Framework Convention on Climate Change

KCI/2022/7/6

Katowice committee of experts on the impacts of the implementation of response measures

18 October 2022

Seventh meeting
Sharm el-Sheikh, 2-3 November 2022

Draft concept note on facilitating the development and exchange of regional, country- and/or sector-specific case studies and approaches on (1) economic diversification and transformation and just transition of the workforce and creation of decent work and quality jobs, and (2) assessment and analysis of the impacts of the implementation of response measures with a view to understanding the positive and negative impacts

I. Background

1. The Conference of the Parties (COP) at its twenty-fifth session, the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP) at its fifteenth session, and the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) at its second session agreed on workplan of the forum on impacts of the implementation of response measure (the forum) and its Katowice Committee on the Impacts of the Implementation of Response Measures (KCI).

2. As per activity 7 of the workplan for the forum and its KCI[1], the KCI is to implement this activity at its meetings held in conjunction with SB 59 and onward, as decided by the forum or KCI, using modality input from experts, practitioners and relevant organizations, and examination of existing case studies to identify an area where it may develop a case study, as appropriate. KCI 6 agreed on a strategy for implementing the activity.

3. The open-ended working group led by the task lead, with the support of the secretariat and the consultant, prepared the draft concept note.

II. Scope of note

4. This background note provides in its annex the draft concept note.

III. Expected action by the Katowice Committee on Impacts

5. The KCI will be invited to hold a discussion on the concept note to implement the activity taking into account inputs from experts, with a view to finalizing the concept note, including the activities to be carried out and a time frame for the delivery of work by email after the KCI meeting.

[1] Decision 4/CP.25, Decision 4/ CMP.15, Decision 4/CMA.2

Annex

Katowice Committee of Experts on the Impacts of the Implementation of Response Measures

Seventh Meeting

Concept note to examine existing case studies and identify an area where the KCI may develop a case study, as appropriate, by the Katowice committee of experts on the impacts of the implementation of response measures

Activity 7: Facilitate the development and exchange of regional, country- and/or sector-specific case studies and approaches on (1) economic diversification and transformation and just transition of the workforce and creation of decent work and quality jobs, and (2) assessment and analysis of the impacts of the implementation of response measures with a view to understanding the positive and negative impacts.

For Review by the UNFCCC and the KCI Members only

I. Introduction

A. Background and context

1. Assessing and analysing the impacts of the implementation of response measures is one of the four work areas of the work programme of the response measures forum and its KCI. Activity 7 focuses on **facilitating the development and exchange of regional, country- and/or sector-specific case studies and approaches on (1) economic diversification and transformation and just transition of the workforce and creation of decent work and quality jobs, and (2) assessment and analysis of the impacts of the implementation of response measures with a view to understanding the positive and negative impacts**. This note contributes to the KCI 6-year workplan (UNFCCC, 2022) by providing a concept note which examines existing case studies and identifies an area where the KCI may develop a case study, as appropriate. This concept note is prepared in accordance with the strategy and agreed tasks set out in Annex VI to Sixth Meeting of the KCI 6 and detailed in the KCI meeting report (KCI, 2022).
2. This concept note first examines existing case studies; then identifies an area where the KCI open-ended working group may develop a case study, as appropriate, with support of secretariat, and consultant if considered necessary, subject to the availability of financial resources.

B. Objective

3. This concept note aims to support the KCI in its deliberations at its KCI 7th Meeting on implementing Activity 7, by examining existing case studies, and then identifying an area where the KCI open-ended working group may develop a case study, as appropriate.

C. Work done

4. In preparing this concept note, various studies and work done by the KCI and the forum have been reviewed to identify (a) what work and case studies, if any, have been undertaken in fulfilment of Activity 7; (b) what areas could then present possible case studies; and (c) what methods could be implemented in undertaking the case studies.
5. Technical papers and concept notes prepared for each of KCI meeting have been reviewed to identify work done in accordance with Activity 7. Specifically, the technical papers and concept notes were reviewed to identify whether any case study has been implemented.
6. The options presented in this paper have been put forth for consideration by the KCI taking into account recommendations of previous KCI technical papers and work by the forum as well as deliberations of the KCI in previous meetings.
7. The concept note will be discussed at the KCI's 7th Meeting and finalized reflecting reviews and inputs from the stakeholders and experts (including relevant UNFCCC constituencies and Constituted Bodies) via email after the KCI 7th Meeting.

D. Structure

8. This concept note is structured as follows. Section II offers a review of the relevant existing work and case studies that have been undertaken by the KCI, the forum, and external organizations where relevant. Section III proposes three possible areas where the KCI may develop a case study, as appropriate, summarizing the merits and challenges of each and selecting a case study. The outline for the proposed case study follows in Section IV and covers an overview, outline, required data, methods, limitations, and timeframe, as well as relevance of the case study to the work of the KCI Activity 7. The final section includes references.

II. Review of existing work and case studies by the KCI and the Forum

9. To date, the KCI has undertaken work on response measures pertaining to methodologies, capacity building, and impacts on specific peoples or groups under different response measures; however, the KCI has not undertaken any specific case studies. All other relevant case studies have been prepared by organizations or groups external to the

KCI and the forum. The following paragraphs review relevant cases studies by external sources (including those commissioned by the UNFCCC) then review the relevant existing relevant work by the KCI.

10. Case studies are offered in a report by McDonald et al. (2020). This report measures the cross-border impacts of the implementation of various response measures, namely carbon pricing response measures (a carbon tax, an energy input tax, and a quantity restriction instrument) on Senegal and Kenya using a global CGE model that is soft-linked to a single-country CGE model. It finds that impacts depend greatly on the type of response measure implemented, with more muted effects under a carbon tax (McDonald et al., 2020). The results of these two case studies offer case studies that can be replicated in other jurisdictions and present technical capacity that can be shared among the KCI and forum, especially developing countries. The study applies computable general equilibrium (CGE) models, which are one of the main quantitative methods for measuring impacts of response measures (KCI, 2022b) and a robust method for examining not only large economic results, but also socioeconomic, household, economic diversification, and industrial-level impacts of response measures as well as just transition indicators. A key contribution of this report is measuring effects of the implementation of response measures on the various sectors of each case study (Senegal and Kenya) as well as household levels, employment, and overall economic welfare.
    a. The conclusion from this study is that CGE models could be extremely helpful as a tool for specific case studies.
    b. The critical limitation of this study is that replicating it to other regions or countries requires the availability of country-wide data as well as technical skills to implement such modelling and interpret its results.
11. Case studies prepared by external organizations include the following studies in CGE models: Ghana (Marcu, Monciatti, & Cosbey, 2021); Kuwait (Shehabi, 2017, 2020); and India (Weitzel et al., 2015), Kenya and Senegal (McDonald et al., 2020), and others as detailed below.
    a. Weitzel et al. (2015) uses an in-country CGE model for India that is 'soft-linked' to a global CGE model to analyse welfare effects of an international climate regime in line with a two-degree target under varying assumptions about international price effects, international transfers and allocation of carbon tax and transfer revenue.
    b. Shehabi (2017) models and measures impacts of reforming inefficient fossil fuel subsidies on oil-producing economies, using Kuwait as a case study using a CGE model specifically constructed for an oil-based economy and database constructed for Kuwait for 2013. The study sheds light on effects of the response measure (subsidy reform) on energy consumption, household welfare, labour income and employment (including local and non-local labour), household welfare, economic diversification, and other factors. A key contribution of this study are: first, it is the first study to examine in details the impact on non-local labour who are people under vulnerable situations; second, it quantifies the impacts of the phasing out of inefficient fossil fuel subsidies under various scenarios; and third, it proposes and examines the implementation of competition and productivity-improvement policy which could maximize positives and minimize negatives of the energy subsidy reform.
    c. Shehabi (2020) models and measures impacts from the global energy transition (reduced price and demand for oil exports) post-pandemic on oil-exporting economies, using Kuwait as a case study. The study applied CGE model constructed for that economy and data constructed for Kuwait for 2015 to following economic dynamics post the mid-2014 oil price declines. Like the previous study, the study sheds light of impacts of various scenarios on effects of the energy transition on domestic revenue and economic conditions, industrial output, consumption, household welfare, labour income and employment, economic diversification, and domestic decarbonization efforts and reforms.
    d. Marcu, Monciatti, and Cosbey (2021) undertake a case study examining cross-border impacts of the implementation of response measures on Ghana. This study is part of a series of country case studies to be developed under the "Reporting on Response Measures under Biennial Update Reporting" project of the ERCST. The case study identified 12 sectors of the economy which are vulnerable to the impacts of response measures: cocoa, manufacture of beverages and food

products (jojoba oil); palm oil; fishing; oil & gas; mining and quarrying without oil and gas and gold (aluminium and manganese). The report quantitatively examined the effects of the following three international response measure on these vulnerable sectors: IMO carbon tax for international shipping, CORSIA under ICAO carbon tax for international aviation and the EU Border Carbon Adjustment Mechanism. The case study follows seven of the nine-step ERCST methodology. This involves describing the key characteristics of the country, identifying the vulnerable sectors, employing stakeholder input for completeness, identifying relevant response measures, performing a quantitative assessment, and identifying and assessing tools and support needed to address the impacts. Through a global computable general equilibrium (CGE) model, the study links Ghana with other international regions and show the desired processes. The results indicate that the overall effects of the IMO carbon tax on Ghana's economy are small. Similarly, the macroeconomic effects of EU CBAM are very small, they could reshuffle export destination patterns change export destination patterns. They also show that the CORSIA/ICAO can have a stronger impact.

e. Da Costa, Stoefs, Cosbey, and Marcu (2021) develop a report that provides a tool for analysing cross-border impacts of the implementation response measures with reference to a case study on Chile. The report suggests two important limitations in assessing impacts of response measures: first, a unified methodology for identifying adverse impacts of international/out-of-jurisdiction impacts has not been developed; and second, identifying impacts of response measures in developing countries is a laborious process. Therefore, to fill this gap, this report offers a simplified bottom-up methodology to assist in reporting impacts of response measures in countries with limited capacity. The study uses both quantitative (a CGE recursive dynamic model) and qualitative analysis covering various sectors of activities and income groups. The study selected four response measures (two international ones and two domestic ones) in order to perform a quantitative assessment. These included a potential IMO carbon tax, implementation of CORSIA, coal-phase out and a domestic CO2 tax. They found that the impacts of all four response measures are expected to be limited on the GDP of Chile, though could impact different vulnerable sectors to a varying degree.

f. Rambharos (2018) studies electricity sector transformation and the impact of mitigation measures on the sector, primarily from the perspective of Africa's largest electricity utility Eskom. The case study discusses how coal capacity is geographically concentrated, while the company's capacity expansion plan has significant geographic spread. The case study also lists proposals to define diversification linked opportunities, including alignment of government policy on emissions aspirations and signals, and to encourage localisation and job creation, identification of retraining opportunities, alternative uses for coal, and support for vulnerable communities.

g. Oie and Mendelevitch (2018) present a case study of role of Colombian coal exports in the international steam coal market. Colombian coal sector is highly export dependent as over 90% of coal is exported and these exports make up approximately 1.3% of GDP. The sector is also a huge source of employment with 130,000 jobs in mining. The demand for coal is shrinking; the country mostly exports to Europe and US, where steam coal consumption has decreased by around 12% from 2005 to 2015. This is primarily due to changes in economic and climate policy in importing countries. While new markets for Colombia coal may arise, difficulty in access and higher competition makes this less likely. The study suggests that continued investment in coal should be reconsidered under different development scenarios.

h. In addition, there are other case studies that assess the changes in emissions resulting from the implementation of response measures, namely carbon taxes, in Sweden (Andersson, 2019), South Africa (Nong, 2020), and China (Fu et al, 2021), but they do not assess the associated socioeconomic within the country of study.

12. Beyond studies on developing economies, some studies examine the impacts of response measures on advanced economies. Key relevant studies include the following:

    a. Hansen et al. (2022) explore possible scenarios for phasing out oil and gas production in the Danish North Sea faster than the government's plans by 2050. The study assesses, first, the

economic impacts of different oil and gas phase-out scenarios using a Monte Carlo simulation. Based on the assessment results, the study then assesses the offshore oil and gas activities that are likely to become unprofitable for the Danish state. The report shows making 2034 a target year for the phase out to meet the 1.5°C global warming limit set in the Paris Agreement would require decisive political decisions and stakeholder engagement, as key stakeholders expect the largest part of reserves to be exploited by the end of the 2030s. At the same time, phasing out oil and gas production by 2034 will result in significant losses in state revenues that exceed losses in other scenarios, thereby making a just transition difficult without accompanying countermeasures (Hansen et al.,2022). The report also aims to promote a just transition by increasing transparency and inclusivity and raising awareness of the need to provide additional support to affected workers and communities in case of an earlier phase-out. This study is one of the few studies that examine the phasing out of fossil fuels, but does not address particularities of economic diversification in detail;

b. Lier et al. (2022) examine the transition away from fossil fuels in Norway, documenting how policy makers and representatives of businesses and civil society organisations (including trade unions and environmental groups) have outlined pathway scenarios towards net-zero carbon emissions and a phase-out vision for the Norwegian oil and gas industry. The study develops two scenarios participating in a focus group using "a so-called 'backcasting' exercise" (Lier et al., 2022). The study concludes with recommendations for relevant stakeholders and decision-makers in Norway on developing the energy sector and making the energy transition part of the existing energy sector. Specifically, the authors recommend that the government establish unambiguous energy transformation goals and timelines, then placing the debate of climate and energy transition policies along these goals in a way that can be communicated to the public and can get support from key social actors. The study recommends the government to establish industry partnerships and mutually binding agreements (possibly through novel institutional arrangements) with social partners, which are firmly based on a just transition framework and on participatory processes that include vulnerable communities and the affected workforce. The social partners should actively develop and propose measures and interventions consistent with the overall goals of expanding renewables, meeting climate targets, and developing the skill set needed in the transformation of the industrial workforce. is an important case study on the impacts of the energy transition on a fossil-fuel exporting economy but does not provide clear economic diversification considerations.

13. Relevant work by the KCI includes Technical Paper KCI/ 2021/5/4 (KCI, 2021a), which provides information about ways of assessing and analysing the impacts of the implementation of response measures and identifies possible actions and means to enhance the capacity and understanding of Parties, including collaboration with identified organizations, in the assessment and analysis of the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition. It also provides steps for assessing and analysing the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition. It also identifies areas of working with stakeholders, from mapping stakeholders to capacity building. This paper provides a literature review and high-level summary of effects of response measures on various people under various policies.
14. Technical paper KCI/2021/5/5 (KCI, 2021b) details qualitative assessment and quantitative (modelling) tools and methods which can be developed, enhanced, customised, and used for modelling and assessing the impacts of implementation of response measures. It also offers a database, compiled through stakeholder interactions with the authors and developers of the tools and methods via an online survey. The paper underscores that quantitative and qualitative methodological approaches complement each other when performing assessment and analysis of impacts of implementation of response measures.
    a. The following are the main tools and methods identified by this technical paper.
        i. Quantitative methods include:
            1. Computable General Equilibrium (CGE) models: Whole economy models based on economic data.

2. Integrated Assessment Models (IAM): Models that integrate geophysical and economic systems.
3. Macroeconometric models: Behavioural equations estimated from national accounts data.

ii. Qualitative tools/mixed methods that collect data using, for example, observation, interviews, and reviewing text,
1. Approaches such as surveys that collect non-numerical and/or numerically descriptive data for analysis

b. A key advantage of the quantitative tools is that they can quantify impacts of response measures on specific sectors of the economy (such as energy, agricultural, services sectors), specific groups (such as women or poorer households), emissions, as well as other factors relevant to micro and macroeconomic indicators and just transition. As such, these methods can be a powerful tool for evaluating policy options that countries can implement to maximize the positive and minimize the negative impacts of the implementation of response measures. However, the application of certain models may require large amounts of data (such as CGE models) that need to be available, accessible, and reliable. The provision of complete and consistent databases can be a limiting factor in the use of certain quantitative tools and methods for assessing the impact of the implementation of response measures, particularly in the least developed countries.

c. A key advantage of the qualitative tools and methods is that they can provide context specific insights, increase transparency in the policy development process and can validate empirically quantitative findings, improving the quality and relevance of impact assessments. However, they cannot provide a quantification of the impacts of response measures or indirect effects that occur as a result.

15. Draft Technical Paper KCI/2022/6/7 (KCI, 2022) offers a review of existing work that assesses and details impacts of the implementation of response measures on specific groups in vulnerable situations, taking into intergenerational equity, gender considerations and the needs of local communities, Indigenous Peoples, the youth, the elderly, the disabled, the poor, and other people in vulnerable situations. This draft paper is the first to review impacts of response measures on people in vulnerable situations under various response measures as potential case studies and examine the areas where studies are lacking. This draft paper summarizes existing literature and assessments, including existing case studies by other groups, on a specific case of people in vulnerable situations but does not offer a case study in itself. The main conclusions are the following.

a. There is relatively limited research on assessing and quantifying the social and economic impacts of response measures on people in vulnerable situations. The literature examined in this draft paper reveals that there is also an increased focus on policy making process and participation rather than on assessing impacts of the implementation of existing policies on people in vulnerable situations.

b. Among the literature reviewed in the draft technical paper, there is an evident variation and unequal coverage across the different groups within them. Women and poor populations are the vulnerable peoples' groups most examined in assessments of response measures. The literature also reveals that vulnerable peoples are consistently marginalised from the process of planning and implementing response measures.

c. The elderly are currently the most affected by climate change. The youth is the group that will be most impacted in the future by both climate change and current implementation of response measures Disabled people are almost absent from the assessments of impacts of response measures on people in vulnerable situations or larger populations.

d. The poor feature in various studies of impacts of response measures on them, possibly because the largest impacts of climate change would fall on them. The implementation of response measures such as carbon taxes, phasing out of coal and reduction of fossil fuel subsidies affects poor households and particularly rural ones (which tend to be poorer than their urban counterparts), by raising energy and non-energy prices and exacerbating their poverty and welfare losses. Labour working in those industries will also be negatively affected through job and welfare losses, although some would benefit from retraining and opportunities in new clean energy sectors.

e. A common theme emerges in the studies and inputs from stakeholders reviewed in this technical paper, namely that engaging vulnerable peoples in the process of designing and implementing response measures is key to the latter's success along with harnessing indigenous knowledge, increasing awareness and technology transfers, and implementing policies to reduce vulnerable peoples' vulnerabilities. The examined literature shows that the effectiveness of mitigation policies increases by incorporating diverse knowledge and input from stakeholders from different groups within the vulnerable peoples.

f. The analysis and conclusions of this technical paper point to an urgent need for further research for measuring impacts of response measures on the vulnerable peoples, for incorporating the ensuing research results in the design of response measures, and for designing policies that reduce negative impacts of response measures on vulnerable peoples.

g. As data on the vulnerable people are not always readily available in economic and labour force data, the research needs to also include qualitative analysis as well as primary research based on direct input and engagement from the vulnerable groups on their experiences and knowledge. Meaningful engagement with vulnerable people should also involve discussions with and representation from the vulnerable peoples in policy discussions to identify impacts on response measures on them and ways of reducing negative impacts, and to incorporate their input in the design and implementation of in-jurisdiction and global mitigation policies.

III. Gaps in assessments and possible options for case studies

16. In determining an area where the KCI may develop a case study, as appropriate, only the relevant existing work prepared by the KCI, the forum, and external groups have been examined. This examined work focused on existing case studies and methods for measuring impacts of the implementation of response measures.
17. The existing studies also highlight that there are opportunities to further measure the impacts of the implementation of response measures, especially on people in vulnerable situations, in part because of the lack of available data and required technical skills and other resources. Furthermore, within the various options of response measures, the existing studies focus on carbon taxes on certain energy or non-energy industries, but there is a significant gap in studies assessing energy transitions, the critical goals of economic diversification and just transition necessary for managing impacts of the response measures, especially in the least developed countries.
18. The aforementioned work reviewed in Section II highlights that quantifying assessments of the impacts of the implementation of response measures and of policies that mitigate the negative effects requires the use of quantitative methods. Nevertheless, the lack of data required to implement these methods implies that focusing solely on quantitative methods-based assessments would largely limit the possibilities of viable case studies that can be replicated and/or generalized to other cases. It would thus disadvantage a significant portion of countries, impacted sectors, and peoples in vulnerable situations as they could not be the subject of the case study or future case studies. Focusing on studies that implement quantitative methods could also entail a lengthy process if data gathering is required given the detailed levels required for the implementation of quantitative methods. Replicating these studies in a timely manner is difficult and would exceed the time by which these assessments are required.
19. Therefore, to widen the scope of assessment and filling the gaps in the existing studies, it is increasingly important to rely on mixed methods that can expand the possibilities of case studies and their replication in a timely manner. This approach would also enable the examination of multiple response measures and the assessment of multiple factors concerning economic diversification and just transition in a way that could be meaningful for policy making.
20. Consequently, in evaluating various potential areas for development of a case study, this concept note has put emphasis on options that could employ mixed methods and use available data and, therefore, be undertaken and replicated and facilitate the development and exchange of information.
21. Accordingly, and based on reviews of existing studies and the gaps in existing research, various areas for potential development of a case study have been considered, and their suitability has been evaluated. The

criteria for proposing the three areas and selecting the final proposed area where a case study may be developed are the following:

a. Options that enable **the examination of a regional, country- and/or sector-specific case studies.**
b. A case study that can facilitate the development and exchange of regional, country- and/or sector-specific case studies and approaches on economic diversification and transformation and just transition of the workforce and creation of decent work and quality jobs.
c. A case study that can facilitate the development and exchange of regional, country- and/or sector-specific case studies and approaches on assessment and analysis of the impacts of the implementation of response measures with a view to understanding the positive and negative impacts, including both intended and unintended consequences.
d. Data availability that can enable the assessment of the case study, with a preference for data available in the public domain.
e. A case study that enables the use of quantitative/qualitative/mixed methods to assess the impacts of climate policies/response measures.
f. A case study that can be done within a timeframe of no more than 16 months.
g. A case study that has generic implications and conclusions that are not too unique to the case study's circumstances, but a case study that can be replicable and applicable to other regions, countries, and/or sectors.

22. Based on the aforementioned criteria and upon review of the relevant work (done by the KCI, the forum, and external groups), this concept note proposes the following three options as potential areas where a case study may be developed, as appropriate, by the KCI:

a. ***Option 1- Country-specific case study***: Assessing the effects of the global energy transition (such as the reduction of hydrocarbon export demand due to global energy transitions and rising climate policies) in a fossil-fuel dependent economy, taking into account people in vulnerable situations (or subsections of them), as well as efforts toward economic diversification and just transition.
b. ***Option 2- Region-specific case study***: Assessing impacts of the implementation of emissions reductions climate policies, such as a global carbon tax, on Southeast Asian export-oriented economies and households, taking into account people in vulnerable situations (or subsections of them).
c. ***Option 3- Sector and region-specific case study***: Assessing impacts of increasing fuel costs on resource-dependent, carbon-intensive tourism sectors in the region or in specific islands of Caribbean and the Pacific region, taking into account people in vulnerable situations (or subsections of them).

23. In evaluating which option is a suitable case study, the following paragraphs summarize the reasons each option is proposed as well as the merits and challenges of undertaking each case study.

a. **Option 1-*Country-specific case study***: Assessing the effects of the global energy transition (such as the reduction of hydrocarbon export demand due to global energy transitions and rising climate policies) in a fossil-fuel dependent economy, taking into account people in vulnerable situations (or subsections of them), as well as efforts toward economic diversification and just transition.
    i. Overview: This option addresses the energy transition, which is both a common and a significant issue facing all economies around the world. The rising efforts in recent years to mitigate climate change have seen a rapid acceleration of the energy transition, which entails a move away from fossil fuels in the energy and power systems towards cleaner forms of energy, most notably renewable energy. The global energy transition affects fossil fuel importing economies as well as fossil fuel producing economies who rely on fossil fuels in local energy consumption and, in some instances, exports. The energy transition response measures could thus include both the global energy transition, i.e., decline in demand for fossil fuels mostly by advanced economies, as well as the energy transition domestically through the expansion of renewables and the phasing out of fossil fuel sectors, such as unabated coal-based and oil-based power plants. This case study could be undertaken using both quantitative as well as qualitative/mixed methods assessments. The quantitative tools

could address high-level macroeconomic impacts as well as sectoral-specific impacts, including impacts on jobs as well as fossil fuels and other economic sectors. The qualitative/mixed methods are based on expectations of economic theory and information in the existing literature, and could be coupled with additional data that will be gathered through surveys. The proposed results include impacts of the implementation of response measures on the socio-economic and sectoral impacts at the national/sectoral level and, if appropriate, could be supplemented by, inter alia, indicators on economic diversification and just transition that would arise from the results.

ii. Advantages: The main advantage of this case study is that it addresses a topical issue that addresses various countries and regions and is at the heart of issues impacting economic diversification, just transition, energy access, and socio-economic development. For fossil fuel exporting economies, the global energy transition as well as domestic energy transition plans represent a need for economic diversification and just transition plans as fossil-based export industries are phased out, which, in some instances, impacts government revenues and economic developments. As such, this case study represents an important element that needs to be addressed by policymakers.. This option is also timely as it could help countries better understand ways to facilitate just transition while undertaking their COP26 commitment to the phasing down of unabated coal and phasing out of inefficient fossil fuel subsidies. Finally, the outcomes of this case study would be country specific and, therefore can be replicated and implemented for other countries and/or sectors as well as other regions. As such, they have potentially large applicability for a wide range of countries, sectors, and other case studies because they are country specific and, therefore, offer the most benefit and relevance for undertaking Activity 7 of the work plan of the forum and its KCI.

iii. Challenges: The primary challenge for this option is the availability of sectoral data for some of the fossil fuel dependent economies to address inter-sectoral, secondary, and detailed household effects. Should sufficient data not be available, the data gathering endeavour that could then be undertaken as part of this case study would fill part of the gap in data to a point that could enable the assessment of the impacts of the energy transition which could help in policy making to address impact of response measures.

b. ***Option 2- Region-specific case study***: Assessing impacts of the implementation of emissions reductions climate policies, such as a global carbon tax, on Southeast Asian's export-oriented economies and households, taking into account people in vulnerable situations (or subsections of them).

i. Overview: Climate mitigation policies that aim at reducing global emissions, including carbon taxes, are an important component of policy instruments and have been shown to be among the most effective policies in reducing emissions. The implementation of these instruments has accelerated in recent years. As Southeast Asian economies have vast industries that target the exportation of energy-intensive products—such as electronics, consumables, and extractive minerals—, they will be impacted by the implementation of carbon taxes. The case study could be undertaken using quantitative, where possible, as well as qualitative/mixed methods assessments, with a heavier reliance on qualitative/survey-based methods due to the lack of available data. The results of qualitative/mixed methods are based on expectations of economic theory, data gathered through surveys, and information from the existing literature, where available.

ii. Advantages: This is an appealing case study as it addresses a significant impact to the exports and socioeconomic development of export-oriented Southeast Asian economies and would have effects at the economic, sectoral, labour, household, and individuals' levels. As such this case study would be very helpful for countries in this region and would also have lessons applicable to other export-dependent economies.

iii. Challenges: The main challenge of this case study is the lack of country-level data and the ensuing challenge of undertaking country-level assessments in Southeast Asian export-

oriented economies. As such, the results of the case study could have limited applicability due to their generic nature. While the result would indeed help in policy making in specific countries, the generic nature of the results and the ensuing policy lessons limit the extent to which these policies could be meaningful in different industries or countries. As such, a meaningful implementation of these policy lessons would require coupling these policies with country- and sector-specific data. Finally, any set of indicators that could be developed under this case study would be region-specific and, therefore, would have limited applicability to specific countries and/or sectors.

c. ***Option 3- Sector and region-specific case study***: Assessing impacts of increasing fuel costs on resource-dependent, carbon-intensive tourism sectors in the region or in specific islands of Caribbean and the Pacific region, taking into account people in vulnerable situations (or subsections of them).

i. Overview: Islands of Caribbean and the Pacific region are often tourism-dependent and also impacted negatively by climate change. Yet tourism is an energy-intensive industry for these islands as it involves travel over large distances which tends to be carbon intensive. The case study could be undertaken using quantitative, where possible, as well as qualitative/mixed methods assessments, with a heavier reliance on qualitative/survey-based methods due to the lack of available data. The results of qualitative/mixed methods are based on expectations of economic theory, data gathered through surveys, and information from the existing literature, where available.

ii. Advantages: The strength of this case study is that it addresses a key sector- tourism- that is at the heart of impacted sectors of the implementation of response measures. In addition to contributing to the macroeconomic development of a large set of islands, the tourism sector is typically labour-intensive so affects the livelihood of large sections of the population of said islands including people under vulnerable situations. As such, this case study would be applicable to a large set of economies and groups.

iii. Challenges: The main challenge of this case study is the lack of country-level data and the ensuing challenge of undertaking country- or economy-level assessments in the islands of Caribbean and the Pacific region. As such, the results of the case study could have limited applicability due to their generic nature. While the result would indeed help in policy making, their generic nature of the resulting policy lessons limit the extent to which these policies could be meaningful in different industries or countries. As such, a meaningful implementation of these policy lessons would require coupling these policies with country- and sector-specific data. Finally, any set of indicators that could be developed under this case study would be region-specific and, therefore, would have limited applicability to specific countries and/or sectors.

24. Based on the aforementioned opportunities and challenges/limitation of every proposed option, this concept note selects Option 1 as the area where a case study may be developed by the KCI, as appropriate. This option is selected because, among the proposed options, it has the most range of applicability and relevance to assessing impacts of the implementation of response measures in other economies and, therefore, will be the most helpful in aiding policy making of policies that can support economic diversification and just transition, as well as maximize the positives and minimize the negative impacts.
25. The final selection of the country/region/sector of the case study would be selected based on inputs from the KCI and decisions by the KCI members.

IV. Outline for proposed case study:

26. **The case study overview:** The proposed case study involves undertaking an assessment of the effects of the global energy transition (such as the reduction of hydrocarbon export demand due to global energy transitions and ambitious climate policies) in a fossil-fuel dependent country, taking into account people in vulnerable situations (or subsections of them), as well as efforts toward economic diversification and just transition. The case study could involve the following stages and data:

a. Data gathering based on data available in the public domain about the facts and circumstances of the case study;
b. Analysing the collected data on the response measure and the possible sectors, people groups, industries, and economic indicators that would be affected by the reduction of hydrocarbon export demand and the energy transitions;
c. Selecting the quantitative method of analysis based on assessments of the data available for the selected country and the type of supporting qualitative method, as needed;
d. Selecting the qualitative methods of analysis, which could be used to gather additional data, in particular relating to economic diversification and just transition efforts, through survey preparation with inputs from stakeholders, determination of the participants list and the dissemination of the survey;
e. Analysing the collected data, as required;
f. Preparing and implementing quantitative as well as qualitative/mixed methods assessments of the various aspects and results;
g. Assessing impacts of the response measures based on the collected data in a way that is grounded in solid economic theory coupled with existing understanding of facts and circumstances of the case study and the data and information collected through the surveys;
h. Assessing how existing and planned efforts related to economic diversification and just transition relate to the possible impacts;
i. Undertaking assessments of the various data based on the combination of indicators that are constructed for assessments;
j. Preparing various policy recommendations that could support economic diversification and just transition, as well as maximize the positive and minimize the negative impacts of the implementation of the response measures
k. Preparing the draft case study report to be reviewed by the KCI;
l. Amending the draft case study report based on inputs from the KCI;
m. Finalising the case study report;

27. **Methods**: The methods used in the case study will be quantitative data-based assessments and qualitative/mixed methods tools. The type of quantitative methods and modelling tools that will be implemented will be determined upon gathering and evaluating the available data on the case study, after which the additional complimentary qualitative/mixed methods will be selected accordingly. Implementing these selected methods will first rely on publicly available data that will be gathered from the public domain. The quantitative tools will be supplemented by qualitative/mixed methods, based on information from existing literature and well-established economic theory as the foundational basis for assessments to describe economic dynamics and the estimated impacts of the assessments of the implementation of response measures. If data available in the public domain are insufficient for implementing economic modelling tools to assess socio-economic and industrial impacts of the implementation of the response measure (energy transition), then additional data will be gathered through surveys. The surveys will be conducted through on-line platforms and will be anonymous to ensure higher participation rates. Additional discussions with the stakeholders could be used to gather data about the impacts of response measures and the responses. These surveys will provide data that can provide context on specific insights, increase transparency in the policy development process and can validate empirically quantitative findings, thereby improving the quality and relevance of impact assessments.
28. **Output and relevance to the KCI activities**: The main output of this study could involve the following, inter alia:
    a. Assessment of the impacts of the implementation of response measures on the socio-economic and sectoral impacts at the national/sectoral level(s), including impacts on macro-economic indicators where and if possible, growth, economic structure, sectoral output, jobs, and distributional effects on households in the country/region/sector of the case study selected by the KCI. The assessment will also consider ongoing and planned efforts to enable economic diversification and just transition within the country. Further, only to the extent possible by the

available data and the existing literature, the assessment would attempt to include impacts on people in vulnerable situations in general terms.

b. The preparation of two sets of indicators that can be implemented by other case studies (regions, countries, sectors, and industries) to assess impacts of responses measures and progress towards policy target and, therefore aid policymakers and stakeholders in policy making. The set of indicators would cover the following:
    i. Economic diversification of existing sectors and the possible development, where possible, or climate-friendly diversified (new or existing) sectors;
    ii. Just transition factors that extend beyond labour and employment considerations and take into account people in vulnerable situations (or subsections of them).

29. **Data**: The case study could use two types of data:
    a. Data about the case study's economy and sector available in the public domain, including but not limited to:
        i. National accounts and economic indicators and performance;
        ii. The availability of an input-output or a supply-use table(s) for the country, if possible
        iii. Data on the energy transition globally;
        iv. Details of the country's fossil fuel sector, including policies/plans for economic diversification and/or just transition, energy sector composition, domestic consumption, export profile, energy transition plans, emissions profile;
        v. Labour and employment, including where possible, skills, gender, income groups, and other groups, as well as information on other national industries that may exist;
        vi. Population, including indigenous and local community composition and concentration in areas that could be impacted by energy transition projects, if applicable.
    b. Data on the sectors and people in vulnerable situations as well as policy targets, which will be collected using surveys that will be prepared as part of this case study.
30. **Advantages and limitations**: The main strength of this assessment is that, in assessing national/sectoral impacts of the selected response measure, the case study combines the application and expectations of economic theory with data collected from the public domain and stakeholders as well as understanding of case study's economic and sectoral dynamics. To the extent that data are available in the public domain for the selected country to enable the implementation of economic models, the quantitative assessment will enable the measurement of socio-economic and industrial impacts of the response measure while capturing indirect intersectoral and labour-energy linkages or second-best effects that could arise. Where the impacts cannot be reliably quantified, the resulting expected direction of the expected impacts (such as an increase or a decrease) will be correct or indicative of the actual direction of impact because it will be based on expectations of economic theory and the case study's economic dynamics under the used assumption and factors. In addition, by complementing the quantitative with qualitative/mixed methods, the study can examine cases that otherwise cannot be examined in quantitative-only based assessments. Similarly, the combination of both methods increases the possibility of replicating the case study to other countries, regions, or sectors. At the same time, the main limitation of this study would be in the event that the selected case study does not have publicly available data that would enable the application of economy-wide models (such as an economy-wide general equilibrium model). Should that be the case, then the selected quantitative method cannot quantify or capture indirect intersectoral and labour-energy linkages or second-best effects that could arise from the implementation of response measures and any policy responses to them.
31. **Timeline(s)** for development of the case study: This completion of this study would require 12 to 14 months to complete all stages.

V. References

Da Costa, M. A. R. T., Stoefs, W., Cosbey, A., & Marcu, A. (2021). *Reporting on the Impacts of Response Measures: Chile Country Case Study*. Brussels: European Roundtable on Climate Change and Sustainable Transition (ERCST). https://secureservercdn.net/160.153.137.163/z7r.689.myftpupload.com/wp-content/uploads/2019/12/ERCST-Reporting-on-the-impacts-of-Response-Measures-Chile-country-case-study.pdf

Hansen, D. S., Madsen, P. T., Sperling, K. Mathiesen, B. V. (2022). *Why wait until 2050? Exploring possible scenarios for phasing out oil and gas production faster than planned in the Danish North Sea.* Oil and Gas Transitions. https://oilandgastransitions.org/wp-content/uploads/2022/09/Why-wait-until-2050-phasing-out-oil-and-gas-in-Denmark.pdf

IPCC (2022a). *Climate Change 2022: Impacts, Adaptation, and Vulnerability.* Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. In Press.

KCI 6th Meeting Report (2022). https://unfccc.int/sites/default/files/resource/Meeting%20Report%20KCI6%20-_Final.pdf

KCI (2021a). *Enhancing the capacity and understanding of Parties, through collaboration and input from stakeholders, on the assessment and analysis of the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition*. KCI/2021/5/4. https://unfccc.int/sites/default/files/resource/TP_Capacity%20building_KCI5.pdf

KCI (2021b). *Facilitating development, enhancement, customization and use of tools and methodologies for modelling and assessing the impacts of implementation of response measures, including identifying and reviewing existing tools and approaches in data-poor environments, in consultation with technical experts, practitioners and other relevant stakeholders*. KCI/2021/5/5. https://unfccc.int/sites/default/files/resource/TP_Facilitation_KCI5.pdf

KCI (2021c). *Facilitate, exchange and share experiences and best practices on the assessment of the environmental, social and economic co-benefits of climate change policies and actions informed by the best available science, including the use of existing tools and methodologies.* KCI/2021/5/7. https://unfccc.int/sites/default/files/resource/Call%20for%20inputs%20for%20KCI%20workplan%20activity%2011%20co-benefits.pdf

KCI (2022). Draft technical paper on identifying and assessing the impacts of the implementation of response measures taking into account intergenerational equity, gender considerations and the needs of local communities, indigenous peoples, youth and other people in vulnerable situations. KCI/2021/6/7. https://unfccc.int/sites/default/files/resource/KCI6_7_TP%20Draft%20%20technical%20paper%20on%20vulnerable%20groups_0.pdf

Lier, D. J., Houeland, C., Holmås, H. E., Szuleck, K., Østring, P. R. (2022). *Petroleum Transition Pathways in Norway: How do Norwegian stakeholders envision pathways to net-zero and phase-out for the country's oil and gas sector?*.Oil & Gas Transitions. https://oilandgastransitions.org/wp-content/uploads/2022/09/Petroleum-Transition-Pathways-in-Norway.pdf

Marcu, A., Monciatti, M., & Cosbey. A. (2021). *Reporting on the Impacts of Response Measures Ghana Case Study*. Brussels: European Roundtable on Climate Change and Sustainable Transition (ERCST). https://ercst.org/wp-content/uploads/2021/11/Reporting-on-the-Impacts-of-Response-Measures-Ghana-Case-Study.pdf

McDonald, S., Shutes, L, Thierfelder, K., Shehabi, M. (2020). *Assessing impacts of the implementation of response measures: The case study of Senegal and Kenya: A Computable General Equilibrium Analysis.* Report published with the UNFCCC https://unfccc.int/sites/default/files/resource/RM_case_study_Senegal_Kenya.pdf

Oie, P. Y. & Mendelevitch, R. (2018). Prospects for steam coal exporters in the era of climate policies: A case study of Colombia. Climate Policy, p. 73–91. https://doi.org/10.1080/14693062.2018.1449094

Shehabi, M. (2017). *Assessing Kuwaiti Energy Pricing Reforms*. Oxford Institute for Energy Studies. https://doi.org/10.26889/9781784670931

Shehabi, M. (2022). Modeling long-term impacts of the COVID-19 pandemic and oil price declines on Gulf oil economies. *Economic Modelling*, *112*, 105849. https://doi.org/10.1016/j.econmod.2022.105849

UNFCCC (2022). *Response Measures.* Retrieved from: https://unfccc.int/topics/mitigation/workstreams/response-measures

UNFCCC (2008). Consideration of information on potential environmental, economic and social consequences, including spillover effects, of tools, policies, measures and methodologies available to Annex I Parties (FCCC/KP/AWG/2008/L.17).

UNFCCC (2015). *Report of the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 13 December 2015*, Addendum. https://unfccc.int/sites/default/files/resource/docs/2015/cop21/eng/10a01.pdf

Weitzel, M., Ghosh, J., Peterson, S., & Pradhan, B. K. (2015). Effects of international climate policy for India: Evidence from a national and global CGE model. *Environment and Development Economics*, 20(4), 516–538. https://doi.org/10.1017/S1355770X14000424.