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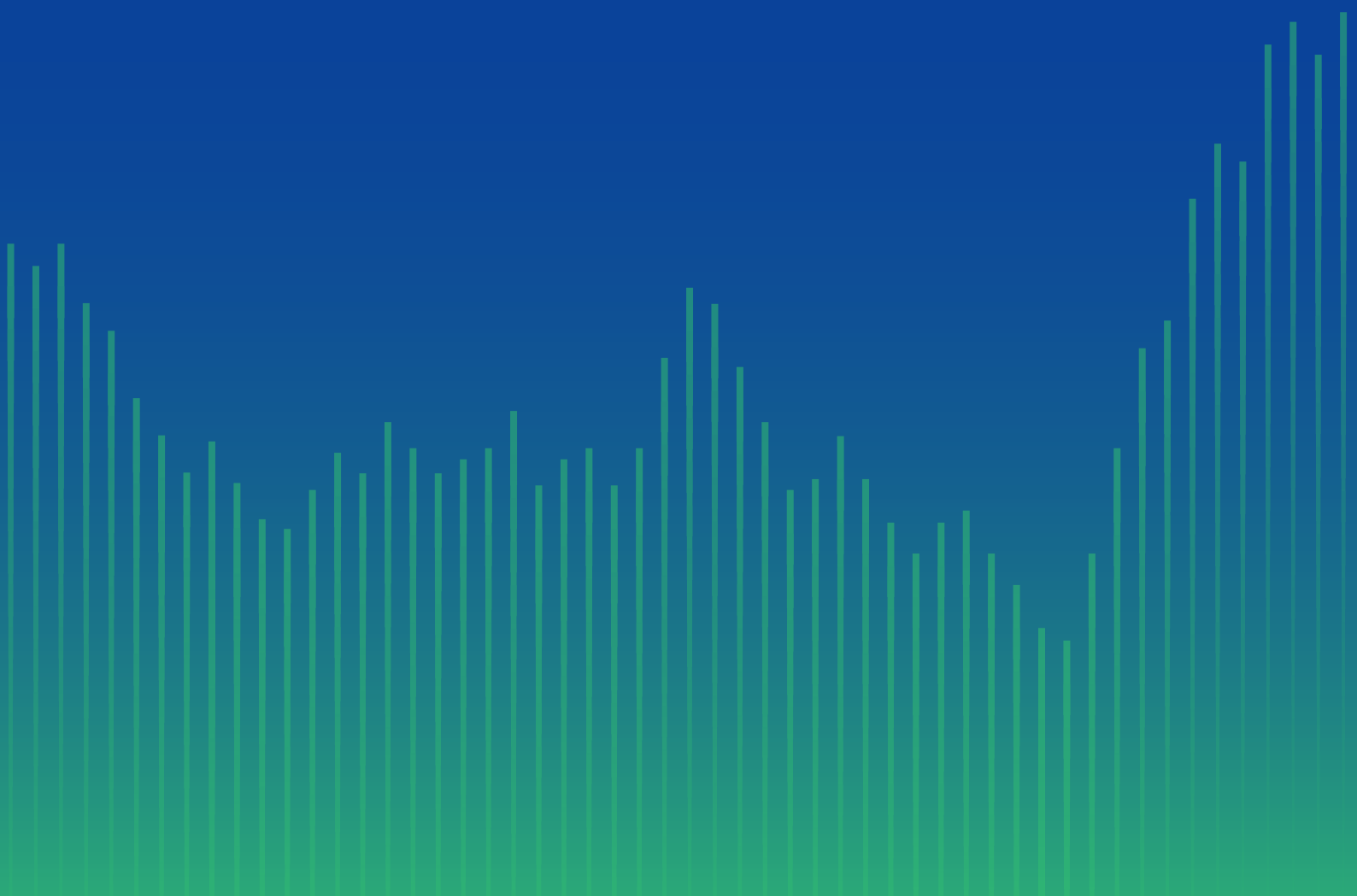
THE EU GREEN DEAL POST COVID-19



Main points

- The EU's goal under the Paris agreement is to reduce greenhouse gas emissions by at least 40% by 2030 and to achieve carbon neutrality by 2050.
- The recent reduction in CO2 emissions due to the Covid-19 economic recession is limited and temporary, and it does not begin to make a dent in the concentration of greenhouse gases in the atmosphere.
- To reduce emissions to the targeted levels will require an aggressive increase in carbon prices.
- Our analysis suggests that, in order to achieve the Paris targets, carbon and energy prices will need to increase significantly.
- Governments should provide sizable fiscal incentives to support the transition, but the feasibility of this in the post-Covid-19 high-public-debt world is unknown.
- Without rapid implementation of bold policies, the credibility of the EU Green Deal will be undermined, with the risk that we exit from the current crisis with an even browner economy.

I. Introduction

This note presents a progress assessment of the European Green Deal in light of the targets defined by the European Union (EU) and by individual member states. First, it summarizes the EU emissions targets; second, it assesses recent emissions trends during the Covid-19 crisis; third, it estimates the increased energy costs that will be required to achieve the EU emissions reduction targets. Overall, our analysis suggests that achievement of the EU emissions targets will require an increase in carbon emissions costs and energy prices of a significance which makes it difficult to believe they can be implemented. It suggests, also, that, in addition to using the revenues from carbon pricing to offer incentives for green investments, the public budget should intervene with an expansionary fiscal policy to support the transition. Whether this will be feasible in a post-Covid, high public debt world remains to be seen.

The 2015 Paris Agreement established the need for global climate action to maintain temperatures at well below 2°C by the end of this century. The EU is at the forefront of climate action.[1] The 7th EU Environment Action Programme (EAP) is the EU's key policy agenda related to the development of multi-annual environmental action programmes that define legislative proposals and environmental policy objectives.[2] The EAP offers a concrete framework for short-term objectives and addresses the 2020-2030 horizon, consistent with the Paris Agreement.[3]

1 *For a comprehensive assessment of Europe's environment see the 6th SOER published by the European Environment Agency The European environment – state and outlook 2020, December 2019.*

2 *EC (2013), Living well, within the limits of our planet: 7th EAP - the new general Union Environment Action Programme to 2020, European Commission, Brussels, Belgium.*

3 *EC (2018), 'Communication from the Commission to the European Parliament, the European Council, the Council, the*

For the period 2021-2030, the new European Commission has set even more ambitious targets for further reducing Green House Gas (GHG) emissions (by 40% compared to 1990 levels), increasing the targeted share of renewable energy to at least 32% in total energy consumption and at least 32.5% improvement in energy efficiency[4], and extend the current 10% electricity interconnection to 15% (to improve security of supply in each Member State) and reduce carbon emissions from cars by 37.5% (compared to 2021 levels). Moreover, the European Commission (EC) has proposed a target of 25% of EU expenditure to support climate goals (Table 1). To achieve its emissions reduction target, the EU aims also to strengthen the EU Emissions Trading System (ETS). Participating sectors will be required to reduce their emissions by 43% (compared to 2005). In addition, for Member States individual binding targets have been set for non-ETS sectors to reduce emissions by 30%. As part of the recent European Green Deal presented by the von der Leyen Commission on 11 December 2019, the EC has proposed further emissions reductions by increasing the EU target to between 50% and 55% by 2030. This is in line with the long-term objective of the European Green Deal to make the EU a climate-neutral economy by 2050.[5] The Climate Law proposed by the EC in March 2020 translates this political commitment into a legally binding target of zero net GHG emissions by 2050.[6] In addition, the EC is launching a public consultation on the future European Climate Pact,[7] which will be launched before the UN Climate Change Conference planned to be held in Glasgow in November 2020 (COP26).

Table 1 2030 Targets for climate and energy *(compared to 1990 levels)*

	GHGs emissions	Renewable energy	Energy Efficiency	Electricity interconnection	Climate in EU-funded programmes	CO2 from cars (*)
2020	-20%	20%	20%	10%	20% (2014-2020)	
2030	-40%	32%	33%	15%	25% (2021-2027)	-37.5% (cars)

(*) CO2 emissions from vans should be reduced by 31% compared to 2021 levels and from lorries by 30% compared to 2019 levels.
Source: EC.

All Member States were required to adopt 10-year integrated National Energy and Climate Plans (NECP) for the period 2021-2030,[8] which were submitted to the EC at the end of 2018. The EC has analysed the projects and provided specific recommendations[9] to fill any gaps in relation to the EU targets and a detailed 'Commission Staff Working Document' for each Member State, which amended the national strategy whose final versions have been sent to the EC. Among all

European Economic and Social Committee, the Committee of the Regions and the European Investment Bank - A clean planet for all: a European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy' (COM(2018) 773 final).

4 In 2018, as part of the 'Clean energy for all Europeans package', the new amending Directive on energy efficiency (2018/2002) set new targets for 2030 and beyond. The target of at least 32.5% to be achieved collectively across the EU implies that EU energy consumption should be no more than 1273 Mtoe (million tonnes of equivalent) of primary energy and/or no more than 956 Mtoe of final energy. https://ec.europa.eu/energy/topics/energy-efficiency/targets-directive-and-rules/energy-efficiency-directive_en

5 For further details on the European Green Deal, see Prometeia Discussion Note no. 12, December 2019.

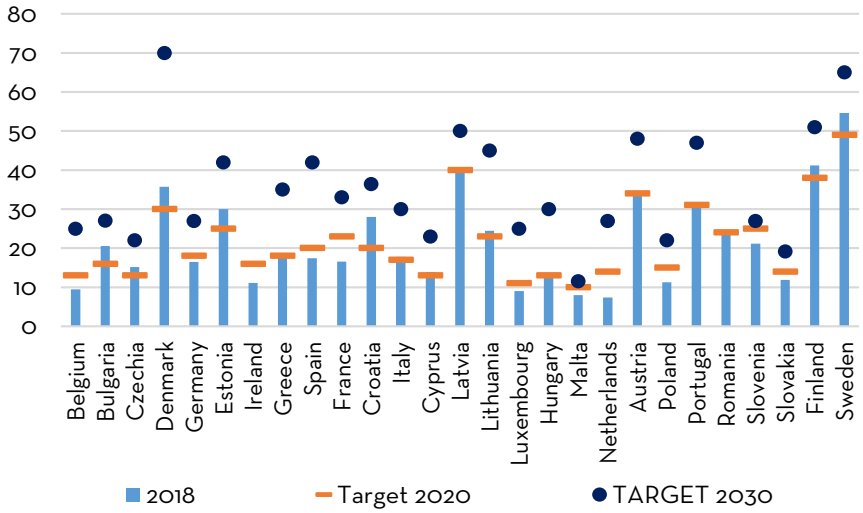
6 This act writes into law the neutrality goal set out in the European Green Deal. It is a proposal for a regulation of the European Parliament and of the Council establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (European Climate Law), COM/2020/80 final. https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12108-Climate-Law.

7 The European Climate Pact aims to involve citizens and communities in actions for our climate and the environment. To encourage broad social engagement – involving government policies and regulation, citizens, communities and organizations in all sectors – the EC launched an online public consultation which closed on 17 June 2020. All contributions to the consultation will be used to define the final draft of the Pact. https://ec.europa.eu/clima/policies/eu-climate-action/pact_en

8 The NECPs were introduced under the Regulation on the governance of the energy union and climate action (EU/2018/1999).

9 COM(2019) 285 final.

Member States, Denmark, Lithuania, Spain and Portugal have indicated significant increases in their shares of renewable energy in their NECPs. Figure 1 shows the 2030 target for the share of renewable energy in gross final energy consumption as reported in the final NECPs (as of 12 June 2020), including revisions related to the EC's recommendations.[10] For energy efficiency, the Member States that have proposed the highest targets for 2030 are Italy (43%), Luxembourg (40%-44%) and Spain (39.5%) for both primary energy consumption and final energy consumption, the Netherlands for primary energy consumption and France for final energy consumption. The area in which the EU as a whole is most successful is reduction of GHG emissions. Figure 2 shows total GHG emissions[11] for the European countries in 2018 and the relative EU targets for 2020 and 2030. Interconnections between national markets aimed at completing the Union's internal electricity market and ensuring security of supply, was not targeted explicitly by all Member States. Some countries have already exceeded the 15% level set for 2030 (Austria, Denmark, Luxembourg, Netherlands, Slovenia), others are aiming at 15% or more by 2030 (Spain, Portugal, France, Greece) while others are indicating lower levels below the target (e.g., Italy 10% by 2030).

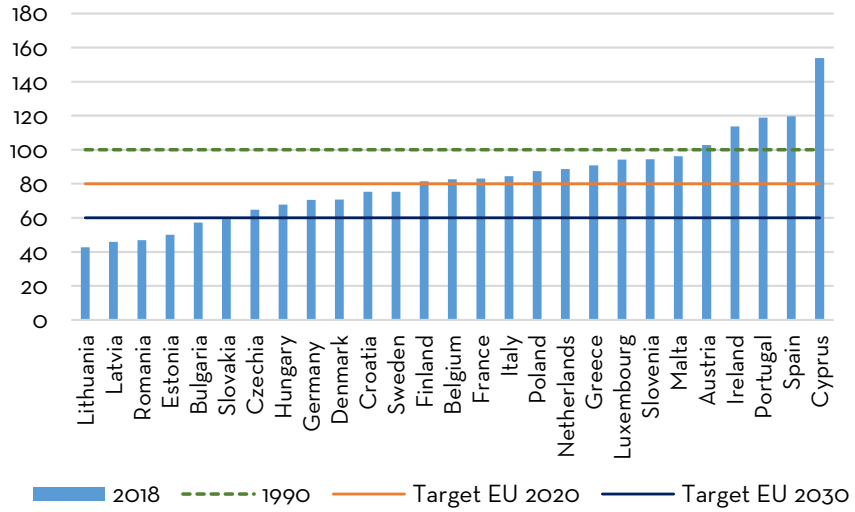


Source: Prometeia's calculations on Eurostat and EC data.

Figure 1

Share of renewable energy in gross final energy consumption

%



Source: Prometeia's calculations on Eurostat data.

Figure 2

Total GHG emissions by country, 2018

(1990=100)

10 *https://ec.europa.eu/energy/topics/energy-strategy/national-energy-climate-plans_en*

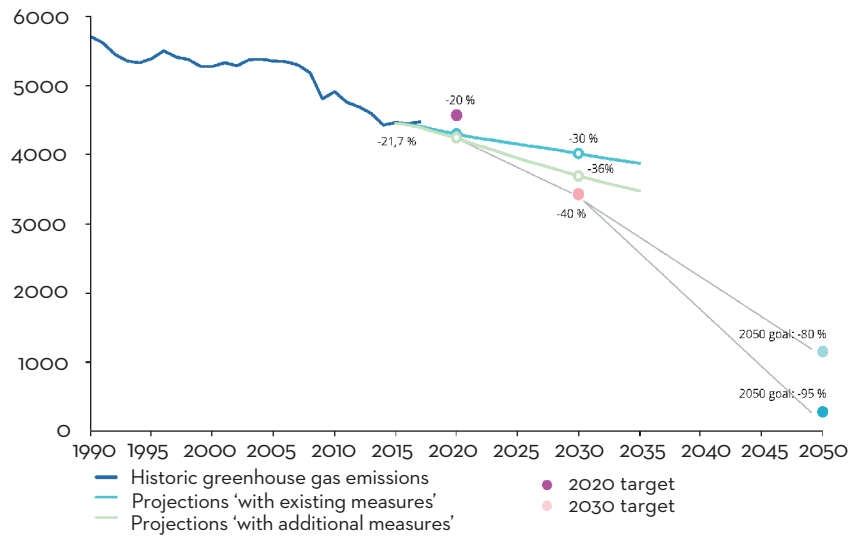
11 *Excluding LULUCF and memo items, including international aviation. Source: Eurostat.*

Member States are also required to develop long-term national strategies consistent with their 2030 NECPs.[12] Long-term national strategies must be in place by 2020 with a horizon of at least 30 years, to be updated every five years if necessary. The strategies must provide information on and targets for total and sector-specific emissions reductions, gross domestic product CO2 intensity, estimates of long-term investment and research, development and innovation plans, expected socio-economic effect of decarbonisation measures and links to other national long-term targets.[13]

II. Climate policy targets: Is the EU on track?

EU GHG emissions decreased by 21.7% between 1990-2017, due mainly to improved energy efficiency, increased share of renewable energy production and a less carbon-intensive fossil fuel mix. In this period, the largest contributors to changes to total GHG emissions were Lithuania (-57.3%), Latvia (-55.7%), Estonia (-48.0%). Germany, France and Italy contributed respectively -25.9%, -13.4% and -15.9%.[14] Emission reductions covered most sectors, with the notable exception of domestic and international transport.

These trends have put the EU generally on track towards achievement of its 2020 targets. However, the 2030 targets will require further improvements to energy efficiency and carbon intensity. Figure 3 shows the projected GHG emissions reductions, based on existing measures (excluding removal from LULUCF[15] and including emissions from international aviation) and additional measures (planned by Member States). The first case is consistent with a 30% reduction in GHG emissions in 2030 compared to 1990; in the second case, the reduction would be 36%. Therefore, further mitigation efforts are needed to achieve the objective of reducing GHG emissions by at least 40%. These efforts should focus on reducing energy consumption, especially in the transport sector, which remains one of the biggest challenges for decarbonisation of the economy.



Source: EEA.

Figure 3

EU GHGs emissions: trends and projections, 1990-2050

million tonnes of CO2 equivalent, MtCO2e

12 *For regulatory reference, see footnote 8.*

13 *The long-term strategies presented by some Member States were submitted on 5 May 2020 and are available at the following link: https://ec.europa.eu/info/energy-climate-change-environment/overall-targets/long-term-strategies_en*

14 *Source: EEA.*

15 *LULUCF is Land Use, Land Use Change, and Forestry. The LULUCF sector in Europe is now a net carbon sink since its forests, on their own, offset net emissions from all other land use; however, the future contribution of forest to reducing GHG emissions is expected to decrease, mainly due to ageing of forests and increased use of forest biomass (EC, 2018, 'Eco-Management and Audit Scheme' (http:// ec.europa.eu/environment/emas/index_en.htm) accessed 5 October 2018).*

Looking ahead, even further efforts will be needed to achieve the 80%-95% target for reducing GHG emissions by 2050.[16] According to the European Environment Agency (EEA), for the EU to achieve carbon neutrality by 2050, primary and final energy consumption[17] across the EU would need to decrease by respectively at least 31% and 43% by 2050 compared to 2005 levels (and perhaps even to 42% and 47% respectively). These reductions must be accompanied by very high shares of energy from renewable sources in the energy mix, which as calculated by the EEA on the basis of the Renewable Energy Directive, should eventually be 100% of the energy mix.[18]

Despite the EU's past progress in reducing energy consumption and the steady increase in the share of energy consumption from renewable sources, there have been deviations in these trends in recent years, due mainly to the increase in total final energy consumption since 2014, demand from transport and increased household energy consumption. Without further efficiency improvements to reduce demand for carbon-intensive fuels, which also has a major impact on GHG emissions, the EU risks not reaching its energy efficiency targets for 2020 and 2030.

In addition to mitigation targets, other key factors, such as the effects of recessions such as that triggered by the Covid-19 pandemic, will affect GHG emissions. According to the International Energy Agency (IEA), the Covid-19 pandemic led to a sharp drop in global energy demand in the first quarter of 2020, which would translate into a decrease of around 6% for the whole year, the largest drop ever recorded. As a result of falling energy demand, oil and natural gas prices as well as global CO2 emissions, have fallen significantly, and more than at any other time since the end of World War II.[19] It is estimated that, if the pandemic is contained over the summer, global emissions for 2020 will decrease by about 5% and by almost 8% if it persists throughout the year (The Breakthrough Institute, 2020).[20] In the EU, US and China, emissions could fall by, respectively, 11%, 9% and 6% in 2020. Nevertheless, however significant these reductions might be, they are nowhere close to affecting the concentrations of GHGs in the atmosphere.

The reduction in CO2 emissions reflects the seriousness of the economic recession, but could be an opportunity to speed up decarbonisation of production systems. The pandemic might accelerate the transition to a low-carbon economy or halt it by increasing use of fossil fuels. Use of renewable energy has been buoyant during the pandemic and is gradually replacing coal for energy production. According to IEA data, despite the recent economic slowdown, global renewable energy capacity has grown by 6% in 2020, – a trend that might increase if investors' preferences for sustainable investments also increase. However, macroeconomic uncertainty could keep oil prices low, reducing green investments and delaying the phasing out of fossil fuels. In the context of the current crisis, it is important to avoid the urgency of a relaunch of economic activity undermining efforts to put the economy on an environmentally sustainable path.[21]

16 *The 80%-95% target to achieve carbon neutrality in 2050, implies a significant contribution from negative emissions technologies - such as afforestation, Bioenergy with Carbon Capture and Storage (BECCS) - capable of absorbing and removing GHGs from the atmosphere.*

17 *Final energy consumption is the total energy consumed by end users such as households, industry and agriculture. It is the amount of energy which reaches the final consumer's doorstep and excludes the energy consumed by the energy sector itself. Primary energy consumption measures is a country's total energy demand. It includes the energy consumed by the energy sector, losses during processing (e.g., from oil or gas to electricity) and distribution of energy, and consumption by final end users. It excludes energy carriers used for non-energy purposes (such as petroleum used not for combustion, but to produce plastics): source: Eurostat.*

18 *See the 6th SOER published by the European Environment Agency (EEA) "The European environment – state and outlook 2020", December 2019.*

19 *https://www.iea.org/reports/global-energy-review-2020/global-energy-and-co2-emissions-in-2020*

20 *The Breakthrough Institute 2020, 'COVID-19 Could Result in Much Larger CO2 Drop in 2020', April 30, 2020.*

21 *Faiella and Natoli (2020), 'The Covid-19 crisis and the future of the green economy transition', Covid-19 Notes, June 17, 2020, Bank of Italy.*

III. The increase in the cost of energy needed to reach carbon neutrality: a simulation exercise

Increasing the cost of energy (carbon pricing) is commonly seen as one of the most effective tools to phase out fossil fuels. The IMF's recent estimates of the impact of carbon pricing on energy costs[22] suggest adoption of a homogeneous lower floor (which would find easier political acceptance) for carbon emissions costs ($75 per ton) rather than country-specific prices. At the level of $75 per ton, global temperatures would be contained at or below 2°C compared to pre-industrial levels, consistent with the Paris agreement. At this threshold, emissions could be reduced by 35% by 2030 compared to the baseline scenario. IMF estimates of the impact of carbon pricing at $75 indicate that the impact would be higher on coal prices which would increase from 130% to 300% (200% on average) in 2030 compared to the baseline. Changes to natural gas and gasoline prices would range respectively from 40% to 130% (45% on average) and from 6% to 30% (an average increase of 9%).

To assess the macro-economic implications of the impact of both ambitious carbon pricing and investment policies to reduce emissions as per the European Green Deal, we use the Prometeia IAM model. We evaluate the impact of an increase in the cost of energy to reach net zero emissions by 2050 for Europe and by 2070 for the rest of the world. We simulated three scenarios: 'BAU' (Business-As-Usual), 'PARIS' (Paris Agreement), and a 'PARIS_EXP' scenario which assumes an expansive fiscal policy. In the BAU scenario we maintain the status quo in terms of carbon pricing,[23] in the PARIS scenario we compute an optimal carbon tax profile consistent with global neutrality targets and assume that the fiscal revenues from carbon taxes are translated into incentives for investments in green energy sources. The PARIS_EXP scenario makes the same assumptions as the PARIS scenario with the addition of a fiscal expansion of 1% of GDP for five years in terms of additional public green investment. The PARIS and PARIS_EXP policies would be implemented starting from 2021.

Implementation of rapid upscaling of carbon capture and storage (CCS), among other factors, is essential to meet Paris Agreement. Recently, the Shared Socio-economic Pathways (SSPs) have been developed in order to gather technological and economic assumptions to be provided to the Integrated Assessment models (IAM) for the implementation of climate scenarios. Among other factors, the development of large negative emissions technologies play a central role. Without reaching a stable negative emissions level of 15-30 gigatonnes of CO2 equivalent (GtCO2e) per year it would be impossible to meet the Paris agreement at global level.[24] Our scenarios include emissions captured by bioenergy with carbon capture and storage technology (BECCS) capable of absorbing and removing GHGs from the atmosphere that are in line with the SSPs scenarios.[25]

In the BAU scenario, the lack of change to CO2 emissions leads to a temperature increase of above 5°C compared to pre-industrial levels. In this scenario, global carbon pricing policies are almost nonexistent since the only area with significant carbon pricing is the EU (currently about $23/ton CO2). Table 2 presents the model results for temperatures, energy prices and GDP for all three scenarios.

To limit emissions, and to reduce temperatures to below 2°C by 2100, a vigorous carbon pricing policy to promote a significant increase in the price of fossil fuels should be enacted - and

22 *IMF (2019) 'Fiscal Monitor: How to Mitigate Climate Change', Fiscal Monitor.*

23 *Catalano M., L. Forni, E. Pezzolla (2020), 'Fiscal tools to reduce transition costs of climate change mitigation' Working paper 2020.*

24 *Rogelj et al. (2018). Scenarios towards limiting global mean temperature increase below 1.5 °C. Nature Climate Change.*

25 *In particular, our assumptions and results are very similar to those of the SSP2-3.4 scenario.*

Table 2 The macroeconomic scenarios for climate change of the Prometeia IAM model

	CLIMA		ENERGY PRICE			GDP				Carbon Price			
	T	CO_2	OIL	COAL	GAS	UE	US	CHN	IND	UE	US	CHN	IND
	C°	MT	$/bbl	$/mt	$/mm-btu	% Dev. From BAU				$/MT CO_2			
BAU													
2020	1.1	36802	50.2	62.0	1.8	-	-	-	-	23	4	6	2
2030	1.3	53325	68.1	102.6	3.3	-	-	-	-	23	4	6	2
2040	1.6	82473	71.7	108.0	3.5	-	-	-	-	23	4	6	2
2050	2.0	113376	70.5	106.3	3.4	-	-	-	-	23	4	6	2
LR	5.3	146020	76.7	115.5	3.7	-	-	-	-	23	4	6	2
PARIS													
2020	1.1	36802	50.2	62.0	1.8	0%	0%	0%	0%	23	4	6	2
2030	1.3	43211	203.2	288.5	17.0	-12%	-16%	-15%	-18%	113	201	192	108
2040	1.5	58081	227.4	230.0	17.9	-7%	-11%	-9%	-10%	166	287	369	126
2050	1.8	56736	206.8	224.3	16.6	3%	-2%	1%	5%	264	477	600	184
LR	2.0	-6953	186.4	245.4	15.7	23%	21%	22%	29%	274	686	654	266
PARIS EXP													
2020	1.1	36802	50.2	62.0	1.8	0%	0%	0%	0%	23	4	6	2
2030	1.3	43211	173.3	246.0	14.5	3%	-4%	4%	-1%	96	171	164	92
2040	1.5	58081	197.5	187.5	15.4	21%	8%	16%	13%	140	241	310	106
2050	1.8	56736	176.9	181.9	14.1	29%	35%	36%	33%	220	398	500	153
LR	2.0	-6953	156.5	202.9	13.2	30%	38%	41%	53%	228	571	550	221

Source: Prometeia's calculations.

swiftly. Our estimates suggest a carbon price above $100 in the EU and around $200 in the US and China by 2030, followed by at least a 400% increase in the prices of coal, oil and gas to reduce the remaining fossil fuel share.

This carbon pricing policy is likely to imply large economic costs in the short-run... in 2030, EU GDP levels would be 12% below the baseline (BAU scenario) and in the US, China and India would be 16%, 15% and 18% respectively below the baseline, even under the assumption that the revenues from carbon taxes would be used to finance incentives for low emissions (green energy) and negative emissions technologies.

...and would imply economic benefits of between 21% and 29% in the long run (2050 and beyond). The delay before any benefits would be achieved is due to the fact that carbon pricing imposes strong inflationary pressure on the economic system which depresses consumption and investment. In addition, it is a process that takes time although it should lead to a sudden devaluation of assets related to the brown sectors.

An expansionary fiscal policy would be required to support the short and medium term transition to a low-carbon economy. To ease the inevitable global recessionary pressures related to the PARIS scenario carbon pricing approach, the PARIS_EXP includes an expansionary fiscal policy aimed at public green investment[26] equal to 1% of world GDP for 5 years. The effect would be to contain the recessionary pressure up to 2030 while at the same time limiting the magnitude

26 *It includes further incentives for private green investment, R&D in green technology and energy efficiency. In this note, we ignore the important issue of the distributive effects of the green transition and the mitigation policies that would be necessary.*

of the carbon price increase. The interaction among these different polices suggest that the simulated carbon pricing and public green investment mix would have a large multiplier while allowing achievement of the ambitious PARIS scenario objectives.

IV. Conclusion

The EU should step up its climate action, especially in view of the need to support the recovery from the Covid-19 pandemic. The objective should be to set short and medium-term recovery strategies on an environmentally sustainable path, in accordance with the carbon neutrality objectives of the European Green Deal announced by the European Commission at the end of 2019.

The EU climate objectives are translated, at the national level, into the specific targets defined in the NECPs for the period 2021-2030 in line with the objectives of the Paris Agreement. These targets relate to reducing GHG emissions, increasing the share of renewable energy in the energy mix, and increasing energy efficiency and electricity interconnectivity.

One of the most ambitious targets is zero net emissions by 2050. Rising energy costs are commonly regarded as the most effective means of reducing emissions and, a fortiori, in this phase of exceptionally low oil prices. On the one hand, carbon pricing would discourage use of fossil fuels and, on the other hand, it would raise revenue which could be used to increase the incentives for green investments. Part of this revenue should be used to compensate the groups most affected by rising energy costs (such as workers in carbon intensive sectors).

To facilitate the transition to a low-carbon economy and achieve carbon neutrality by 2050, will require substantial public support for green investments, as suggested by our simulations. Using the revenue from carbon pricing to fund low emissions (green) energy incentives would seem insufficient to ensure the phasing-out of fossil fuels and zero net emissions by 2050. More regulatory intervention will be needed in parallel with increased public financial support to foster energy efficiency and green investments. Without rapid implementation of bold policies, the credibility of the EU Green Deal will be undermined and we risk emergence from the current crisis to a "browner" economy than before the crisis.

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