sought and added value obtained.

1. Energy

Key interventions governments in Europe have recently announced or successfully implemented:

- Germany: Extra funding for a CO₂-focused building renovation programme, with an additional EUR 1 bn in 2020 and 2021 taking the annual totals to €2.5 bn²⁴,
- Berlin, Oslo, Bristol, London: [Mayors pledged](#)²⁵ to shift out of fossil fuels and into green energy, buildings, transport and other investments to help them recover from the pandemic and tackle climate change. Declaration to divest covers 36 m residents and over \$295 bn in assets, and
- Italy: The Italian government has offered a tax deduction of 110% over 5 years for the realisation of new PV residential plants. Economic assessment shows great opportunity for consumers to tackle climate change whilst obtaining relevant economic profits²⁶.

To take further action, the following approaches could be adopted:

a. A new paradigm in the electricity sector

Higher temperatures are expected to increase electricity demand for cooling, reduce heating demand and reduce electricity generation from thermal power plants. The effects of climate change on the supply of electricity from non-thermal sources show a wide geographical variability due to differences in expected temperature and precipitation changes²⁷. Increased cooling demand also causes fluorinated GHGs ([F-gas Regulation](#))²⁸. As the demand to "**electrify everything**" grows, the challenge to green the energy mix for generating electricity rises steeply. The generation costs for **solar and onshore wind** energy have fallen significantly in recent years, and now the **rapid installation of additional capacity** can follow. Many cities and companies have committed to electrify every vehicle in their fleet in the years ahead. The combination of decentralised energy sources and digitalisation allowing customers to generate their own electricity, becoming "**prosumers**"²⁹, both consumers and producers of electricity, or even "**prosumagers**" who also store their electricity³⁰ opens new opportunities for a fast diffusion of micro renewable energy solutions. **Energy communities** include virtual power plants, peer-to-peer trading, microgrids, and community-scale energy projects. It is widely expected that distributed energy resources capacity additions in the form of physical infrastructure, such as solar PV, generator sets, controllable energy storage, and electric vehicles will play an ever greater role³¹. A study of least cost 100% renewable energy systems for 139 nations suggests some **28% of all-purpose annually averaged end-use energy demand might be met by rooftop PV**, comprising 1.8 billion 5-kW residential rooftop PV systems (14.9%) and 75 million 100-kW commercial/government rooftop systems (11.6%)³². Low-carbon transition pathways will be varied, driven by social, technological, and organisational contexts, and shaped by institutional change processes, and interaction with the existing regime and incumbent actors. Denmark and Germany, have formally recognised that the **transition to a renewable energy future requires incorporating energy systems that are tailor-made at the local level as well as centralised power production**, and hence the strategic role of municipalities, local stakeholders, and authorities to formulate such initiatives³³.

Policy frameworks at European level should take into account the potential of distributed energy resources and increasingly enable these social innovations.

b. Deploying renewable energy on a large scale

The levelised cost of energy (LCOE)³⁴ of solar PV has fallen by more than 60% between 2010 and 2016. In the EU, **onshore wind energy currently shows the lowest overall LCOE**, especially in regions of high latitudes. **In 2030, solar PV utility power plants represent the lowest LCOE** of all technologies across all the G20 countries with the exception of Northern European countries, where onshore wind continues to have the lowest LCOE³⁵. Comparing median values of LCOEs shows that hydro, solar PV, onshore wind, and geothermal are lowest. **Hydro is the cheapest, followed by solar PV, onshore wind, and geothermal.** For the lower range of capital costs, the LCOEs of renewable energy technologies, except concentrated solar power and offshore wind, are **lower than those of fossil fuel-based and nuclear technologies**³⁶. Since the capital costs of biomass-based technology vary widely depending upon the feedstock type, the cost competitiveness of biomass with fossil fuels and nuclear depends on the type of feedstock³⁶. Therefore, **investment in renewables and reliance on renewables for electricity, heat and mobility is not only environmentally desirable, but also economically rational.**

The IEA agrees in the [World Energy Outlook 2020](#)³⁷ with these findings by saying that the world's best **solar power schemes now offer the "cheapest... electricity in history"** with the technology cheaper than coal and gas in most major countries. The main scenario has 43% more solar output by 2040 than it expected in 2018, partly due to detailed

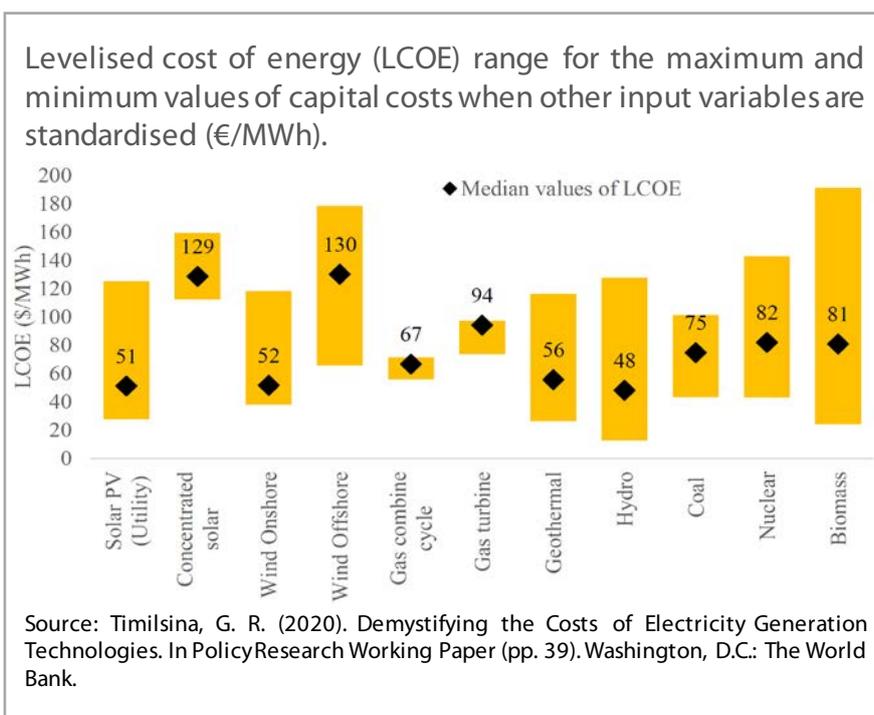
new analysis showing that solar power is 20-50% cheaper than thought. Despite a more rapid rise for renewables and a "structural" decline for coal, it is too soon to declare a peak in global oil use, unless there is stronger climate action. Demand for gas could rise 30% by 2040, unless the policy response to global warming steps up. This means that, while global CO₂ emissions have effectively peaked, they are "far from the immediate peak and decline" needed to stabilise the climate. The World Energy Outlook 2020 also includes detailed modelling of a 1.5°C pathway that reaches global net-zero CO₂ emissions by 2050. It says individual behaviour change, such as working from home "three days a week", would play an "essential" role in reaching this new "net-zero emissions by 2050 case".

c. Decarbonisation without nuclear power

Accounting for evaluations in the multidisciplinary literature, nuclear power **cannot be seen as a transition or bridging technology** because it misses to be the 'best-in-class' in the sector concerning its climate mitigation potential. Moreover, it would lead to a lock-in of carbon-intensive coal plants for up to 10-20 years until the new built nuclear plants to replace them would become operational. It even can be seen to hamper the deployment of other low-carbon alternatives due to its high capital intensity, which could be devoted to the scale-up of alternative energy sources like solar, wind and water³⁸.

2. Food and health

Key interventions governments in Europe have recently announced or successfully implemented:



- 25 European regions: contribution of small farms to regional production³⁹,
- Germany: [Food Policy Councils \(Ernährungsräte\)](#) in Berlin and Cologne work systematically to make local food systems more sustainable,
- France: [Highest score on policy and governmental action](#), notably response to food losses, tackling distribution-level loss, management of water supplies, climate change mitigation, and policy response to unhealthy diets. France penalises supermarkets for food waste, and
- Netherlands: consumers and changing informal institutions as driving forces for plant-based meat substitutes; breakthrough of these technologies and products is intertwined with the formation of new user practices and institutions⁴⁰.

To take further action, the following approaches could be adopted:

The [Farm to Fork Strategy \(F2F\)](#)⁴¹ is an important component of the [EGD](#)¹ and addresses the sustainability of EU food systems. Besides the **positive health impacts of reduced emissions and pollution** from sustainable production and processing of food, the strategy aims to engage the consumer by encouraging dietary shifts towards increased consumption of sustainable foods, including vegetables, fruit, whole grains, nuts, and seeds, and reduced consumption of red and processed meat. Food scholars acknowledge that the F2F Strategy presents a food systems approach. However, rigorous monitoring, impact assessments, binding mechanisms and coherent, integrated rights-based legislative frameworks are necessary to enforce and reinforce the targets and goals. Currently EU governance is ill-adapted to address the systemic nature of food system challenges. Unhealthy diets continue to generate significant social, economic, and environmental costs. IPES-Food's blueprint for a '[Common Food Policy](#)'⁴² offers a concrete vision of a policy reform. Four indispensable aspects of this governance shift are: (i) coherence across policy areas; (ii) coherence between levels of governance; (iii) governance for transition; and (iv) food democracy⁴³.

The acceleration in a shift towards sustainable transport strategies, as proposed in the [EGD](#)¹, could result in major health benefits particularly if **active travel**, such as walking and cycling, together with greater use of public transport is promoted. For example, a [German study](#)⁴⁴ found that a kilometre driven by car costs EUR 0,269 social costs on top of the EUR 0,408 private costs, while cycling results in a net benefit of 0,607 per kilometre. Another [recent study](#)⁴⁵ found that in Denmark every kilometre travelled by bike, instead of by car, means €1 gained in terms of health benefits. The study also suggested that if Danes biked 10 % more on an annual basis, an additional gain would be 267,000 fewer sick days, 6 % less traffic congestion in the major cities and DKK 1.1 billion saved in the public health care system.

3. Hard-to-Abate Industries

Key interventions governments in Europe have recently announced or successfully implemented:

- Denmark: Grants of USD 0.14bn to fund electrification and energy efficiency in industry during 2020-24 to promote a "green transition"⁴⁶, and
- Germany: With an economic policy framework, the Hydrogen Strategy, and EUR 9bn in state aid the government aims to cut emissions in heavy industry, trains, trucks and aircrafts by supporting the energy transition. Support will be given to the development of supplier companies, of H2 infrastructure such as filling stations and pipelines and to H2 research. This should create 470,000 new jobs.

To take further action, the following approaches could be adopted:

a. From carbon-intense mineral oil company to sustainable energy supplier

Unsustainable business practices were prolonged by climate inaction. Pricing of environmental pollution, material use and GHGs below social costs is equivalent to subsidy for polluting firms. For decades, this hindered the development of sustainably producing companies and often confined them to a niche. Companies with a non-sustainable core business or with very high energy intensity are particularly difficult to transform. **Horizontal diversification** beyond oil and gas into renewable energy now represents a strategic opportunity for the established industry players. Most firms from the oil and gas sector have taken some steps to enter the world of renewable energy by investing in a range of activities focused on renewable energy, such as geothermal energy, algae for biofuel, bio-diesel, and solar-powered recharging stations for electric cars⁴⁷.

Denmark's largest energy company, DONG Energy (now rebranded as Ørsted) changed its strategy from a focus on fossil fuels to establishing offshore wind farms. From the early 1980s until 2016, the company represented the Danish state in exploration and production of oil and natural gas in the North Sea. Within a few years, Ørsted **became a global market leader in offshore wind farms**. With 6500 employees mainly in Denmark and Germany and in partial owned by the Danish state (which has 50.4% of its shares) the company is a major supplier of electricity and district heating to Danish households, and is now transitioning from a reliance on fossil fuels (oil, coal, and natural gas) to renewable energy sources (offshore windfarms). The company made the transformation from a fossil-fuel based energy company to a global green industry leader⁴⁸.

Ørsted **reduced its carbon emissions by 86%**, and by 2025, it plans to be carbon neutral in their energy generation and operations. They also have a target of achieving a carbon neutral footprint by 2040. Recently Ørsted was listed by a [rating agency](#)⁴⁹ as the **#1 sustainable company** for combining business performance with a swift decarbonisation transformation.

Corporate responses to climate change also find expression through the language of the non-instrumental ethical orientations associated with notions of corporate citizenship, political CSR, and green conservatism⁴⁸. **Sustainability managers face difficult ethical dilemmas** about how to respond to trade-offs between corporate interests and broader public interests in handling climate change. The managers interviewed all showed skills in re-framing such dilemmas in various ways to ensure that the business case complies with ethics. The sustainability manager in Ørsted made use of his 'voice' in promoting the business case for sustainability in future strategies. The translation of macro-level issues that manifest as credible claims and commitments in sustainability reports is a major challenge facing energy firms and sustainability managers now⁴⁸.

b. Carbon-free steel production

Iron and steel, chemicals, cement, non-ferrous metals, paper, and pulp etc. are referred to as energy-intensive industries because they use energy resources as primary raw material. Energy efficiency has played a major role in reducing the industrial sector's energy intensity and emissions. Nonetheless, incremental changes in current industrial production technologies are insufficient to help economies decarbonise⁵⁰. The present drive to low CO₂ emission steelmaking has led to the adoption of Energiron ZR direct reduction technology to use high levels of hydrogen as the reductant in several European pilot projects aimed at low or zero carbon steelmaking. A consortium, consisting of Voestalpine, Siemens, VERBUND and Austrian Power Grid and scientific partners is building one of the world's largest electrolysis plants for the production of green hydrogen. Together, they are working on the realisation of the innovative hydrogen demonstration plant at the Voestalpine site in Linz with a view to produce carbon-free steel⁵¹. Also Sweden's Ovako has run a trial.

4. Mobility

Key interventions governments in Europe have recently announced or successfully implemented:

- Austria: Bailout of Austrian Airlines linked to several climate conditions such as reduction of domestic flight emissions by 2030, end of flights where a train connection under 3hrs exists, and minimum price for tickets via fees and taxes⁵²,
- France: Bailout of Air France linked to climate conditions such as fleet efficiency improvements, reduction of domestic flight emissions by 2024, and a fuel mandate by 2025⁵², and
- Portugal and The Netherlands have signed a [MoU to develop green hydrogen in Europe](#)⁵³, and affirmed their intentions to develop a strategic export-import value chain to ensure production and transportation of green hydrogen.

To take further action, the following approaches could be adopted:

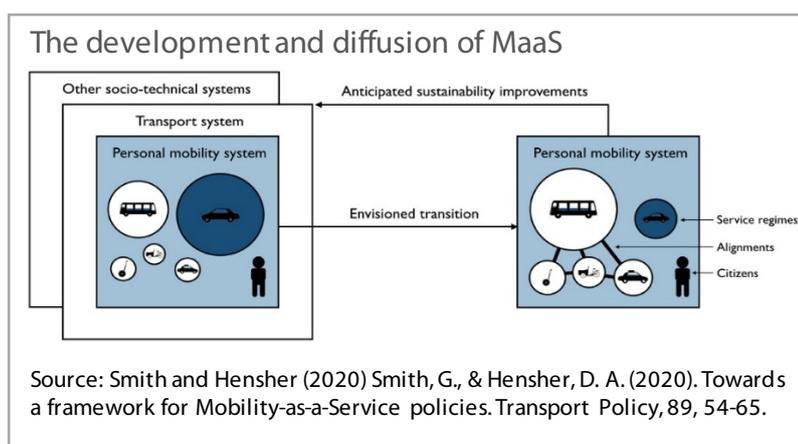
a. Green hydrogen

A large number of green hydrogen projects are starting up. **France** unveiled already in 2018 a €100 million investment plan for the technology. Hydrogène de France (HDF) had a €90 million investment in a hydrogen project in French Guiana. France has deployed **hydrogen-powered passenger buses**, and the Auvergne

Rhône-Alpes region committed €200 m toward 1,000 hydrogen vehicles and 15 electrolysers. **Germany** has plans for 20 **research labs**, with a total budget of €100 m.

b. Mobility-as-a-Service (MaaS)

Digitalisation and decarbonisation meet in **MaaS**, which is “a type of service that through a joint digital channel enables users to plan, book and pay for multiple types of mobility services”. It is a **collaborative and potentially disruptive innovation**, as MaaS developments require collaboration between multiple public and private stakeholders, and that the diffusion of MaaS might transform current practices **within the personal mobility regime**⁵⁴. The public sector has a key *enabler* in MaaS, i.e., that implementation of new public policies is needed to create conducive conditions for MaaS developments.



A current example of **MaaS is Whim in Helsinki**⁵⁵. Berlin, Lisbon and Scotland are currently trialling integrated apps. Currently the **ULTIMOB**⁵⁶ project (Ultimative Integrated Mobility Solutions – funded by the Austrian Research Promotion Agency FFG) is analysing the use of MaaS in four types of regions, which are difficult to reach with usual sustainable mobility instruments (e.g. tourism-induced transportation in a Tyrolian valley, peri-urban area around Graz). The project outcomes include multimodal hubs to

accelerate the effects of modal shifts in everyday traffic, solutions for tourist baggage logistics on the last mile, etc. by helping them meet their mobility needs and solve the inconvenient parts of individual journeys as well as the entire system of mobility services. By grouping all transport services under one (sometimes fixed-rate) payment, MaaS helps people organise the way they travel, simplifies and enhances the traveller experience to promote the use of public transport.

A successful MaaS service also brings **new business models** and ways to organise and operate the various transport options, with advantages for transport operators including access to improved user and demand information and new opportunities to serve unmet demand. The aim of MaaS is to provide alternatives to the use of the private car that may be as convenient, more sustainable, help to reduce congestion and constraints in transport capacity, and can be even cheaper. **With public sector support, MaaS can be one element among several for a green recovery.**

Overall estimate of the total effects such opportunities and added values could have, both in terms of cost saving and in terms of accelerating the green transition

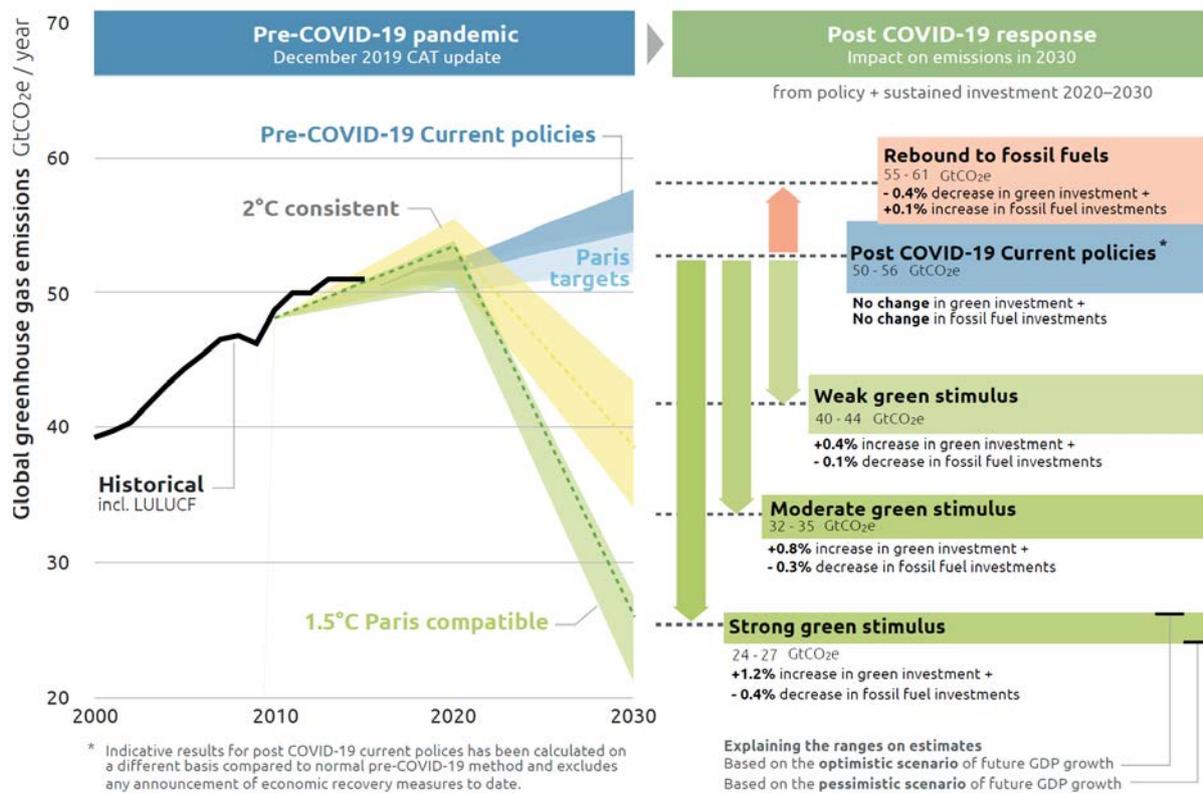
As ‘business as usual’ would imply temperature increases over 3°C leading to great future uncertainty, instability, and climate damages⁵⁷, the recovery from the current economic crisis provides an opportunity to build consensus and steer investments under NGEU etc. Actions to support the transition to a more sustainable economy, include **strengthening carbon pricing, prioritising investment in green infrastructure and innovation, reducing subsidies and tax exemptions for emissions-intensive activities, and promoting green finance**⁵⁸. Studies of fiscal responses during the financial crisis suggest that the economic success of fiscal stimulus is affected by two attributes: the speed at which the stimulus delivers real-world impact; and the short- and long-run economic **multiplier**⁵⁹.

The International Monetary Fund (IMF) recently called on countries to **increase public investment** on digital infrastructure and green technology, and support economic recovery from the coronavirus pandemic. Advanced economies should take advantage of historically low borrowing costs to increase spending on infrastructure maintenance immediately. The IMF estimates that increasing public investment

in current conditions by 1% of GDP was likely to increase GDP by more than 2% after two years. There is scope to generate between 2m and 3m jobs for every Euro of expenditure in the EU⁶⁰.

Governments should focus attention on **small-scale maintenance projects** while preparing plans for new infrastructure, particularly **large transformational projects** which would bring economic benefits in the post-COVID-19 era⁶¹.

Benefits of a coordinated climate-mitigation economic stimulus that can kick-start transition to a low-carbon economy that is achieved by green investment over the next decades.



Source: Climate Action Tracker (2020): [A government roadmap for addressing the climate and post COVID-19 economic crises](#)

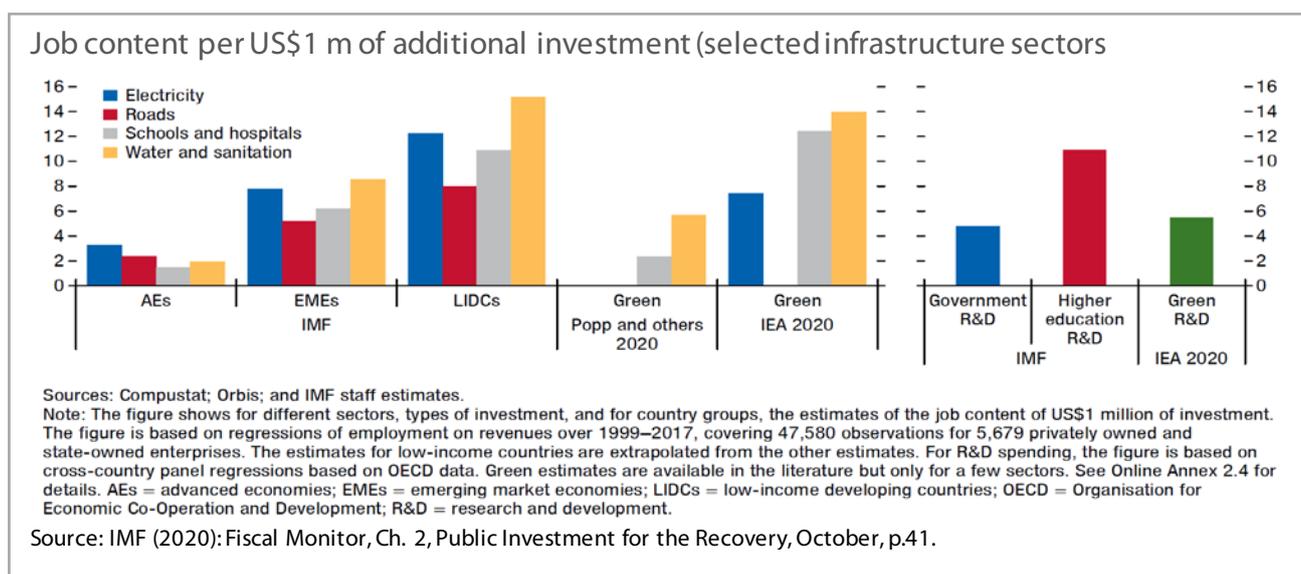
The magnitude of the stimulus packages will have a stronger effect on the degree to which the transformation happens, with an increase of 1.2% per GDP in annual global green investments resulting in higher emission reductions and enabling the ability to reach Paris Agreement goal⁶¹. However, there is also a **high risk that carbon emissions will rebound to pre-COVID levels if governments do not shift investments from fossil fuels to low carbon development or if they continue supporting fossil fuel in their recovery spending.**

Five policies with high economic multipliers and climate impact are: (1) clean **physical infrastructure investment** in the form of renewable energy assets, storage (including hydrogen), grid modernisation; (2) building **efficiency spending for renovations** and retrofits including improved insulation, heating, and domestic energy storage systems; (3) investment in **education and training** to address immediate unemployment from COVID-19 and structural shifts from decarbonisation; (4) natural capital investment for **ecosystem resilience and regeneration** including restoration of carbon-rich habitats; and (5) climate-friendly agriculture, and **clean R&D spending**⁶².

Co-benefits of climate policies include reduced waste, inefficiency, pollution, congestion, and food waste, and improved health outcomes, biodiversity, and ecosystem sustainability. As the figure below shows, employment can be generated with red or green investments, so to generate higher social welfare green investments should be prioritised. A combination of energy efficiency measures for buildings, boosting the

uptake of renewable energy technologies by offering a capital subsidy of 50% on new wind and solar equipment to incentivise investment during the immediate recovery period, accelerated electricity grid improvements through additional government investment, subsidies to cover 20% of the cost of new electric vehicles for households that scrap their old internal combustion engine vehicles, and a tree-planting initiative of 10 bn trees worldwide over 2021–23 lead to positive societal benefits.

The modelling results clearly show the **Green Recovery plan (as specified above) is consistently more favourable than other options by boosting GDP and employment, as well as contributing to additional reduction in CO₂ emissions. Indeed, at EU level, this effect increases over time with significantly better outcomes shown in 2030, if Green Recovery packages are pursued⁶³.**



Final recommendations on policy actions

Large rapid absolute reductions of resource use and GHG emissions cannot be achieved through observed decoupling rates, hence **decoupling needs to be complemented by sufficiency-oriented strategies and strict enforcement of absolute GHG reduction targets.**

In determining whether the EU is recovering successfully from COVID-19, the evolution of the quality of life and **well-being of people**, as well as GHG emissions and loss of nature should be monitored. GDP is a means to an end, not an end. The EU should present a forward-looking, ambitious vision for an economy geared to the UN Sustainable Development Goals.

The IEA' World Energy Outlook 2020 says **achieving net-zero emissions will require "unprecedented" efforts from every part of the global economy**, not just the power sector. **Green recovery measures lead to better economic, employment and environmental outcomes.**

Successful examples in the fields of energy (electricity, heating and mobility), industry, food and health illustrate how transitioning towards circular and climate neutral economies can be fostered. Green economic recovery measures stabilise livelihoods, create jobs and reduce biophysical impact. These measures will be more effective, when accompanied by the following: full carbon pricing, prioritising investment in green infrastructure and innovation, phasing-out subsidies and tax exemptions for emissions-intensive activities, and promoting green finance.

Measures that put forward the **managed decline of fossil fuels** should be central to the green recovery plan. This includes no easing of environmental regulations, a phase-out of fossil fuel subsidies, and no bailouts for fossil fuel-related companies. This excludes relief packages for workers become unemployment due to coal plant shutdowns for example, or the financing of **retraining programmes for fossil fuel workers.**

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