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**FILIP MEDUNIC ARGUES
THAT THE EUROPEAN
UNION NEEDS A
SANCTIONS DOCTRINE**

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LABOUR AND SOCIAL
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Code of coercion

A photograph of a wooden mallet with a large, rectangular head, positioned as if about to smash a brown egg that is sitting in a white ceramic eggcup. The background is dark, and the lighting highlights the textures of the wood and the egg.

Filip Medunic argues that the EU needs a sanctions doctrine – a framework to set out the goals, means, and risks for the use of economic measures

The idea of forming an alliance for sanctions [akin to NATO](#) has been floating around for a [while](#). But it has never had as good an opportunity to gain traction as [it does now](#). G7 countries are experiencing an unprecedented moment of unity and, with surprising swiftness, have imposed the strongest ever economic sanctions regime on Russia.

European leaders and commentators are right to acknowledge the importance of coordinated economic measures. But NATO and its collective defence commitment is not quite the right analogy for future geo-economic policies. The EU instead needs a sanctions doctrine – a framework to set out the goals, means, and risks for the use of economic measures.

There is no sign that economic measures for policy objectives (economic coercion or warfare) will be used less in the future and the world has entered a period that will define the next global trade order. The EU should act to shape this order before it is drawn deeper into the vortex of economic warfare.

Impact and effectiveness of economic sanctions are not fully understood and require continuous research. There is good reason to remain cautious on the application of tools of economic coercion for strategic reasons (do they have the intended political impact?) and ethical reasons (do they harm the intended target or others?).

Nonetheless, European policymakers have compelling reasons to codify rules on when and why they resort to economic sanctions. These measures have become much more than a tool for limited coercion or for signalling disapproval of a certain policy.

Sanctions now often define the rules of engagement with the global financial system – and they may have the same effect on trade. But greater restrictions on the global financial and trade order could contribute to long-term

instability unless policymakers have a common understanding of the purpose of these measures and the risks they involve.

According to most estimates, sanctions achieve some of their objectives between 30 per cent and 40 per cent of the time (although this depends on various conditions).

The EU needs a sanctions doctrine. This is the only way to prevent open societies and economies that are dependent on free trade from eroding the environment they have benefited from for so long – and from imposing increasing costs on others. It should define the goals, capabilities, and thresholds for applying sanctions, as well as techniques for lifting them.

A sanctions doctrine would improve the European Union's policymaking process and provide its global partners with clarity about the measures it would implement in certain conditions

Goals

The difference in assessing success depends on the question asked: are the economic measures having an effect? Or: are the political objectives reached? For the second question these political objectives need to be defined as well. When sanctions are used as a tool 'to do something' then there is barely a coherent answer to this question.

There are nonetheless several political objectives that can be clustered roughly into different categories according to the likelihood of them being realized.

For instance, pressuring an actor into negotiations to resolve a non-violent border dispute is more realistic than ending military aggression to defend abstract national ideas or a regime. In the same way it has been proven several times that regime change is not an objective that can and should be the goal of sanctions.

There are, however, limited objectives that can help defuse military conflict or oppression if they are incorporated into a larger strategy encompassing more tools than only economic sanctions. Most importantly, they need a clear path towards being lifted and the possibility for the private sector to re-engage with a once sanctioned actor.

Therefore, policy makers and the private sector need to continue in a much deeper way the discussion about what the policy objectives can be on the one hand, and what the economic measures are on the other hand.

Capabilities

A sanctions doctrine should define the different measures the Union has at its disposal, coupled with an assessment of their consequences for the EU and for the target. This would necessarily involve the private sector as well, which in the end implements most economic measures, with the exemption of central bank asset freezes or visa restrictions for example.

Private sector actors might face implementation difficulties due to insufficient personnel or clear enough regulations, but they might also be able to point to secondary consequences further down the line, that on a political level ought to be avoided. It is necessary to involve the private sector in the design of measures to understand their consequences. It might also pre-empt cases of implementation failure and close loopholes.

If sanctions are applied by a large group of actors, they are more efficient, as evasion is more difficult. It is however paramount that those 'on board' see a real benefit in these measures and perceive the application of economic coercion as a legitimate tool.

If actors are on the other hand feeling that the measures only work to some interests and might even erode some of their own welfare benefits, coalitions will be hard to find or weak in their resolve.

Political resolve is driving sanctions policy, and often the desire to act outweighs the probability of success, which itself is hard measure. In the public sphere it is a question of communicating the objectives and means to reach them. Communication should be careful in not announcing objectives that are not reachable.

Thresholds

When sanctions are decided they have in most cases an effect on the economy of the implementing state and on the perception of the measures in its society. A threshold approach could help to avoid unpopular or counterproductive measures.

It cannot be defined without the goal and needs an assessment of the probability of success of the economic measure in question. This could include the costs for the implementing economy, the costs for the targeted economy and the political goal that is connected to the measures.

Lifting sanctions

If sanctions cannot be lifted it will be priced into any strategy by international actors. If they are a tool to add pressure to negotiate certain relationships, there needs to be the real prospect for lifting.

If they are set to demand unrealistic goals, they serve as a punishment - which deteriorates their acceptance and can also increase resolve by the targeted actor. It can even lead societies in targeted states to rally in support against such measures, especially if non-elites bear the bulk of the domestic costs for the targeted economy.

Although this issue is sometimes quietly ignored in assessments of coercive economic measures, sanctions can have a **severe impact** on civilians in the **long term** without achieving any of the intended policy outcomes.

A sanctions doctrine would improve the European Union's policymaking process and provide its global partners with clarity about the measures it would implement in certain conditions. Like a military doctrine, it could help prevent escalation.

A doctrine can also help in providing more buy-in from EU member states. The G7 has become a prominent forum for coordinating and announcing Western punitive economic measures, especially with regards to Russia. But G7 countries do not share a single market, and only a few EU member states are full members.

Defining a doctrine at EU level could help a more coherent EU decision making and even pre-empt some of the lengthy discussions on capacity of implementation on member state level.

The exercise could also help to continue the discussion between member states and the European private sector, which at the end will be at the forefront of implementation of many measures.

The union is currently debating an anti-coercion instrument, which would be the world's first such measure for collective economic deterrence. Therefore, the EU is already much further along in the process of institutionalising its approach to economic retaliation than any other state or group of states.

The public debate on the instrument shows that the issue of when to apply it is highly complex – and that, at the moment, this is only at the EU level and purely for deterrence.

As such, before attempting to resolve any international problem by sanctions, the EU will first need to clarify its own sanctions goals and honestly assess the potential and limitations of sanctions in a broader doctrine.

The EU's internal market, technological strength, and commitment to open trade mean that it has huge geopolitical potential. But the union will need to understand the strengths and weaknesses of economic measures before it can fulfil this potential on a global scale. ■

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The role of competition

The background features a dark green gradient with a large, semi-circular shape. Inside this shape, the text 'CO2' is written in a large, dark green font, and 'NEUTRAL' is written below it in a smaller, light green font. Below the text, there are stylized illustrations of factory smokestacks emitting smoke. The overall theme is climate change and industrial production.

Georg Zachmann looks at the role of competition in the transition to climate neutrality, and argues for the regulation of production to best serve European consumers

Summary

The transition to climate neutrality requires the reallocation of production factors from polluting activities to non-polluting activities. The main push for this reallocation will come from governmental decarbonisation targets that are translated into stringent climate policy tools, such as carbon pricing and emissions standards. But the complex process of recombining production factors will require the coordination of millions of individuals and firms. The efficiency of this recombination process will be a main driver of the cost of the transition.

Based on a consistent analytical framework, I argue that much more political attention should be paid to the markets and regulators that guide the re-allocation of production factors, to bring them in line with a carbon-neutral economy at the best service of European consumers. Three main issues should be considered:

1. The transition will change the role and efficiency of markets in allocating resources;
1. Competitive markets can make the transition more efficient;
1. In some areas, a too-narrow focus on competition can be detrimental, and needs to be discussed.

To improve the institutions for resource allocation in the transition, policymakers should revisit three levels of intervention: 1) competition rules and enforcement should be adjusted to meet the new challenges of the transition; 2) efficient markets that are central to a climate-neutral economy – such as for electricity, emission rights or circular logistics – need to be properly designed; 3) the advantages and disadvantages of more direct state control in specific sectors should be revisited in light of the challenges of the transition.

In summary, policymakers need to get away from simplistic state-or-market narratives. The focus should be on developing politically feasible frameworks for leveraging the benefits of competition for efficient resource allocation in the transition.

Institutions should not focus solely on static efficiency, but must forcefully encourage investments in new systems and innovation. The role of institutions that determine resource allocation in the transition is an underappreciated but crucial area for future research and policy action.



1. Introduction

1.1. Markets are important for the transition

Decarbonisation implies a massive re-allocation of resources in our economy. Companies need to change how they produce and sometimes what they produce – occasionally retiring carbon-intensive assets before the end of their economic lifetimes.

Consumers need to reduce their carbon footprint by replacing carbon-intensive by carbon-neutral consumption, which implies buying the appliances that allow them to do so. Workers and capital need to move from brown to green sectors. And the massive transition¹ must happen very quickly.

The transition is also likely to be bumpy. It remains undetermined what will be the most economic technologies, the most efficient systems, the best mix of reduced demand versus more carbon-neutral supplies, and the optimal share of domestic versus imported clean fuels.

Those issues are highly interdependent. Mistakes could be made and their consequences significant. Individual projects might fail completely. Specific technology solutions might cost twice as much as alternatives. Complete systems might be dozens of percent more expensive than others².

And when constraints on production factors (land, specific capital and labour) are binding – which they will likely be – any misallocation will either slow down the transition and/or remove these production factors from other needs. If that becomes too expensive, climate policy might fail.

The transition thus needs mechanisms to ensure reasonably efficient resource allocation in a dynamic interconnected system characterised by uncertainty. Markets are a very powerful tool to coordinate the production,

consumption, investment and innovation decisions of billions of individuals and millions of firms, and thus to enable a high level of consumption given the available production factors.

Markets can deal with explicit constraints, such as emissions limits in cap-and-trade mechanisms, and monetise trade-offs, such as competition for land used for solar panels or food. They are good at determining robust answers to multidimensional questions (what is the best combination of storage and flexible electricity generation?).

Economic policy will have to strike the balance between ensuring that the most productive systems are speedily selected, and that economic actors have incentives to invest in the necessary complementary infrastructure, and making sure that the regulatory framework allows the new systems to be efficiently used and developed

They are innovative in finding new solutions (such as smartphones), facilitate optimal resource allocation across borders and are much better than governments in cancelling wasteful projects.

1.2. Unregulated markets will not efficiently allocate resources

Free markets may be the most efficient mechanisms at allocating resources, but they can also fail to allocate resources optimally, and this is very relevant to decarbonisation:

- i) If unregulated, companies tend to discharge too much pollution as they do not face the full societal costs (environmental externalities³);
- ii) Companies tend to underinvest in developing new technologies that can be reproduced by others which did not spend money on research and development (innovation spillovers);
- iii) Private investors would not be able to monetise investments in bicycle lanes or re-wetting moorlands by charging individual beneficiaries (public goods);
- iv) The more electric vehicle owners use a specific charging system, the more corresponding charging stations break-even (network effects⁴);
- v) Consumers buy cheaper but more energy-intensive appliances as they care more about the price than the long-term cost (such hyperbolic discounting is a form of behavioural bias);
- vi) Landlords have less incentive to improve the energy efficiency of apartments rented to tenants than of their own apartment (such split incentives are a form of coordination problem);

- vii) Banks do not know whether borrowers will be willing/able to pay back energy-efficiency loans – and hence ask for higher interest rates (information asymmetries);
- viii) Companies that face too little competition might provide less of their product to increase market prices and hence earn higher revenues (market power);
- ix) Companies and consumers might not believe that governments will implement announced stringent climate policies, such as rising carbon prices, leading them to inefficiently delay investments in low-emission production, infrastructure and appliances (time inconsistency).

As misallocations could be particularly costly in the dynamic process of a whole-economy transition (see section 2), a sound institutional framework to minimise such market failures is crucial.

1.3. Market rules will shape the efficiency of the transition

Policies that address these market failures can drastically improve resource allocation. The Tinbergen Rule ('one instrument per policy target', for example carbon pricing for the environmental externality, or innovation policy for the innovation externality) is a very important first principle for establishing the policy architecture.

But market failures are often complex. Policies to address them face practical limitations, such as the inability to enforce competition policy abroad, or imperfect information on the cost structures of incumbents, and can hence only act as partial solutions.

Moreover, policies to address one market failure might have side-effects. Trade-offs emerge. For example, patents boost innovation at the cost of temporary market power (OECD, 2004). Accordingly, concrete policy design needs

to address these complexities in a way that provides a framework for markets to allocate resources as efficiently as possible.

1.4. Paper structure

In this paper we discuss how competitive markets will have to change to support efficient resource allocation in the dynamic and uncertain transition to a decarbonised economy. In the next section, we discuss transition-related challenges to competitive markets that policy should address.

In the third section, areas where more competition can unleash market forces will be discussed. In section four, we review areas where policymakers might want to balance a too-narrow focus on competition against other policy goals, including environmental benefits.

We conclude with recommendations primarily on the role of competition authorities (though not explicitly discussing the very important issue of state aid⁵).

2. Challenges for efficient resource allocation in the transition

The transition will affect disproportionately those economic activities that are prone to very clear market failures: the transition will require more innovation, new networks and platforms and more coordination on new systems. The transition itself might amplify the detrimental effects of some of the market failures described above.

Moreover, to overcome such barriers, governments might want to resort to policies that put effectiveness before efficiency, for example by prioritising meeting targets over cost-minimisation. But this might create new competition issues during the transition.

For example, the need for energy and material efficiency might require more coordination in some areas than current market structures can provide. Consequently, new market structures with very limited numbers of potential competitors might emerge.

The transition will recalibrate the roles of major economic players. In general, a speedy transition will require more coordination of actions over different time periods. The state will likely take a stronger role in organising the emergence of a sustainable economic system.

But companies will also want to coordinate more. In the following, we describe transition-related trends that reduce the potential of competition to allocate resources efficiently.

2.1. Increasing role of networks and platforms

A sustainable economy will have to be more resource-efficient than today. Corresponding efficiency gains can come from aggressively exploiting economies of scale and scope. Digitisation/digitalisation promises to supercharge the efficiency-potential in many sectors.

The result is that in a number of areas, a role is emerging for centralised platforms or networks to coordinate economic behaviour, with the ability to extract significant rents.

Four examples illustrate this:

First, resource use can be reduced substantially⁶ in a circular economy in which products that lose some of the use-value for consumers (an old smartphone for example) are transferred to that economic actor that can generate most value from reusing, repairing, repurposing or recycling it.

It is easily conceivable that large online retailers that maintain several integrated networks, including customer and supplier bases, logistics and payments, would be best positioned to master this challenge, reinforcing the virtually incontestable position of such firms.

Second, in the electricity system of the future, passive users could turn into prosumers who reduce the cost of the electricity system by supplying, consuming, producing or storing electricity based on real-time system information.

Again, several overlapping networks (standardised appliances, power lines, data networks, information aggregation and payments/billing) would be required to run efficiently a system with a massive number of distributed energy resources. For several years, big players in some of these networks have been trying to position themselves in this market, hoping to benefit from the value that can be created by managing these systems.

A third example is integrated energy solutions for big consumers like a university or groups of consumers like a neighbourhood or even a town or city, for which different heat, electricity and gas networks can be co-optimised with the locally available supply, storage and design of the demand.

Finally, multimodal mobility services that reduce the need for individual vehicles and empty runs work better the more mobility providers are co-optimised; consumers might prefer to use one software tool that deals with planning, buying the service and paying for it.

The better complex multi-actor systems can be designed and coordinated, the less expensive the infrastructure, energy and resources required for the transition will be. Single companies that can coordinate many economic actors, most notably through digital platforms, can operate more efficiently the bigger they are.

As a result, the same efficiency gains that will help with the transition might result in sectors characterised by reduced competition. Some of the current platform-economy incumbents are potentially well positioned to extend their market power to potentially very significant new services. The promise of excessively high rents in the longer term might create a welcome competitive race in the short term⁷.

However, as seen with smart grids, such a competition for a new market can also lead to an unproductive paralysis in which different players that each possess essential infrastructure try to secure a central position in new value chains, making it difficult to quickly find good compromises on standards and systems.

Consequently, economic policy will have to strike the balance between ensuring that the most productive systems are speedily selected, and that economic actors have incentives to invest in the necessary complementary infrastructure, and making sure that the regulatory framework allows the new systems to be efficiently used and developed.

2.2. Downscaling of 'brown' systems

The downscaling of fossil-fuel related economic activities and the exit of players from shrinking markets could lead to increasing market concentration in the whole market – when the number of players decreases faster than the volume – or the disintegration of some markets, leading to highly concentrated market segments (for example if connections between market segments become unprofitable and are abandoned).

One example is the natural gas wholesale market. It has already been seen how decreasing gas exploration in the EU resulted in increasing market shares of Russian gas in Europe.

If at some point in the transition natural gas pipelines that connect market areas are decommissioned or converted into hydrogen pipelines, the internal natural gas market might disintegrate and the dominance of gas suppliers will increase in the disconnected natural gas market areas.

Another challenge is that uncoordinated disconnection of users from incumbent gas distribution networks has negative spillovers for the remaining users as the fixed cost of the distribution system then falls on a smaller pool of users.

As it will be mainly more affluent households that can afford to invest in electric heat-pumps, poorer households in particular could be confronted with increasing gas distribution tariffs. If left to the market, this might trigger a chaotic 'doom loop' of cascading disconnections, which would be clearly less efficient than a planned decommissioning of distribution networks⁸.

2.3. Reduction in international competition

Import competition can substantially reduce the market power of domestic firms (or at least render markets contestable)⁹. In recent years, trade policy has become increasingly an area of international climate policy. The most tangible example is the carbon border adjustment mechanism (CBAM), proposed by the European Commission in the Fit for 55 package¹⁰.

The CBAM is intended to prevent carbon leakage by requiring EU importers of certain carbon-intensive products to buy an amount of allowances proportional to their products' carbon content, with the carbon content either established individually based on a verification procedure that might be difficult for smaller importers, or based on default values that, if too high, might make importers worse off than most domestic companies¹¹.

In some of the quite highly concentrated sectors covered by CBAM, there could be significant reductions in the competitive pressure from imports (Baccianti and Schenker 2022)¹². The increasing market power of EU companies might translate into increasing mark-ups or lower quality¹³.

Moreover, CBAM is controversial and could lead trade partners to retaliate, at worst leading to a trade war¹⁴. This might further break up international markets, increasing market concentration in many sectors in a way that reinforces the market power of local companies.

Finally, rising fuel costs from the transition to low-carbon fuels and the need to invest in low-carbon ships might cause international transportation costs to increase. This might make imports more expensive and hence increase the local market power of domestic companies.

2.4. Public interventions risk inefficient favouring of incumbents

The transition will require massive government intervention to overcome some of the market failures listed in section 1. But governments are not omniscient, efficient or necessarily benevolent.

Bureaucracies and policymaking have their own failings that systematically prevent stops them achieving efficient results^{15, 16}. Government resource allocation, such as through R&D budgets, and administrative decisions, such as on market rules, follow different dynamics than market/price/competition-based resource allocation.

Politicians compete for voters and campaign funding, bureaucracies compete for power, and decision-makers compete for careers. These incentives are often more aligned with the interests of incumbents/insiders ('regulatory capture'), than with those of the general public, who might benefit from fairer treatment of new entrants.

Accordingly, administrations are, for example, worse than companies at stopping projects/policies that turn out inefficient, which is a problem in a transition with a lot of uncertainty. Administrations also set standards and market rules that tacitly form barriers against technological change. Rules to protect specific rights in a status quo market might become so complex that only large players can safely navigate them.

Because government decisions shape the structures of competition in markets that will be crucial for efficient resource allocation in the transition, preventing an undue bias in favour of incumbents goes way beyond the role of competition authorities and courts.

Europe's long-term competitiveness will benefit if it finds ways to strengthen the voice of proponents of new business models, technologies and market entrants in the political/administrative process.

2.5. National transition policies might undermine the internal market

EU countries differ in their preferences for policy tools, market rules, standards, and infrastructure and innovation projects. The transition will require major new policies in many sectors.

While some areas are harmonised through EU-wide rules, tools and programmes, much of the heavy-lifting will come from member-state policies. This provides room for targeting policy to national circumstances and allows testing of different solutions, which at best can result in mutate-and-select-evolution of the fittest policy proposals.

But national policies also carry the risk of increasing market fragmentation in the EU. Decarbonisation policies such as the deployment of renewables through national feed-in tariff systems can result in clear cases of resource misallocation in the EU (Abrell *et al* 2020).

Aggressive uncoordinated national support programmes for industry decarbonisation and hydrogen deployment also run the risk of highly inefficient allocation of resources.

2.6. Strategic behaviour in emerging certificate markets

The carbon market is crucial for decarbonisation. The EU emissions trading system is characterised by the presence of a relatively limited number of important players that compete in the same commodity markets, including electricity, steel and cement.

The structure of these markets implies that higher carbon prices can be largely passed through to consumers (European Commission, 2016), and some companies obtain significant volumes of allowances for free. This structure might make it profitable for individual companies or colluding entities to manipulate the carbon price, for example by buying up more allowances than a company in perfect competition would do, in order to increase the price of their products and hence their profits¹⁷.

Given this tail-wag-the-dog market, close monitoring is needed and it would be beneficial to increase the number of players – for example by extending carbon trading to cover more sectors – or reduce the volumes of free allowances. Measures to reduce competition, such as CBAM (see above), meanwhile, would be detrimental for competition.

2.7. Risk of 'green-washing' anti-competitive arrangements

There are good reasons for competition policy to permit arrangements that improve the coordination of companies during the transition (section 4). But there is a risk that companies will seek such arrangements primarily to reduce competition.

One challenging area is green alliances of companies. Such alliances agree environmental standards among each other – and jointly promote corresponding labels. They are clearly anti-competitive if they do not allow other companies that meet their same standards to join.

But also if they are open to all companies, by letting the insiders establish the standards, they essentially coordinate the speed of efficiency improvements in the industry – and competition policy needs to watch very carefully whether this on balance increases the ambition.

2.8. Summary

The examples described illustrate that the transition will profoundly change the allocative outcomes of market competition. In most cases, neither direct public management nor full laissez-faire competition will lead to satisfactory results.

To ensure efficient resource allocation, policy must, early on, re-adjust the institutional framework. The optimal points of intervention will differ case-by-case, and interventions might need to adjust dynamically over time. Relatively light-handed intervention to protect virtuous competition can be done by adjusting competition authority toolkits.

For example, market definitions can be revised when investigating declining brown sectors, rules should be clarified on the evaluation of green efficiencies to prevent green-washing, and state-of-the-art market monitoring (eg. in certificate markets) should be put in place. These adjustments would go a long way to prevent abuses of market power that threaten efficient resource allocation.

The politically but also technically most challenging intervention is designing efficient markets. Well- designed markets with robust regulatory oversight will often be the only realistic option for benefiting from the efficiencies of markets, without falling for the inefficiencies from rising market power, especially in network/platform sectors.

This is not made easier by the fact that market design is a continuous process that is at constant risk of being taken over by incumbents, and that suffers from different preferences in different EU countries.

Finally, the costs and benefits of direct state control in essential pieces of infrastructure need to be evaluated on a case-by-case basis. It might be that the benefits of being able to design a functioning market around directly state-controlled infrastructure exceed the inefficiencies of public-sector management of the infrastructure segment of the value chain.

This shows that it will be impossible to develop one single institutional framework to facilitate efficient resource allocation in a dynamic transition process. Quite the reverse: a complex mix of institutions and instruments will be needed to approach the efficiency frontier.

3. Competition can make the transition more efficient

The transition can be defined as a recombination of production factors into products and services that increase utility for consumers, while generating much less or no greenhouse gases.

Market mechanisms are well placed to play a significant role in determining efficient combinations quickly. In this section, we show with examples that competition will be important in allowing markets to pursue this role.

3.1. Competition pushes innovation which is crucial in the transition

Innovation is crucial for efficient decarbonisation. Previous cost-degressions for wind and solar power generation facilitated more aggressive global decarbonisation targets – such as the carbon-neutrality pledge in the Paris Agreement.

Future innovations are already priced-in in the large-scale economic models that underpin European climate targets. The cost of offshore wind turbines, for example, is expected to fall by one third by 2050 according to the assumptions used for the European Commission's impact assessment that justified EU climate neutrality by 2050.

While basic research into completely new technologies such as nuclear fusion is almost entirely provided by governments, much of the resources that go into translating this research into new products are provided by companies¹⁸.

Competition is thus a strong incentive for innovation activity. Having better production processes, products or services is a mayor way for a company under pressure of competition to maintain extraordinary profits. By investing in innovation, companies can achieve/defend this ability.

Competition creates a positive incentive to innovate while punishing companies that do not innovate, as successful innovation by a competitor will have adverse impacts on the non-innovative companies' ability to charge high margins.

Finally, the competitive success of companies depends on their targeting of resources to innovation activities in the commercially most promising areas, and on their ability to take resources away from innovation activities that cease

to look promising. In the transition, shifting resources from a multitude of 'brown' to green innovation projects will be crucial.

But the literature indicates that market structure impacts innovation in a complex way¹⁹. While more competition increases the incentives for innovation, it can also reduce the means to do so.

One major finding that there is less innovation in sectors with an extreme intensity of competition is possibly explained by the argument that neck-and-neck competition decreases the free cash flow of companies to fund innovation activities (Aghion *et al* 2005).

In sectors that do not easily support multiple providers, such as electricity transmission and distribution, railroads or logistics, incumbents do very little R&D (Popp *et al* 2020). But innovation might still occur in the non-oligopolistic segments of the value chain, and contestability through more modular technologies (wind and solar versus large complex power plants) can be related to more innovation.

The structure of competition impacts both the speed and direction of innovation. While larger incumbents are suited to developing incremental innovations, small new firms are better at developing radical innovation (D'Estea *et al* 2011; Christensen and Bower, 1996; Hamilton and Singh, 1992; Henderson, 1993).

In the absence of market incentives for innovation, regulation or public ownership can try to mimic them²⁰. But while this is an improvement over purely cost-based regulation (without any innovation incentives), it might often result in incumbents optimising to meet the demands of the regulator/mechanism, rather than meeting the future needs of consumers.

As innovation is so crucial for an efficient transition, policymakers, including competition authorities, should put a high value on protecting and encouraging competition in green sectors in the many cases where it is good for innovation.

The European Commission has demonstrated such encouragement. In the 2018 merger between Bayer and Monsanto²¹, the Commission found significant R&D overlaps, including in green products. The Commission cleared the merger on the condition that the parties divested certain activities to ensure adequate continuation of R&D in these activities.

3.2. Competition for 'green quality' contributes to the transition

Consumers often care about purchasing sustainably, and are willing to pay for it (Volpin, 2020)²². Consuming more sustainable products thus increases consumer welfare.

An overwhelming majority of Europeans (94 percent) say that protecting the environment is important to them personally, and a third believe that changing consumption patterns is the most effective way of tackling environmental problems (Eurobarometer, 2017).

Other studies confirm that consumers' attitudes and beliefs reflect an intention to consume more sustainable products (see Annex for a discussion on the literature on consumer preference for green products). This is a strong motivation for companies to distinguish themselves from competitors by offering more sustainable products.

Competition for sustainability is hence a driver for innovation and a speedier transition, and policy should encourage it.

Under current competition policy practices, environmental protection is not treated as a standalone non-economic goal to be defended in the way that, say, market integration is²³. Nor has environmental protection justified derogation from competition rules²⁴.

Where the European Commission has taken environmental concerns into account, it has been as an element of consumer welfare²⁵ and, more specifically, as a mark of the 'quality' of products. 'Quality' is a key aspect of competition under EU law. When firms compete on quality, any agreement or behaviour that artificially weakens quality may be subject to a prohibition.

In the context of mergers, for example, the European Commission (2013) states that *"competitive harm caused by a reduction of quality [is] on an equal footing with an increase of prices, or a reduction of output, choice of goods and services."*

In 2017, the Commission blocked the proposed takeover of Aer Lingus by the low-cost airline Ryanair on the basis that the merged entity would impose lower service quality at equal prices²⁶.

Agreements or behaviour that undermine sustainability to the detriment of consumers may be deemed anti-competitive and treated with the same severity as those that raise prices. If sustainability is a quality that consumers care about, then a merger that would allow the phasing out of a sustainable line or product could be blocked for this reason.

Similarly, competition authorities may prohibit or punish agreements between companies or conduct by dominant firms that limit green quality (under Articles 101(1) and 102 of the Treaty on the Functioning of the EU, respectively).

The Commission is in fact at time of writing investigating an agreement under which car manufacturers allegedly colluded to limit the development and roll-out of technology to reduce pollutants in emissions from cars²⁷.

So undercutting of sustainability as a result of mergers, acquisitions and abuse of market dominance can already be sanctioned by competition authorities by referring to the negative impact on 'green quality'.

But it becomes very difficult for competition authorities if lower sustainability needs to be balanced against potential cost benefits for consumers in the same case. Moreover, competition policy is focused on the impacts on current and possibly potential consumers, but not on externalities cases have on all living (let alone future) citizens.

3.3. Competition between institutions helps identify more efficient and resilient solutions

Virtuous competition can emerge not only between companies, but also between technology systems, regulatory systems, countries and institutions (Petersmann and Steinbach, 2020). Particularly in the European context, allowing some differentiation between member state approaches might enable a faster and more resilient transition, if differentiation is not used to protect suboptimal solutions.

Different energy mixes in EU countries enhance mutation and selection of the best technologies based on geographical and pre-settled conditions. Having a wide energy portfolio fosters competition and permits complementarity among technologies, lowering the price of energy and increasing supply resilience.

A high degree of freedom in technology adoption by EU countries has resulted in a very diverse assortment of energy technologies in the EU, which was complemented by the emergence of a bandwagon effect by pioneer countries dragging others to adopt effective technologies.

For example, the successful early adoption of solar photovoltaics in Germany was a strong market signal for southern countries such as Italy and Spain to invest in the technology. Italy is now the second producer of solar energy (after Germany) with 20.5 gigawatts of installed capacity, amounting to about 8 percent of its electricity production, while Spain was both the EU's and Europe's largest solar market in 2019, after adding an estimated 4.7 GW in a single year (Schmela *et al* 2019).

Therefore, the French government's commitment to spend €1 billion on small modular reactors, known as SMRs, and other technologies such as atomic waste recycling, might increase the portfolio of available low-emission technologies²⁸.

Similarly, the German National Hydrogen Strategy²⁹, and its required network of international partnerships to guarantee supply of green hydrogen, represents an opportunity to assess the real potential of the technology for the foreseeable future.

Having EU countries bet on distinct technologies could turn out to be a winning strategy. It could lead to a more resilient portfolio of sometimes complementary solutions, and might allow the EU to maintain its technological advantage in low-carbon energy sources.

Competition might emerge not only between technological solutions for the transition, but also between the policies and rules to bring about the transition. Different regulatory/policy approaches among EU countries have improved the common understanding and selection of the most effective policies for the roll out of low-carbon technologies.

Table 1. Share of first (green) and second (yellow) most important source of zero carbon electricity consumption in the five most populous EU countries 2021

	Nuclear	Solar	Wind	Hydro
Germany	12%	9%	21%	3%
France	47%	7%	2%	1%
Poland		2%	10%	1%
Italy		10%	8%	15%
Spain	22%	10%	24%	13%

Source: Entso-E.

For instance, regulatory convergence is now emerging around the auctioning of feed-in premiums as the most common policy framework for incentivising the adoption of renewable energy sources. This is the standard price-setting mechanism in Czechia, Denmark, Germany, Italy, the Netherlands, Estonia, Finland, Slovenia, Slovakia and Spain³⁰.

Given the massive uncertainty and complexity of the choices, trying different technologies, systems and regulations might be more likely to result in the emergence of efficient solutions.

But, at some point, eliminating ineffective solutions will increase overall efficiency. Unleashing the power of the internal market by removing regulatory and infrastructure bottlenecks and cancelling support for inferior solutions can speed up this process³¹.

For example, a more integrated energy market at the EU level would not only increase the degree of competition energy providers are exposed to, but would also guarantee greater benefits from investments in successful technologies.

In fact, increasing the potential customer base of energy companies makes risk-taking more appealing because the returns on fruitful investments will be higher. This is particularly important in a sector with high upfront costs in R&D and subsequently in infrastructure.

Therefore, a broad conclusion could be that allowing heterogeneity in emerging regulations/systems can be very helpful in developing a resilient portfolio of solutions. However, at some point these solutions need to be exposed to competition with each other to determine the most efficient role for each.

In the European context, this approach bring two risks: to avoid costly mistakes in terms of backing ultimately unsuccessful approaches, countries might 1) prefer to wait and see and try to converge on the most conventional approach, and 2) they might try to protect their suboptimal solutions from true competition.

This might be rectified partly by engineering some risk-pooling between countries in order to allow them to take on the risk that mistakes will be made.

3.4. Testing disruptive ideas can require exemptions from regulations that discriminate against new entrants

An efficient transition will require not only massive investments in available low-carbon alternatives, but also the emergence of new business models and new technologies. This might allow new market players with different backgrounds to bring new ideas and different capabilities to old sectors that are dominated by incumbents. Start-ups might contribute disruptive ideas that enable more efficient transition pathways.

Economic activities in mature sectors are regulated by a complex web of rules to address a wide array of societal concerns (including privacy concerns, environmental protection, construction safety, social protection and energy security).

The rules were co-created between societal actors and incumbents. In many cases, the arrangements imply that incumbents address some externality in return for protection against too much competition. For example, the complexity and bureaucracy of some regulations are a de-facto barrier to entry into specific business activities.

For an efficient transition, the challenge will be to find the right balance between protecting legitimate societal concerns and allowing new dynamism in mature sectors. The emphasis should thus be on finding ways to remove barriers that discriminate needlessly against new entrants which are testing disruptive ideas and contesting incumbents.

4. Areas where a too-narrow focus on competition needs to be discussed

Focusing solely on defending competition might, in the presence of strong market failures, aggravate misallocations. In this section, we discuss cases in which public intervention in competition might improve resource allocation during the transition.

4.1. Some green innovation might justify temporary competition derogations

Because innovation is so crucial in the transition, the wider competition framework should be calibrated to make good use of the entrepreneurial innovation machine. But prioritising more and better innovation over lower mark-ups in competition policy is easier said than done³².

This is best illustrated by the century-old academic debate on whether patents are a good tool to balance competition and innovation. While economists have learnt a lot about the dimensions and drivers of the trade-off in terms of the cost of patent protection and impact on innovation³³, there is still no consensus on an efficient toolbox (Scotchmer, 1991, 2004; OECD, 2004; Dosi *et al* 2006; Boldrin and Levine, 2008; Henry and Stiglitz, 2010; Haskel and Westlake, 2018).

A more recent question relates to the innovation-competition trade-off when assessing the desirability of acquisitions of small innovators by incumbents. In some cases, these might be 'killer acquisitions' that destroy potential innovative disruptors.

In other cases, it might be the best way to quickly scale up a new solution or to encourage entrepreneurs to innovate in the first place. Hence, if acquisition by an incumbent helps to scale-up green solutions rapidly, the environmental benefits might be worth safeguarding.

Another example of the competition/green-innovation trade-off is innovation cooperation between companies. The incentives to invest in innovation might be sub-optimal for companies in complex value chains.

It is much easier for a company to justify investment in a marginal improvement to its current contribution to the existing system (say a combustion engine cylinder) than in a more sustainable new system (electromobility).

In the transition, such cases are not unimportant. As noted by IEA (2020), "*low-carbon electricity systems are characterized by increasingly complex interactions of different technologies with different functions in order to ensure reliable supply at all times,*" placing a premium on collaborative research between different partners, stretching well beyond partners in the energy field.

While there is scant evidence on the role of collaborative research in the energy sector, the work that does exist suggests government intervention can facilitate collaboration³⁴.

EU initiatives such as the Fuel Cells and Hydrogen Joint Undertaking or the Battery Alliance offer the participating companies some shield against competition authorities' claims of anticompetitive collusion.

These examples show that the competition/innovation trade-off is particularly complex and getting it right is particularly rewarding. In fact, there is little discussion in the academic literature about whether it is possible and desirable to discriminate in the innovation-competition trade-off between societally useful ('green') and detrimental ('brown') innovation.

Nevertheless, it is clear that an over-strong focus on static efficiency is suboptimal. Competition policymakers should in general emphasise dynamic effects more – which depending on the case can imply either a more permissive or more restrictive stance.

4.2. Investment in new systems might require cooperation between potential competitors

The transition will require the quick deployment of new productive systems, in the circular economy or multimodal transport, for example. Coordination by companies to develop new sustainable systems will be necessary in the innovation stage, and also when coordinating investments in emerging systems to overcome chicken-and-egg problems.

Current coordination structures might go a long way in allowing the coordination/synchronisation of significant capital investment, but it should not be excluded that in specific cases more exclusive forms of cooperation will be required to enable investments in new systems.

One illustrative example of the high capital-specificity of new system investments is the complementarity of a hydrogen-based steel-plant, a hydrogen transmission system, and electrolyzers. None of the three elements are useful without the others.

Each player in one part of the value chain might have an incentive to look for more economic partners once the system is established, but no partner would invest if it were worried that the other partners might switch once the system is running.

Hence, the investment might only go ahead if partners sign watertight long-term exclusive cooperation agreements, or even form an exclusive joint venture. Sector regulation and competition policy need to provide a framework to encourage such systems to emerge, with the proviso that they are eventually opened up to competition after companies manage to recover their capital costs.

In this, and other cases of investment in new systems, temporary exemptions should be considered to rules that were developed to protect competition in mature sectors.

4.3. Some 'green efficiencies' might trump competition concerns

Competition policy already has tools to protect 'green competition', by treating green as a quality (see section 3). But consumers do not always demand sustainable products³⁵.

In such cases, competition does not drive green progress – firms have little incentive to invest in costly clean-ups. Worse still, in markets where consumers care primarily about prices, firms may have little choice but to adopt the dirtiest production processes.

There might thus be cases when reducing competition (eg. through mergers and acquisitions) might have positive environmental effects. For example, a merger of an emerging company with a clean technology and an incumbent with a dirty technology could allow the clean technology company to develop faster based on the incumbent company's infrastructure.

Competition authorities might therefore have to rule on behaviours that are good for the environment but otherwise anti-competitive³⁶. EU competition policy is asymmetric in its analysis of harmful and beneficial effects.

Beneficial effects, or 'efficiencies', are typically only considered in the second stage of a two-step process, while harmful effects are considered in the first step. In the first step, the European Commission assesses whether the agreement, merger or behaviour restrains competition.

If the action raises competition concerns then, in a second step, the Commission examines potential efficiencies. The burden of proof is on the companies to show that the improvements offset the anti-competitive restrictions – the so-called efficiency defence.

In practice however, efficiency arguments are largely ignored, the Commission having set demanding requirements which are rarely met in practice.

Competition authorities must identify if a merger between a clean-tech company and an incumbent 'dirty' tech company is a killer acquisition to destroy a new green competitor, an acquisition that primarily aims to consolidate market shares, or an acquisition that will serve the faster deployment of the environmental technologies developed by the emerging company.

As the future business model of the merged company (brown or green) is unknown to the competition authority, this might be resolved partly by attaching conditions and obligations to such an acquisition. In our example, this might be a specified share of clean technology sales in the overall sales of the new company.

4.4. Global market imperfections might require protection for European companies

Some countries, notably China and Russia, seek to ensure that in some sectors their companies do not compete or do even collaborate on foreign markets (Monopolkommission, 2020, p.18). They also do not give foreign companies full access to their markets (Monopolkommission, 2020, p.15).

Moreover, countries like China provide implicit or explicit subsidies to certain companies in international competition (Monopolkommission, 2020).

This can lead to foreign companies operating in Europe securing larger markets, greater scale efficiencies, higher profits and hence more funds for further expansion. This might result in European companies facing an unfair disadvantage in sectors that are crucial for the transition.

And as the transition will alter the determinants of competitiveness in many industries (eg increasing demand for specific skills, capital or low cost renewables), countries that manage to establish agglomeration effects in new industries most effectively might benefit from such industrial policy for a long time.

A much quoted, but also disputed example is the active Chinese support for its photovoltaic panel industry (Goron, 2018). It has been argued that the subsidised Chinese industry has killed off its European competitors through dumping.

As a remedy, there are calls for national champions to be supported in the EU to level the playing field. Most prominently, the creation of Airbus and the proposed Alstom/Siemens merger were justified on the basis that they would strengthen European companies in international competition for aviation/rail-technology³⁷.

In fact, Motta and Peitz (2019) pointed out that EU merger control can allow the formation of European champions if companies can show that efficiency gains (synergies and complementarities) outweigh anti-competitive effects in terms of higher prices and less choice in the short term, and less investment, innovation and quality in the long term.

“But in the Siemens/Alstom case, there is no public information that points to such synergies, and the European Commission stated that the parties have not substantiated any such efficiency claims”, Motta and Peitz (2019) added.

But how should the EU then react to unfair market practices by foreign companies? In crossborder trade, European undertakings are already protected by anti-dumping and anti-subsidy instruments.

However, such measures – as in the case of Chinese solar panels – are complicated by internal divisions inside the EU, the threat of retaliation and their focus on narrow product categories (Goron, 2018). The first-best approach would be for EU’s competition authorities to continue to build partnerships with foreign antitrust institutions, preferably in the context of trade agreements, which have chapters on competition policy³⁸.

But this long-term approach will be continuously challenged by incentives to deviate. As an alternative to solving unfair global competition challenges by resorting to the inefficiencies of national champions, Motta and Peitz (2019) proposed *“preventive intervention – such as excluding from tenders non-EU firms suspected of engaging in such behaviour – or with having to resort to anti-dumping provisions.”*

The sustainability dimension will further complicate the already almost insoluble issue of ensuring a sufficiently level playing field between companies from different economic systems.

4.5. Resolving uncertainty about competition law treatment might promote investment

An efficient transition will likely be characterised by the development of new business models and new company ecosystems with new networks of contractual regulations between companies (see section 3.4).

Regulatory and competition agencies will require time and experience to identify which of those are helpful or innocent, and which might substantially reduce competition. This might create substantial uncertainty on the part of companies and hence might delay the transition.

In principle, temporary and targeted deviations from rules that protect competition in mature sectors should be allowed if those rules would have unduly complicated the emergence of new systems. Such regulatory holidays could act as innovation incentives similar to patents and could be compatible with later regulation, thereby preventing long-run monopolistic exploitation (Choi, 2011).

Gans and King (2003) set out conditions under which access holidays can increase investment incentives for innovative infrastructure. Simulations by Nitsche and Wiethaus (2011) confirmed increased investment incentives.

However, there are two commitment issues for regulatory holidays: first, that regulation will actually come at the stipulated date (or incident); second, that regulation will not come before that date. However, breaking the latter commitment and installing regulation may itself take time, meaning the commitment period is implicitly assured.

This potentially long lag will have to be traded off against the danger that the firm building the new market may gain a long-lasting first-mover advantage (Briglauer, 2014).

5. Making competition fruitful for the transition

We have provided examples of how the transition will affect the ability of markets to allocate resources efficiently, and how competition policy can help but also obstruct efficient resource allocation in the transition.

From this, it should be quite clear that policy frameworks will need to be adjusted to ensure economic actors have the right incentives to efficiently reallocate resources in line with the transition. It is most important to address the environmental externality directly and effectively through carbon pricing.

But the multitude of overlapping market and government failures implies that a carbon price alone will not be enough for an efficient transition.

In the following we discuss which shifts in policy frameworks would be effective in guiding resource allocation in the transition, from the least intrusive to the most intrusive.

5.1. Adjusting competition rules and enforcement

Competition rules are devised primarily to address the strategic behaviour of companies with market power that results in inefficient allocation of resources.

The EU Treaty gives EU competition authorities³⁹ the power to prohibit cartels, to punish or prevent abusive practices by powerful firms, and to block mergers that threaten to significantly reduce competition⁴⁰. But competition policy tools interact with other externalities.

In the course of their work, competition authorities may find that some ostensibly anti-competitive practices have environmental benefits. An industry-wide agreement to phase out energy-intensive washing-machines may restrict competition, for example, but lead to reduced carbon emissions.

Conversely, competition authorities may find some industrial actions acceptable on pure competition grounds, but alarming for environmental reasons. They could, for instance, be called to rule on an acquisition by a dirty incumbent that wants to delay greening its production process by eliminating a competitor that exerts little competitive pressure but has green potential.

A common misconception is that the EU competition framework is directed solely towards maximising the welfare of consumers defined in terms of allocative efficiency⁴¹ and measured through prices.

According to this understanding, competition enforcers would be bound to making the decision that secures the lowest price (or highest quantity) for consumers, regardless of non-price concerns such as the environment⁴².

But as the EU Court of Justice has made clear that *“the competition rules were aimed at protecting not only the interests of competitors or of consumers, but also the structure of the market and, in so doing, competition as such.”*⁴³.

Non-economic factors may and have been relevant to competition decisions, most notably the integration of national markets into a single European market⁴⁴.

More generally, and as noted by the legal scholar Giorgio Monti (2007), *“to date no competition authority has deployed competition law in accordance with one unchanging set of aims – the goals of antitrust vary over time; even at the same time, the law can be pursuing different, even mutually contradictory, goals.”*

Issues of law are at the sole discretion of the EU courts (the General Court and the EU Court of Justice), which enjoy full judicial review (Ibáñez Colomo, 2018).

So where does environmental protection stand? Can EU competition enforcers pursue sustainability as one of their legitimate aims? As Kingston (2012) and others⁴⁵ have argued, from a legal standpoint the answer is yes.

The Treaty on the Functioning of the European Union (TFEU) states: *“the Union shall ensure consistency between its policies and activities, taking all of its objectives into account”* (Article 7 TFEU).

Environmental protection has featured prominently among the EU’s policies since long before the European Green Deal. Article 11 TFEU says that *“environmental protection requirements must be integrated into the definition and implementation of the Union’s policies and activities, in particular with a view to promoting sustainable development.”*

The question therefore is not so much whether but how competition policy can serve the EU’s environmental goals.

Protect competition

The main task of competition policy is to protect competition in both green and non-green sectors. In general, this will remain the most important task for competition policy, which will help make best use of the resources needed for a socially viable transition.

Sharpen existing tools to take into account sustainability in competition decisions

As we have argued, competition enforcement and sustainability are not opposing aims, but they interact strongly on a case-by-case basis, sometimes in a complementary way, sometimes not.

Considering the environmental performance of products and services as a quality and assessing whether a

competition case might lead to reduced quality will mean taking into account sustainability concerns.

Accepting 'efficiency defence' arguments in competition cases, in particular when there are clear benefits in terms of resource use, is another element of a sustainability-friendly competition policy.

But marginal sustainability gains should not provide carte blanche for companies to engage in anticompetitive behaviour at the detriment of all-economy resource allocation. Hence, the assessment will remain an exercise in the weighting of the arguments – with more visibility of the sustainability effects.

On other important elements of competition policy enforcement, such as market definition⁴⁶ (eg. are green acquisition targets in the same sector as the brown acquirer?) or the test applied for the anticompetitive effects of mergers (eg. in complex emerging value chains), the effects in terms of efficient resource allocation in the transition should be assessed and monitored.

But before competition authorities are asked to consider such effects in their decisions, a better theoretical understanding is needed.

Legal certainty

As the transition must be fast, waiting for legal clarity on new business models and corporations might take too much time. Existing law provides various instruments at European and national level to ensure legal certainty in cases of uncertainty over new arrangements.

At European level, these instruments include:

- ‘No infringement’ decisions pursuant to Article 10 of Council Regulation (EC) No 1/2003, by which the European Commission can decide that Article 101 TFEU and/ or Article 102 TFEU does not apply to certain commercial practices if the “*Community public interest [...] so requires*”, and
- Informal guidance letters that the European Commission can publish in the case of novel questions in individual cases.

Competition authorities should consider using these tools more for cases in which some tight coordination is needed for a limited period of time and a credible vision of a competitive market after this phase is provided.

Sector inquiry on new sectors

Some sectors that are extremely relevant for the transition, including electricity, circular economy sectors and shared mobility, are developing or changing fast and developing new forms of interaction between companies.

This is much needed, but also carries risk in terms of monopolisation that might become a problem at later stages of the transition. To provide guidance (some metrics for critical concentration levels or undue practices) but also comfort to innocent developments, sector inquiries and/or benchmarking analysis should be conducted as per Article 17 of Regulation (EC) No 1/2003.

Improve competition authority capacity

The expected changes in economic organisation during the transition – in particular the increasing role of networks, systems and platforms – will require substantial legal and economics expertise in order to reach robust and speedy analysis and decisions. Accordingly, it will be important to strengthen the capacity of competition authorities in these complex areas⁴⁷.

5.2. Designing markets

Many of the sectors relevant for the transition have characteristics (network effects, scale and scope economies, platform effects, high capital specificity) that imply that unregulated markets either under-invest in socially desirable capital (eg. back-up capacities) or that market concentration makes resource allocation inefficient.

To produce efficient results, market rules need to be put in place that give market actors incentives that are aligned with maximising citizens' welfare. This is easier said than done, as the decade-long series of reforms of the electricity market design has shown. But there is no way to benefit from the power of competition in the internal market in these sectors other than designing robust markets.

As each network/platform technology creates different challenges to be addressed by regulators and competition authorities, and each industry presents specific problems, this is not the place to provide specific recommendations. Some more generic recommendations can be given however to illustrate some of the trade-offs:

- 1) New vs. old sectors: It might make sense to discriminate between emerging sectors where chicken-and-egg issues require strong coordination of investments, and more mature sectors. But again, any exemption to infrastructure access or unbundling rules⁴⁸ should be subject to clear sunset dates and a plan for how competition will be eventually protected.
- 2) National vs. European market designs: There is a trade-off between using the efficiency of the internal market and enabling effective national climate policies. This will remain a tension throughout the transition. This trade-off is better addressed through well-balanced initial policy design than by leaving it to state aid rules and their interpretation⁴⁹. One solution is policies that tolerate periods of national support whilst pushing convergence to the first-best outcome of European integration.

- 3) Regulating access to new networks or not: Network and platform rules are important elements for new smart solutions in energy and mobility. Opening new networks to competitors might discourage investments, while not opening them might prevent virtuous competition. It is crucial that rules do not allow an incontestable position to emerge. For network rules, the UK's Furman Review (Furman *et al* 2019) recommended measures including inter-operability⁵⁰ and data openness as part of a regulatory framework that shapes the market.
- 4) System vs. company competition: In industries with competing networks (electric vs. hydrogen vehicles; district vs. individual electric heating; ride-sharing vs. public transport), having several systems compete (some even government driven) while trying to ensure that this system competition is based on merit rather than incumbent market power, might initially be enough competition. When one system prevails, however, it might become relevant to determine access conditions/interfaces, and to require unbundling.
- 5) Policy experimentation⁵¹: temporarily giving differentiated permissive rules in specific geographical areas (eg. not enforcing unbundling of hydrogen networks in Catalonia), when this serves to test a credible hypothesis on why this could be a useful approach, and closely monitoring the effects, might be a way to learn more quickly what works and what does not.

This illustrates how multifaceted and complex, but also path-prescribing, market design questions will be. But unregulated/unmonitored self-organisation risks running into problems, and companies might hence in anticipated obedience not try promising ideas at all.

Accordingly, EU countries and the EU will need to invest political capital in determining the playing field for competition in these sectors, which are so crucial for decarbonisation.

5.3. Direct state control

The economics in some sectors make it very difficult to engineer virtuous competition between companies, even with sophisticated market rules. Moreover, it is difficult to design markets so they produce the distributional results and resource allocation that are desired politically.

As the assessment on the balance of imperfections of markets, trust in indirect tools to address them and the imperfections of direct public management differ between countries and change over time, there are very different levels in EU countries of state ownership in some sectors, and also clear ups and downs in these shares over time.

Different developments in the energy sector, which remained state- controlled in France and went from liberalisation in the 1990s in Germany to some re-nationalisation in the 2010s, is a striking example.

And state control in specific sectors is not binary. It can range from (i) very light touch provision of company coordinating services, such as EU industrial alliances, that actually even shield companies against certain policies, (ii) via medium-level interventions such as strong regulation of the activities of private companies through specific agencies, public-private partnerships and minority shareholdings, to (iii) very heavy-handed direct control through majority shareholding in essential companies (eg. platforms or network providers), or even complete value chains (electricity and rail sectors in several EU countries).

Again, the optimal balance will be case-specific as countries and sectors differ markedly – and this is not the place to provide a comprehensive list of specific recommendations. However, a few selected considerations illustrate the complexity of the trade-offs:

- Public-body coordination: One approach would be to allow governments to take some temporary coordination role (as for example tried with EU industrial alliances) – but very often those protect incumbents.
- Regulation: Since a regulatory agency can never be completely independent of political influences, its mandate can shift from providing a solution to market failures to becoming an instrument for the protection of incumbents.

Regulation can thus become a barrier against technological change and can create inefficient path dependence and reduce dynamic competition. Moreover, domestic regulatory initiatives in a context in which services are often supra-national in scope, are unlikely to lead to efficient outcomes.

- Public financing: providing public financing especially thorough public banks in ways that enable additional efficient investments in sustainable projects, requires this financing to be used to overcome well-defined market failures. Hence public finance might be less useful in reasonably competitive segments with limited externalities (eg mature renewables).
- State control: Direct control over decisions ('build X nuclear power plants by 20XX!') can be an advantage in speeding up the transition, but public companies' incentives are often less-well aligned with minimising resource misallocation.
- Fiscal rules: If public budgets are credit-constrained by fiscal rules, direct forms of state control (through public companies) might be more difficult.

The balance of the advantages and disadvantages of different forms of state control is a never-ending policy discussion. But the role of competition in the transition cannot be discussed without noting that the need for an efficient transition will require a reassessment of arguments. This discussion has clearly started in practice in specific cases (eg. re-nationalisation of energy networks in Germany), but it requires a more comprehensive framework.

6. Conclusion

Competition and carbon pricing remain key for an efficient transition

Markets will play a central role in the EU's transition to carbon neutrality. Efficiency of resource allocation between sectors is crucial to chart a least-cost route to net zero.

Products, services and underlying sectors will undergo abrupt and significant reshaping. The challenge for policy is to adapt dynamically to evolving circumstances, creating the framework to ensure effective allocation of labour and capital.

On balance, the urgency of the climate transition does not alter the broad principle that free markets are good for achieving efficient resource allocation. Competition must continue to be supported, particularly with the goal of spurring innovation.

This should take place within an underlying framework of progressively more ambitious carbon pricing, which remains the most effective tool for addressing the principal market failure – that of mispriced carbon emissions.

Efficient allocation in the transition will require well-designed markets

However, carbon pricing alone will not efficiently allocate resources because of a number of further externalities, or market failures. There are therefore compelling cases for public intervention to improve resource allocation.

The main challenge will be designing markets for new network industries, including hydrogen, smart grids, the circular economy and multi-modal transport. In all these areas there are efficiency gains to be had from economies of scale and/or scope.

A careful balance needs to be struck between allowing coordination of competitors in a sector in order to develop new integrated systems, and potentially even permitting a certain degree of market power to encourage them to make initial investments, while providing longer-term robust protection against abuse of this power.

Policy framework should focus on enabling innovation

As Europe peers over the precipice of rapid energy-system change, it is not clear whether all member states will move in the same direction in terms of technology and policy choices.

Moving together would provide valuable efficiency gains, but diverging paths would permit greater adherence to national political preferences and, importantly, could offer valuable experimentation on what technologies and policies work well, and which don't.

In this and other cases there are trade-offs between pushing for innovation outcomes and sacrificing short-term (sometimes green) gains. The benefits of providing innovative green solutions to the rest of the world means we take the view that in cases of conflict, policy should err on the side of innovation.

Running through the veins of policy must remain the mantra of 'allowing failure'. A large body of literature in the Schumpeterian tradition finds empirical evidence for positive effects of exit or firm turnover on growth (Comin and Mulani, 2005; Aghion and Howitt, 2006; Fogel *et al* 2006).

While companies are very good at stopping failing projects, politicians are less so. Failure should not only be tolerated but expected.

A discussion is needed on how to ensure efficient resource allocation in the transition

Economic models that assume perfect market outcomes and flawless government decisions already demonstrate that the low-carbon transition implies substantial challenges for jobs, growth and welfare.

If on top of this, an inappropriate institutional framework leads to very inefficient resource allocation, the corresponding cost might make the transition politically unmanageable.

As the EU and its members are now committed to ambitious climate targets and the necessary changes in production and consumption become clearer, it is high time to discuss which fundamental reforms are needed to ensure that the institutional framework that guides resource allocation in the transition is up to challenge.

There are no easy answers on how to organise sectors so that they use the benefits from competition, while minimising detrimental rent-seeking behaviour. But, an efficient transition will, depending on the sector require revised competition rules, redesigned markets and recalibrated roles for the state and the private sector. ■

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Endnotes

1. Throughout, the term 'transition' refers to the process of transition to a climate-neutral economy.
2. Benchmarking is very difficult because it is very hard to control for all the idiosyncrasies of different systems. In the energy sector, with its quickly changing regulatory and market conditions, there are abundant examples of projects that completely failed: eg. German coal plants (Moorburg, Datteln) that were built but never entered into operation; the Montalto di Castro, Stendal and other nuclear power plant projects that were abandoned. Moreover, some large energy projects turn out to be unprofitable, such as the big third generation reactor projects in Finland and Flamanville, which had huge cost overruns.
3. This environmental externality is not restricted to greenhouse gases. Concepts such as 'natural capital' try to introduce environmental factors better into economic analysis. See for example <https://www.ons.gov.uk/economy/environmentalaccounts/methodologies/naturalcapital>
4. Desruelle et al (1996) argued that the complementarities between different components of systems lead to a form of network effects.
5. For a comprehensive analysis see https://ec.europa.eu/competition-policy/system/files/2021-06/kd0521173enn_EEAG_revision_2021_0.pdf
6. For an estimate, see PACE (2021).
7. This would be competition for ownership of the infrastructure ('for the market' competition), rather than actually between competing construction projects ('in the market' competition).
8. If using heat-pumps is cheaper for affluent households than connecting to district heating, similar effects might also arise there.
- 9 See <https://voxeu.org/article/us-firms-market-power-has-declined-due-import-competition>
10. See https://ec.europa.eu/commission/presscorner/detail/en/IP_21_3541
11. "Average emission intensity of the 10 per cent worst performing EU installations for that type of goods"
https://ec.europa.eu/info/sites/default/files/carbon_border_adjustment_mechanism_0.pdf p.67

12. European Commission (2016, p.156) showed how concentrated markets in steel, cement and refineries in the EU are.
13. On the other hand, if CBAM is used to reduce the free allocation of allowances, the corresponding distortions of international competition might make the international division of labour more efficient.
14. To minimise this risk, the EU wants to set up a CBAM system that is compatible with the rules of the World Trade Organisation.
15. This is often forgotten in modelling exercises that expect efficient government policies.
16. They, for example, make unavoidable mistakes, such as supporting the development of technologies that do not perform, like companies, but they are often worse at stopping them.
17. This depends on the ability of companies to pass through the carbon cost to product prices, which is relatively high in ETS sectors.
18. Measuring private R&D is difficult. According to the IEA, three quarters of clean energy R&D is done by business while one quarter by governments (IEA, 2020).
19. The relationship between market power and innovation is a deep research topic with diverse theoretical and empirical results. See for example Schumpeter (1942), Arrow (1962), Gilbert and Newbery (1984), Cohen (2010), Aghion et al (2021), Ding (2020), Gilbert (2020).
20. An example is the innovation components in state-of-the-art revenue regulation models, such as RIIO in the UK electricity distribution industry. See <https://www.ofgem.gov.uk/energy-policy-and-regulation/policy-and-regulatory-programmes/network-price-controls-2013-2023-riio-1/network-price-controls-2013-2023-riio-1-riio-1-network-innovation-funding>
21. Bayer/Monsanto (2018, M.8084).
22. This section was co-written by Julia Anderson.
23. In other words, subject to what OECD (2020) calls “abstract balancing”, or balancing that occurs outside of the economic framework of competition policymaking.

24. For example, using the 'public interest clauses' that allow member states to overrule European Commission merger clearances (Article 21 of the EU Merger Regulation). See Dunne (2020).
25. Environmental consideration may also be indirectly considered as contributing to cost savings. This was the case, for instance, the CECED case where the Commission cleared an agreement to phase out the least energy-efficient washing machines that resulted in electricity cost savings for individual purchasers (2000/475/EC). In these cases, environmental considerations do not enter the (price-based) analysis.
26. Ryanair/Aer Lingus I (2017, M.4439).
27. For new diesel and petrol passenger cars. Open case AT.40178. Press release available at: https://ec.europa.eu/commission/presscorner/detail/en/IP_19_2008
28. See <https://www.bloomberg.com/news/articles/2021-10-12/france-to-build-small-nuclear-reactors-by-2030-in-export-push>
29. See the German National Hydrogen Strategy available at https://www.bmbf.de/bmbf/de/forschung/energiewende-und-nachhaltiges-wirtschaften/nationale-wasserstoffstrategie/nationale-wasserstoffstrategie_node.html
30. [https://energypedia.info/wiki/Feed-in_Premiums_\(FIP\)](https://energypedia.info/wiki/Feed-in_Premiums_(FIP))
- 31 Two important caveats apply: first, some technological choices might create path dependencies (ie. moving out of an unsuccessful bet will be difficult); second, competition might only come up with efficient technology choices when (public) infrastructure choices are optimal.
32. Caveneile et al (2021) estimated in a general equilibrium model that the dynamic welfare effects of antitrust are an order of magnitude larger than the static allocative efficiencies, but that "the complex interactions ... exhibit how daunting a challenge optimal antitrust policy design can be in practice".
33. In principle, allowing companies that successfully bring societally useful innovation to the market to temporarily enjoy extraordinary returns is a very powerful incentive for said innovation.
34. This research primarily focuses on flows of knowledge across borders (eg Haščič et al 2012; Conti et al 2018) or across institutions. For alternative energy technologies, scientific articles and patents with authors from multiple types of

institutions (eg. university and corporations) are cited.

35. For the rest of this paper, the term 'sustainable' refers to environmental sustainability.

36. Or consumers do not yet benefit from or perceive the 'green quality' improvement.

37. Patrick Rey and Jean Tirole questioned whether Airbus and the Alstom-Siemens merger were analogues: "Whereas Airbus was a new challenger to Boeing, which had a near-monopoly in the commercial-aviation market at the time, the Alstom- Siemens merger would have reduced the number of players in the European rail industry". See <https://www.project-syndicate.org/commentary/alstom-siemens-rejected-merger-european-competition-policy-by-patrick-rey-and-jean-tirole-2019-03>

38. See https://www.bruegel.org/wp-content/uploads/2021/11/Strategische_Au_enwirtschaftspolitikStudie_AA_2.pdf p.105

39. 'EU competition authorities' is used to refer to the whole EU institutional infrastructure of competition policy as enshrined in case law, official publications, and administrative practices. DG COMP, the European Commission department responsible for competition matters, is as the administrative authority, and acts as both investigator and decision-maker.

40. This paper does not cover state aid. Note that the new Guidelines on State aid for climate, environmental protection and energy (CEEAG) of the European Commission entered into force in January 2022.

41. Allocative efficiency is a state at which goods and services are optimally distributed according to consumers' preferences.

42. This is a version of the Chicago school approach, according to which the goal of competition policy is to maximise total welfare, defined as the sum of consumer welfare and producer welfare. The European Commission's 2004 move towards a "more economic approach" has been interpreted as a shift towards a Chicago school approach to EU competition law (see Daskalova, 2015).

43. Case C-501/06 P GlaxoSmithKline Services Unlimited v Commission and Others [2009] ECR I-9291, para 63.

44. Based on case law and official publications, Ezrachi (2018) identified seven objectives of EU competition law:

consumer welfare, fairness, market integration, plurality and economic freedom, consumer well-being, efficiency and innovation, and effective competitive structures.

45. For example, Holmes (2020), Dolmans (2020), Nowag (2019).

46. One challenge is that classic tools such as the SSNIP test, which seeks to identify the smallest market within which a hypothetical monopolist could impose a Small Significant Non-transitory Increase in Price, do not work for changes in quality (there is no 'SSNIQ' test).

47. Between 2010 and 2018 the number of posts in DG COMP was reduced slightly from 830 to 804, while the 2015 inquiry into e-commerce alone already required a team of around 15 full-time equivalents over a period of 18-24 months.

48. Opponents of required vertical unbundling point to benefits of vertical integration such as achieving operating efficiencies and avoiding double marginalisation. But in our view the most important aspect is de-risking in the build-up phase.

49. For example, several EU countries and the European Commission are currently considering commercialisation contracts ('carbon contracts for difference'). These contracts provide support to low-carbon industrial installations based on the prevailing carbon price. The most efficient solution is to allocate such support via transparent competition at European level (McWilliams and Zachmann, 2021).

50. Besen and Farrell (1994) stated that firms operating in network markets face a core strategic decision concerning whether to make products that are compatible with those of rival firms (pursue competition within standards) or make products that are incompatible (pursue competition between standards).

51. One problem with many of the currently proposed 'Reallabore' – a German initiative to create a regulatory sandbox to try new technologies – is that they just extrapolate existing business models.

52. The three groups are named the 'climato-natifs', the 'ecolo-equitables' and the 'ecolo-hipsters'. In these three groups, between 62 percent and 90 percent declare that environmental considerations are important or very important factors in their consumption decisions and between 71 percent and 88 percent declare that these same considerations are important or very important factors in their lifestyle choices.

53. Climate Neutral Group, 2020s koopgedrag en klimaat, 2018.
54. Wageningen Economic Research, Monitor Duurzaam Voedsel 2019, 2020.
55. Sustainability in this survey encompasses environmental harm as well as respect to human rights and provision of good working and employment conditions.
56. 'Fully agree' or 'don't agree at all' with the statement "I am willing to spend more on a product if it is environmentally friendly" (IFAK; Ipsos; GfK Media and Communication Research, 2020).
57. Climate Neutral Group, 2020s koopgedrag en klimaat, 2018.
58. 'Fully agree' or 'don't agree at all' with the statement "I am willing to spend more on a product if it is environmentally friendly" (IFAK; Ipsos; GfK Media and Communication Research, 2020).

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Annex. Consumer preference for green

For competition authorities, actual consumption behaviour matters more than intentions. Analyses (and most notably market definitions), are based largely on past consumption data, ie. revealed preferences.

This includes data from the market under study, or, if such data does not exist (for instance because the market does not exist), econometric techniques can help estimate consumers' preferences based on information gleaned from other markets (eg. the travel cost method).

When revealed preferences can neither be observed nor estimated, competition authorities conduct surveys to gauge consumers' intended behaviour in hypothetical markets, ie. their stated preferences. But even there, survey questions and choice situations are designed to elicit consumption decisions as if they were in real markets (Lianos, 2018).

So, are consumers' green intentions reflected in their actual purchase choices? On aggregate, yes. A French study estimated that 44 percent of consumers are "significantly engaged" in sustainable consumption (l'ObSoCo, 2020). This group of consumers is composed of three sociological types for whom environmental considerations largely guide consumption and lifestyle choices⁵².

Overall, French consumers give themselves 6.7 out of 10 when asked to grade the extent to which they consider the environmental impact of their shopping choices (l'ObSoCo, 2020). Climate Neutral Group (2018) found that 50% of respondents to a Dutch survey indicated that they purchase climate-neutral products⁵³. In Italy, 26 percent of families purchase at least one organic product (which is generally less carbon-intensive) per week (ITC, 2019).

The trend is also positive. In the Netherlands, sustainable food accounted for 14 percent of all food purchases in 2019, up from 6 percent in 2013⁵⁴. In 2018, 21.5 million Italian families (81 percent) purchased at least one organic product, a 5 percent increase from just a year before.

A survey of retailers in the five largest EU markets finds that 85 percent increased their sales of sustainable products in the five years leading up to 2019 (ITC, 2019)⁵⁵. The great majority (92 percent) of these surveyed retailers expected sales of sustainable products to increase in the next five years, with around three-quarters of these companies expecting the growth to exceed 10 percent (ITC, 2019). French young adults are much more environmentally conscious than previous generations (l'ObSoCo, 2020).

There are however signs of polarisation, and of possible entrenchment. The share of Germans that declare themselves fully willing to pay more for green products has increased in the last five years, from 6 percent to 8 percent. But so has the share declaring themselves not at all willing to pay more for green products (from 14 percent to 15 percent)⁵⁶.

The l'ObSoCo study found that in France, values and political affiliation are the most important predictor of sustainable consumption; not classic demographic characteristics (eg income, education, location). Given the tendency of people to cluster around values, those that care more about sustainability will find themselves comforted by their choices, while those uninterested in sustainability will be subject to little pressure to change.

Such polarisation gives a political dimension to competition decisions that prioritise one group over another, raising questions of legitimacy on the part of unelected competition officials (see section 4).

And while most consumers care about sustainability, they care even more about price. The l'ObSoCo study found that sustainability considerations do not ultimately drive purchase decisions. Price is much more important.

Sustainability trails behind price and other features that directly benefit consumers such as taste, performance and aesthetic quality. Price is one of the three most important factors when choosing which food products to buy for 62 percent of respondents.

Environmental consideration makes it to the top three for only 29 percent of those surveyed. The different is even more significant for non-food products (71 percent and 25 percent).

Similarly, in the Netherlands, a survey found that environmental impact is a deciding purchasing factor for only 6 percent of respondents⁵⁷. Only 8 percent of surveyed Germans declared themselves fully willing to pay more for green products⁵⁸.

The social dimension of the climate transition

Mehtap Akgüç, Kalina Arabadjieva and Béla Galgóczi outline some of the key labour and social effects of the EU's Fit for 55 climate package and potential responses that should be considered

As well as the inclusion of the notion of just transition into the preamble of the 2015 Paris Agreement, and then in the Glasgow Climate Pact, employment and distributional aspects of climate change mitigation have been recognized at the highest policy level of European union. This can be seen as a modest but important achievement of a several decades-long campaign for a just transition by the labour movement.

The announcement of the European Green Deal (EGD)¹ in 2019 had already included pledges to 'leave no-one behind.' The Just Transition Mechanism² and the proposed Social Climate Fund³ are some of the main EU measures announced to date intended to mitigate the impact of the transition on the most affected regions, vulnerable individuals and businesses.

The Council Recommendation on the social and labour aspects of the climate transition, which is not legally binding, has also provided guidance to member states on how to ensure that the green transition takes place in a just and fair way.

This is a huge challenge that spans across many questions, such as the distributional effects of decarbonization policies, jobs losses and employment transitions, the protection of basic social rights and inclusion of citizens in decision-making, to name but a few.

By no means should this instrument be seen as a substitute for strengthening the social dimension of EU legislative and policy measures on climate change. Nor should it give reason to lower climate ambitions – a 'just transition' does not mean 'slow transition.'

A just transition for the EU can only be 'just' in a true sense if it goes with maximum climate ambition, particularly given Europe's historical debt to low carbon footprint developing countries. With this in mind, we outline some

of the key labour and social effects of the EU's Fit for 55 climate package⁴ on the EU population and potential responses that the recommendation should consider.

Employment effects

Climate policies are having and will continue to have a major effect on the world of work. Millions of new jobs are being created in the transition to a net zero carbon economy, but a large number of jobs will also disappear.

Inclusive and comprehensive social and economic policies are essential to securing social justice, resilience and sustainability

The majority of jobs will go through a fundamental transformation. This unprecedented wave of restructuring will have unequal effects on many fronts, including skills, gender, age, economic activity and region. Sectoral differences are particularly high.

The energy and automotive sectors will be the ones most affected by the decarbonisation drive from climate and environmental regulations at European and national levels. While coal has no future and coal-dependent jobs will be gone, the automobile does have one, albeit in quite a different form from the one we know.

In the coal-based power sector the majority of currently existing jobs will disappear in a decade and the regional effects will be harsh⁵, as over 90% of coal jobs are concentrated in ten NUTS 2 regions, four of them in Poland.

With a more than 5% share of total European employment, the automotive sector is a key employer. For the car industry, the demise of the combustion engine and the electrification of the powertrain will require the development of new competences, skills and forms of work organisation.

These will have a substantial impact on the comparative advantages held by certain nations and manufacturers⁶. The renewable energy sector, construction and low-carbon infrastructure are expected to deliver most of the job creation⁷.

However, transitional policies should consider the local dimensions of the transition - the places where jobs are lost and created are not necessarily the same and relocating labour is not straightforward.

Jobs and skills

Climate change policy will have a major impact on jobs, their skill contents and how they are performed.

The transition will come along with increasing demand for skills in the renewable and cleaner energy sector, energy and resource efficiency, digital competences, STEM knowledge to trigger innovation and breakthrough technology, greener construction methods, city planning and design, technical competences in adaptation, waste management, maintenance and repair technologies to reduce resource exigency as well as boost circular economy practices, to name a few⁸.

To match the rising demand in specific skills and competences for the green transition, training programs and education curricula need to be adapted to the needs of the labour market. Public sector and businesses could cooperate to adapt the training and education programs.

Training, reskilling and upskilling should be made available to the wider workforce and in a flexible format to the extent possible (eg. online or flexible hours) to ensure that nobody is left behind and attract new talents to green jobs, avoiding skill gaps.

Working time and work conditions will also be impacted by climate change and environmental degradation. For example, extreme and frequent heatwaves will necessitate reorganization of working time in key sectors or equipment of air conditioners will be needed to provide appropriate health and care services in regions experiencing adverse climate effects⁹.

Distributional effects

Effective climate policies can only be based on a comprehensive policy framework that include regulation, standards, taxes and market mechanisms in a balanced manner. While market mechanisms – such as the EU's Emissions Trading Scheme¹⁰ - that set price signals to market actors are one important element of this in changing

investment and behavioural patterns, they can only have the desired effects in well-functioning markets, but current energy markets are far from that.

Moreover, the signals themselves have significant regressive distributional effects, disproportionately affecting low-income households, for whom fuel and transport consumption make up a higher share of their income¹¹.

Poorer households also have less capacity to change, as while low-carbon products (electric vehicles, rooftop solar panels, and so on) may have low operating costs, they tend to have high, upfront capital costs – presenting a hurdle for households with little access to cheap capital.

Certain vulnerable groups are likely to be affected more than others during the transition. For example, climate change induces gendered effects as men are disproportionately employed in polluting sectors. This can imply mitigating effects for women: while it can result in overall poverty for the household as men lose jobs, it might also encourage women to enter into the labour force for paid employment – yet with concerns about job quality – to support household income.

However, there is also wide evidence pointing to disproportionate vulnerabilities – such as having fewer resources at disposal, reduced access to education as well as being frequently excluded from information and decision-making processes – faced by women during green transition¹². Just transition must mean also empowering women and addressing these structural inequalities.

Another group experiencing vulnerabilities is migrants. For one, most of the foreign-born workers are employed in relatively low-paying and polluting sectors and have no or only limited access to training to upskill towards transition to low-carbon economy¹³.

The other aspect relates to the future – both internal and international – migratory movements towards Europe as a result of climate emergency. Both of these aspects point to the importance of targeted social and labour market policies to manage flows, ensure successful socioeconomic integration and just transition for everyone including migrants.

This would contribute to global climate justice as the ones most adversely impacted by climate change are not the main contributors to it.

Fundamental rights

The environmental, social and economic effects of climate change and related mitigation policies threaten the enjoyment of fundamental human rights¹⁴. These include basic social and economic rights, widely recognised in international and European human rights instruments and national constitutions¹⁵. They constitute entitlements to basic conditions for a decent human life, without which it is impossible to speak of a 'just' transition.

Both the distributional and employment consequences of climate change policies could affect various basic rights such as the right to work, the right to just working conditions, the rights to an adequate standard of living and to protection from poverty and social exclusion.

As the burdens of the transition fall disproportionately on those who are already most vulnerable, disparate impacts of policies along the axes of gender, ethnicity, migrant status, disability or other protected status could impinge on the right to equality and non-discrimination.

Threats to fundamental rights in global supply chains arise in the context of delivering the resources and technology necessary for decarbonisation¹⁶.

At the same time, fundamental rights can provide a normative framework for the basic elements – necessary but not sufficient – of just transition policy. Aside from the rights mentioned above, ensuring respect for rights to vocational training, fair remuneration, social security, equal opportunities, and collective bargaining – and others – could constitute the foundations of a strategy to address the impacts of the green transition on workers and citizens more broadly.

Discussion of fundamental rights is, however, largely absent from the European Green Deal and Fit for 55 packages. Reference is made to the European Pillar of Social Rights¹⁷, a list of 20 principles without binding legal effect. There is no mention of the EU's own Charter of Fundamental Rights¹⁸, nor other international legal norms.

The Recommendation could be an opportunity to strengthen the link between the just transition agenda and long-standing frameworks for the protection of fundamental labour and social rights, such as the European Social Charter or the core Conventions of the International Labour Organization.

Citizen participation

Climate protest movements such as Fridays for Future, as well as the tens of thousands of people who took to the streets during COP26 make clear that citizens want to have their voices heard when it comes to climate change.

A key challenge for a procedurally fair green transition is to ensure that the public, and especially the most affected communities and citizens, have an opportunity to participate in decision-making.

Participation is a means to empowering and fostering cooperation with affected communities, and contributing to better outcomes and increased democratic legitimacy. In the labour context, this means meaningful participation by workers and social dialogue.

Climate citizen assemblies, convened in France, the UK and some other European countries over the last years are gaining popularity as a forum for public debate on climate change. The on-going Conference on the Future of Europe includes a panel on climate change, too.

But simply providing a forum is not enough – decision-makers also have to listen. Transparency, information and capacity-building are crucial to meaningful involvement, as are active steps to include marginalised groups and to ensure diversity across factors such as gender, ethnicity, age, socio-economic status or geographic location.

The way forward

Getting climate change under control is in the interest of humanity, the unprecedented restructuring process economies need to go through in a few decades to reach net zero emissions is policy driven. These policies will have differential effects on people with different socio-economic characteristics, and policymakers have a dedicated responsibility to address these.

A just transition means that addressing both the employment and distributional effects of a transition to net zero should be an integral part of the package and not supplementary corrective measures.

The EGD has recognised this, but in practice social and employment policy initiatives have remained fragmented and additional. This shortcoming has become very clear with the announcement of the Fit for 55 package in July 2021.

Europe now has a Just Transition Fund with limited resources, dedicated mostly to helping coal regions manage the social and employment effects of coal phase-out. This is very important but reaches a small fraction of people affected by decarbonisation.

The newly announced Social Climate Fund has a very specific target, namely to fend off the detrimental distributional effects of a new emissions trading system for buildings and transport, but even for that it may not be enough¹⁹. Sectors that are highly affected, the automotive sector and energy intensive industries do not have dedicated instruments and a fund.

European-level labour market and social policy initiatives should provide guidance to member states to manage change, and the proposed Council Recommendation is one way of doing so.

In this context, 'leaving no-one behind' should be more than a slogan and translate into concrete measures. Contrary to the declarations, just transition policies are not yet an integral part of the European Green Deal agenda and of the more concrete Fit for 55 policy package.

A comprehensive just transition policy framework should include the following elements:

1. Support for workers in the transition to new jobs with measures targeted to specific sectors (automobile, energy intensive industries, etc.) tailored to national and regional specifics.
2. Deal with the distributional effects of climate policies with targeted measures against energy and transport poverty, supporting and facilitating the affordability and accessibility of low carbon technologies to lower income households (retrofitting of buildings, access to renewable energy, vehicle fleet change, developing public transport).
3. Regional development initiatives to help carbon intensive regions towards a sustainable low-carbon economy.

4. Promote social dialogue and stakeholder involvement at all levels (EU, national, regional and plant level) in managing change towards a zero-carbon economy, including meaningful involvement by citizens.
5. Make sure that newly created green jobs are also good jobs in terms of contract type, social security, wages and working conditions in line with the ILO decent work agenda.

Today a large part of the workforce is in fear of change, a concern that is justified in a labour market environment characterised by increasing precariousness.

As long as 'change' remains fearful, the biggest transformation since the industrial revolution ahead of us cannot succeed. Inclusive and comprehensive social and economic policies are therefore essential to securing social justice, resilience and sustainability. ■

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The grand energy bargain needed to defeat Putin

Ben McWilliams, Simone Tagliapietra and Georg Zachmann argue that deeper integration and accelerated investment will allow the EU to push the transition to cleaner and more affordable energy

Europe finds itself in the middle of a perfect energy storm. Over the last months, three overlapping shocks were pushing the European Union into the worst energy crisis it ever experienced. The first shock affecting global energy markets is an after-effect of the pandemic. During the peak of the COVID crisis in 2020-21, oil and gas investments sharply declined, resulting in a profound energy supply-demand imbalance once global energy demand quickly bounced back. Hence all fuel markets in virtually all corners of the world experience scarce supplies and high prices.

Next came the Russian shock, which started well before the invasion of Ukraine on February 24. Russia has been manipulating European natural gas markets since summer 2021 by substantially reducing exports and not refilling Gazprom-owned storage sites in the EU ahead of last winter.

Since spring this year Russia used its remaining supplies as leverage to push individual countries to relax sanctions on financial transactions and technology – by reneging on long-term supply contracts that were considered sacred by European partners. By the beginning of July, Russia is now only sending one-third of previously anticipated volumes.

As a result, gas prices in the EU have exploded more than tenfold and governments are nervously trying to protect consumers against this price shock by handing out billions in subsidies.

Finally, a series of unlucky coincidences have worsened Europe's already tight energy situation. Corrosion problems have pushed France to shut down half of its nuclear power plants, increasing the need for gas in power generation. Moreover, a severe drought has drained European rivers and lakes to extremely low levels, compromising not only hydropower generation, but also thermal plants that require cooling as well as coal-fired power plants that rely on waterways to deliver coal.

As a result of these three shocks, in the coming winter Europe will not have enough energy to meet desired demand. This represents Europe's greatest systemic risk right now, under both economic and political perspectives.

A disordered energy crisis would not only push Europe into a spiral of economic recession and social tensions, but also expose its political unity to the risk of energy protectionism. This would weaken its foreign policy, and notably its stance against the Russian aggression in Ukraine.

Energy security is challenged as never before and some trade-offs with social and environmental goods must be temporarily reassessed

Putin's strategy to weaken Europe's support for Ukraine by weaponizing energy is now clear to all. For European leaders not to succumb they must rapidly prepare the counter-offensive for what will be a difficult winter.

Choices over how to manage limited energy supply will shape the future of Europe's energy system and have wider political ramifications. If managed correctly, deeper integration and accelerated investments can allow Europe to defeat Putin's strategy while also pushing the transition toward cleaner and more affordable energy.

To make this happen, European leaders must strike a grand bargain to pool the diverse untapped energy potentials of its member states in order to unwind the Union from the dependency on Russia and lay the foundations for a rapid wave of clean energy investments.

- Firstly, all countries must honestly and immediately bring forward every available supply-side flexibility to the European energy market. This will require painful political compromises.

German nuclear and lignite might reduce gas dependency on Russia noticeably; Dutch gas fields could contribute a lot; stronger imports from Ukrainian nuclear plants could displace a few percentage points of gas-burn; and temporarily lowering pollution and labour-time standards even in less Russia-dependent countries would help supplies.

Energy security is challenged as never before and some trade-offs with social and environmental goods must be temporarily reassessed.

- Secondly, agreeing to jointly procure gas on international markets will reduce the risk that member states unity falls apart as they outcompete each other over limited supplies.

Moreover, joint procurement promises to lower financial and political cost for the gas and might allow to use pooled gas volumes to provide energy to the most severely hit consumers.

- Thirdly, all countries must make honest and comprehensive efforts to reduce demand wherever possible. This requires serious and straightforward communication to the public. Policymakers must explain to citizens that there is an impending trade-off between household energy consumption and the preservation of jobs and peace.

Moreover, countries need to ensure that all consumers have good incentives to reduce consumption. European leaders should agree to stop directly subsidising energy consumption and instead subsidise energy reduction. Regulatory tools such as speed limits or changing minimum temperature rules for buildings need to be on the table.

Politically unlocking yet untapped energy supply and demand reduction potential in Europe will substantially alleviate energy market pressures.

- The fourth crucial element of the grand bargain will be to secure a political commitment to maintain a well-functioning European energy market that ensures that molecules and electrons flow to where they are most needed.
- Fifth, European money should be pooled for providing compensation for difficult domestic decisions. Households in Groningen should be compensated for increased tremor risk, and it is not the Dutch government who faces strong incentives for doing so.

For terminating Algerian gas contracts and allowing gas to flow into Italy, Spain should be reimbursed the substantial price differential to more expensive LNG. And compensating demand reduction in Southern Europe might also be facilitated by providing joint incentives. Countries most responsible for the current crisis should contribute more.

- Sixth and crucially, the poorest in society exposed to energy poverty are more vulnerable than ever and continue to need support.

National governments should provide lump-sum transfers or other social aid that does not weaken price signals for reducing energy consumption. Given the massive fiscal imbalances in the EU – the above-mentioned European fund might also contribute.

- Finally, short-term imperatives must not detract from the deployment of long-term solutions to reduce fossil fuel consumption. The EU already has ambitious plans, further upgraded by RePowerEU, which will have a chance to function only if Europe manages the coming winter.

Programmes for electrification, for the deployment of heat pumps, for structural energy efficiency, for the digitalisation of grids, for the deployment of renewables, for the build-out of low-carbon industrial supply chains, for public transport solutions and for clean mobility should be reinforced.

This European grand energy bargain will ensure that the most dependent economies such as Germany can sustain a winter without Russian gas; that vulnerable consumers in all countries are protected; and that less-dependent countries are politically enabled to shoulder some of the burden.

Such a European solution is the best bet to protect the European institutions – such as the energy and carbon markets - that are needed for a cost-efficient transition to carbon neutrality and to defeat Putin’s energy weaponization. ■

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A union that stands strong together

Ursula von der Leyen, in her annual State of the Union speech, outlines the European Union's main political priorities for the next working year

Never before has this Parliament debated the State of our Union with war raging on European soil. We all remember that fateful morning in late February. Europeans from across our Union woke up dismayed by what they saw. Shaken by the resurgent and ruthless face of evil. Haunted by the sounds of sirens and the sheer brutality of war.

But from that very moment, a whole continent has risen in solidarity. At the border crossings where refugees found shelter. In our streets, filled with Ukrainian flags. In the classrooms, where Ukrainian children made new friends. From that very moment, Europeans neither hid nor hesitated. They found the courage to do the right thing.

And from that very moment, our Union as a whole has risen to the occasion. Fifteen years ago, during the financial crisis, it took us years to find lasting solutions. A decade later, when the global pandemic hit, it took us only weeks.

But this year, as soon as Russian troops crossed the border into Ukraine, our response was united, determined and immediate. And we should be proud of that. We have brought Europe's inner strength back to the surface. And we will need all of this strength. The months ahead of us will not be easy. Be it for families who are struggling to make ends meet, or businesses, who are facing tough choices about their future.

Let us be very clear: much is at stake here. Not just for Ukraine – but for all of Europe and the world at large. And we will be tested. Tested by those who want to exploit any kind of divisions between us. This is not only a war unleashed by Russia against Ukraine. This is a war on our energy, a war on our economy, a war on our values and a war on our future.

This is about autocracy against democracy. And I stand here with the conviction that with courage and solidarity, Putin will fail and Europe will prevail.

The courage to stand with our heroes

Today courage has a name, and that name is Ukraine. Courage has a face, the face of Ukrainian men and women who are standing up to Russian aggression. I remember a moment in the early weeks of the invasion. When the First Lady of Ukraine, Olena Zelenska, gathered the parents of Ukrainian children killed by the invader. Hundreds of families for whom the war will never end, and for whom life will never go back to what it was before.

Let us chart once again a joint way forward. With more freedom to invest. And more scrutiny on progress. More ownership by member states. And better results for citizens. Let us rediscover the Maastricht spirit – stability and growth can only go hand in hand

We saw the first Lady leading a silent crowd of heartbroken mothers and fathers, and hang small bells in the trees, one for every fallen child. And now the bells will ring forever in the wind, and forever, the innocent victims of this war will live in our memory. And a nation of heroes has risen. Today, Ukraine stands strong because an entire country has fought street by street, home by home.

Ukraine stands strong because people have stayed in Kyiv to lead the resistance. And we have seen in the last days the bravery of Ukrainians paying off. Europe's solidarity with Ukraine will remain unshakeable. From day one, Europe has stood at Ukraine's side. With weapons. With funds. With hospitality for refugees. And with the toughest sanctions the world has ever seen.

Russia's financial sector is on life-support. We have cut off three quarters of Russia's banking sector from international markets. Nearly one thousand international companies have left the country. The production of cars fell by three-quarters compared to last year. Aeroflot is grounding planes because there are no more spare parts.

The Russian military is taking chips from dishwashers and refrigerators to fix their military hardware, because they ran out of semiconductors. Russia's industry is in tatters. It is the Kremlin that has put Russia's economy on the path to oblivion.

This is the price for Putin's trail of death and destruction. And I want to make it very clear, the sanctions are here to stay. This is the time for us to show resolve, not appeasement. The same is true for our financial support to Ukraine. So far Team Europe have provided more than €19 billion in financial assistance.

And this is without counting our military support. And we are in it for the long haul. Ukraine's reconstruction will require massive resources. For instance, Russian strikes have damaged or destroyed more than 70 schools. Half a

million Ukrainian children have started their school year in the European Union. But many others inside Ukraine simply don't have a classroom to go to.

So I am announcing that we will support the rehabilitation of damaged Ukrainian schools. And that is why we will provide €100 million. Because the future of Ukraine begins in its schools. We will not only support with finance – but also empower Ukraine to make the most of its potential. Ukraine is already a rising tech hub and home to many innovative young companies.

So I want us to mobilise the full power of our Single Market to help accelerate growth and create opportunities. In March, we connected successfully Ukraine to our electricity grid. It was initially planned for 2024. But we did it within two weeks. And today, Ukraine is exporting electricity to us. I want to significantly expand this mutually beneficial trade.

We have already suspended import duties on Ukrainian exports to the EU. We will bring Ukraine into our European free roaming area. Our solidarity lanes are a big success. And building on all that, the Commission will work with Ukraine to ensure seamless access to the Single Market. And vice-versa.

Our Single Market is one of Europe's greatest success stories. Now it's time to make it a success story for our Ukrainian friends, too.

One lesson from this war is we should have listened to those who know Putin. To Anna Politkovskaya and all the Russian journalists who exposed the crimes, and paid the ultimate price. To our friends in Ukraine, Moldova, Georgia, and to the opposition in Belarus.

We should have listened to the voices inside our Union – in Poland, in the Baltics, and all across Central and Eastern Europe. They have been telling us for years that Putin would not stop. And they acted accordingly.

Our friends in the Baltics have worked hard to end their dependency on Russia. They have invested in renewable energy, in LNG terminals, and in interconnectors. This costs a lot. But dependency on Russian fossil fuels comes at a much higher price. We have to get rid of this dependency all over Europe.

Therefore we agreed on joint storage. We are at 84% now: we are overshooting our target. But unfortunately that will not be enough. We have diversified away from Russia to reliable suppliers. US, Norway, Algeria and others. Last year, Russian gas accounted for 40% of our gas imports. Today it's down to 9% pipeline gas.

But Russia keeps on actively manipulating our energy market. They prefer to flare the gas than to deliver it. This market is not functioning anymore. In addition the climate crisis is heavily weighing on our bills. Heat waves have boosted electricity demand. Droughts shut down hydro and nuclear plants.

As a result, gas prices have risen by more than 10 times compared to before the pandemic. Making ends meet is becoming a source of anxiety for millions of businesses and households. But Europeans are also coping courageously with this.

Workers in ceramics factories in central Italy, have decided to move their shifts to early morning, to benefit from lower energy prices. Just imagine the parents among them, having to leave home early, when the kids are still sleeping, because of a war they haven't chosen. This is one example in a million of Europeans adapting to this new reality.

I want our Union to take example from its people. Reducing demand during peak hours will make supply last longer, and it will bring prices down. This is why we are putting forward measures for member states to reduce their overall electricity consumption.

But more targeted supported is needed. For industries, like glass makers who have to turn off their ovens. Or for single parents facing one daunting bill after another. Millions of Europeans need support. EU member states have already invested billions of euros to assist vulnerable households.

But we know this will not be enough. This is why we are proposing a cap on the revenues of companies that produce electricity at a low cost. These companies are making revenues they never accounted for, they never even dreamt of.

In our social market economy, profits are good. But in these times it is wrong to receive extraordinary record profits benefitting from war and on the back of consumers. In these times, profits must be shared and channelled to those who need it the most.

Our proposal will raise more than €140 billion for member states to cushion the blow directly. And because we are in a fossil fuel crisis, the fossil fuel industry has a special duty, too. Major oil, gas and coal companies are also making huge profits. So they have to pay a fair share – they have to give a crisis contribution.

These are all emergency and temporary measures we are working on, including our discussions on price caps. We need to keep working to lower gas prices. We have to ensure our security of supply and, at the same time, ensure our global competitiveness.

So we will develop with the member states a set of measures that take into account the specific nature of our relationship with suppliers – ranging from unreliable suppliers such as Russia to reliable friends such as Norway.

Another important topic is on the agenda. Today our gas market has changed dramatically: from pipeline gas mainly to increasing amounts of LNG. But the benchmark used in the gas market – the TTF – has not adapted. This is why the Commission will work on establishing a more representative benchmark.

At the same time we also know that energy companies are facing severe problems with liquidity in electricity futures markets, risking the functioning of our energy system. We will work with market regulators to ease these problems by amending the rules on collateral - and by taking measures to limit intra-day price volatility.

And we will amend the temporary state aid framework in October to allow for the provision of state guarantees, while preserving a level playing field. These are all first steps. But as we deal with this immediate crisis, we must also look forward.

The current electricity market design – based on merit order – is not doing justice to consumers anymore. They should reap the benefits of low-cost renewables. So, we have to decouple the dominant influence of gas on the price of electricity. This is why we will do a deep and comprehensive reform of the electricity market.

Now - here is an important point. Half a century ago, in the 1970s, the world faced another fossil fuel crisis. Some of us remember the car-free weekends to save energy. Yet we kept driving on the same road. We did not get rid of our dependency on oil. And worse, fossil fuels were even massively subsidised.

This was wrong, not just for the climate, but also for our public finances, and our independence. And we are still paying for this today. Only a few visionaries understood that the real problem was fossil fuels themselves, not just their price.

Among them were our Danish friends. When the oil crisis hit, Denmark started to invest heavily into harnessing the power of the wind. They laid the foundations for its global leadership in the sector and created tens of thousands of new jobs. This is the way to go! Not just a quick fix, but a change of paradigm, a leap into the future.

Staying the course and preparing for the future

The good news is that this necessary transformation has begun. It takes place in the North Sea and the Baltic Sea, where our member states have invested heavily in offshore wind. It takes place in Sicily, where Europe's largest solar plant will soon produce the latest generation of solar panels. And it takes place in northern Germany, where regional trains now run on green hydrogen.

Hydrogen can be a game changer for Europe. We need to move from the niche market to the mass market for hydrogen. With REPowerEU, we have doubled our goal: we want to produce ten million tons of renewable hydrogen in the European Union, every year by 2030.

To achieve this, we need to create a market leader for hydrogen, and in order to fill the investment gap and link future supply and demand I can announce that we will create the European Hydrogen Bank. It will help to ensure the purchase of hydrogen, in particular by using the resources of the innovation.

It will be able to invest €3 billion to help build the hydrogen future. This is how the economy of the future will be built. That is our European Green Deal. And we've all seen in recent months how important the European Green Deal is.

The summer of 2022 will be remembered. We have all seen the dry rivers, the burning forests, the extreme heat. And the situation is much more serious. Until now, the glaciers of the Alps have served as an emergency reserve for rivers such as the Rhine or the Rhône. But as Europe's glaciers melt faster than ever, future droughts will be much more serious.

We must work tirelessly for climate adaptation and make nature our first ally. That is why our Union will push for an ambitious global agreement for nature when of the United Nations Conference on Biodiversity to be held in Montreal this year. And we will do the same at COP27 in Sharm el-Sheikh.

But in the short term, we also need to be better equipped to deal with climate change. No country can fight extreme weather events and their destructive forces alone. This summer, we sent planes from Greece, Sweden or Italy to fight fires in France and Germany.

But as these events become more frequent and intense, Europe will need more capacity. That is why today I am announcing that we will double our capacity to fight against fires over the next year. The European Union will buy ten light amphibious aircraft and three additional helicopters to complete our fleet. This is European solidarity in action.

The last years have shown how much Europe can achieve when it is united. After an unprecedented pandemic, our economic output overtook pre-crisis levels in record time. We went from having no vaccine to securing over 4 billion doses for Europeans and for the world. And in record time, we came up with SURE – so that people could stay in their jobs even if their companies had run out of work. We were in the deepest recession since World War 2. We achieved the fastest recovery since the post-war boom.

And that was possible because we all rallied behind a common recovery plan. NextGenerationEU has been a boost of confidence for our economy. And its journey has only just begun. So far, €100 billion have been disbursed to member states. This means: €700 billion still haven't flown into our economy.

NextGenerationEU will guarantee a constant stream of investment to sustain jobs and growth. It means relief for our economy. But most importantly, it means renewal. It is financing new wind turbines and solar parks, high-speed trains and energy-saving renovations. We conceived NextGenerationEU almost two years ago, and yet it is exactly what Europe needs today.

So let's stick to the plan. Let's get the money on the ground. The future of our children needs both that we invest in sustainability and that we invest sustainably. We must finance the transition to a digital and net zero economy. And yet we also have to acknowledge a new reality of higher public debt.

We need fiscal rules that allow for strategic investment, while safeguarding fiscal sustainability. Rules that are fit for the challenges of this decade. In October, we will come forward with new ideas for our economic governance.

But let me share a few basic principles with you. Member states should have more flexibility on their debt reduction paths. But there should be more accountability on the delivery of what we have agreed on. There should be simpler rules that all can follow. To open the space for strategic investment and to give financial markets the confidence they need.

Let us chart once again a joint way forward. With more freedom to invest. And more scrutiny on progress. More ownership by member states. And better results for citizens. Let us rediscover the Maastricht spirit – stability and growth can only go hand in hand.

As we embark on this transition in our economy, we must rely on the enduring values of our social market economy. It's the simple idea that Europe's greatest strength lies in each and every one of us.

Our social market economy encourages everyone to excel, but it also takes care of our fragility as human beings. It rewards performance and guarantees protection. It opens opportunities but also set limits. We need this even more today. Because the strength of our social market economy will drive the green and digital transition. We need an enabling business environment, a workforce with the right skills and access to raw materials our industry needs. Our future competitiveness depends on it.

We must remove the obstacles that still hold our small companies back. They must be at the centre of this transformation – because they are the backbone of Europe's long history of industrial prowess. And they have always put their employees first – even and especially in times of crisis. But inflation and uncertainty are weighing especially hard on them.

This is why we will put forward an SME Relief Package. It will include a proposal for a single set of tax rules for doing business in Europe – we call it BEFIT. This will make it easier to do business in our Union. Less red tape means better access to the dynamism of a continental market.

And we will revise the Late Payment Directive – because it is simply not fair that 1 in 4 bankruptcies are due to invoices not being paid on time. For millions of family businesses, this will be a lifeline in troubled waters.

The lack of staff is another challenge for Europe's businesses. The number of unemployed is lower than ever before. This is good! But at the same time, the number of vacancies is at a record level.

Whether truck drivers, waiters or airport staff. Whether also nurses, engineers or IT technicians. From unskilled to university degrees, Europe needs them all! We therefore need to invest much more in education and training.

To this end, we want to work closely with the private sector, because they know best which specialists they need today and tomorrow. And we need to better reconcile this need with the objectives and wishes of the job seekers themselves for their career path. In addition, we want to recruit more targeted specialists from abroad who work here for companies and strengthen Europe's growth.

An important first step is to improve their skills in Europe and to recognise that Europe must become more attractive for those who can do something and want to get involved. That is why I propose that 2023 be the European Year of Enlargement.

Whether we're talking about custom-made chips for virtual reality or storage cells for solar systems – access to raw materials is crucial in the transformation towards a sustainable and digital economy and for the success of our small- and medium-sized enterprises.

Lithium and rare earths will soon be more important than oil and gas. Our demand for rare earths alone will increase fivefold by 2030. And that's a good sign! Because it shows the speed at which our European Green Deal is progressing.

The only problem is that a single country currently dominates almost the entire market. We must avoid becoming dependent again, as with oil and gas. This is where our trade policy comes into play. New partnerships help us not only to strengthen our economy, but also in advancing interests and our values globally. With like-minded partners, we can also work standards and ensure environmental standards.

Above all, we need to strengthen our relations with these partners and with important growth regions. I will therefore ratify the agreements with Chile, Mexico and New Zealand. And we are conducting negotiations with important partners such as Australia and India ahead.

But securing supplies is only a first step. The processing of these metals is just as critical. Today, China controls the global processing industry. Almost 90 % of rare earths and 60 % of lithium are processed in China.

We will identify strategic projects all along the supply chain, from extraction to refining, from processing to recycling. And we will build up strategic reserves where supply is at risk. This is why I am announcing a European Critical Raw Materials Act.

We know this approach can work. Five years ago, Europe launched the Battery Alliance. And soon, two third of the batteries we need will be produced in Europe. Last year I announced the European Chips Act. And the first chips gigafactory will break ground in the coming months.

We now need to replicate this success. This is also why we will increase our financial participation to Important Projects of Common European Interest. And for the future, I will push to create a new European Sovereignty Fund. Let's make sure that the future of industry is made in Europe.

Standing up for our democracy

As we look around at the state of the world today, it can often feel like there is a fading away of what once seemed so permanent. And in some way, the recent passing of Queen Elizabeth II reminded us of this.

She is a legend! She was a constant throughout the turbulent and transforming events in the last 70 years. Stoic and steadfast in her service. But more than anything, she always found the right words for every moment in time.

From the calls she made to war evacuees in 1940 to her historic address during the pandemic. She spoke not only to the heart of her nation but to the soul of the world. And when I think of the situation we are in today, her words at the height of the pandemic still resonate with me. She said: *"We will succeed – and that success will belong to every one of us."*

She always reminded us that our future is built on new ideas and founded in our oldest values. Since the end of World War 2, we have pursued the promise of democracy and the rule of law. And the nations of the world have built together an international system promoting peace and security, justice and economic progress.

Today this is the very target of Russian missiles. What we saw in the streets of Bucha, in the scorched fields of grain, and now at the gates of Ukraine's largest nuclear plant – is not only a violation of international rules. It's a deliberate attempt to discard them.

This watershed moment in global politics calls for a rethink of our foreign policy agenda. This is the time to invest in the power of democracies. This work begins with the core group of our like-minded partners: our friends in every single democratic nation on this globe.

We see the world with the same eyes. And we should mobilise our collective power to shape global goods. We should strive to expand this core of democracies. The most immediate way to do so is to deepen our ties and strengthen democracies on our continent.

This starts with those countries that are already on the path to our Union. We must be at their side every step of the way. Because the path towards strong democracies and the path towards our Union are one and the same.

So I want the people of the Western Balkans, of Ukraine, Moldova and Georgia to know: you are part of our family, your future is in our Union, and our Union is not complete without you!

We have also seen that there is a need to reach out to the countries of Europe – beyond the accession process. This is why I support the call for a European Political Community – and we will set out our ideas to the European Council.

But our future also depends on our ability to engage beyond the core of our democratic partners. Countries near and far, share an interest in working with us on the great challenges of this century, such as climate change and digitalisation.

This is the main idea behind Global Gateway, the investment plan I announced right here one year ago. It is already delivering on the ground. Together with our African partners we are building two factories in Rwanda and Senegal to manufacture mRNA vaccines. They will be made in Africa, for Africa, with world-class technology.

And we are now replicating this approach across Latin America as part of a larger engagement strategy. This requires investment on a global scale. So we will team up with our friends in the US and with other G7 partners to make this happen.

This is part of our work of strengthening our democracies. But we should not lose sight of the way foreign autocrats are targeting our own countries. Foreign entities are funding institutes that undermine our values. Their disinformation is spreading from the internet to the halls of our universities.

Earlier this year, a university in Amsterdam shut down an allegedly independent research centre, which was actually funded by Chinese entities. This centre was publishing so-called research on human rights, dismissing the evidence of forced labour camps for Uyghurs as 'rumours'.

These lies are toxic for our democracies. Think about this: we introduced legislation to screen foreign direct investment in our companies for security concerns. If we do that for our economy, shouldn't we do the same for our values? We need to better shield ourselves from malign interference.

This is why we will present a Defence of Democracy package. It will bring covert foreign influence and shady funding to light. We will not allow any autocracy's Trojan horses to attack our democracies from within.

For more than 70 years, our continent has marched towards democracy. But the gains of our long journey are not assured. Many of us have taken democracy for granted for too long. Especially those, like me, who have never experienced what it means to live under the fist of an authoritarian regime.

Today we all see that we must fight for our democracies. Every single day. We must protect them both from the external threats they face, and from the vices that corrode them from within. It is my Commission's duty and most noble role to protect the rule of law.

So let me assure you: we will keep insisting on judicial independence. And we will also protect our budget through the conditionality mechanism. And today I would like to focus on corruption, with all its faces. The face of foreign agents trying to influence our political system. The face of shady companies or foundations abusing public money.

If we want to be credible when we ask candidate countries to strengthen their democracies, we must also eradicate corruption at home. That is why in the coming year the Commission will present measures to update our legislative framework for fighting corruption.

We will raise standards on offences such as illicit enrichment, trafficking in influence and abuse of power, beyond the more classic offences such as bribery. And we will also propose to include corruption in our human rights sanction regime, our new tool to protect our values abroad.

Corruption erodes trust in our institutions. So we must fight back with the full force of the law.

Our founders only meant to lay the first stone of this democracy. They always thought that future generations would complete their work. *“Democracy has not gone out of fashion, but it must update itself in order to keep improving people’s lives.”*

These are the words of David Sassoli – a great European, who thought that Europe should always look for new horizons. And through the adversities of these times, we have started to see what our new horizon might be.

A braver Union. Closer to its people in times of need. Bolder in responding to historic challenges and daily concerns of Europeans. And to walk at their side when they deal with the big trials of life.

This is why the Conference on the Future of Europe was so important. It was a sneak peek of a different kind of citizens’ engagement, well beyond election day. And after Europe listened to its citizens’ voice, we now need to deliver.

The Citizens' Panels that were central to the Conference will now become a regular feature of our democratic life. And in the Letter of Intent I have outlined a number of proposals for the year ahead that stem from the Conference conclusions.

They include for example a new initiative on mental health. We should take better care of each other. And for many who feel anxious and lost, appropriate, accessible and affordable support can make all the difference.

Democratic institutions must constantly gain and regain the citizens' trust. We must live up to the new challenges that history always puts before us. Just like Europeans did when millions of Ukrainians came knocking on their door. This is Europe at its best. A Union of determination and solidarity.

But this determination and drive for solidarity is still missing in our migration debate. Our actions towards Ukrainian refugees must not be an exception. They can be our blueprint for going forward. We need fair and quick procedures, a system that is crisis proof and quick to deploy, and a permanent and legally binding mechanism that ensures solidarity.

And at the same time, we need effective control of our external borders, in line with the respect of fundamental rights. I want a Europe that manages migration with dignity and respect. I want a Europe where all member states take responsibility for challenges we all share. And I want a Europe that shows solidarity to all member states.

We have progress on the Pact, we now have the Roadmap. And we now need the political will to match.

Three weeks ago, I had the incredible opportunity of joining 1,500 young people from all over Europe and the world, who gathered in Taizé. They have different views, they come from different countries, they have different

backgrounds, they speak different languages. And yet, there is something that connects them. They share a set of values and ideals. They believe in these values.

They are all passionate about something larger than themselves. This generation is a generation of dreamers but also of makers. In my last State of the Union address, I told you that I would like Europe to look more like these young people. We should put their aspirations at the heart of everything we do. And the place for this is in our founding Treaties.

Every action that our Union takes should be inspired by a simple principle. That we should do no harm to our children's future. That we should leave the world a better place for the next generation.

And therefore, I believe that it is time to enshrine solidarity between generations in our Treaties. It is time to renew the European promise. And we also need to improve the way we do things and the way we decide things.

Some might say this is not the right time. But if we are serious about preparing for the world of tomorrow we must be able to act on the things that matter the most to people. And as we are serious about a larger union, we also have to be serious about reform.

So as this Parliament has called for, I believe the moment has arrived for a European Convention.

They say that light shines brightest in the dark. And that was certainly true for the women and the children fleeing Russia's bombs. They fled a country at war, filled with sadness for what they had left behind, and fear for what may lie ahead.

But they were received with open arms. By many citizens like Magdalena and Agnieszka. Two selfless young women from Poland. As soon as they heard about trains full of refugees, they rushed to the Warsaw Central Station. They started to organise. They set up a tent to assist as many people as possible.

They reached out to supermarket chains for food, and to local authorities to organise buses to hospitality centres. In a matter of days, they gathered 3,000 volunteers, to welcome refugees 24/7.

Magdalena and Agnieszka's story is about everything our Union stands and strives for. It is a story of heart, character and solidarity. They showed everyone what Europeans can achieve when we rally around a common mission. This is Europe's spirit. A Union that stands strong together. A Union that prevails together. Long live Europe. ■

Ursula von der Leyen is President of the European Commission

This article is based on the [2022 State of the Union Address](#), Strasbourg, 14 September 2022

Monetary policy in the euro area

Christine Lagarde says the ECB will not let this phase of high inflation feed into economic behaviour and create a lasting inflation problem

After a long period when inflation in the euro area was too low, it is now far too high. We are in the tenth consecutive month of record-high inflation rates and we may see this streak continue in the near term. Inflation is being caused by a series of unprecedented shocks, which have led to turning points in the global economy. As a result, price pressures have proven much stronger and more persistent than originally projected.

In this setting, monetary policymakers must ensure that inflation does not become entrenched and that it returns to target in the medium term. And our policy response will need to account for the special combination of shocks that we are facing in the euro area. In my remarks, I would like to address two issues. First, the nature of the inflation shock we are facing in the euro area today, and second, the implications this has for monetary policy now and in the future.

The shocks hitting the euro area economy

In our monetary policy strategy, the appropriate response to a deviation of inflation from our target depends on three factors: the source, size and persistence of that deviation.

Typically, when the source of an inflationary shock is stemming mainly from demand, monetary policy will respond proactively to prevent the economy from overheating. And when faced with supply shocks, to the extent that such shocks are seen to have no lasting impact on inflation, central banks will 'look through' and extend the medium-term policy horizon if necessary.

But such a neat categorisation does not adequately capture the situation we are facing in the euro area today. We are not seeing the type of demand-led overheating that is visible in the United States and, despite a tight labour market, the risk of a wage-price spiral so far seems to remain contained.

Instead, the euro area is seeing an increase in inflation driven by two unprecedented shocks. These shocks have constrained global supply, but they have also shifted demand and led to a large and persistent inflation response.

The first shock was the pandemic. Pandemic-related supply bottlenecks and rising prices have reinforced each other, with firms reacting to the threat of shortages by ordering more and earlier. This 'bullwhip effect'¹ has driven up prices along the pricing chain.

Monetary policy cannot prevent the first-round effects of many of these shocks. But it can ensure that they do not become embedded. This is what the ECB is doing

At the same time, the fiscal and monetary policy response to the pandemic has succeeded in protecting nominal incomes, thereby supporting a fast recovery of demand when our economies reopened. The resilience of incomes has, in turn, triggered large swings in demand across sectors.

During the lockdown period, and thanks notably to e-commerce, consumption was concentrated on durable goods. Then, when the economy reopened, we saw strong pent-up demand for services. Since the start of the pandemic, the volatility of durable goods consumption has been almost ten times higher than during the preceding two decades, and almost 30 times higher for services.

This has led to inflation broadening into both industrial goods and services. Today, around three-quarters of the items in the core inflation basket have inflation rates above 2%.

The second shock has been Russia's unjustifiable invasion of Ukraine. Even before the invasion, OPEC+ production cuts and capital constraints on US shale producers were restricting energy supply. This resulted in a spike in energy prices which was a major factor in our underestimation of inflation².

But the invasion has hugely aggravated the supply squeeze and sent energy prices to extraordinary levels, making it all the more challenging to forecast inflation. European gas and electricity prices are up 105% and 75%, respectively, since the months before the invasion³, and around 650% and 450%, respectively, since the first half of 2021.

This surge in energy prices has directly contributed around 30% to the headline inflation rate since the start of this year and, indirectly, has added to the broadening of price pressures across the economy. In fact, the models used by

the national central banks indicate that the indirect effects of higher energy costs are currently contributing around one-third to core inflation.

The persistence of inflation

Collectively, these shocks have pushed inflation a long way from our target. Headline inflation – which was negative as recently as December 2020 – has risen by 9.4 percentage points from its trough during the pandemic to its peak last month. Core inflation has risen by 4.1 percentage points.

In the recent past, elastic global supply has meant that shocks to production or energy have dissipated eventually. Following the Iraqi invasion of Kuwait in the 1990s, for example, oil prices fell below their pre-war level after around five months. And following the Japanese earthquake and nuclear disaster in 2011, production is estimated to have returned to normal after only seven months for Japanese firms⁴.

But the shocks triggered by the pandemic and the war have also created what I have previously called a ‘new global map’ of economic relationships⁵. The economic turning points on this new global map imply that supply constraints are likely to last longer than in the past. And this means, in turn, that it is taking longer for the inflationary effects of those shocks to fade out.

Two issues are worth considering here. First, geopolitics have shaken up European energy markets. The cut in gas supplies owing to the Russian invasion has become a major structural change which will have ramifications for several years.

For example, following the two oil shocks of the 1970s – the OPEC embargo and the Iranian revolution – the effect on oil prices was still persistent after three years. This was because, in both cases, the shocks were related to a

lasting shift in the geopolitical landscape, and reductions in oil supply could not be fully offset by oil from other sources⁶.

Today, although the EU response will cushion the rise in energy costs, fossil fuel prices are likely to be higher for some time. Fully replacing European imports of Russian fossil fuels is a challenge in the short term, even though there are an increasing number of examples of substitution effects taking place⁷.

Over the longer term, the war is likely to accelerate the green transition in Europe, including the switch to renewables. This will require considerable green investment but will also weigh on investment in oil and gas production during the transition phase. That could put upward pressure on fossil fuel prices while demand for those fuels remains high.

If energy prices are durably higher during the transition, it may have an impact on industrial production in Europe, affecting both supply and prices. This is certainly how firms in the euro area see the situation. In a recent ECB survey, at least 80% of respondents expected the ongoing transition to make the raw materials and energy they use more expensive, leading to higher prices for their products⁸.

Second, globalisation is and will be changing. The disruptions created by the pandemic, the exposure of vulnerabilities, the new geopolitical landscape and the prospect of higher energy and transport costs look set to trigger a reassessment of global value chains.

While I doubt that we will see de-globalisation, firms are likely to hold higher inventories on a permanent basis and shorten their supply chains to relocate high-value services and R&D centres. This is especially true where strategic considerations come into play.

We might also see energy-intensive production being relocated owing to the uneven impact of the current energy price shock. Added to this, the speed of the transition and the new energy mix will contribute to material transformations.

A recent survey finds that around 60% of firms had increased their inventories of critical products by the end of 2021, and almost 90% were expecting to regionalise their production over the next three years⁹.

This is likely to reduce efficiency and increase costs, which could create inflation pressures while supply chains are adjusting. It could also make the economic cycle more volatile¹⁰.

Over time, however, the turning points I have identified could also dampen the impact on prices. The green transition, for example, should ultimately lead to falling electricity prices. And insofar as the inventory cycle returns, it will be a multiplier for lower prices when inventories are liquidated in a downturn.

The ECB's monetary policy response

So, to sum up, we are currently facing a situation where lingering supply constraints are an important factor causing above-target inflation to persist for longer – and their effect is being exacerbated by the release of pent-up demand. In this setting, monetary policy needs to avoid deviations from our target becoming entrenched and return inflation to 2% in the medium term.

Two considerations are important here. The first is the destination of monetary policy: we need to normalise policy, and be ready to adjust rates by as much as necessary to reach our inflation target in the medium term.

The second consideration is the pace of rate increases: since interest rates are rising from very low levels, the pace of rate increases can mobilise the signalling channel of monetary policy directly.

Let me address each of these points in turn.

The destination of monetary policy

First, when inflation is high and growth is constrained by inelastic supply, monetary policy cannot remain expansionary and add to inflationary pressures by pushing up demand. It is therefore appropriate to pursue a strategy of monetary policy normalisation.

As I explained in a blog post earlier this year¹¹, normalisation implies ending net asset purchases and then raising rates to neutral levels – so levels that are neither expansionary nor restrictive.

That is why the ECB has not only started raising interest rates, but also communicated that we expect to raise interest rates further over the next several meetings. And to ensure that these changes in our policy stance are effective, we have taken several decisions over the last few months to preserve the orderly transmission of our stance throughout the euro area¹².

As we move forward, we will reassess whether a normalisation strategy is sufficient to bring us back to 2% inflation over the medium term. Ultimately, the terminal rate at which our hiking cycle ends must be compatible with inflation returning durably to our target – and that rate will depend on how the economic environment evolves around us.

One key factor will be how the persistence of the shocks we are facing affects inflation expectations and potential output. If there were evidence that high inflation risked de-anchoring inflation expectations, then the policy rate that is compatible with our target would lie in restrictive territory.

Similarly, were we to conclude that ongoing supply shocks had durably lowered economic potential, we would have to ensure that demand remains aligned with supply.

Another key factor will be how the growth outlook affects inflation. Negative supply shocks will result in a growth slowdown, which will likely have an impact on the prevailing inflation rate. In past euro area recessions going back to the 1970s, headline inflation has fallen by about 1.1 percentage points a year later, while core inflation has fallen by about half that amount¹³.

But this is not a hard-and-fast rule: in some recessionary episodes, such as those triggered by a worsening of supply conditions, inflation has stayed the same or even risen. In our downside scenario, which captures – among other shocks – the impact of a complete cut-off of Russian gas, we project that the economy will contract next year before picking up in 2024. But inflation is expected to be higher at the end of the projection horizon than in the baseline scenario¹⁴.

A third factor will be the actions of governments. Monetary policy will do whatever is needed to return inflation to our target. But a truly European approach where monetary and fiscal policy complement each other can improve the inflation outlook.

In particular, how fiscal policies support firms and households through the difficult winter ahead will play an important role in inflation dynamics. Targeted, temporary and tailored measures are needed to protect the

incomes of the most vulnerable, while also preventing a significant loss of capacity owing to production cuts and bankruptcies.

But beyond that, it will make a difference whether fiscal policy focuses mainly on public consumption and transfers – which may add to inflationary pressures – or on public investment and debt sustainability. As many of the sources of inflation today are on the supply side, government policies that lift supply and redirect investment to where it is needed are necessary to support sustainable growth.

The pace of rate increases

The second consideration in responding to current inflation is the pace of rate increases.

When inflation is high for a long period of time, an important role for monetary policy is to ensure that inflation expectations remain anchored as the shocks work their way through the economy. If expectations become de-anchored and trigger a wage-price spiral, it can lead to inflation becoming persistent even after the shocks disappear.

Raising interest rates has a mechanical effect on demand and inflation, and thereby on inflation expectations. But when interest rates are starting from unusually low levels, rate hikes are more powerful if they also create signalling effects that influence expectations directly.

In this context, especially compared with the traditional focus on 25 basis-point increments, adjusting the pace of rate hikes is a key tool to signal our determination to fulfil our mandate and keep inflation expectations contained. And moving faster at the start of the hiking cycle clearly conveys our commitment to bring down inflation to our medium-term target.

At present, inflation expectations remain relatively well anchored across a range of measures. But there are two reasons why it would be unwise to take this for granted.

First, the shock is severely affecting the prices of those consumption items, such as groceries and petrol, that have the greatest influence on households' inflation expectations¹⁵. The ECB's Consumer Expectations Survey shows that, since February this year, both mean and median expectations for inflation three years ahead have risen by around 1 percentage point.

Second, we are seeing a rapid change in the economic environment, with inflation switching from being very low to being extremely high. History suggests this can leave a scar on expectations.

For example, research finds that differences in inflation expectations between people from the former East and West Germany can largely be explained by the lasting effect of the inflation shock after reunification. This contrasted strongly with the perceived norm of zero inflation in the German Democratic Republic and seems to have led former East Germans to over-adjust to an environment of rising prices¹⁶.

This imperative to anchor inflation expectations helps explain why, over the last two policy meetings of the ECB's Governing Council, we raised our key interest rates by 125 basis points in total.

This is the fastest change in rates in our history and it has sent a strong signal of our determination to return inflation to our medium-term target in a timely manner. This major step also took into account the unusually low level of interest rates and the limited risk of overreacting at the start of the hiking cycle.

Going forward, the appropriate pace of future rate increases will be decided on a meeting-by-meeting basis. Indeed, as we have repeatedly emphasised, we will remain data dependent in all scenarios. Where rates ultimately settle, and the size of the steps that we move in, will depend on how the inflation outlook evolves as we proceed.

Conclusion

Inflation in the euro area has proven to be much higher and more persistent than originally projected. This reflects the unprecedented series of shocks we have faced, and the fact that those shocks have led to turning points in our economic environment.

Monetary policy cannot prevent the first-round effects of many of these shocks. But it can ensure that they do not become embedded. This is what the ECB is doing.

We have taken major steps along the path of normalising our monetary policy, frontloading our rate increases. This signals that we are determined to bring inflation back to our medium-term target of 2% in a timely manner and ensure that inflation expectations remain well anchored.

We will not let this phase of high inflation feed into economic behaviour and create a lasting inflation problem. Our monetary policy will be set with one goal in mind: to deliver on our price stability mandate. ■

Christine Lagarde is President of the European Central Bank

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Monetary policy and the Great Volatility

The Great Moderation was a period of prosperity. Isabel Schnabel argues that it is up to central banks whether today's challenges will lead to the Great Volatility

The Great Moderation was a period of prosperity and broad macroeconomic stability¹. The volatility of both inflation and output declined, the length of economic expansions increased, and people in most economies experienced sustained improvements in their standards of living.

There is broad agreement that better monetary policy was an important factor behind the Great Moderation². As central banks took up the fight against spiralling inflation in the late 1970s and early 1980s, they brought down and stabilised inflation expectations at levels that provided a solid nominal anchor for firms and households.

The subsequent advance of inflation targeting around the world is believed to be a prime reason why the global financial crisis of 2008 merely interrupted the Great Moderation³. Afterwards, macroeconomic volatility quickly dropped back to its previous low levels.

Yet, monetary policy was not the only factor behind the Great Moderation. Good luck, in the sense of a smaller variance of the shocks hitting the global economy, is widely believed to have played an important role as well⁴.

Compared with the 1970s, for example, real oil prices traded in a much narrower range from the second half of the 1980s until the mid-2000s.

The question I would like to discuss is whether the pandemic, and more recently Russia's invasion of Ukraine, will herald a turning point for macroeconomic stability – that is, whether the Great Moderation will give way to a period of 'Great Volatility' – or whether these shocks, albeit significant, will ultimately prove temporary, as was the case for the global financial crisis.

My answer to this question is that of a 'two-handed economist'. On the one hand, there is a tangible risk that the nature and persistence of the shocks hitting our economies will remain unfavourable over the coming years.

On the other hand, the decisions that central banks are taking today to deal with high inflation can shape the future course of our economies in a way that mitigates and limits the ultimate impact of these shocks on prosperity and stability.

Trust in our institutions is even more important at a time of major and disruptive structural change that brings about larger, more persistent and more frequent shocks

A new era of volatility

The pandemic and the war in Ukraine have led to an unprecedented increase in macroeconomic volatility. Output growth volatility in the euro area over the past two years was about five times as high as it was at the peak of the Great Recession in 2009⁵. Inflation volatility has surged beyond the levels seen during the 1970s.

Once the exceptional effects of the pandemic and the war wash out from the data, output and inflation volatility are bound to decline.

Yet, there are valid grounds to believe that policymakers will find themselves in a less favourable environment over the medium term – one in which shocks are potentially larger, more persistent and more frequent.

Climate change is a major driver. The experience of recent years leaves no doubt that the incidence and severity of extreme and disruptive weather events are rising sharply, exposing the global economy to greater volatility in output and inflation⁶.

This summer, the European Union – like many other parts of the world – is suffering from one of the most severe droughts on record, with nearly two-thirds of its territory in a state of alert or warning⁷.

The pandemic and the war are likely to add to instability in the years to come. They challenge two of the fundamental stabilising forces that have contributed to the decline in volatility during the Great Moderation: globalisation and an elastic energy supply. Globalisation acted as a gigantic shock absorber.

The breakup of the Soviet Union and global economic liberalisation from the 1980s onwards led to about half of today's world population being integrated into the global economy.

Labour supply became so abundant, and production capacity so large, that even periods of strong demand rarely succeeded in putting persistent upward pressure on prices and wages⁸.

However, even before the pandemic, protectionism and nationalism were on the rise⁹. Tariff and non-tariff barriers were raised as the benefits of free trade were increasingly being called into question¹⁰.

Today, the world economy is at risk of fracturing into competing security and trade blocs. The international network that connects our economies is fragile. We are witnessing new and alarming forms of protectionism.

Consider health. Although vaccines have been rolled out in advanced economies for nearly two years now, a third of the world population is still unvaccinated. Unequal access to effective COVID-19 vaccines means that ending the pandemic remains elusive.

Food protectionism, meanwhile, is causing misery and social unrest in parts of the world. The number of governments imposing export restrictions on food and fertilizers is close to that recorded during the 2008-2012 food crisis, exacerbating the repercussions of the war on food supply.

Protectionism is going hand-in-hand with a fundamental reappraisal of global value chains. Many critical inputs to our modern societies, such as semiconductor chips, are produced in just a handful of countries. Europe's energy crisis has exposed the deep fragilities of such an economic system.

Efforts to enhance diversification will help secure strategic autonomy and make value chains more robust. But they also imply duplication and inefficiency.

And if used as a form of protectionism, a greater reliance on domestic production may leave countries more – rather than less – vulnerable to shocks in the future¹¹.

The second stabilising force – an elastic energy supply – will also become less powerful in absorbing shocks in the years to come.

Following the oil price shocks of the 1970s, the distribution of global oil supply changed drastically. OPEC's global market share fell from 53% in 1973 to 28% in 1985 as Mexico, Norway and other countries started producing significant amounts of oil¹².

The 'Shale Revolution' in the United States, which started at the turn of the century, changed the oil market once again. It is estimated to have resulted in a significant increase in the price elasticity of oil and gas supply¹³.

As a result, just as globalisation led to excess supply in product and labour markets, limiting price and wage increases, the emergence of the United States as a large net exporter of energy buffered the impact of demand shocks on oil and gas prices over the past 15 years.

The green transition and the war in Ukraine will lastingly make fossil energy scarcer and more expensive at a time when renewable energy carriers are not yet sufficiently scalable. Over the coming months, acute shortages, in particular in Europe, may require painful adjustments to production and consumption.

The shift to greener technologies will reduce such pressures over the longer run, but it will also broaden the sources of energy shocks during the transition.

Most green technologies require significant amounts of metals and minerals, such as copper, lithium and cobalt. As their supply is constrained in the short and medium term, and often concentrated in a small number of countries, action to quickly reduce our dependency on fossil energy will lead to firms and governments competing for scarce commodities, thereby pushing up prices¹⁴.

Of course, such fundamental and disruptive changes to the structure of our economies also offer important opportunities.

There is hope that the war in Ukraine unites those who embrace the values of liberty, territorial integrity and democracy. And the determined fight against climate change holds the potential for strong and sustainable growth.

But even then, the challenges we are facing are likely to bring about larger, more frequent and more persistent shocks in the years ahead.

The role of monetary policy

The transition to the Great Volatility is not a pre-determined outcome, however. If the nature of the shocks changes – that is, if one of the factors that had contributed to the Great Moderation subsides – the other factor – better policies – becomes more important in ensuring macroeconomic stability.

Fiscal policy will play an important role in enhancing the resilience of our economies.

Governments need to adapt their policies to the risk of a protracted period of lower potential output growth. With debt-to-GDP ratios at or close to historical highs, spending should focus on protecting social cohesion and

promoting productive and green investments that will help secure long-term prosperity and rebuild fiscal space needed to cushion future shocks.

Monetary policy, in turn, needs to protect price stability. What this means in an environment of elevated volatility and structural change is, however, controversial.

Because monetary policy operates with long lags, price stability is typically defined over the medium term, giving central banks some discretion over the extent and length of inflation overshoots that they are willing to tolerate over the short run.

This discretion is particularly relevant in the case of supply-side shocks that tend to push prices and output in opposite directions. Stabilising inflation is then no longer equivalent to stabilising output – the divine coincidence of monetary policy disappears¹⁵. Such shocks therefore imply a trade-off for monetary policy, between inflation and output.

The experience of the 1970s suggests that the extent of this trade-off is highly path dependent. A poorly chosen course of action can make attaining price stability significantly more costly in the future.

This path dependency puts a heavy weight on the decisions that central banks are taking in response to the challenges we are facing today.

For the first time in four decades, central banks need to prove how determined they are to protect price stability. The pandemic and the war are consistently suppressing the level of aggregate supply at a time of strong pent-up demand, leading to sharp price pressures across a large range of goods and services.

There are two broad paths central banks can take to deal with current high inflation: one is a path of caution, in line with the view that monetary policy is the wrong medicine to deal with supply shocks¹⁶.

The other path is one of determination. On this path, monetary policy responds more forcefully to the current bout of inflation, even at the risk of lower growth and higher unemployment. This is the 'robust control' approach to monetary policy that minimises the risks of very bad economic outcomes in the future¹⁷.

Three broad observations speak in favour of central banks choosing the latter path: the uncertainty about the persistence of inflation, the threats to central bank credibility and the potential costs of acting too late.

Uncertainty about inflation persistence requires a forceful policy response

The first observation relates to how central banks should act in the current environment of large uncertainty.

William Brainard's well-known attenuation principle suggests that central banks should tread carefully in the face of uncertainty about how their policies are transmitted to the broader economy¹⁸. There are at least two conceptual cases where the Brainard principle breaks down.

One is the existence of the effective lower bound. The best way for central banks to avoid the perils of a liquidity trap is to ease policy swiftly when a disinflationary shock hits the economy in the vicinity of the lower bound¹⁹. This principle has become a cornerstone of the monetary policy strategies of many central banks, including the ECB.

The second case is when there is uncertainty about the persistence of inflation. When the degree of inflation persistence is uncertain, optimal policy prescribes a forceful response to a deviation of inflation from the target to reduce the risks of inflation remaining high for too long²⁰.

In this case, it is largely irrelevant whether inflation is driven by supply or demand. If a central bank underestimates the persistence of inflation – as most of us have done over the past one-and-a-half years – and if it is slow to adapt its policies as a result, the costs may be substantial²¹.

In the current environment, these risks remain significant. Unprecedented pipeline pressures, tight labour markets and the remaining restrictions on aggregate supply threaten to feed an inflationary process that is becoming harder to control the more hesitantly we act on it.

About 20 years ago, here in Jackson Hole, Carl Walsh was clear about what this implies for the conduct of monetary policy: to reduce the risks of a Volcker-type policy shock, central banks should conduct policy assuming that inflation is persistent, as the costs of underestimating persistence are higher than those of overestimating it²².

Such a policy naturally puts a stronger emphasis on incoming data. Two sets of indicators matter most for deciding on the policy adjustment required to restore price stability.

One is actual inflation outcomes along the entire pricing chain. These play a more critical role than they would normally do, as they serve as an important reference point for policymakers to evaluate future pipeline pressures, the forces driving inflation persistence and risks of a de-anchoring of inflation expectations.

The other is data on the state of the economy to assess how fast supply and demand imbalances are correcting in response to both changes in interest rates and the repercussions of adverse supply-side shocks.

At the same time, the nature of inflation uncertainty implies that forward guidance on the future path of short-term interest rates becomes less relevant, or that it even risks adding to volatility rather than reducing it.

A key condition for the success of forward guidance in steering expectations over the past decade was a macroeconomic environment characterised by both historically low inflation volatility and the constraints of the effective lower bound.

Forward guidance is less appropriate in conditions of high volatility. When shocks are large and frequent, central banks can give no reliable signal about the future path of short-term interest rates, other than the broad direction of travel consistent with a reaction function that is calibrated on the assumption of high inflation persistence.

Risks of a de-anchoring of inflation expectations are rising

The second observation tilting the trade-off facing monetary policy towards more forceful action relates to central banks' credibility.

Our currencies are stable because people trust that we will preserve their purchasing power. For politically independent central banks, establishing and maintaining that trust is an important policy objective in and of itself.

Failing to honour this trust may carry large political costs²³. History is full of examples of high and persistent inflation causing social unrest. Recent events around the world suggest that the current inflation shock is no exception. Sudden and large losses in purchasing power can test even stable democracies.

Surveys suggest that the surge in inflation has started to lower trust in our institutions²⁴. Young people, in particular, have no living memory of central banks fighting inflation.

We are witnessing a steady and sustained rise in medium and long-term inflation expectations in parts of the population that risks increasing inflation persistence beyond the initial shock.

In the euro area, consumers' medium-term inflation expectations were firmly anchored at our 2% target throughout the pandemic. According to the most recent data, median expectations are close to 3%, while average expectations have increased from 3% a year ago to almost 5% today²⁵.

Average long-term inflation expectations of professional forecasters, too, have started to gradually move away from our 2% target. In July, they stood at 2.2%, a historical high.

For both consumers and professional forecasters, we are also observing a marked increase in the right tail of the distribution – that is, the share of survey participants who expect inflation to stabilise at levels well above our 2% target²⁶. Option prices in financial markets paint a similar picture²⁷.

In the 1970s, such shifts in the right tail of the distribution preceded shifts in the mean²⁸.

We broadly know why these shifts happen among consumers who are financially less literate. These consumers predominately form their expectations based on inflation experiences²⁹.

But for the euro area, the ECB's consumer expectations survey shows that people who are financially more literate and who see themselves as playing a relevant role in actual price and wage-setting have recently revised their medium-term inflation expectations to a larger extent than other survey participants.

This is a source of concern. Unlike for consumers who form their expectations based on their experience of inflation, the higher inflation expectations of financially literate people are unlikely to subside if and when inflation starts decelerating. This increases the probability of second-round effects.

We cannot say for certain what is behind these upward revisions to inflation expectations. But two potential explanations come to mind. One is that higher medium-term inflation expectations may be the result of a perception that monetary policymakers have reacted too slowly to the current high inflation.

A cardinal principle of optimal policy in a situation of above-target inflation is to raise nominal rates by more than the change in expected inflation – the Taylor principle. If real short-term interest rates fail to increase, monetary policy will be ineffective in dealing with high inflation.

In the United States, a systematic failure to uphold the Taylor principle was one of the key factors contributing to the persistence of inflation in the 1970s³⁰.

The second explanation is that higher inflation expectations may reflect more fundamental concerns, possibly related to fiscal and financial dominance, or to the recent review of central banks' monetary policy frameworks that focused more on the challenges of too-low inflation rather than too-high inflation³¹.

All these factors may have created perceptions of a higher tolerance for inflation and a stronger desire to stabilise output.

Determined action is needed to break these perceptions. If uncertainty about our reaction function is undermining trust in our commitment to securing price stability, a cautious approach to policymaking will no longer be the appropriate course of action.

Instead, a politically independent central bank needs to put less weight on stabilising output than it would when inflation expectations are well anchored.

Policymakers should also not pause at the first sign of a potential turn in inflationary pressures, such as an easing of supply chain disruptions. Rather, they need to signal their strong determination to bring inflation back to target quickly³².

This is another key lesson of the 1970s. If the public expects central banks to lower their guard in the face of risks to economic growth – that is, if they abandon their fight against inflation prematurely – then we risk seeing a much sharper correction down the road if inflation becomes entrenched.

Central banks are facing a higher sacrifice ratio

The third, and closely related, observation that supports a more forceful policy response relates to the potential costs of acting too late – that is, when high inflation has become fundamentally entrenched in expectations, a situation that neither the United States nor the euro area are facing today.

In the early 1980s, many central banks had to tolerate large and costly increases in unemployment to restore confidence in the nominal anchor. There are at least three reasons to believe that a similar endeavour could be even more costly today in terms of lost output and employment.

One is that our economies have become less interest rate-sensitive over time, meaning that more withdrawal of monetary accommodation would be required for a given desired decline in inflation.

The growing importance of intangible capital is partially responsible for this. In the United States, its share in total investment has tripled since 1980. And in the euro area, it has increased from about 12% in 1995 to 23% today. Research finds that intangible capital-intensive firms tend to be net savers because intangible capital is more difficult to mobilise as collateral for bank lending, making the cost of credit less important³³.

These effects are reinforced by the structural shift towards services, which tend to be, on average, less responsive to monetary policy than more capital-intensive sectors, such as manufacturing³⁴.

The second reason why a de-anchoring of inflation expectations has become more costly relates to the slope of the Phillips curve.

There is a wealth of studies that find that the Phillips curve has become flatter over the past few decades³⁵.

Before the pandemic, a flat Phillips curve meant that central banks could allow the economy to run hot before inflationary pressures would emerge. Today, a flat Phillips curve means that lowering inflation – once it has become entrenched – potentially requires a deep contraction.

The third reason concerns the relevant measure of slack.

Even if the true slope of the Phillips curve were to be steeper than is suggested by reduced-form estimates, the fact that it is often global rather than domestic slack that matters for price-setting reduces the sensitivity of the economy to interest rate changes on a much broader level³⁶.

The events of the past one-and-a-half years are testimony to the increased relevance of global economic conditions for inflation³⁷.

In other words, central banks are likely to face a higher sacrifice ratio compared with the 1980s, even if prices were to respond more strongly to changes in domestic economic conditions, as the globalisation of inflation makes it more difficult for central banks to control price pressures.

Conclusion

High inflation has become the dominant concern of citizens in many countries.

Both the likelihood and the cost of current high inflation becoming entrenched in expectations are uncomfortably high. In this environment, central banks need to act forcefully. They need to lean with determination against the risk of people starting to doubt the long-term stability of our fiat currencies.

Regaining and preserving trust requires us to bring inflation back to target quickly. The longer inflation stays high, the greater the risk that the public will lose confidence in our determination and ability to preserve purchasing power.

Trust in our institutions is even more important at a time of major and disruptive structural change that brings about larger, more persistent and more frequent shocks. A reliable nominal anchor eases the transition towards the new equilibrium, and improves the trade-off facing central banks in the future.

All in all, therefore, an important lesson from the Great Moderation is that it is also up to central banks whether the challenges we are facing today will lead to the Great Volatility, or whether the pandemic and the war in Ukraine will ultimately be remembered as painful but temporary interruptions of the Great Moderation. ■

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