

Organization of the Petroleum Exporting Countries (OPEC)



Views on efforts related to addressing
the social and economic consequences and
impacts of response measures
for input to first technical assessment (TA)
for global stocktake (GST)

Summary

While countries strive to face the challenge of climate change, governments assess and implement different mitigation policies and measures with inherent uncertainties.

A scenario analysis is implemented to estimate the potential impacts of response measures on emissions reduction, future energy demand and the economies of selected energy-exporting developing countries, arising from mitigation action that is aligned with the long-term goals of the Paris Agreement.

Analysis shows that there is no one-size-fits-all approach to mitigate climate change. Energy-exporting developing countries are expected to experience significant socio-economic consequences due to mitigation action and response measures, particularly in those countries whose access to financing and technology is limited.

In view of such vulnerabilities, it is essential to establish or restore the very foundations of resilience and stability in their societies, identifying mitigation options that could lead to 'win-win' solutions with environmental and socio-economic benefits and enhancing collaboration among countries.

The spread of the impacts of climate response measures will be uneven, exacerbating existing global inequalities. A coherent approach is therefore needed to set the world on a sustainable, more resilient and fair pathway.

The amount of \$100 billion per year that developed countries have committed to climate finance support for developing countries is not expected to offset the adverse impacts of response measures. Support provided by developed countries should increase substantially to ensure an inclusive, equitable and just transition.

In the years ahead, countries will continue implementing their enhanced NDCs and LTSs, mobilising also funding for COVID-19 recovery efforts. It is essential to eliminate or avoid the adverse impacts of climate response measures, prioritising equity and justice while also synergising environmental, economic and social aspects of sustainable development.

Parties' contributions to reducing global emissions should be subject to differentiated responsibilities, capabilities and national circumstances. The

different starting point between developed and developing countries needs serious consideration for the implementation of the Paris Agreement. Developing countries should have the policy space to address climate change in the context of sustainable development.

The role of international cooperation should be highlighted, as it could contribute to the identification and sharing of best practices and experiences of countries that relate to addressing the adverse impacts of response measures and enhance collaboration for creating a conducive international environment to improve the capacities and reduce the socio-economic impacts of such measures on developing countries.

The fulfilment of developed countries' commitments on critical issues such as climate finance, technology transfer and capacity-building in developing countries is required for all countries to be able to enhance their mitigation action and reduce vulnerability to the harmful effects of climate change.

Nobody should be left behind, and all viable mitigation and adaptation measures, technological innovation, including CCUS technologies, blue hydrogen and the CCE platform, enhanced investment for energy access, and improved energy efficiency must be part of the solution.

OPEC and its Member Countries advocate putting multilateralism at the centre of energy, climate and sustainable development. OPEC remains committed to the UNFCCC process, and subscribes to a sustainable path forward; one that works for all.

Views on efforts related to addressing the social and economic consequences and impacts of response measures for input to first GST-TA

– Background

Article 14 of the Paris Agreement (PA) provides for a periodic global stocktake (GST) of the PA implementation with the objective to assess the collective progress towards achieving the purpose of the agreement and its long-term goals.

The GST should be done in a comprehensive and facilitative manner, considering mitigation, adaptation and the means of implementation and support (including finance flows), and in the light of equity and the best available science. The GST should also consider efforts on the socio-economic consequences and impacts of climate response measures and averting, minimising and addressing loss and damage.

The GST outcome is expected to inform UNFCCC¹ Parties on updating and enhancing ambition for climate action and support – communicated through the nationally determined contributions (NDCs) – as well as on increasing international cooperation to tackle the challenge of climate change. Its output should include best practices, new opportunities and lessons learned.

The first GST (GST1) is taking place from November 2021 to November 2023, implementing a five-year cycle thereafter. The three components of the first GST are: information collection and preparation, technical assessment, and consideration of outputs. The Chairs of the UNFCCC Subsidiary Bodies have reached out to invite the submission of inputs from UN agencies and other international organisations, supportive of the UNFCCC process.

In this context and taking into consideration national circumstances and development priorities of oil-producing and exporting developing countries as well as the expected adverse impacts of the implementation of climate response measures on the economies of oil-producing and exporting developing countries, the Organization of the Petroleum Exporting Countries (OPEC) submits its input to the first GST technical assessment (GST-TA) with a focus on efforts related to addressing the social and economic consequences and impacts of climate mitigation response measures.

¹ United Nations Framework Convention on Climate Change.

– *Global emissions and mitigation action*

The NDCs of the Parties to the PA have emerged as a common platform, through a bottom-up approach, towards achieving the long-term temperature goal of the agreement.

Under Article 4 of the PA, Parties are expected to develop progressively more ambitious NDCs over time. The first request to enhance climate ambition was in 2020, whereas the cover decision² of COP26 calls Parties to align their NDC-targets with the PA temperature goal by the end of 2022, taking into account different national circumstances.

Some Parties have also developed their mid-century, long-term low greenhouse gas (GHG) emission development strategies (LTSs). Additionally, there is growing momentum from countries to set ‘net-zero emissions’, ‘carbon neutrality’ or ‘climate neutrality’ targets, to be achieved by 2050 or 2060.

Anticipating to see whether and how countries will fulfil their pledges and aspirations, major economies have committed trillions of dollars to COVID-19 recovery spending, and many countries advocate for a post-pandemic ‘green’ recovery.

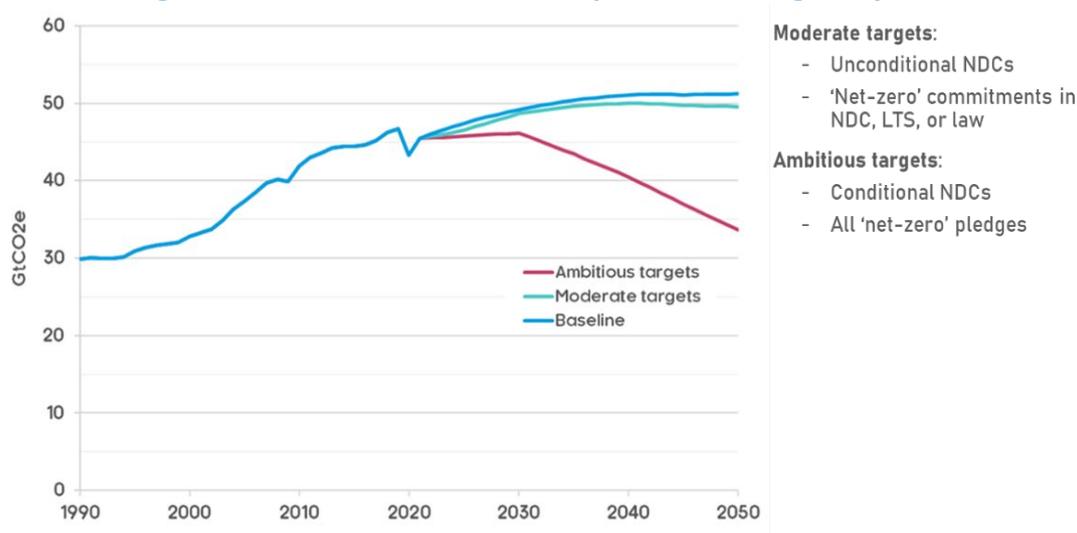
In light of the above, the possible future global GHG emissions trajectory is within the envelope of alternative pathways (Figure 1, next page). Similarly to the conclusion of the UNFCCC Secretariat’s synthesis report³, it is evident that the estimated emission reductions resulting from NDC-implementation and achievement of ‘net-zero’ pledges that are either in law or included in an NDC or LTS fall short of what is required. This indicates the need for Parties to further strengthen their mitigation action under the Paris Agreement. In addition to the emissions gap, an implementation gap exists between the projected emissions of current policies and those implied by Parties’ NDCs.

It should be further noted that the Paris Agreement stipulates the relationship that climate change actions, responses and impacts could have with equitable access to sustainable development. Recognising the specific needs and special circumstances of developing countries, the agreement aims to strengthen the global response to the challenges of climate change, giving consideration to sustainable development and efforts to eradicate poverty.

² The Glasgow Climate Pact, decision 1/CP.26 and 1/CMA.3.

³ FCCC/PA/CMA/2021/8/Rev.1, available at: <https://unfccc.int/documents/307628>.

Figure 1: Global GHG emissions as per Parties' targets by 2050



The need to tackle climate change and consider the broader challenges of sustainable development is more urgent than ever amid the present disturbing times of the COVID-19 pandemic. The challenges are especially onerous for developing countries, which feel the effects acutely.

For the world to emerge from the present crisis, a response, recovery and move into a more sustainable, inclusive and resilient future require a surge in international solidarity and cooperation. An action area that could be leveraged to facilitate the coherent implementation of climate action and sustainable development objectives relates to energy access for all.

Recognising that energy is inextricably linked to climate change and many other sustainable development goals (SDGs), and has a vital role to play in COVID-19 recovery efforts, eradication of energy poverty should be an overarching goal for resilient and sustainable development. This requires to have a holistic view of the energy sector, ensuring energy is affordable for all while moving toward a more inclusive and equitable world in which every person has access to energy as referenced in SDG7.

Key to achieving this is providing access to modern energy sources, aligning the cost, reliability, quality and affordability of energy services within a policy framework that does not discriminate against any energy source and ensures that no one is left behind. Achieving universal energy access should also be an integral part of a just and inclusive energy transition that is not a one-size-fits-all process and takes into account national priorities, capabilities and circumstances. The provision of financial support and technology transfer are

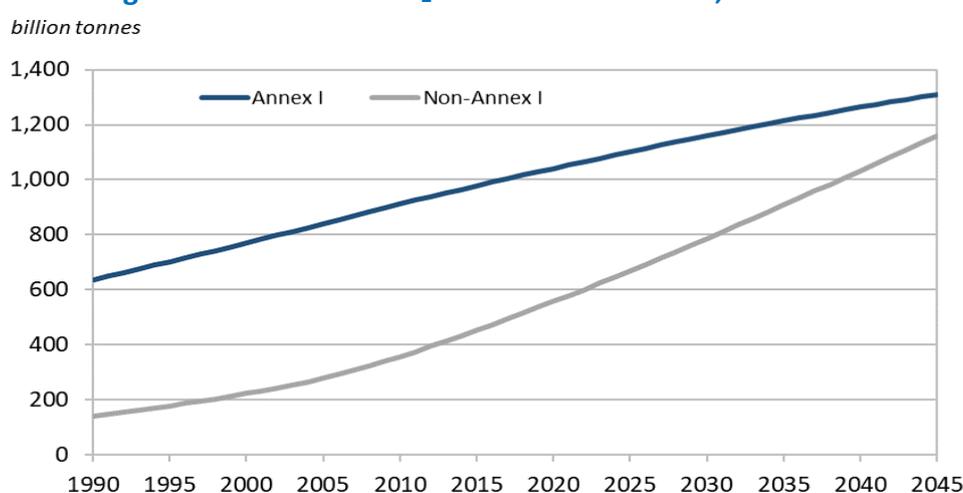
enabling factors for enhancing efforts to promote energy access, particularly in developing countries.

Against this backdrop, the current dynamics of climate change should be taken into consideration, which are the growth of the emissions, the continuing large disparity in historical and per capita emissions between developed and developing countries, the shrinking carbon-space in the atmosphere for receiving additional emissions in the future, and the significant adverse impacts of climate change arising from global warming in all countries worldwide.

Given the economic downturn and COVID-19 containment measures that led to lower energy demand in 2020, energy-related CO₂ emissions declined by around 2 billion tonnes this year, the largest annual emissions decline ever recorded. Yet, it is expected that under the baseline, part of this decline will be offset in 2021. The continuation of the recovery process in the years thereafter is likely to result in a further increase in overall CO₂ emissions, albeit with a growth deceleration.

In addition, the historic disparity in cumulative emissions between developed and developing countries continues. Estimates of cumulative CO₂ emissions since 1990, as presented in Figure 2, show a significant gap in cumulative emissions between Annex I and non-Annex I countries. This has developed throughout the past century. This gap is also expected to remain in place throughout the projection period, despite growing energy demand in developing countries.

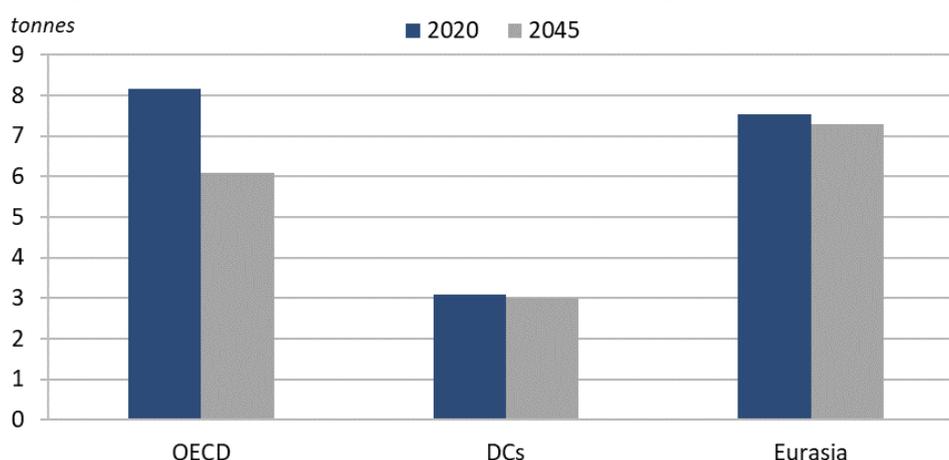
Figure 2: Cumulative CO₂ emissions from 1990, 1990–2045



Source: OPEC, 2021.

On a per capita basis, emissions from OECD countries are gradually decreasing, yet they still remain higher than that of developing countries even in 2045. Some OECD countries have decoupled CO₂ emissions and GDP growth, but either only at high levels of per capita income and per capita emissions or only temporarily. Energy efficiency improvements and deployment of low-emissions technology have contributed to these trends. Nevertheless, Figure 3 shows the staggering difference between the very low values in developing countries (DCs) of approximately 3 tonnes per capita and much higher values of around 8 tonnes per capita in developed regions.

Figure 3: Per capita CO₂ emissions by major region, 2020 and 2045



Source: OPEC, 2021.

Assuming that global CO₂ emissions continue to be released at current rates, it is estimated that the remaining carbon budget for keeping global warming well below 2°C would be exhausted before mid-century. Climate mitigation action should therefore be enhanced at a global level, accommodating the differentiated responsibilities and capabilities among countries. As stipulated in the Paris Agreement, developed countries should take the lead and achieve emission reductions considering the principles of the Convention and the agreement – particularly those of equity and common-but-differentiated responsibilities and respective capabilities (CBDR-RC).

The fulfilment of developed countries' commitments on critical issues such as climate finance, technology transfer and capacity-building in developing countries is also required for all countries to be able to enhance their mitigation action and reduce vulnerability to the harmful effects of climate change. As there is a vast gap between the support required and support provided, climate finance, in particular, should be scaled up and take into account funding

requirements for both mitigation and adaptation, as well as the significant role of public finance.

Climate finance should be new, additional, adequate and predictable, ensuring a balance between support for mitigation and for adaptation in developing countries. Technology transfer and capacity-building are needed too. Capacity-building – including in the energy sector – is critical, through integrating climate change and support action to reduce emissions, adapting to its negative consequences, and eliminating the impacts of the implementation of response measures. Innovative solutions such as the CCUS (carbon capture, utilisation and storage) technologies, blue hydrogen and the CCE (circular carbon economy) platform could provide an integrated approach for emissions management and reduction to support sustainable energy systems and respond to climate targets.

Overall, inclusive processes and approaches, as well as comprehensive strategies that allow just transition and sustainable development for all, leaving no one behind, should be important components of climate mitigation action.

– *Adverse impacts of climate response measures*

As previously stated, in order to achieve the long-term temperature target of the Paris Agreement, Parties are called to take action by implementing NDCs and increasing their efforts in the years ahead, while considering national circumstances and priorities.

In addition, Parties to the Paris Agreement recognise that they may be affected not only by climate change, but also by the impacts of the measures taken in response to it. Owing to the intrinsic relationship that climate change actions and response measures have with equitable access to sustainable development and the eradication of poverty, Parties should consider, when implementing the Agreement, the concerns of Parties with economies most affected by the impacts of response measures, particularly developing countries (Article 4.15).

This is aligned with the Convention that calls Parties to take into full consideration the specific needs and concerns of developing countries arising from the adverse effects of climate change and the impact of the implementation of response measures – especially of *‘countries whose economies are highly dependent on income generated from the production, processing and export, and/or on consumption of fossil fuels and associated energy intensive products’* (Article 4.8).

The Paris Agreement further states that mitigation co-benefits resulting from Parties' climate change actions and economic diversification plans can contribute to mitigation outcomes (Article 4.7).

In this context, the progression of Parties' NDCs towards the ultimate temperature target of the Paris Agreement is likely to lead to increasingly enhanced mitigation actions that could have significant implications for the economies of developing countries – including energy-producing and exporting developing countries – and their sustainable development, particularly in the post-pandemic era.

Implementation of climate response measures could entail significant socio-economic structural changes, and could raise distributional concerns. Alternate mitigation pathways may entail distributional impacts such as changes in employment and economic structure. Meeting the Paris Agreement goals could decrease the use and value of fossil fuels, affecting those industries, individuals, and societies that depend on associated revenues and jobs. Especially developing countries would feel the social and economic implications with their high dependence on hydrocarbon products as a revenue stream, considering that they would be exposed to reduced fiscal incomes owing to low energy demand.

Consequently, shifting energy investment portfolios for delivering rapid decarbonisation in the economy could have global distributional impacts, including job reallocations. Climate mitigation policies could have important distributive effects between and within countries, either reducing or increasing inequality and poverty, depending on policy instruments, design and implementation. The impacts of the implementation of climate response measures therefore necessitate implementation of appropriate policies to ensure a fair, inclusive, equitable, sustainable and just transition.

Taking into account growing challenges and uncertainties that could affect climate mitigation action, alternative energy transition pathways are herewith assessed, reflecting potential future states of the global economy and energy system. The possible adverse impacts of the announced response measures in addressing the global challenge of climate change are estimated for the economies of energy-producing and exporting developing countries, particularly OPEC Member Countries.

Using the Reference Case of the World Oil Outlook (WOO) as baseline, alternative scenarios are analysed in order to estimate the potential adverse effects of the implementation of response measures, while considering policies

consistent with climate mitigation targets incorporated in Parties' NDCs, LTSs and 'net-zero emissions' announcements, including pandemic recovery spending.

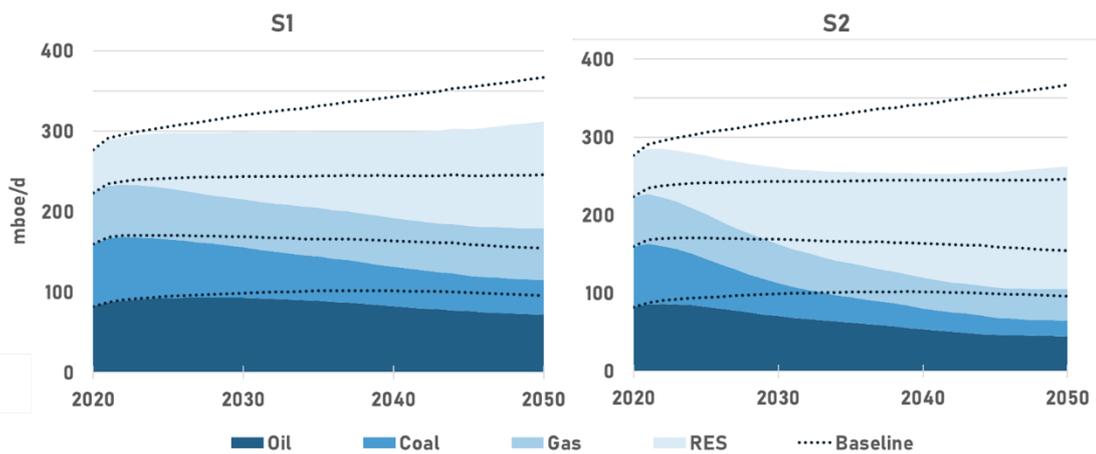
Scenario 1 (S1) – 'Sustainable recovery': Scenario 1 assumes consideration of sustainable recovery from the COVID-19 pandemic. Government policy addresses the environmental pillar of sustainability along with socio-economic aspects. Parties commit to existing NDCs – including the new and updated NDCs – and enact appropriate policies to achieve these targets in the short- to medium-term. In the longer term, governments have more ambitious mitigation action compared to the baseline, yet emission reductions still fall short of what is required to achieve the Paris Agreement temperature target.

Scenario 2 (S2) – 'Ambitious mitigation action': This scenario builds on Scenario 1 and assumes even larger emission reductions. In the short- to medium-term, government policy globally focuses on 'green growth' recovery plans. Parties commit to enhancing their existing NDC targets. In the long-term, governments continue to pursue mitigation policy beyond current commitments, achieving 'net-zero emissions' targets through investment, technological progress, regulation and behavioural change. The level of GHG emissions is consistent with the long-term ambition of the Paris Agreement being fulfilled.

Such climate mitigation action results in reductions in global energy demand, particularly hydrocarbons demand (Figure 4, next page). Under Scenario 1, the share of renewables in the power generation sector increases, leading to an almost 20% reduction of global demand for natural gas by 2030 compared to the baseline. The reductions for coal (-10.2%) and oil (-6.3%) are lower, yet by 2050 these reach the level of -27.2% and -24.8%, respectively. For natural gas, demand declines by 29.4% by 2050, implying relatively stable demand over the projection period.

A marked transformation of the global energy system is observed under Scenario 2. Investment, technological progress, regulation and behavioural change lead to an accelerated reduction in demand for traditional hydrocarbons. By 2030, total coal demand is 39.3% lower than in the baseline, gas demand is 33.5% lower, and oil demand is 28.8% lower. By the end of the projection period, the respective estimated reductions are at the level of -66.1% for coal, -55.9% for natural gas, and -53.4% for oil. This corresponds to a 60% share of renewable energy sources in total primary energy demand (Figure 5, next page).

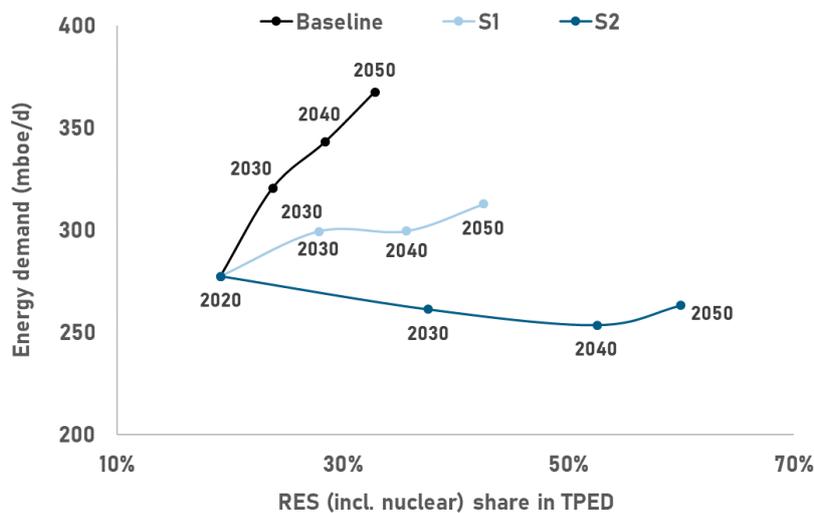
Figure 4: Global primary energy demand and the energy mix



Note: RES includes nuclear, hydro, biomass and other renewables (e.g. wind, solar, geothermal).

Source: OPEC, 2021.

Figure 5: Global energy system

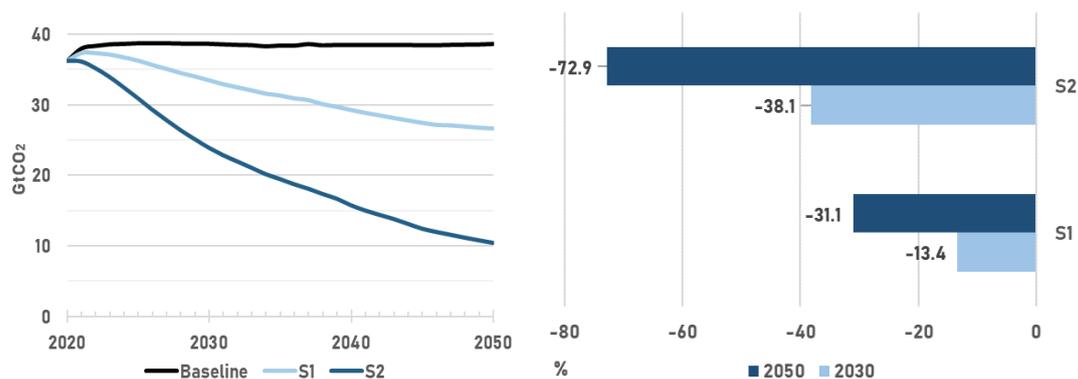


Note: RES includes nuclear, hydro, biomass and other renewables (e.g. wind, solar, geothermal).

Source: OPEC, 2021.

Estimations of future worldwide emissions illustrate that only emission reductions achieved under Scenario 2 are expected to be aligned with the long-term temperature target of the Paris Agreement. Figure 6 (next page) illustrates the estimated level of global energy-related CO₂ emissions under each scenario up to 2050, along with the percentage changes compared to the baseline in 2030 and 2050. It appears that under Scenario 1, global energy-related CO₂ emissions are reduced by about 31% in 2050 compared to the baseline. Under Scenario 2, the respective emissions reduction is more than 72%.

Figure 6: Impact on energy-related CO₂ emissions



Source: OPEC, 2021.

Given the above-presented impacts on global primary energy demand, it is expected that energy-producing and exporting developing countries could face adverse impacts arising from the implementation of enhanced climate action. Each of the scenarios analysed results in increasingly adverse impacts from the implementation of climate mitigation response measures on petroleum-exporting developing countries – including OPEC Member Countries. It is evident that the magnitude of negative socio-economic impacts could be substantial under stringent climate mitigation action, as considered in Scenario 2.

In particular, Table 1 shows that in Scenario 2 it is estimated that OPEC Member Countries' GDP could be 13.7% lower than in the baseline by 2050. These adverse impacts are driven by a loss of value in traditional hydrocarbon sectors, lower export revenues and weakened terms of trade. In addition, the reduction in OPEC Member Countries' GDP is expected to be larger than the overall effect on the global economy.

Table 1: Percentage change in GDP compared with the baseline

	<i>S1 – Sustainable recovery</i>	<i>S2 – Ambitious mitigation action</i>
2030		
<i>OPEC</i>	-3.1	-8.5
<i>World</i>	-0.2	-0.5
2050		
<i>OPEC</i>	-5.3	-13.7
<i>World</i>	-0.4	-1.0

Source: OPEC, 2021.

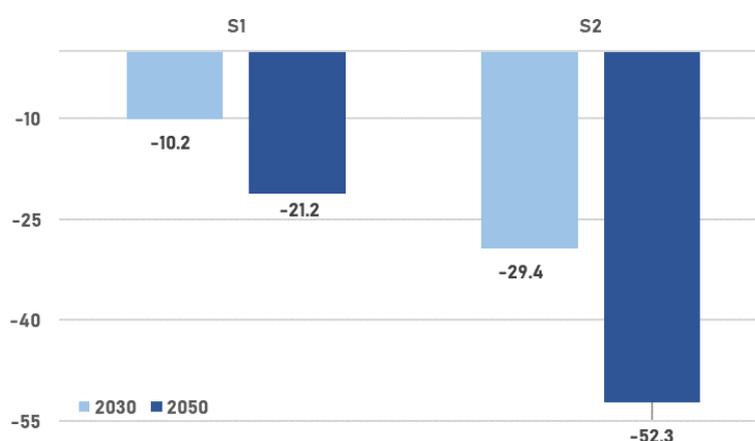
Besides losses in the wider economy and declining consumption, employment levels are also likely to be adversely affected in OPEC Member Countries. This

is the result not only of job losses across the hydrocarbon industry, but also losses in the public sector that relies on fiscal flows from the industry.

Moreover, Figure 7 shows the estimated losses of reduced oil export revenues for OPEC Member Countries under the two scenarios. The impacts increase in magnitude both over time and as the level of mitigation action increases through the scenarios.

In 2050, an estimated loss of more than 20% of oil export revenues is seen for OPEC economies under Scenario 1 compared to the baseline. Under Scenario 2, the negative implications for OPEC's oil export revenues are further deteriorated, as their losses range from almost 30% in 2030 to more than 50% in 2050.

Figure 7: Impact on oil export revenues for OPEC economies, %



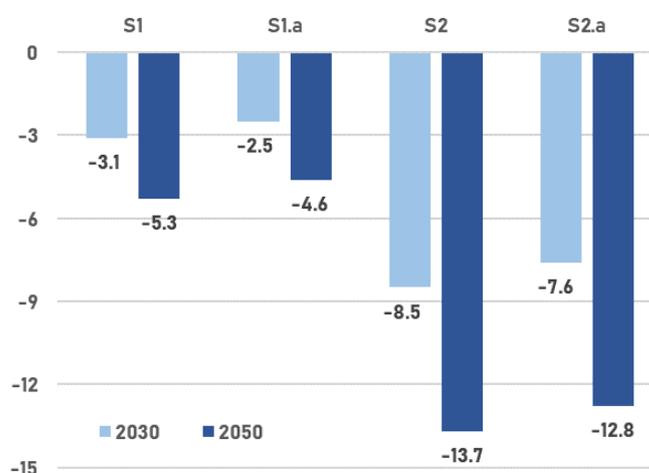
Source: OPEC, 2021.

In light of the above, a sensitivity case is modelled (S1.a, S2.a), which takes into consideration the need for a 'just transition'. The possibility of a global Just Transition Fund is explored, based on support provided by developed countries to developing countries, with the objective to promote sustainable development through the Paris Agreement implementation and enhance global efforts to address the adverse impacts of the implementation of climate mitigation response measures.

This sensitivity shows that the adverse impacts from the implementation of mitigation response measures could be partially offset through global cooperative efforts. Yet the offset is likely to be relatively modest, unless developed countries provide very substantial trade and investment opportunities for energy-exporting developing countries. Figure 8 (next page) shows that OPEC Member Countries' GDP is estimated to decline by 12.8% by

2050 in the ‘just transition’ sensitivity (S2.a), compared with a 13.7% reduction in Scenario 2.

Figure 8: Impact on GDP for OPEC economies, %



Source: OPEC, 2021.

– Concluding remarks

Many different climate mitigation pathways exist, with some being more aligned with the long-term temperature target of the Paris Agreement. With uncertainty around the economic recovery from COVID-19 remaining high in the short- to medium- term, a number of Parties to the agreement have submitted their new or updated NDCs. Some have also communicated their LTSs, introducing pledges for ‘net-zero emissions’ targets.

In this context, two illustrative scenarios along with a sensitivity case were analysed, aiming to provide estimations of the socio-economic implications of mitigation action associated with these pathways on energy-exporting developing countries. Analysis indicates that existing contributions fall short of the Paris Agreement temperature target, and will need to be substantially increased as in the most ambitious scenario.

This could lead to significant changes in future energy demand and the energy mix, while the adverse impacts of response measures could rise disproportionately with higher emission reductions. Any potential adverse impacts from the implementation of mitigation response measures at a global level are only modest. However, regional results show high variability. Energy-exporting developing countries, such as OPEC Member Countries, will face substantially higher mitigation costs than major economies.

The spread of the impacts of climate response measures will be uneven, with energy-producing and exporting developing countries suffering bigger losses than other economies, exacerbating existing global inequalities. The amount of \$100 billion per year that developed countries have committed to climate finance support for developing countries is not expected to offset the adverse impacts of response measures. Support provided by developed countries should increase substantially to ensure a fair, inclusive, equitable, sustainable and just transition.

In the years ahead, countries will continue implementing their enhanced NDCs and LTSs, mobilising also funding for COVID-19 recovery efforts. It is essential to eliminate or avoid the adverse impacts of climate response measures, prioritising equity and justice while also synergising environmental, economic and social aspects of sustainable development. Parties' contributions to reducing global emissions should also be subject to differentiated responsibilities, capabilities and national circumstances.

The different starting point between developed and developing countries needs serious consideration for the implementation of the Paris Agreement, as reflected in its Article 4.1. Parties should act according to their socio-economic circumstances as a one-size-fits-all approach will not be constructive. Developing countries should have the policy space to address climate change in the context of sustainable development.

The role of international cooperation should be highlighted, as it could contribute to the identification and sharing of best practices and experiences of countries that relate to addressing the adverse impacts of response measures. Overall, it is important, while intensifying climate action, to consider different national circumstances, evoke the principles of the Convention – including those of equity and CBDR-RC – balance mitigation, adaptation and means of implementation, such as climate finance, technology transfer and development, and capacity-building support, and take into account the overriding priority of sustainable development.

OPEC and its Member Countries welcome coordinated actions and inclusive approaches for all nations to collectively tackle climate change. International cooperation and identification of mitigation options that could lead to 'win-win' solutions with environmental and socio-economic benefits are vital to ensure a fair and just transition.

Nobody should be left behind, and all viable mitigation and adaptation measures, technological innovation, including CCUS technologies, blue

hydrogen and the CCE platform, enhanced investment for energy access, and improved energy efficiency must be part of the solution.

This brief note presents a case study that relates to the activities that could inform the work under the first technical assessment for the global stocktake. The OPEC Secretariat expresses its willingness and preparedness to collaborate with the UNFCCC Secretariat and other stakeholders supportive of the UNFCCC process on issues related to addressing the social and economic consequences and impacts of climate response measures.