Nature Climate Change: Supplementary Information for

“The fourth pillar of inequality? Different levels of policymakers’ scientific scenario knowledge widen the gap between World regions”

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# Sample and methods

First, pre-interviews were made with policy supporters and enablers to prepare the survey and two follow-up interviews. Second, we examined a sample of 62 UNFCCC COP25 delegates, primarily national focal points, i.e., formally listed contact persons for the respective parties. For COP25, 299 were listed as National Focal Point and representative contact persons for each party (196 of 197 parties), representing semi-industrialized non-Annex1 (80%) and industrialized Annex1 countries (20%) (UNFCCC, 2020). COP-25 at Madrid had about 25,000 participants, party and non-party stakeholders (UNFCCC, 2021). About 10,000 observer organizations and about 13,600 were party representatives (UNFCCC, 2019).

In a first invitation round, we distributed a survey in English and Portuguese via email to 120 delegates (113 national focal points and seven non-focal points) and sent two reminder emails. We emailed all UNFCCC National Focal Points (299) in a second round – 21 emails were returned. Sixty-two answered the survey partially or entirely, making a response rate of 22%. Participants could respond via a link in the email to an online survey generated in SurveyXact.

Regional sample descriptions are shown in Table 1.

Table 1. Invited participants (national focal points).

|  |  |  |
| --- | --- | --- |
| **Category** | **Count** | **Share** |
| **non-Annex1** | 238 | 80% |
| **Annex1** | 61 | 20% |
| **Total** | 299 |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Region** | **Count** | **Share** |
| **Non-Annex 1** | Africa | 13 | 21% |
| (61%) | Latin Am | 9 | 15% |
|  | Asia | 9 | 15% |
|  | Island state | 7 | 11% |
| **Annex 1** | Europe/EU | 21 | 34% |
| (39%) | US | 1 | 2% |
|  | AUS/NZ | 2 | 3% |
| **Total** |  | 62 | 100% |

The sample included 39 participants from least, semi, and newly industrializing non-Annex 1 countries (63%) and 23 from industrialized Annex 1 countries (37%), significantly representative of the examined population. Most Annex 1 participants represented European countries (18), with fewer responses from the United States (1), Australia (2), and Asia (0). However, this is a logical consequence of the methodological choice of examining the national focal point population. The average age was 45 years – non-Annex 1 (Mean(M)=43) and Annex 1 participants (M=48). The participants identified their primary work role as either policymaker, researcher, or stakeholder/other (Table 3). For the analyses, we grouped informants by their role in policymaking (policy advisors/supporters (29) vs. policy enablers (29), which is sometimes compared with their role at the COP (Table 2). The two categories are grouped by least, semi, and newly industrializing non-Annex 1 and industrialized Annex 1 country representatives.

Table 2. Participant classifications for analysis: Role in Policymaking (& UNFCCC role)

|  |
| --- |
|  **Role in policymaking UNFCCC role** |
|  | Policy AdvisorsAdvisory, informing or following roles | Policy enablersCoordinating or leading roles | UNFCCC delegate & non-negotiator | UNFCCC negotiatorParticipated in formal COP negotiations |
| All (count) | 29 | 29 | 13 | 39 |
| Share (%) | 50% | 50% | 24% | 66% |
| non-Annex 1\* | 14 | 22 | 5 | 26 |
| Share (%) | 39% | 61% | 14% | 75% |
| Annex 1 | 15 | 7 | 8 | 12 |
| Share (%) | 68% | 32% | 36% | 55% |

\* Least, semi, and newly industrializing countries

Table 3. Primary work role

|  |  |  |  |
| --- | --- | --- | --- |
|  | Policymaker | Researcher | Stakeholder |
| All | 39 | 11 | 8 |
| Share (%) | 67% | 19% | 14% |
| non-Annex 1 | 28 | 4 | 4 |
| Share (%) | 78% | 11% | 11% |
| Annex 1 | 11 | 7 | 4 |
| Share (%) | 50% | 32% | 18% |

For the analyses, we compare and analyze the perceptions of UNFCCC delegates and national policymakers grouped by their role in policymaking: *"Policy advisors & supporters"* (50%) vs. *"Policy enablers"* (50%). The first group comprises informants with an advisory role (35% of total), informative or following role in policymaking (6%), or other or no stated role (8%). The policy enablers comprise informants with a leading role (37%) and a coordinating role (13%) in policymaking.

Additionally, we analyze and compare the perceptions between *"UNFCCC non-negotiators"* (24%) (UNFCCC delegates with no negotiation experience) and *"UNFCCC negotiators"* (65%). UNFCCC non-negotiatorscomprise the group of party members who did not participate in formal negotiation actions, like taking the microphone in plenary sessions. The number of participants with UNFCCC experience comprises 89% of the total respondents. That they do not sum to 100% can be explained by the fact that focal points have been shared with colleagues (7) who have no negotiation experience or did not answer that question in the survey.

# Interviews, survey, and question coding

## Interviews

Table 4. Interviewed researchers, policymakers, and UNFCCC delegates

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Nationality | Role | IPCC author(IPCC session delegate) | UNFCCC delegate | Interview locationYear: 2019 |
| Antonina Ivanova | Bulgaria/Mexico | ResearcherInforming policy | 2002-AR4, AR5, AR6(WC/WG3 2008-2015) |  | Skype (La Paz, Mexico) |
|  |  |  |  |  |  |
| Tom van Ierland | Belgium | Policymaker/Researcher(European Commission)Former UNFCCC negotiator) |  | 2008-2018Represent EU | Telephone (Brussels) |
| Allen Fawcett | United States | Policymaker/researcher |  |  | Microsoft Teams (Washington DC) |
| Klaus Radunsky | Austria | UNFCCC Delegate, Policymaker | IPCC delegate (Austria) | UNFCCC delegate (EU) | Email |
| Pedro Barata | Portugal | UNFCCC delegate, a former negotiator |  | 1999-2020 | Zoom (Lisbon) |
| Halaze Manhice | Mozambique | Policymaker/researcher |  |  | Zoom (Maputo) |
| Jyoti Parikh | India | Researcher/guiding policy | Review editor (SRES) |  | Skype (New Delhi) |
| Jim Skea | United Kingdom | IPCC Chair | LA: 2AR, 3AR; VC: AR5, SP1.5, AR6  |  | Skype (London), 2018 |

Table 5. Interviewed researchers and scenario developers

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Nationality | Scenario development | IPCC author(IPCC session delegate) | UNFCCC delegate | Interview locationYear: 2018 |
| Dennis Tirpak | United States | SA90 | AR1, AR4(1989) | 1992-1995 | Skype |
| Pier Vellinga | Netherlands | SA90 | COC: AR1, AR2; LA: AR3  | 1989-1992 | Skype |
| James Edmonds | United States | SA90-SSP/RCP  | AR1 to AR6 |  | Denver University (US), Lisbon (Portugal) |
| Rob Swart | Netherlands | SA90, IS92, SRES | AR1 to AR4 |  | Skype, Lisbon (Portugal) |
| William Pepper | United States | IS92, SRES |  |  | Washington D.C. |
| Ged Davis | United Kingdom | SRES |  |  | Skype |
| Detlef van Vuuren | Netherlands | SRES, RCP, SSP | AR4, AR5 |  | The Hague (Netherlands) |
| Kasper Kok | Netherlands | SSP |  |  | Skype |
| Kirsten Halsnæs | Denmark |  | AR4 & AR5 |  | Copenhagen (Denmark) |
| Filipe Duarte Santos | Portugal |  | Reviewer: AR5 | 2000-present | Lisbon (Portugal) |
| Maria Figueroa | Venezuela |  | AR5 & AR6 |  | Copenhagen (Denmark) |

The policymaker interviews followed the following semi-structured question guide:

1. Social variables
	1. What is your nationality
	2. Your role/occupation (can also be your previous role)
		1. Researcher
		2. UNFCCC Delegate
		3. Politician
		4. Policymaker
		5. Other [which?]
	3. Which country do you represent in intergovernmental processes (e.g., IPCC, UNFCCC)?
		1. IPCC representation: [years/reports],
		2. Participation in IPCC sessions or other IPCC intergovernmental forums [yes/no, years]
		3. UNFCCC representation: [which years]

1. Main (research) questions
2. It seems like you know the tool of “**emissions scenarios**” quite well? Is that correct?

 Not at all(1), not really(2), in-between(3), yes(4), yes totally(5)

1. Do you find the emissions scenario to be policy-relevant?

Not at all(1), not really(2), in-between(3), yes(4), yes totally(5)

1. Which scenarios do you consider **most** policy-relevant
2. Other regions/ countries? Do they use scenarios to model for policymaking?

UNEP, CAT, Others

1. In which way are emissions scenarios relevant (or not relevant)
2. Do they support raising awareness of causes/emissions drivers?
3. Do they provide topics to discuss in negotiations? Do they support specific arguments for or against mitigation in negotiations? Or
	* + 1. Do they support the development of roadmaps/actionable policy options for climate mitigation? Adaptation?
4. Do they provide topics to implement in international treaties?
5. Do they provide topics/causes to implement in international national policies?
6. Do they effectively explore plausible future socio-economic developments?
7. Are you satisfied with the emissions scenarios informing the IPCC assessments?

Not at all(1), not really(2), in-between(3), yes(4), yes totally(5)

1. What are their weaknesses/strengths?
2. How can scenarios be improved to support policymaking
3. How can scenarios be improved to support UNFCCC intergovernmental processes
4. In your perspective, you see the benefits of involving policymakers and stakeholders in scenario development? (yes - no)
5. There is a risk that it will affect the scenario developments significantly

Not at all(1), not really(2), in-between(3), yes(4), yes totally(5)

1. There is a risk that it will affect the emission range

Not at all(1), not really(2), in-between(3), yes(4), yes totally(5)

1. Who else should I interview?

## Survey questionnaire

|  |
| --- |
| Thank you for participating in our survey! As an expert in climate change and policymaking, your knowledge is essential to understand the role of scientific knowledge in policymaking in various countries.Your answers are voluntary, but your opinions are important. Your responses will remain anonymous and will only be reported in aggregate. Depending on your answers' length, the survey should take between 10 and 18 minutes to complete.Thank you in advance for your cooperation and insights.Questions or challenges with the survey? Email: japedersen@fc.ul.pt.**(1/4) Initial questions about you and your role:** |

A. Your nationality, residence country, and age

|  |  |
| --- | --- |
| Your nationality | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Your country (the country you represent) | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Your age | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

B. Regarding your work with climate change, which of the following matches your role (or previous role) the best?

(1) ❑ researcher

(2) ❑ Policymaker

(3) ❑ Politician

(4) ❑ Stakeholder

(5) ❑ Other (please specify) \_\_\_\_\_

C. Which of the following best describes your role regarding policymaking?

(2) ❑ Informing role (neutrally informing)

(1) ❑ Following role (e.g., policy wishes are guiding your work/research)

(3) ❑ Advisory role (e.g., guiding policy options)

(4) ❑ Leading role (e.g., forming policies)

(7) ❑ Coordinating policy

(6) ❑ No role

(5) ❑ Other (please specify) \_\_\_\_\_

F. In your opinion, how important is it to act now and anticipate the future to avoid future events of ...

|  | Not important | Low importance | Neutral | High importance | Very high importance |
| --- | --- | --- | --- | --- | --- |
| Terror | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |
| Pandemics | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |
| Climate change-related impacts | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |
| Biodiversity loss | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |

D. Have you participated in IPCC/UNFCCC intergovernmental sessions or other policy activities? (if not, then you can continue to the next question)

|  | If yes, Please add the years/periods of participation (e.g., "2012, 2015-2019") |
| --- | --- |
| In IPCC | \_\_\_\_\_ |
| UNFCCC | \_\_\_\_\_ |
| National policymaking | \_\_\_\_\_ |
| Regional policymaking (e.g., UNASUR, EU, Pacific Affairs) | \_\_\_\_\_ |

E. Are you or have you been a UNFCCC negotiator?

(1) ❑ Yes, I am currently a UNFCCC negotiator

(2) ❑ Yes, I am a former UNFCCC negotiator

(5) ❑ I have been a negotiator in another intergovernmental forum (please specify) \_\_\_\_\_

(3) ❑ No, I have not been

|  |
| --- |
| (2/4) Scientific knowledge, policymaking, and emissions scenarios  |

|  | Highly delaying policy actions (3) | Moderately delaying (2) | Slightly delaying (1) | Neutral (0) | Slightly driving (1) | Moderately driving (2) | Highly driving policy actions (3) |
| --- | --- | --- | --- | --- | --- | --- | --- |
| a. Scientific knowledge about climatic changes in the future | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |
| b. Recorded national climate-related impacts/catastrophes | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |
| d. Economic assessments of the cost of national mitigation actions vs. no-action  | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |
| c. Economic assessments of future climate-related impacts | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |
| e. Voter's interests (e.g., national public opinion) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |
| f. Public media debate | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |
| g. Advocacy/interests of NGO's | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |
| h. Advocacy/interests of fossil energy industries | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |

1. In your opinion, which of the below factors is either "Delaying" (left) or "Driving" (right) climate mitigation policy actions (emissions reductions) in your country?

(1) What is the most important driver? (Has anything changed over time?)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. In a national context, which of the following types of "Scientific knowledge" are useful to design "mitigation (emission reduction) policies" in your country?

Assessments of ...

|  | Not at all | Not really (to a low degree) | In-between (maybe) | Yes, to some degree | Yes, to a high degree |
| --- | --- | --- | --- | --- | --- |
| .. possible future temperature rises and climatic changes (e.g., climate scenarios) | (0) ❑ | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ |
| .. possible future climate change-related impacts (e.g., impact scenarios) | (0) ❑ | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ |
| .. possible future socioeconomic developments and emissions trends (e.g., emission scenarios) | (0) ❑ | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ |
| .. recommended policy actions and their time estimates (e.g., roadmaps) | (0) ❑ | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ |
| .. economic costs of future climate-related impacts | (0) ❑ | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ |
| .. economic costs of mitigation actions vs. no-action  | (0) ❑ | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ |

(2) How can scientific knowledge be improved to better support NATIONAL policymaking?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Emission scenarios (some people know them, and others don’t): Honestly, how well do you know the scientific tool of emission scenarios?

*Description: Emissions scenarios describe future pathways and projections of future global socioeconomic developments and associated greenhouse gas emissions in, for instance, 2030, 2040, 2050, and 2100.*

(1) ❑ No, I don't know them at all

(2) ❑ Not really (I may have heard about them)

(3) ❑ In-between (I have heard about/seen them but not sure what they express)

(4) ❑ Yes, I know them (I have seen them and know a little about the variables included)

(5) ❑ Yes, I know them very well (I know several variables and what the scenarios express)

(6) ❑ I participated in the developments of some scenario series

4. In a national context, have the "emission scenarios" used in IPCC assessment reports been policy-relevant? (e.g., supported designing national mitigation policies in your country?)

|  | Not at all | Not really (to a low degree) | In-between (maybe) | Yes, to some degree  | Yes, to a high degree | I don't know |
| --- | --- | --- | --- | --- | --- | --- |
| SA90 (informing the 1st IPCC Assessment Reports (1990)) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| IS92 (informing the "IPCC 1992-supplementary report" & "2nd IPCC Assessment Reports (1995)")  | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| SRES (informing the 3rd & 4th IPCC Assessment Reports (2001 & 2007)) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| RCPs (informing the 5th IPCC Assessment Reports (2013/2014)) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| SP1.5 pathways (IPCC special report 2018) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| SSP-RCP combinations (informing the 6th IPCC Assessment Reports (planned 2021)) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |

(4) How do they support (or don't support) national policymaking?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Have scenario series (outside the IPCC context) been policy-relevant, e.g., been useful for national policymaking?

|  | Not at all | Not really (to a low degree) | In-between (maybe) | Yes, to some degree | Yes, to a high degree | I don't know |
| --- | --- | --- | --- | --- | --- | --- |
| UNEP Emission gap reports 2013-2019 (policy assessments/assessing National Determined Contributions (NDCs) & Paris targets) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| Climate Action Tracker (policy assessments of NDCs & Paris targets)  | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| IEA (International Energy Agency) scenarios  | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |

6. Emissions scenarios would become more policy-relevant (e.g., support national policymaking) ...

|  | No, incorrect | No, it is partly incorrect | In-between (maybe) | Yes, it is partly correct | Yes, it is correct |
| --- | --- | --- | --- | --- | --- |
| 1. If the emission scenarios, their variables, and storylines were communicated more simplistic? (e.g., making it easier to understand which different futures they express) | (1) ❑ |  (2) ❑ |  (3) ❑ |  (4) ❑ |  (5) ❑ |
| 2. If the emission scenarios were less complex to implement in policy analyzes (i.e., my country needs expertise/knowledge to understand & use scenarios) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |
| 3. If the emission scenario output data were less demanding to process (i.e., my country needs computer capacity to use scenarios) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |
| 4. If scientists identify best guess scenarios? (e.g., the most likely futures) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |
| 5. If policymakers were included in the emission scenario development process? (e.g., participated in scenario planning meetings)  | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |
| 6. If policymakers were included in the emission scenario development process? (e.g., participated in scenario planning meetings)  | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |

(6) How can emission scenarios be improved to be more policy-relevant? (e.g., to be applicable in national policies)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |
| --- |
| (3/4) Evaluating the relevance of scientific knowledge in the ”UNFCCC” context(UNFCCC: United Nations Framework Convention on Climate Change) |

7. In the context of UNFCCC, which of the below factors are either "Delaying" (left) or "Driving" (right) UNFCCC negotiations towards international climate treaties?

|  | Highly delaying policy actions (3) | Moderately delaying (2) | Slightly delaying (1) | Neutral (0) | Slightly driving (1) | Moderately driving (2) | Highly driving policy actions (3) |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Scientific knowledge about climatic changes  | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |
| Recorded historical climate-related events/catastrophes | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |
| Economic assessments of the cost of mitigation (emission reduction) actions vs. no-action  | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |
| Economic assessments of future climate-related impacts | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |
| Public opinion (voter's interests) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |
| Public media debate | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |
| The interests/advocacy of NGO's | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |
| The interests/advocacy of fossil energy industries | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ | (7) ❑ |

(7) What is the most important driver? (Has anything changed over time?)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. In the context of UNFCCC, which of the following types of "Scientific knowledge" are applicable (supportive) to design international climate treaties?

Assessments of ...

|  | Not at all | Not really (to a low degree) | In-between (maybe) | Yes, to some degree | Yes, to a high degree |
| --- | --- | --- | --- | --- | --- |
| .. possible future temperature rises and climatic changes (e.g., climate scenarios) | (0) ❑ | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ |
| .. possible future climate change-related impacts (e.g., impact scenarios) | (0) ❑ | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ |
| .. possible socioeconomic developments and the related emissions trends (e.g., emission scenarios)  | (0) ❑ | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ |
| .. recommended policy actions and their time estimates | (0) ❑ | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ |
| .. economic costs of future climate-related impacts | (0) ❑ | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ |
| .. economic costs of mitigation (emission reduction) actions vs. no-action  | (0) ❑ | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ |

(8) How can scientific knowledge be improved to better support UNFCCC processes? (Is anything needed?)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. Have some of the below emission scenarios been relevant for UNFCCC negotiations?

|  | Not at all | Not really (to a low degree) | In-between (maybe) | Yes, to some degree  | Yes, to a high degree | I don't know |
| --- | --- | --- | --- | --- | --- | --- |
| SA90 (informing the 1st IPCC Assessment Reports (1990)) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| IS92 (informing the "IPCC 1992-supplementary report" & "2nd IPCC Assessment Reports (1995)")  | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| SRES (informing the 3rd & 4th IPCC Assessment Reports (2001 & 2007)) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| RCPs (informing the 5th IPCC Assessment Reports (2013/2014)) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| SP1.5 pathways (IPCC Special Report 2018) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| SSP-RCP combinations (informing the 6th IPCC Assessment Reports (planned 2021)) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| UNEP Emission gap reports 2013-2019 (policy assessments of NDCs) | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| Climate Action Tracker (policy assessments of NDCs)  | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |
| International Energy Agency scenarios | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ | (6) ❑ |

(9) How do emission scenarios support UNFCCC processes? (Or why don't they support)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. The scenarios reaching the 2 °C target (RCP2.6) and 1.5 °C target (SSP1-1.9 & the SP1.5 pathways) include mitigation assumptions of "Negative Emissions Technologies (NETs)".

In your perspective, do these assumptions distract policy actions (e.g., delay real current mitigation actions)?

*NETs cover various technologies such as BECCS (bioenergy with carbon capture and storage) CDR (and carbon dioxide removal) to remove CO2 from the air. These technologies are not yet realized, developed, or made it possible to implement on the large scale as required to reach the 1.5  or 2-degree targets.*

(1) ❑ Yes, It has distracted negotiations and postponed current actions

(2) ❑

(3) ❑

(5) ❑ Neutral (It has not distracted or delayed the negotiations)

(4) ❑

(6) ❑

(7) ❑ No, It has inspired and strengthened current actions

(8) ❑ I haven't heard about NETs

(10)

(1) ❑ I never heard about NETs

(2) ❑ I heard about NETs

(3) ❑ I know the concept of NETs

(10) You are welcome to explain which advantages or complications NETs have for future policies:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |
| --- |
| (4/4) Climate mitigation policy |

11. Do you agree or not agree?

|  | No, it is incorrect | No, it is partly incorrect | In-between (maybe) | Yes, it is partly correct | Yes, it is correct |
| --- | --- | --- | --- | --- | --- |
| 1. The mitigation policies formulated by my country (the country I represent) are possible to implement in practice? | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |
| 2. The country's institutions have the capacity to implement them? | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |
| 3. The country has the technology to implement the stated law/policy effectively? | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |
| 4. The NDC of my country will be implemented  | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |

12. Politicians in your country would be more motivated to implements mitigation policies if ...

|  | No, it is incorrect | No, it is partly incorrect | In-between (maybe) | Yes, it is partly correct | Yes, it is correct |
| --- | --- | --- | --- | --- | --- |
| .. they are informed about the cost of mitigation actions vs. no-action? | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |
| .. they are informed about national climate change impacts & costs in the near-term future (e.g., 2030/2040)? | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |
| .. they are informed about climate change impacts & costs in the long-term future (e.g., 2070/2080)? | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |
| .. the voters request mitigation action? | (1) ❑ | (2) ❑ | (3) ❑ | (4) ❑ | (5) ❑ |

(11 & 12) You are welcome to explain the above answers (and to add final reflections)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Thank you very much for your participation!

(Feel free to distribute the survey link to relevant contacts)

Please add your email if you want preliminary results:

\_\_\_\_\_

## Survey coding

The following questions (their answers) were transformed into nominal (classification) or ordinal (ordering) variables. Coding values are shown in the tables below.

Question A

|  |  |  |
| --- | --- | --- |
| Categories for Analyses | Multiple choice answers: Nominal variable (classification) | Ordinal variable (ordering) |
| High-income & low-income countries | EU, US, China, Brazil | (2) |
|  | Remaining  | (1) |
|  |  |  |
| Non-OECD & OECD regions | Non-OECD | (1) |
|  | OECD | (2) |
|  |  |  |
| Climate halter & climate progressor | Progressor (small island states, Spain, Portugal, Netherlands, Sweden) | (3) |
|  | Middle (Germany, Denmark, France) | (2) |
|  | Halter (US, China, Poland, Hungary, Brazil) | (1) |

Question B

|  |  |  |
| --- | --- | --- |
| Categories for Analyses  | Multiple choice answers: Nominal variable (classification) | Ordinal variable (ordering) |
| Researcher vs. no-researcher | Researcher | (1) |
|  | Policymaker | (2) |
|  | **Other** + guiding, forming or leading policy (**Question C** – see below) | (2) |
|  | Stakeholder | (3) |
|  | Other + following policy = stakeholder | (3) |
|  |   |  |
| Researcher vs policymaker | Researcher | (1) |
|  | Policymaker | (2) |
|  | Stakeholder | (0) |
|  | Other | Depending on qualitative answer:(0) if no policy tasks(2) If the respondent indicates having policy tasks (e.g., policy advisor, negotiator) |

Question C: Which of the following best describes your role regarding policymaking?

|  |  |
| --- | --- |
| Multiple choice answers: Nominal variable (classification) | Ordinal variable (ordering) |
| 1 No role / 1 role | (1) |
| 2 Informing role (neutrally informing) / Informing role (3ly informing)  | (2) |
| 3 Following role (e.g., policy wishes are guiding your work/research) | (3) |
| 4 Advisory role (e.g., guiding policy options) | (4) |
| 5 Leading role (e.g., forming policies)  | (5) |
| 6 Coordinating policy | (5) |

Question F

|  |  |
| --- | --- |
| Multiple choice answers: Nominal variable (classification) | Ordinal variable (ordering) |
| 5 Very high importance | (1) |
| 4 High importance | (2) |
| 3 Neutral | (3) |
| 2 Low importance | (4) |
| 1 Not important | (5) |

Question 1 & 7

|  |
| --- |
| Highly delaying policy actions (3) |
| Moderately delaying (2) |
| Slightly delaying (1) |
| Neutral (0) |
| Slightly driving (1) |
| Moderately driving (2) |
| Highly driving policy actions (3) |

Question 2, 4, 5, 8, 9

|  |
| --- |
| Yes, to a high degree (5) |
| Yes, to some degree (4) |
| In-between (maybe) (3) |
| Not really (To a low degree) / Not really (2) |
| Not at all (1) |
| I don't know (0) |

Question 3

|  |  |
| --- | --- |
| Multiple choice answers: Nominal variable (classification) | Ordinal variable (ordering) |
| I participated in the developments of some scenario series | (6) |
| Yes, I know them very well (I know several variables and what the scenarios express) | (5) |
| Yes, I know them (I have seen them and know a little about the variables included) | (4) |
| 3 (I have heard about/seen them but not sure what they express) | (3) |
| Not really (I may have heard about them) | (2) |
| No, I don't know them at all | (1) |

Question 6, 11, 12

|  |
| --- |
| Yes, it is correct (5) |
| Yes, it is partly correct (4) |
| In-between (maybe) / In-between (3) |
| No, partly incorrect (2) |
| No, it is incorrect (1) |

Question 10

|  |  |
| --- | --- |
| Multiple choice answers: Nominal variable (classification) | Ordinal variable (ordering) |
| 1 Yes,  | (1) |
| 2  | (2) |
| 3 (3) | (3) |
| 4 Neutral (It has not distracted or delayed the negotiations) | (4) |
| 5  | (5) |
| 6  | (6) |
| 7 No, It has inspired and strengthened current actions | (7) |
| 4 I haven't heard about NETs | (4) |

# References

UNFCCC, 2021. About the Secretariat [WWW Document]. United Nations Framework Convention on Climate Change. URL https://unfccc.int/about-us/about-the-secretariat (accessed 10.26.21).

UNFCCC, 2020. National focal points.

UNFCCC, 2019. Provisional list of registered participants. Madrid, Spain.