



Technology Executive Committee

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Twenty-first meeting

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Preliminary findings of the surveys on needs, gaps and challenges and measures to develop and enhance endogenous capacities and technologies

Background note

I. Introduction

A. Background

1. As per activity 2 of the thematic area Enabling environment and capacity-building of its workplan for 2019–2022, the TEC agreed to analyse measures that facilitate countries in enhancing enabling environments to promote endogenous capacities and technologies. The work in this year focuses to identify and analyse, including from CTCN work, needs, gaps and challenges, and enabling environments to promote endogenous capacities and technologies. The deliverable in 2020 is a working paper/product, followed by a recommendation to COP/CMA in 2021. The **task force on Enabling environment and capacity-building**¹ implements this activity inter-sessionally, supported by the secretariat and a survey expert.

2. At TEC 20, the TEC agreed to an approach² to capture information on needs, gaps and challenges, and measures to develop and enhance endogenous capacities and technologies, namely through conducting surveys to three targeted groups of stakeholders who can provide insights into the information inquired above. The TEC also provided further guidance to the taskforce on a draft survey to the first stakeholder group and to further develop surveys for different stakeholder groups. The TEC took note that the surveys would be launched starting in May 2020.

3. For the purpose of the surveys, the taskforce has applied the following understanding of “endogenous capacity” and “endogenous technologies” based on its recommendation to COP and CMA in 2019:³

- (a) **"Endogenous technologies"** are those that have been:
 - (i) Developed within the country or by a team of in-country and external people, or
 - (ii) Developed elsewhere but modified and adapted within the country or by a team of in country and external people to meet the country's needs and conditions;
- (b) **"Endogenous capacities"** include the capacities to:
 - (i) Assess climate-related technology needs from the individual to the national level;
 - (ii) Identify appropriate technologies to assist in meeting identified needs, and
 - (iii) Adapt technologies to local needs and conditions.

4. The taskforce further elaborated on what “in country” entails and used it in the introduction of the three surveys: **"In-country"** skills, knowledge, and practices include those contributed by

¹ <https://unfccc.int/tclear/tec/members.html#Task>.

² [TEC 20 Note on approach to surveys](#).

³ FCCC/SB/2019/4.

people from governments at all levels, local communities and indigenous groups with traditional knowledge, academia, businesses, and others located within the country.

B. Scope of the note

5. The note contains preliminary surveys report on needs, gaps and challenges, and enabling environments to promote endogenous capacities and technologies (Annex 1) and questionnaires sent to stakeholder groups (Annex 2).

6. The preliminary surveys report includes results from all closed-ended questions (quantitative information and ratings of issues) and an analysis of open-ended question related to Challenges. Responses to other open-ended questions will be analysed in the next version of the report.

7. The report also presents two cross-cutting issues that were analysed across all questions and across the three respondent groups, to allow for a deeper understanding of how the different pieces of information fit together.

C. Possible action by the Technology Executive Committee

8. The TEC will be invited to consider this preliminary report and provide guidance to finalise the report, with a view to present the final report and recommendations at the first meeting of the TEC in 2021. In particular the TEC may wish to provide:

- (a) Feedback on the preliminary report; and
- (b) Suggestions for other cross-cutting areas for inclusion in the final report. Possibilities include:
 - (i) Stakeholder engagement (including issues relating to gender, indigenous peoples and local communities);
 - (ii) Financing;
 - (iii) Evaluating impacts of technologies;
 - (iv) Legal and regulatory issues;
 - (v) Other as deemed appropriate by the TEC.

II. Inter-sessional work of the taskforce

9. The taskforce on Enabling environment and capacity-building finalized the three surveys, taking into consideration inputs received at TEC 20, and further refined the targeted stakeholders for each questionnaire.

(a) **Survey 1** covers issues relating to national management of technologies and related capacity building. Targeted respondents are those with responsibility for national-level policies and programs involving climate technologies, namely National Designated Entities (NDE) and Technology Needs Assessment Focal Points (TNA FP);

(b) **Survey 2** covers more general knowledge about what is required to support endogenous capacities and technologies issues. Targeted respondents are those who have knowledge on technology and capacity-building issues in the context of UNFCCC process, such as members of the TEC, former TEC members, CTCN-AB members, and PCCB members and observers of these constituted bodies;

(c) **Survey 3** focuses on what works in practice. Targeted respondents are those who have first-hand knowledge of gaps, needs, and challenges relating to programmes involving endogenous capacities and technologies, from climate technology projects with which they or their organization have been involved. These included CTCN Network members who have implemented technical assistance projects, Nairobi Work Programme network members, practitioners identified by the nine civil society constituencies as having expertise in climate technologies, and technology

stakeholders who have expressed their interest to engage in TEC work on endogenous issues during the launch of an expression of interest period in November 2019.

10. The SurveyMonkey platform was used to design the surveys and analyse results. The surveys were distributed as follows:

(a) Survey 1: NDEs and TNA FP – launched on 26 May 2020 with a deadline 15 June 2020;

(b) Survey 2: TEC, former TEC, PCCB, taskforces, observers – launched on 28 May with 2020 with a deadline 20 June 2020;

(c) Survey 3: Practitioners (CTCN Network, NWP, recommendations by constituencies, and individuals who expressed interest) – launched 17 June 2020 with original deadline 30 June 2020.

11. Reminders to Survey 1 and 2 groups were sent around mid-June and all surveys were relaunched on 8 July 2020 and deadlines were extended until 23 July 2020. Another reminder was sent at the end of July. All surveys on the platform were closed on 7 August 2020. As of this date, the SurveyMonkey platform showed 45 responses for Survey 1, 34 responses for Survey 2, and 26 responses for Survey 3.

12. As guided by TEC20, all three questionnaires are a hybrid of closed-ended questions (based on rating scales) and open-ended (more qualitative) questions, recognizing that issues such as needs, gaps, and challenges and enabling environments may be specific to each country or respondent's experience.

13. It is worthy to note that respondents for all three surveys have actively provided responses to these open-ended questions. Due to limited time, not all responses to open-ended questions could be analysed and included in this report. Most of the open-ended questions are still work in progress, due to high volumes of inputs provided by the respondents (for example just the section on Challenges produced 402 verbatim responses).

14. The preliminary findings report thus includes results from all closed-ended questions (quantitative information and rating of issues) and an analysis of open-ended question on Challenges, where no rating scales were included. The survey results contain a rich collection of data that may be useful to many groups interested in different aspects of endogenous capacities, including areas beyond technologies. The final section shows how cross-cutting issues may be addressed to stimulate further discussion.

III. Next steps

15. Following TEC 21, the preliminary report will be revised, incorporating:

(a) Feedbacks and comments from TEC21;

(b) Analysis of the remaining open-ended questions;

(c) Discussion of additional cross-cutting issues of interest;

(d) Links to findings in other reports, such as TEC work on enabling environments and challenges based on TNA work, and a capacity building needs and gaps report produced by PCCB;

(e) Conclusions and recommendations based on all the findings.

16. The final product will be presented to the TEC at its first meeting in 2021.

Annex I

PRELIMINARY SURVEY REPORT ON NEEDS, GAPS AND CHALLENGES AND MEASURES TO DEVELOP AND ENHANCE ENDOGENOUS CAPACITIES AND TECHNOLOGIES

Table of contents

- Summary
- 1. Introduction
- 2. Respondent Characteristics
- 3. Needs and Gaps
- 4. Stakeholder Participation
- 5. Enabling Environments and Challenges
- 6. Measures to Enhance Endogenous Capacities
- 7. Cross-cutting Issues
- 8. Next Steps

SUMMARY

Building on previous work, the Technology Executive Committee (TEC) is continuing to analyze ways to support and enhance endogenous capacities and efforts to develop new climate-related technologies and to modify existing technologies to meet local needs and conditions. Three surveys were conducted to gather perceptions about gaps, needs, enabling environments, challenges, and other information relating to endogenous capacities and technologies. The three surveys were designed for and distributed to national authorities working on climate technologies; members and observers of the TEC, the Climate Technology Centre and Network (CTCN), and Paris Committee on Capacity Building (PCCB); and practitioners with experience working on projects involving climate-related technologies.

This report presents preliminary findings from the three surveys, highlighting results from all closed-ended questions (quantitative information and ratings of issues) and an analysis of open-ended question related to Challenges. Responses from other open-ended questions will be analyzed in the next version of the report.

On **capacity needs**, all groups reported relatively high levels of weakness in national capacities to deal with climate technologies for mitigation, adaptation, and cross-cutting issues, with national entities indicating the highest levels of weakness and practitioners the lowest. The three groups also perceived high needs for specific **skills and knowledge** such as assessing local community needs for climate technologies or making development more sustainable, but differed again in identifying the areas of highest need.

On **stakeholder participation**, national entities were asked about actual levels of participation by different groups in climate technology-related activities. The other two survey groups were asked who should be involved in these activities. For every single stakeholder group, the national representatives reported lower levels of involvement in their country than the respondents to the other two surveys had advised. In other words, actual levels of stakeholder participation do not match aspirations.

All three groups rated many different factors as contributing moderately or significantly to **enabling environments**. Factors such as collaboration, financing, and technical skills consistently were enablers. When asked to list **challenges**, respondents came up with a number of suggestions that could be broadly mapped into the same categories as enabling environments, but without consensus on specific issues. Noteworthy are challenges related to the new categories of research and innovation and aspects of technologies.

Separate questions addressed **measures to enhance** country capacities to develop new climate technologies and to adapt existing technologies to local needs and conditions. The measures included areas such as funding, collaborative efforts, and training and education. All three groups rated all measures listed as moderately or very important. Importance ratings for developing new technologies were generally slightly higher than for modification of existing technologies.

Two cross-cutting issues widely regarded as important to endogenous capacities and technologies were selected for analysis across all questions and across the three respondent groups. These are: **collaboration and cooperation**, and **research and innovation**. The analysis has allowed for a deeper understanding of linkages among perceptions of different stakeholder groups.

Work will continue on incorporating responses to open-ended questions, analyzing other cross-cutting issues throughout the surveys, and connecting the findings of the surveys to related work such as TEC mapping of enablers and challenges and PCCB studies on needs and gaps in capacity building. The revised report will be presented to the TEC at TEC 22.

1. INTRODUCTION

The TEC approved conducting surveys targeted at three groups thought to be knowledgeable to identify needs, gaps, enabling environments, challenges, and other issues relating to promoting endogenous capacities and technologies, as per Activity C.2 of the TEC rolling workplan 2019-2022. Three similar surveys were designed for the three groups, with some customization to match the likely knowledge and experiences of the different groups.

A. Survey targets

Survey 1: National perspective. The national entities appointed to handle UNFCCC technology-related issues seemed most likely to know what was happening in their countries at the national level, along with what their country needs with respect to climate capacities and technologies. Survey 1 consequently was designed for the National Designated Entities (NDEs) and Technology Needs Assessment Focal Points (TNAFPs) in all countries that have made appointments to these positions.

Survey 2: General expertise on climate technologies. Three UNFCCC bodies work most closely with climate technologies and/or related capacities. These include the Technology Executive Committee (TEC), the Climate Technology Centre and Network (CTCN), and the Paris Committee on Capacity Building (PCCB). Members and observers of all three groups were thought have special expertise and knowledge about the issues under study. Survey 2 was sent to all current and former members of the three groups, along with observers known to have attended meetings of the TEC, CTCN Advisory Board, or PCCB.

Survey 3: Experience on the ground. National leadership and overall expertise did not seem to cover all perspectives of interest. In order to learn what people working with climate-related projects had to say, Survey 3 was designed for practitioners who work directly with climate-related technologies. These included CTCN Network members who have implemented technical assistance projects, Nairobi Work Programme network members, practitioners identified by the nine civil society constituencies as having expertise in climate technologies, and technology stakeholders who have expressed their interest to engage in TEC work on endogenous issues during the launch of an expression of interest period in November 2019.

B. Survey questions

The three surveys are very similar. All three were conducted in English only.

Some questions were framed slightly differently to fit with the experience and expertise of each group. The most common difference was in the country or countries the group was asked to consider for each question. Survey 1 respondents were most often asked to focus on their own country. Members and observers were more likely asked to focus on countries in general. And practitioners were asked to focus on the country where they had the most experience.

Survey questions are presented in italics throughout the report. Where questions differed on the three surveys, the differences are explained in brackets [] in the report.

C. Survey distribution

The SurveyMonkey platform was used to design the surveys and analyze results. The surveys were distributed as follows:

- Survey 1: NDEs and TNA FP – launched on 26 May 2020 with a deadline 15 June 2020
- Survey 2: TEC, former TEC, PCCB, taskforces, observers – launched on 28 May with 2020 with a deadline 20 June 2020
- Survey 3: Practitioners (CTCN Network, NWP, recommendations by constituencies, and individuals who expressed interest) – launched 17 June 2020 with original deadline 30 June 2020

Reminders to Survey 1 and 2 groups were sent around mid-June and all surveys were relaunched on 8 July 2020 and deadlines were extended until 23 July 2020. Another reminder was sent at the end of July. All surveys on the platform were closed on 7 August 2020.

D. Survey responses

As of 7 August 2020, SurveyMonkey showed 45 responses for Survey 1, 34 responses for Survey 2, and 26 responses for Survey 3. The Survey 1 response will be calculated based on the number of NDEs and TNAPs contacted. Response rates cannot be calculated for the other two groups because the numbers of invitations distributed are unknown.

This preliminary report provides an overview of results in each section, with comparisons across the three groups.

2. RESPONDENT CHARACTERISTICS

A. Countries and regions

All three surveys asked which country the respondent was from, and in which region that country is located. Table 1 shows the number of countries represented by the survey respondents. Table 2 shows the distribution of those countries across the five regions recognized by the United Nations.

Table 1

Respondent home countries

	Survey 1	Survey 2	Survey 3
<i>Number responding</i>	46	31	27
<i>Number of countries reported</i>	39	25	19

Table 2

Regions in which respondent countries are located

Regions	Survey 1	Survey 2	Survey 3
African States	44%	12%	35%
Asian States	26%	32%	31%
Eastern European States	12%	9%	4%
Latin American and Caribbean States	14%	12%	12%
Western Europe and Other States	5%	35%	19%
<i>Number responding</i>	43	34	26

In general, the regions of members and observers were different from those of the other two groups. Seven out of ten of the responding NDEs and TNAFPs were from African (44%) or Asian (26%) states. Numbers were similar for the practitioners of Survey 3 (African 35%, Asian 31%). In contrast, fewer than half of the members and observers were from African (12%) or Asian (32%) states. More than a third of the Survey 2 respondents reported they were from Western Europe and Other States (35%), while fewer Survey 1 (5%) or Survey 3 (19%) respondents were from that area. None of the groups had many respondents who reported being from Eastern Europe or Latin America or the Caribbean.

Practitioners were asked an additional question about countries where they have worked.

In which country have you had the most experience with endogenous capacities and technologies?

The regions where practitioners had worked lined up very closely with the regions where they lived. The main exception was that more reported experience in Latin American and Caribbean States (22%), and fewer had gained their experience in Western Europe and other States (4%).

B. Languages

Understanding language preferences is critical to effective communication. All three surveys asked about language competencies and comfort.

Which languages do you speak? (Check all languages that you speak.)

Table 3 shows the languages that respondents reported they could speak. Nine out of ten respondents to each of the surveys reported that they speak English. No other language was spoken by more than a third of any group.

Table 3
Languages spoken by respondents

Languages spoken	Survey 1	Survey 2	Survey 3
Arabic	13%	6%	0%
Chinese	0%	12%	0%
English	91%	100%	96%
French	20%	32%	25%
Russian	11%	6%	0%
Spanish	13%	15%	11%
Other	28%	41%	46%
<i>Number responding</i>	46	34	28

The surveys also asked about preferences among the UN languages.

Which United Nations language do you feel most comfortable using? (Please select only one UN language. Feel free to skip this question if you prefer not to respond.)

Table 4
Use of United Nations languages

United Nations languages	Survey 1	Survey 2	Survey 3
Arabic	7%	0%	0%
Chinese	0%	3%	0%
English	67%	82%	82%
French	15%	3%	11%
Russian	4%	3%	0%
Spanish	7%	9%	7%
<i>Number responding</i>	46	34	28

Table 4 shows the results of the use of UN languages. Two-thirds of the Survey 1 respondents and more than four out of five of the respondents to the other two surveys indicated they are comfortable using English. An additional 15% of the Survey 1 group said they were most comfortable with French. Note that the surveys were administered entirely in English, so people uncomfortable with the English language may have avoided participating in the surveys.

C. Roles relating to UNFCCC and climate technologies

Each survey asked additional questions about the roles respondents have played in the UNFCCC process or in working with climate-related technologies.

Survey 1: NDEs and TNAPs

Roles and experience

Information was sought about multiple roles that NDEs and TNAPs play in the UNFCCC process. Their responses appear in Table 5.

In which of the following roles do you serve? Please check all roles involving climate technologies in which you currently serve.

Table 5
Roles in UNFCCC process – Survey 1

Current Roles	Percent
National Designated Entity	80%
Technology Needs Assessment Focal Point	38%
UNFCCC Focal Point	11%
Global Environment Facility Focal Point	0%
National Designated Authority	4%
Other government position related to the UNFCCC (please specify)	10%
<i>Number responding</i>	45

Four out of five (80%) of the respondents currently serve as NDEs, and 38% serve as TNAFPs. Fourteen people serve in both roles.

Survey 1 asked NDEs and TNAFPs about their years of experience in those roles.

If you currently serve as a National Designated Entity, how many years have you served in that position?

If you currently serve as a Technology Needs Assessment Focal Point, how many years have you served in that role?

Table 6 presents the number of years reported by the two groups.

Table 6
Years of experience as NDE or TNAFP

Years in role (calculated using 36 current NDEs and 22 current TNAFPs)	NDEs	TNAFPs
Less than 1 year	3%	9%
1 year	3%	23%
2 years	22%	27%
3 years	17%	18%
4 years	11%	9%
5 or more years	44%	14%
<i>Number of responses</i>	36	22

Of the 36 current NDEs, their median years of experience is 4 years. TNAFPs tend to have slightly less experience, with a median of 3 years. Fewer than one in ten of either group reported they had less than a year of experience.

Survey 2: Members and Observers

Survey 2 asked respondents about the roles they play in the UNFCCC process. Their responses are shown in Table 7.

In which of the following roles do you currently serve or have you previously served? Please check all roles involving climate technologies in which you currently serve.

Table 7
Roles in UNFCCC process – Survey 2

Roles	Number	Percent
TEC member	13	39%
TEC observer	12	36%
TEC task force member	6	18%
CTCN AB member	5	15%
CTCN AB observer	5	15%
PCCB member	4	12%
PCCB observer	1	3%
Country negotiator	12	36%
Other role related to UNFCCC	7	21%
<i>Number of respondents</i>	33	--

Most of the Survey 2 respondents are TEC members (39%) or TEC observers (36%). Fewer than one in six reported that they are a CTCN AB member (15%), CTCN AB observer (15%), or PCCB member (12%).

More than one in three respondents reported that they are currently country negotiators (36%). Of these, twelve people said they were TEC members and six others reported that they are TEC observers. Seven negotiators said they were CTCN AB members or observers.

Survey 3: Practitioners

Survey 3 respondents have experience working on the ground with climate-related technologies and are less likely to be directly involved in UNFCCC processes. One question did ask about CTCN membership, but the main questions focused on types of experiences with climate technology-related work rather than on specific roles within the UNFCCC.

CTCN membership

The CTCN is the operational arm of the Technology Mechanism. Many climate practitioners are members of the CTCN Network. The survey was sent to the CTCN network, as well to other practitioner groups, such as those subscribing to the newsletter for the Nairobi Work Programme and individuals identified by UNFCCC constituencies representing observer organizations. The survey enquired about CTCN network membership. Responses are presented in Table 8.

Are you a CTCN Network member?

Table 8
CTCN membership

CTCN Network member	Percent
Yes	26%
Not sure	37%
No	37%
<i>Number of respondents</i>	27

Just over one in four (26%) of the responding practitioners said they are members of the CTCN Network, 37% stated no, while more than a third (37%) were not sure. It is not clear from this particular response

if the respondents were unsure because they do not know whether their organization is a member of CTCN network or if they are unfamiliar with the CTCN.

Experience with climate technologies

Survey 3 also asked practitioners about their experience with climate technologies, which illuminates the types of roles they have played. Responses are presented in Table 9.

Please check all activities involving climate technologies in which you have experience.

Table 9
Experience with climate technologies – Survey 3

Climate technology activities	Percent
Promoted good practices in uses of climate technologies	71%
Designed or developed project involving climate technologies	57%
Adapted climate technologies to meet local needs and conditions	54%
Implemented project involving climate technologies	50%
Trained people in using climate technologies	50%
Researched climate technologies	46%
Collaborated in public/private partnership involving climate technologies	36%
Collaborated in South-South or triangular cooperation involving climate technologies	36%
Developed new climate technologies	25%
Other activities related to climate technologies (please specify)	21%
Represented climate technology company	14%
<i>Number of respondents</i>	28

Most of the responding practitioners have promoted good practices in uses of climate technologies (71%). More than half have designed or developed a project involving climate technologies (57%), and half reported they have implemented a project involving climate technologies (50%). Respondents were more likely to have adapted climate technologies to meet local needs or conditions (54%) than to have developed new climate technologies (25%). More than a third have participated in collaborative efforts such as public/private partnerships (36%) or South-South or triangular cooperation (36%).

D. Employment

All three surveys included questions about respondents' main and secondary employers.

Who is your primary employer? Please check only one option.

Table 10 shows the primary employers reported by the three groups of respondents.

Table 10
Primary employer

Primary Employer	Survey 1	Survey 2	Survey 3
National government	85%	29%	4%
Sub-national government	0%	0%	0%
Intergovernmental organization	0%	3%	11%
Academia	4%	24%	18%
Business or industry	0%	9%	7%
Non-governmental organization	2%	15%	46%
Consulting firm	7%	12%	4%

Other	2%	9%	11%
<i>Number responding</i>	46	34	28

Survey 1, which was sent to national representatives, confirmed that most respondents work for their national government (85%). The remainder work mainly for consulting firms (7%) or academia (4%).

Members and observers were more varied, with more than half working either for their national government (29%) or academia (24%). Non-governmental organizations (15%) and consulting firms (12%) employ a few more.

The practitioners reported a different set of employers. Almost half work for NGOs (46%), with the next most frequent employer being academia (18%). Almost none of the practitioners work primarily for business and industry (7%), their national government (4%) or consulting firms (4%).

None of the respondents on any of the surveys reported working primarily for a sub-national government, although one person from Survey 1 and one from Survey 3, said they had a secondary employer below the national level. Local and municipal governments are heavily engaged in climate action, and their employees may deserve a separate survey in any future work on endogenous capacities and technologies.

The surveys also asked for the roles that respondents play with their primary employer. This was an open-ended question. A list of responses will be available in the expanded report to be presented at TEC 22.

What is your primary role with this employer?

An additional question addressed other employment. Responses are summarized in Table 11.

If you work for more than one entity, please check any other types of organizations for whom you currently work.

Table 11

Other employers

Other Employers (percentages based on the number from that survey who responded to this item)	Survey 1	Survey 2	Survey 3
National government	78%	9%	13%
Sub-national government	4%	0%	6%
Intergovernmental organization	0%	0%	13%
Academia	22%	15%	38%
Business or industry	9%	9%	13%
Non-governmental organization	4%	21%	50%
Consulting firm	9%	6%	31%
Other	4%	6%	25%
<i>Number responding</i>	23	15	16

Some of the NDEs and TNAPs have secondary jobs. While only 4% work primarily for academia, 22% reported that they have a secondary academic role. None of the 9% said they work primarily for business and industry, but 9% reported a secondary role. Many of the respondents to Surveys 2 and 3 also reported secondary employment.

3. NEEDS AND GAPS

As part of analyzing measures that can promote endogenous capacities and technologies, the surveys sought to investigate current gaps and needs in country's endogenous capacities from different perspectives. Information was also collected relating to perceptions about current skill and capacity needs.

A. Current capacities on endogenous technologies

To determine perceptions about capacity needs in particular areas, all three surveys included the following question.

Using the definitions of endogenous capacities and technologies described at the beginning of this survey, please rate the level of [Survey 1: your country's, Survey 2: country, Survey 3: country where you have the most experience] current capacities in the climate technology areas listed below.

A list of 22 climate technology areas was provided for the ratings. The areas were identified as falling under Mitigation (M), Adaptation (A), or Cross-cutting (X), and included examples for each area (not included in the table). The complete list of areas, including examples, can be found in the survey questionnaires. Respondents were asked to use the following scale for their ratings.

- Very weak capacities
- Somewhat weak capacities
- Somewhat strong capacities
- Very strong capacities

The **identification of needs and gaps requires information about areas of weakness**. Table 12 shows the percentages of respondents who chose either "Very weak" or "Somewhat weak capacities," implying a strong need for capacity building in that area.

Table 12

Weaknesses in current endogenous capacities

Current Capacities	Survey 1	Survey 2	Survey 3
M: Carbon fixation & abatement	80%	62%	43%
M: Transport	85%	53%	36%
M: Energy efficiency	46%	26%	57%
M: Renewable energy	43%	32%	68%
M: Waste management	80%	47%	25%
M: Forestry	46%	29%	39%
M: Agriculture	78%	50%	18%
M: Industry	78%	41%	39%
A: Early warning and environmental assessment	70%	53%	32%
A: Agriculture and forestry	54%	35%	39%
A: Water	63%	59%	29%
A: Human health	78%	62%	29%
A: Infrastructure and urban planning	76%	53%	25%
A: Coastal zones	65%	44%	18%
A: Marine and fisheries	74%	44%	18%
X: Governance and planning	63%	53%	29%
X: Financial management	65%	47%	32%
X: Monitoring and reporting	65%	53%	46%
X: Communication	59%	50%	57%
X: Legal and regulatory	59%	59%	32%

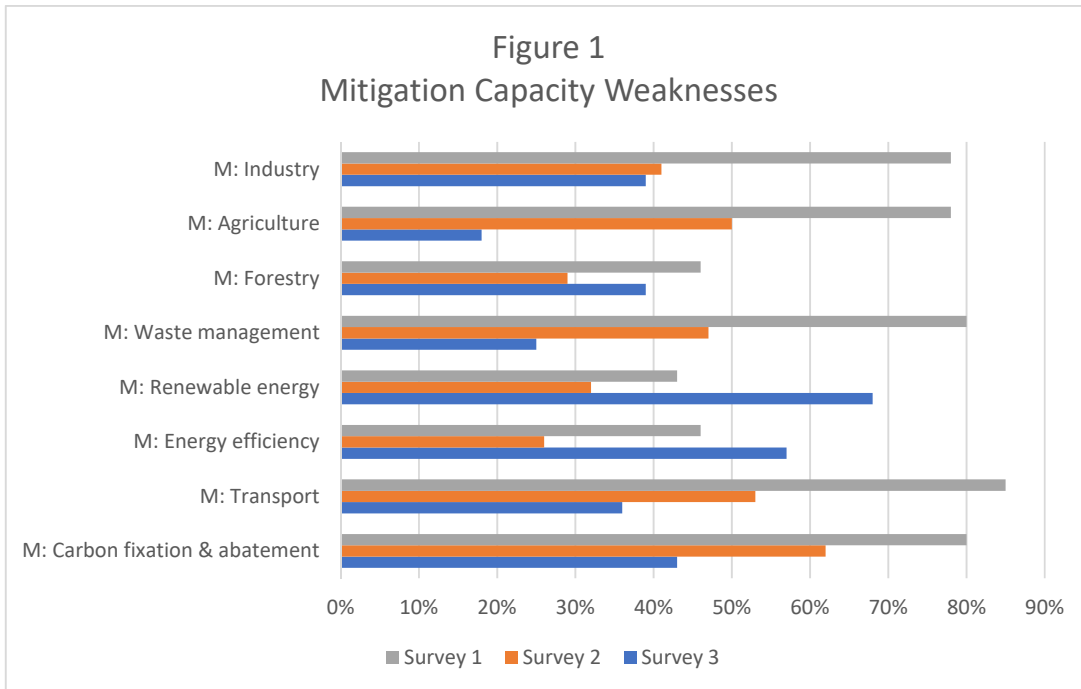
X: Engaging affected stakeholders	46%	65%	50%
X: Gender responsiveness	63%	65%	39%
<i>Number</i>	45	34	28
<i>Range</i>	43%-85%	26%-65%	18%-68%
<i>Median</i>	65%	53%	32%

Overall, the NDE/TNAFPs reported the highest levels of weakness compared to other respondent groups. More than half of the Survey 1 respondents rated 18 of the capacity areas as very or somewhat weak. All eight of the mitigation areas were rated among the most or least weak of the areas, with the adaptation and cross-cutting issues falling in between. Five mitigation areas were perceived to have the weakest capacities, along with one adaptation area. M: Transport (85%), M: Carbon fixation and abatement (80%), and M: Waste Management (80%) were the areas rated as having the weakest capacities in the respondents' countries. Mitigation also showed up among the areas seen as least weak. M: Renewable energy (43%), X: Engaging affected stakeholders (46%), and M: Forestry (46%) were perceived to be less weak

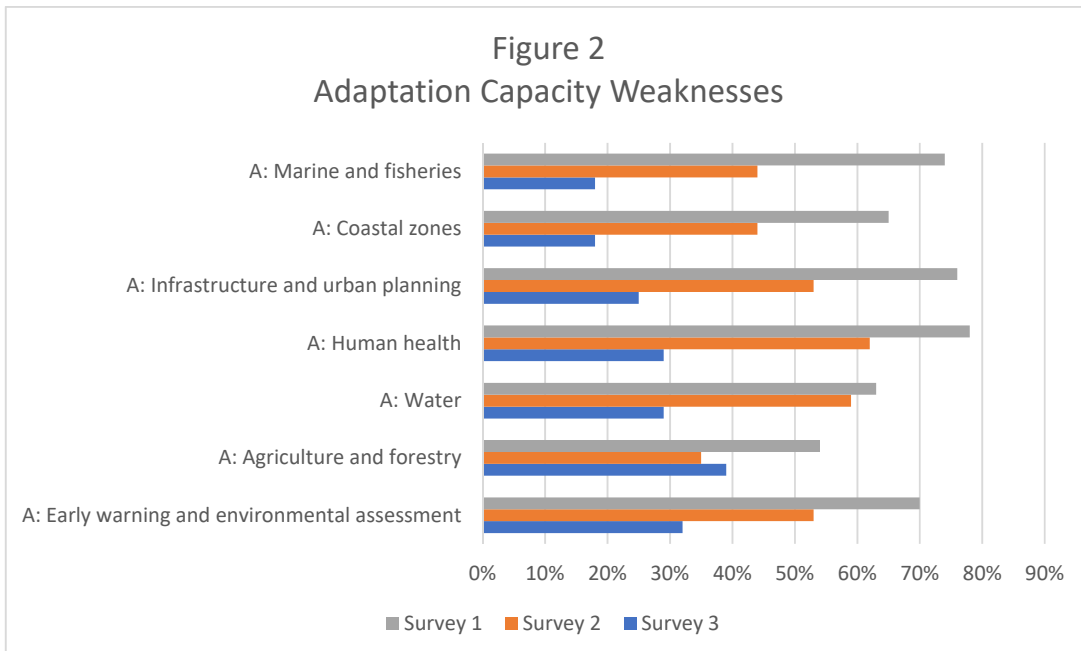
Members and observers, who were not focusing on a particular country, saw somewhat less weakness, although there were still 13 areas rated as weak by at least half the Survey 2 respondents. They focused less on weaknesses in mitigation and more on human issues, finding that X: Gender responsiveness (65%), X: Engaging affected stakeholders (65%), M: Carbon fixation and abatement (62%), and X: Human health (62%) were the areas where countries have the weakest capacities. They saw the least levels of weakness in three mitigation areas: M: Energy efficiency (26%), M: Forestry (29%), and M: Renewable energy (32%).

Practitioners, focusing on the countries where they had the most experience, tended to see even less weakness. Only four areas were weak by half or more of the respondents. These included M: Renewable energy (68%), X: Communication (57%), M: Energy efficiency (57%), and X: Engaging affected stakeholders (50%). Areas they rated as least weak included A: Coastal Zones (18%), A: Marine and fisheries (18%), and M: Agriculture (18%).

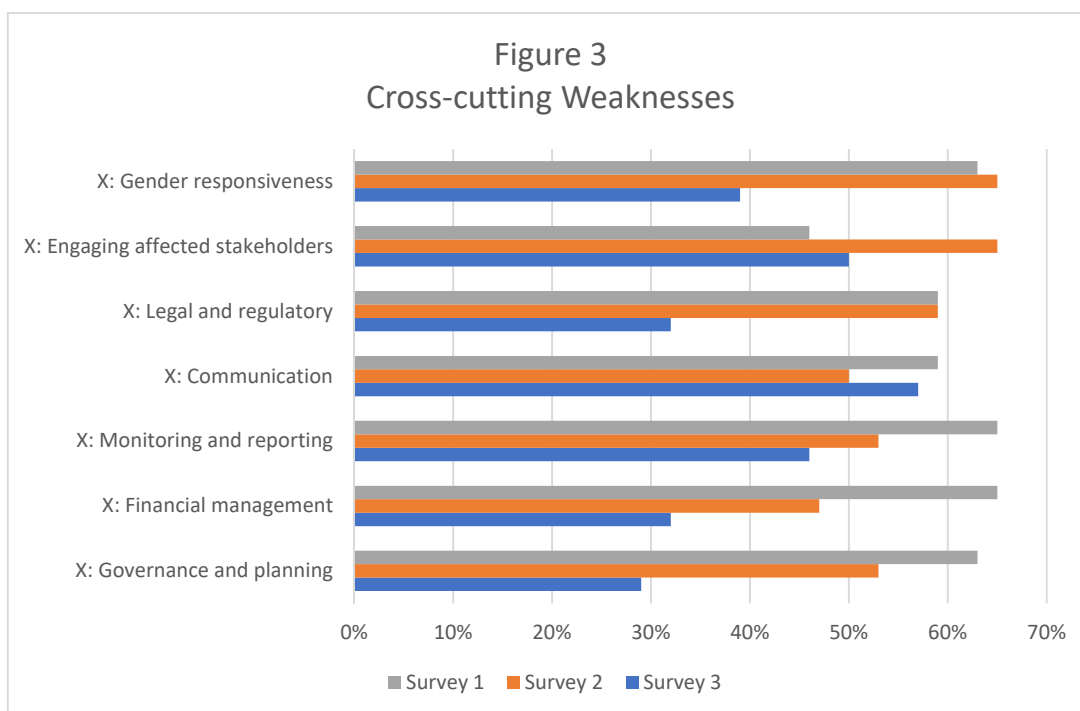
Responses across the three surveys were quite diverse. Three figures present bar graphs showing the differences in ratings. Figure 1 shows responses on Mitigation, Figure 2 on Adaptation, and Figure 3 for Cross-cutting issues.



Of the three groups, national representatives saw the highest level of weakness on all mitigation issues except renewable energy and energy efficiency, where practitioners saw greater weakness. Members and observers were in between the other two groups on all mitigation items.



Results were similar for adaptation. Survey 1 respondents consistently perceived more weaknesses than the other two groups. Survey 3 showed the least concern about weaknesses on all adaptation items except for agriculture and forestry, when Survey 3 recorded slightly more weakness than for Survey 2.



Responses were more varied for cross-cutting issues. Again, Survey 1 respondents tended to see more weakness on most issues, but Survey 2 equaled or exceeded Survey 1 estimates of weakness on engaging affected stakeholders, gender responsiveness, and legal and regulatory issues. Survey 1 greatly exceed Survey 3 ratings of weakness on most issues, especially on financial management and governance and planning.

Further study might explain the strong differences between national representatives and practitioners. Perhaps it is because the Survey 1 respondents have a broad view of different issues, while the Survey 3 practitioners are focused more on a particular project.

Open-ended question on endogenous capacity needs

Following the ratings on current capacities, all three surveys asked respondents to list areas where capacity building is needed. Table 13 shows the number of responses from each group.

Please list up to five areas in which you think [Survey 1: your country, Survey 2: countries, Survey 3: country you are focusing on] needs to enhance its capacities to develop new technologies; to adapt existing technologies to local needs and conditions; or to help implement your NDCs, NAPs, or national priorities. You may use the list from the previous question or describe something different.

Table 13

Responses to open-ended question on endogenous capacity needs

Capacity needs	Survey 1	Survey 2	Survey 3	Total
Number of respondents	41	29	26	96
Number of capacity needs listed	197	126	109	432

Due to large number of responses received for this question, the categorization of the responses is work in progress and will be reported in the next version of the report.

Open-ended question on NDE capacity needs

Survey 1 also included a question about individual needs to build capacities. This question was included because in previous work NDEs had indicated they had personal capacity building needs. The number of their responses is recorded in Table 14.

In the previous TEC survey, NDEs indicated a need to enhance their own capacities. Please describe any areas in which you would like to enhance your own skills and knowledge in relation to your role(s) in the UNFCCC process.

Table 14

Responses to open-ended question on NDE personal capacity needs

NDE personal capacity needs	Survey 1
Number of respondents	38
Number of personal needs listed	38

The categorization of the responses is work in progress and will be reported in the next version of the report.

B. Skills and knowledge needs

All three surveys also asked for perceptions about needs for specific skills and knowledge.

Rate the level of [Survey 1: your country's, Survey 2: country, Survey 3: country you have chosen] needs for skills and knowledge relating to endogenous capacities and technologies. Leave blank any areas in which you have no opinion.

Each survey then presented 24 skills and knowledge areas to be rated using the following scale.

- No needs
- Weak needs
- Moderate needs
- Strong needs
- Very strong needs

Table 15 shows the percentage of those responding to this section who chose either “Strong needs” or “Very strong needs.”

Table 15

Skill and knowledge needs

Skills and knowledge	Survey 1	Survey 2	Survey 3
Assessing local community needs for climate tech	78%	62%	68%
Selecting appropriate technologies	78%	62%	68%
Importing technologies	60%	35%	18%
Installing technologies	80%	50%	61%
Maintaining technologies	82%	65%	57%
Adapting technologies to local needs and conditions	87%	71%	71%
Operating technologies safely and efficiently	76%	62%	64%
Recycling technologies at end of use	91%	79%	57%
Improving supply chains	84%	62%	54%
Making development more sustainable	87%	76%	79%

Drafting legal and regulatory approaches to tech	76%	53%	71%
Dealing with intellectual property issues	67%	44%	46%
Evaluating social/econ/env impacts of technologies	71%	62%	75%
Managing interdisciplinary teams	51%	56%	71%
Working with external industries and consultants	58%	35%	39%
Managing finances relating to technologies	71%	59%	50%
Encouraging development/adaptation for local needs	82%	71%	64%
Avoiding unintended consequences	56%	62%	50%
Estimating useful lives of technologies	58%	41%	46%
Engaging various stakeholders	58%	68%	46%
Utilizing local and indigenous knowledge	80%	68%	61%
Empowering social capital	73%	62%	68%
Assessing gender impacts of technologies	71%	62%	64%
Boosting national and community ownership	71%	62%	71%
<i>Number of responses to this section</i>	45	34	28
<i>Range</i>	51%-91%	35%-79%	18%-79%
<i>Median</i>	76%	62%	64%

The national entities of Survey 1 saw the strongest needs for skills and knowledge in recycling technologies at end of use (91%), adapting technologies to local needs and conditions (87%), and making development more sustainable (87%). Those respondents saw the least needs for skills and knowledge in managing interdisciplinary teams (51%) and avoiding unintended consequences (56%).

Survey 2 members and observers rated the highest needs for skills and knowledge in the areas of recycling technologies at the end of use (79%), making development more sustainable (76%), adapting technologies to local needs and conditions (71%), and encouraging development and adaptation of technologies to meet local needs (71%). This group saw much lower needs in the areas of importing technologies (35%), working with external industries and consultants (35%), and estimating useful lives of technologies (41%).

The practitioners of Survey 3 reported the highest needs are in making development more sustainable (79%) and evaluating the social, economic, and environmental impacts of technologies (75%). They saw much lower needs for skills and knowledge in importing technologies (18%) and working with external industries and consultants (39%).

4. STAKEHOLDER PARTICIPATION

The groups involved in planning and implementing projects and programs can affect the way issues are framed, the problems addressed, and the solutions chosen. Findings from the previous TEC survey indicated that adopting a participatory approach could enhance endogenous capacities and technologies. The three surveys were used to gather information about the groups involved in or that should be involved in making climate technology-related decisions.

Survey 1 included the question about to what extent different stakeholders ***have been involved***.

Findings from the previous TEC survey indicated that adopting a participatory approach could enhance endogenous capacities and technologies. To what extent have each of the following groups been involved in the planning, development, and deployment of climate-related technologies in your country? Please leave blank any area in which you have no opinion.

Surveys 2 and 3 asked about who ***should be involved*** through a more general normative question.

To what extent do you believe each of the following groups should be involved in the planning, development, and deployment of climate-related technologies?

Table 16 presents the percentages of respondents to each survey who said a group was (Survey 1) or should be (Surveys 2 and 3) somewhat or significantly involved.

Table 16
Stakeholder participation

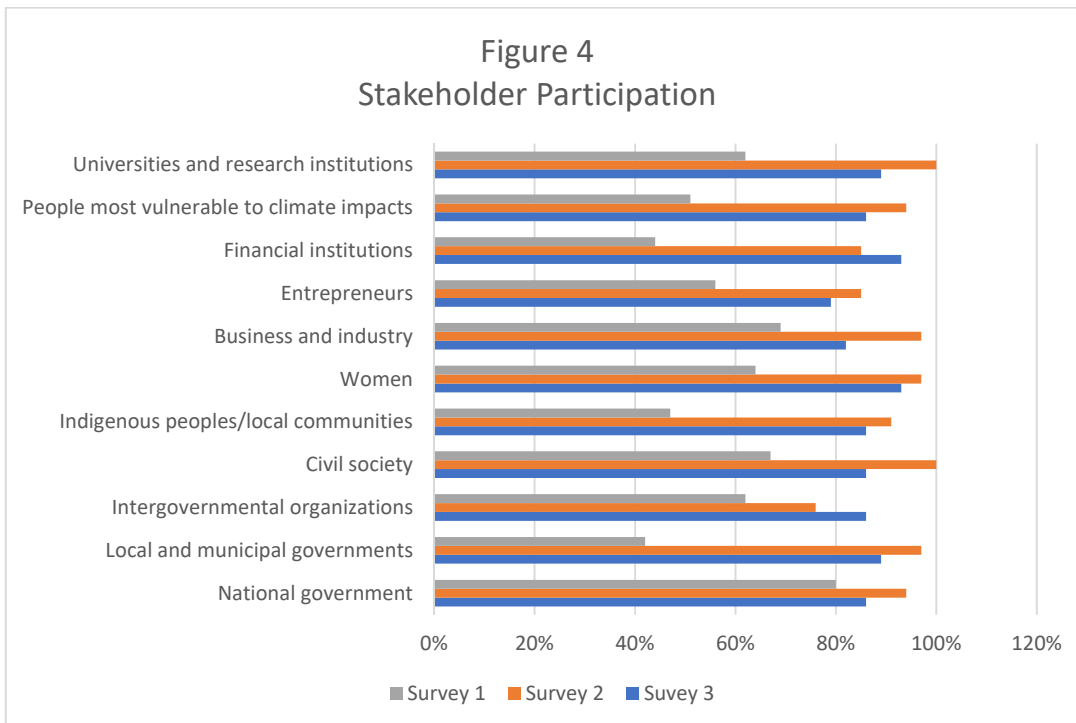
Stakeholder groups	Survey 1	Survey 2	Survey 3
National government	80%	94%	86%
Local and municipal governments	42%	97%	89%
Intergovernmental organizations	62%	76%	86%
Civil society	67%	100%	86%
Indigenous peoples/local communities	47%	91%	86%
Women	64%	97%	93%
Business and industry	69%	97%	82%
Entrepreneurs	56%	85%	79%
Financial institutions	44%	85%	93%
People most vulnerable to climate impacts	51%	94%	86%
Universities and research institutions	62%	100%	89%
<i>Number responding</i>	45	34	28
<i>Range</i>	42%-80%	76%-100%	79%-93%
<i>Median</i>	62%	94%	86%

Four out of five (80%) of the respondents to Survey 1 said that national governments were involved in such activities in their country. Respondents reported that business and industry (69%) were the next most involved group, followed by civil society (67%). The least involved groups were reported to be local and municipal governments (42%) and financial institutions (44%).

The members and observers responding to Survey 2 supported high participation by everyone. All of them supported the involvement of both civil society and university and research institutions. The only groups supported by fewer than 90% of the Survey 2 respondents were intergovernmental organizations (76%), entrepreneurs, (85%), and financial institutions (85%).

The Survey 3 practitioners were slightly less supportive than Survey 2 respondents of involvement by all but two groups. Practitioners saw more need for involvement for intergovernmental organizations (86%) and financial institutions (93%). While practitioners saw slightly lower needs for involvement by most groups, more than four out of five of the practitioners supported involvement by each of the groups. The only exception was entrepreneurs (79%).

Survey 1 reports about actual group involvement indicate that participation generally is much lower than the Survey 2 and 3 respondents think it should be. These differences are shown in Figure 4. For every single group, the national representatives of Survey 1 reported lower levels of involvement in their country than respondents to the other surveys had advised. From these results, it appears that aspirations for stakeholder's involvement are much higher than the reality.



5. ENABLING ENVIRONMENTS AND CHALLENGES

A. Introduction

Promoting endogenous development of new technologies and the adaptation of existing technologies requires enabling environments, and the ability to deal with challenges to such work. The three surveys included questions to assess the importance of various enabling factors, and to identify significant challenges.

Previous studies have found that similar factors sometimes are cited as both enablers and challenges. The task force on enabling environments and capacity building suggested that the responses to the open-ended question about challenges be sorted into the same categories as the ratings questions presented on enabling environments. This was done to facilitate comparisons, with the addition of a few new categories to accommodate responses about challenges that did not fit into the enabling environments categories.

Please note that the actual numbers in each category are not comparable. The percentages for enabling environments are based on the total number of responses to each ratings question (close-ended question). The percentages for challenges are based on the total number of challenges provided by respondents to open-ended question on Challenges in each of the three surveys. The percentages for challenges are consequently much smaller than those for the enabling environments ratings. The rankings of the ratings and responses provided for enablers and challenges matter more than the percentages themselves.

B. Enabling environments

The TEC and other constituted groups have long been concerned with identifying the factors that enable certain behaviors and outcomes. The surveys in this study included questions about enabling strategies that can help build and improve country capacities to develop and adopt climate technologies.

Close-ended question on enabling strategies

All three surveys included the following close-ended question:

For each of the following, [Survey 2: no specification, Survey 3: and based on your experiences in your focus country], please indicate the degree to which strategies in that area can enable environments for enhancing climate capacities and technologies [Survey 1: in your country].

The question was followed by a list of 17 factors. For each one, respondents were asked to indicate whether that factor:

- Does not enable
- Enables slightly
- Enables moderately
- Enables significantly

As with previous questions, the only difference across the three surveys was in the country or countries they were asked to consider.

Table 17 shows the percentage of respondents for each of the three surveys who indicated that a factor “Enables moderately” or “Enables significantly.”

Table 17
Strategies for enabling environments

Enabling strategies	Survey 1	Survey 2	Survey 3
Collaboration: Internal	89%	97%	96%
Collaboration: External	87%	100%	82%
Economic issues	69%	88%	79%
Financing	82%	91%	96%
Legal and regulatory structures: Domestic	76%	94%	82%
Legal and regulatory structures: International	69%	82%	64%
Institutional and organizational issues	80%	88%	86%
Information: Research	80%	94%	82%
Information: Contextual	69%	74%	68%
Human resources: Technical skills	84%	97%	93%
Human resources: Management skills	71%	82%	86%
Human resources: Analytical skills	67%	94%	79%
Governance: Decision-making	78%	88%	82%
Governance: Financial	80%	79%	82%
Education: Domestic	87%	88%	86%
Education: International	76%	71%	61%
Communication	89%	91%	79%
<i>Number of respondents</i>	45	34	28
<i>Range</i>	67%-89%	71%-100%	61%-96%
<i>Median</i>	80%	88%	82%

In general, respondents saw all the listed factors as enablers. Survey 2 respondents (members and observers) tended to see factors as slightly more enabling than did respondents to the other two surveys. At least 67% of the respondents rated all factors as moderately or significantly enabling.

The Survey 1 national representatives saw collaboration (internal 89%, external 87%), communication (89%), and domestic education (87%) as the most enabling of the factors. They were least likely to rate analytical skills (67%), contextual information (69%), international regulatory issues (69%), and economic issues (69%) as enabling.

Members and observers also saw collaboration (external 100%, internal 97%) as an enabling factor, joined by technical skills (97%). They were least likely to rate international education (71%), contextual information (74%), and financial governance (79%) as enabling.

Practitioners also saw internal (96%), but not external (82%), collaboration as highly enabling, along with financing (96%) and technical skills (93%). They were least likely to rate international education (64%), contextual information (68%), communication (79%), and economic issues (79%) as enabling.

Open-ended question on other enabling factors

To complement and expand upon the ratings results, all three surveys asked respondents to describe enabling factors in their own words.

Please describe up to five factors that you believe contribute significantly to enabling environments to enhance [Survey 2: in-country, Survey 3: endogenous] climate capacities and technologies [Survey 1: in your country]. You may use the categories listed above or describe a different enabler.

Table 18 shows the number who responded and the number of factors that were listed, while Table 19 presents some examples of responses provided. These samples are not intended to be representative or inclusive of all the responses but are simply to illustrate some of the thoughts of the respondents.

Table 18**Responses to open-ended question on other enabling factors**

Enabling factors responses	Survey 1	Survey 2	Survey 3	Total
Number of respondents	40	27	23	90
Number of enabling factors listed	184	114	88	386

Table 19**Examples of responses on list of other enabling factors**

Survey 1
<ul style="list-style-type: none"> integrated collaboration among stakeholder collaboration with researchers, funders, or practitioners from outside active communication with CEO's and awareness raising campaigns, like workshops, networking-events, websites (like for instance: www.ecotechnology.at, cleaner-production.eu, LinkedIn etc.
Survey 2
<ul style="list-style-type: none"> Collaboration is very important, so that not different people work to try the same problem themselves. I really think that it's important to collaborate since climate change is a global problem and we need to tackle it together Collaboration with external researchers, including academia and students Interdisciplinary development, deployment and monitoring of technologies technical education and training - data analysis, technological
Survey 3
<ul style="list-style-type: none"> Collaboration with users/communities All stakeholders at every level Private Oil and Gas Sector

Due to large number of responses received for this question, the categorization of the responses is work in progress and will be reported in the next version of the report.

C. Challenges

The flip side of enabling environments involves challenges that can impede progress. The three surveys only used an open-ended question to gather perceptions about challenges to the development of new technologies or modification of existing technologies. As in most other questions, NDEs and TNAFPs were asked to focus on their own country, while members and observers and practitioners were asked a more general question.

Please list up to five challenges that are likely to hinder [Survey 1: your country's, Survey 2: in-county, Survey 3: endogenous] development of new technologies or modification of existing technologies to meet local needs and conditions.

As suggested by the task force, the same categories of enabling strategies were used to group responses to the open-ended question on challenges to facilitate comparisons. Three new categories were added

for challenge responses that did not fit well into the categories for enabling environments, namely “technologies,” “research and innovation,” and “other.”

Table 20 shows the percentage of challenges that fell into different categories for each of the three groups. Percentages were determined by dividing the number of challenges listed in a category by the total number of challenges provided by respondents to that survey. The areas in bold are the general categories used, usually followed by sub-categories in normal type. Percentages for sub-categories are not reported because they are so small.

Table 20
Challenges to development or modification of technologies

Challenges	Survey 1	Survey 2	Survey 3	Total
Collaboration	6%	11%	7%	8%
Internal (includes stakeholder engagement)				
External				
Economic issues	4%	3%	1%	3%
Financing and other resources	17%	13%	11%	14%
Legal and regulatory structures	7%	5%	4%	6%
Domestic				
International				
Institutional and organizational	3%	3%	11%	5%
Policy				
Other				
Information	15%	9%	12%	12%
Research				
Contextual (includes politics)				
Human resources	18%	9%	11%	14%
General capacities (new sub-category)				
Technical skills				
Management skills				
Analytical skills				
Governance	7%	10%	10%	9%
Decision-making (includes planning)				
Financial				
Education	0%	3%	1%	1%
Communication	4%	3%	5%	4%
Technologies (new category)	9%	19%	14%	13%
General				
Assessing and adapting to local needs				
Evaluation of impacts				
Specific technologies				
Research and innovation (new category)	10%	10%	11%	10%
Other (new category)	1%	0%	2%	1%
<i>Number of respondents</i>	42	28	25	95
<i>Total comments</i>	186	116	100	402

In general, challenges were spread out among the categories. No more than one in five challenges for a particular survey fell into any one of the categories.

For the NDEs and TNAFPs, only three areas were cited as challenges by more than 10% of the respondents. Human resources (18%) were listed most often as challenges. This category includes general statements about capacities, as well as more specific areas such as technical, training, and analytical skills. More than half of the Survey 1 human resources challenges fell into the general capacity category.

Financing (17%) was the second challenge area most often cited by NDEs and TNAFPs. Most of these responses just provided one or two words, such as "finance" or "funding," but a few referred to resources, such as "availability of resources: financial, human, economic."

Information was the third most frequently listed challenge on Survey 1. This category included access to information, which was cited by six respondents. The remaining 21 information challenges addressed contextual factors such as general country characteristics, cultures, and politics.

For the Survey 2 members and observers, issues relating to technologies (19%) were cited as challenges most frequently. Of these, seven people cited issues relating to assessing and adapting to local needs and conditions.

Financing (13%) again was the second most frequently cited challenge. Most comments cited something like "lack of funding," but some were more specific, such as "costs of technologies."

Collaboration (11%) was the third most frequent challenge listed by Survey 2 respondents. Almost all of these referred to internal issues, including general stakeholder engagement ("fragmentation of stakeholders"). A couple of responses referred to cooperation with the private sector or academia.

The Survey 3 practitioners also listed issues relating to technologies (14%) more than any other challenge. Four of the technology challenges mentioned the need to assess local needs and match them to technologies.

Challenges relating to information were the next most frequently cited in Survey 3. These were focused mainly on various contextual variables.

No one challenge stand out as significant. Respondents cited many interesting challenges but provided no consensus on challenges of concern.

6. MEASURES TO ENHANCE ENDOGENOUS CAPACITIES

Additional information was needed to determine whether developing new climate technologies and adapting existing technologies might require different types of measures. Respondents were asked to rate the importance of various measures for working in the two areas. Two questions were presented.

How important are the measures listed below to enhancing [Survey 1: your country's; Surveys 2 & 3: endogenous] capacities to develop new climate technologies?

How important are the measures listed below to enhancing [Survey 1: your country's; Surveys 2 & 3: endogenous] capacities to adapt existing technologies to local needs and conditions?

The measures listed tend to be more specific than the general strategies listed for enabling environments discussed in the previous section, and separate responses were required for: **developing new technologies** and for **adapting existing technologies to local needs and conditions**.

The same rating scale was used for both questions.

- Not important
- Slightly important
- Moderately important
- Very important

A. Capacities to develop new technologies

Table 21 shows the percentages of respondents to all three surveys who chose “Moderately important” or “Very Important” for each measure to enhance in-country capacities to develop new technologies.

Table 21

Measures to enhance capacities to *develop new technologies*

Measures to enhance country capacities to develop new technologies	Survey 1	Survey 2	Survey 3
Access to additional funding	100%	88%	96%
Training in research, develop, innovation	100%	91%	93%
Educational programs	100%	100%	89%
Collaboration with external researchers	93%	97%	89%
Collaboration with external industries	91%	97%	85%
Public/private partnerships	91%	85%	85%
Participation on international teams	89%	91%	81%
Access to peer-reviewed literature	76%	85%	78%
Access to existing databases	89%	88%	81%
Exchange programs	84%	74%	74%
Fellowships	89%	71%	78%
Travel to international conferences	89%	56%	74%
Ability to deal with intellectual property	87%	82%	81%
<i>Number of respondents</i>	45	34	27
<i>Range</i>	76%-100%	56%-100%	74%-96%
<i>Median</i>	89%	88%	81%

All three groups said almost all the measures listed were important. Only one item was rated important by fewer than seven out of ten respondents (Survey 2, travel to international conference (56%)). The three groups were very similar in their highest and lowest ratings.

The survey 1 respondents saw everything on the list as important. At least three out of four rated every item as at least of moderate importance. All 45 of the Survey 1 respondents saw access to additional

funding; training in research, development, and innovation; and educational programs as moderately or very important. The lowest rating went to access to peer-reviewed literature (76%). Exchange programs (84%) and ability to deal with intellectual property (87%) also were viewed as less important.

Survey 2 respondents also unanimously rated educational programs as important but gave their next two highest ratings to collaboration with external researchers (97%) and collaboration with external industries (97%). Survey 2 respondents saw the least importance in experiences likely to be outside of a country, including travel to international conferences (56%); fellowships (71%), and exchange programs (74%).

The Survey 3 practitioners rated access to additional funding (96%), training in research, development, and innovation (93%), educational programs (89%), and collaboration with external researchers (89%) as the most important measures relating to the development of new technologies. They saw exchange programs (74%), travel to International conferences (74%), and fellowships (78%) as less important.

B. Capacities to adapt existing technologies to local needs and conditions

Tables 22 below shows the percentages of respondents to all three surveys who chose “Moderately important” or “Very Important” for each measure to enhance in-country capacities to adapt existing technologies to local needs and conditions.

Table 22

Measures to enhance capacities to adapt existing technologies to *local needs and conditions*

Measures to enhance country capacities to adapt technologies to local needs	Survey 1	Survey 2	Survey 3
Access to additional funding	98%	88%	100%
Training in research, development, innovation	98%	85%	93%
Educational programs	95%	97%	82%
Collaboration with external researchers	84%	88%	86%
Collaboration with external industries	84%	88%	82%
Public/private partnerships	93%	91%	75%
Participation on international teams	86%	74%	82%
Access to peer-reviewed literature	70%	71%	68%
Access to existing databases	82%	74%	75%
Exchange programs	82%	62%	64%
Fellowships	84%	59%	75%
Travel to international conferences	84%	47%	61%
Ability to deal with intellectual property	86%	65%	79%
<i>Number of respondents</i>	44	34	28
<i>Range</i>	70%-98%	47%-97%	61%-100%
<i>Median</i>	84%	74%	79%

The national entities of Survey 1 continued to see all areas as important and gave their highest ratings to the same three measures: access to additional funding (98%), training in research, development, and innovation (98%), and educational programs (95%). Their lowest importance ratings went to access to peer-reviewed literature (70%), access to existing databases (82%), and exchange programs (82%).

Members and observers again saw educational programs (97%) as the most important measure. Public/private partnerships (91%) jumped into second place in importance. They gave their lowest importance ratings to the same three areas as for developing new technologies.

Survey 3 practitioners kept access to funding (100%) at the top of their list, followed by training in research, development, and innovation (93%). Seen as least important were travel to international conferences (61%), exchange programs (64%), and access to peer-reviewed literature (68%).

7. CROSS-CUTTING ISSUES

Many topics occurred repeatedly in various forms throughout the surveys. This section takes two issues and follows them throughout the three surveys. Additional topics may be explored for the next version of the report.

A. Collaboration and partnerships

In addition to general stakeholder engagement, questions were asked about collaborating across groups and forming partnerships to plan and take actions relating to climate technologies. Items relating to collaboration and cooperation were included in questions about practitioner experience, skills and knowledge, enabling environments, and measures to enhance capacities to develop new technologies and to adapt existing technologies to local needs and conditions. Collaboration and partnerships were also mentioned in responses to some of the open-ended questions.

Practitioners, the group most likely to have been involved with on the ground action, were asked to indicate whether they had experience with collaborative programs. Just over one-third (36%) reported that they had collaborated in public/private partnerships involving climate technologies. The same number (36%) reported experience with South-South or triangular cooperation.

In evaluating country needs for skills and knowledge, more than half of all three groups rated managing interdisciplinary teams as a strong or very strong need. Practitioners were more likely to see this as a strong need (71%). Working with external industries and consultants showed similar ratings (58%) from Survey 1 respondents. Respondents to Survey 2 (35%) and Survey 3 (39%) were somewhat less likely to see this as a strong need. All these results were below the median for that group, except for the practitioner ratings for managing interdisciplinary teams.

Collaboration and cooperation were rated as some of the most important strategies to support enabling environments for enhancing climate capacities and technologies. Internal collaboration, including collaboration among national and local governments, civil society, indigenous peoples, businesses, and others within the country was rated as the top enabler by Survey 1 (89%), and Survey 2 (96%) respondents, and the second highest by Survey 2 (97%). External collaboration, including collaboration with researchers, funders, or practitioners from outside the country was an enabler by 100% of the Survey 2 respondents, and was the third highest enabler for Survey 1 (87%). Practitioners rated external collaboration right at the median of enablers (82%).

On the flip side, collaboration was much less likely to be regarded as a challenge to developing new technologies or modifying existing technologies to meet local needs and conditions. Only 8% of the many challenges listed involved internal or external collaboration.

The questions about the importance of measures to enhance country capacities to develop new or modify existing climate technologies included four measures involving collaborations. For developing new technologies, almost all respondents rated collaborative projects with researchers in other countries as moderately or very important (Survey 1 (93%), Survey 2 (97%), Survey 3 (89%). The importance of collaboration with external researchers was rated slightly lower for the adaptation of existing technologies to local needs and conditions (Survey 1 (84%), Survey 2 (88%), Survey 3 (86%).

The importance of collaborative projects with industries in other countries also received high ratings from all three groups. Importance ratings for developing new technologies were quite high: Survey 1 (91%), Survey 2 (97%), Survey 3 (85%). For adapting technologies, ratings dropped slightly: Survey 1 (84%), Survey 2 (88%), and Survey 3 (82%). Public/private partnerships also were important.

Overall, all three respondent groups recognized the importance of and need for collaboration and cooperation. They were less likely to see strong needs for skills and knowledge, but more likely to recognize importance of collaboration and partnerships in creating enabling environments.

B. Research and innovation systems

This entire study is about how to enhance endogenous innovation, both with respect to developing and modifying technologies. A few areas focused more specifically on systems designed to promote research and innovation in countries. The surveys asked about the extent to which institutional and organizational issues, including policies, programmes, and organizational structures, can enhance enabling environments.

The open-ended challenges question produced the largest number of responses relating to research and innovation systems. About one in ten respondents in each group cited a challenge relating to research or innovation systems. Country lack of encouragement for development of technologies was a problem by two respondents. One Survey 2 respondent cited “Lack of research, or (financial) support for research, development and demonstration of climate technologies. A Survey 3 respondent pointed to “The challenge of taking endogenous technologies to a level that international technologies are.”

The two sections on measures to enhance country capacities to develop new or to modify existing technologies asked about training in the research, development, and innovation process. This was one of the highest rated measures. All the Survey 1 respondents rated this measure as moderately or very important. It was also the most important area for practitioners (93%). Survey 2 respondents rated this measure as slightly less important (91%).

The numbers were similar for the importance of measures to enhance capacities to adapt existing technologies to local conditions. Training in research, development, and innovation was tied for the top rating on Survey 1 (98%) and was seen as important by all of the practitioners responding to Survey 3 (100%). The percentage of Survey 2 respondents was only slightly lower (85%).

8. NEXT STEPS

Work will continue on incorporating responses to open-ended questions, analyzing other cross-cutting issues throughout the surveys, and connecting the findings of the surveys to related work such as TEC mapping of enablers and challenges and PCCB studies on needs and gaps in capacity building. The revised report will be presented to the TEC at TEC 22.

Annex II

Questionnaires sent to three stakeholder groups

TEC 2020 NDE and TNAFP Survey

The Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC) has directed the Technology Executive Committee (TEC) to continue work on endogenous capacities and technologies. National Designated Entities (NDEs) and Technology Needs Assessment Focal Points (TNAFPs) play important roles relating to climate technologies in countries. The TEC is turning to you for information on how endogenous capacities and technologies can effectively support the implementation of climate action to achieve the goals of the Paris Agreement. This survey will specifically focus on identifying needs, gaps, challenges, and enabling environments to promote endogenous capacities and technologies.

We hope you will take the time to complete the survey. *Please respond as a government employee rather than in your personal capacity.* You need not complete the survey all at once. You can go back to answer more questions and change responses until the end date, as long as you use the same device and web browser each time. *Please be sure to click on "Done" at the end to submit your responses when you have completed the survey.*

The TEC considers climate technologies to cover a broad range of strategies to address mitigation, adaptation, and cross-cutting issues. The TEC considers climate technologies to include:

- **Hardware:** Physical tools
- **Software:** Processes, knowledge, and skills needed to install and manage technologies
- **Orgware:** Institutional mechanisms to support the acquisition and management of technologies

Definitions

Surveys conducted in 2018 asked about the scope and components of "endogenous capacities and technologies." In its 2019 report to the COP, the TEC identified elements that stakeholders often include in their understanding of endogenous capacities and technologies. Based on those findings, we ask you to use the following definitions as you respond to the questions in this survey.

- "Endogenous technologies" are those that have been:
 - Developed within the country or by a team of in-country and external people, or
 - Developed elsewhere but modified and adapted within the country or by a team of in-country and external people to meet the country's needs and conditions.
- "Endogenous capacities" include the capacities to:
 - Assess climate-related technology needs from the individual to the national level,
 - Identify appropriate technologies to assist in meeting identified needs, and
 - Adapt technologies to local needs and conditions.

"In-country" skills, knowledge, and practices include those contributed by people from governments at all levels, local communities and indigenous groups with traditional knowledge, academia, businesses, and others located within the country.

SURVEY FOR NATIONAL DESIGNATED ENTITIES AND TECHNOLOGY NEEDS ASSESSMENT FOCAL POINTS

Respondent and Country Characteristics

1. Which country are you from?

2. In which region is your country located?

- African States
- Asian States
- Eastern European States
- Latin American and the Caribbean States
- Western Europe and Other States

3. Who is your primary employer? Please check only one option.

- National government
- Sub-national government (such as a state, provincial, or local government or planning authority)
- Intergovernmental organization
- Academia
- Business or industry
- Non-governmental organization
- Consulting firm
- Other (please specify)

4. If you work for more than one entity, please check any other types of organizations for whom you currently work.

- National government
- Sub-national government (such as state, provincial, or local government or planning authority)
- Intergovernmental organization
- Academia
- Business or industry
- Non-governmental organization
- Consulting firm
- Other (please specify)

5. In which of the following roles do you serve? Please check all roles involving climate technologies in which you currently serve.

- National Designated Entity
- Technology Needs Assessment Focal Point
- UNFCCC Focal Point
- Global Environment Facility Focal Point
- National Designated Authority
- Other government position related to the UNFCCC (please specify)

6. If you currently serve as a National Designated Entity, how many years have you served in that position?

- Less than 1 year
- 1 year
- 2 years
- 3 years
- 4 years
- 5 or more years
- I do not currently serve as a National Designated Entity

7. If you currently serve as a Technology Needs Assessment Focal Point, how many years have you served in that role?

- Less than 1 year
- 1 year
- 2 years
- 3 years
- 4 years
- 5 or more years
- I do not currently serve as a Technology Needs Assessment Focal Point

8. What languages do you speak? (Check all languages that you speak.)

- Arabic
- Chinese
- English
- French
- Russian
- Spanish
- Other (please specify)

9. Which United Nations language do you feel most comfortable using? (Please select only one UN language. Feel free to skip this question if you prefer not to respond.)

- Arabic
- Chinese
- English
- French
- Russian
- Spanish

Needs, Gaps, and Challenges

10. Using the definitions of endogenous capacities and technologies described at the beginning of this survey, please rate the level of your country's current capacities in the climate technology areas listed below. Leave blank any area in which you have no opinion.

	Very weak capacities	Somewhat weak capacities	Somewhat strong capacities	Very strong capacities
Mitigation: Carbon fixation and abatement (such as oil and gas flaring reduction or CO2 capture and storage)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Transport (such as modal shift or electric vehicles)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Energy Efficiency (such as efficient lighting or energy management systems)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Renewable energy (such as solar PV or renewable energy resource mapping)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Waste management (such as landfill aeration or recycling)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Forestry (such as afforestation or carbon stock measurement)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Agriculture (such as N2O/CH4 reduction or minimizing food waste)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Industry (such as fuel switch or power plant rehabilitation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Early warning and environmental assessment (such as early warning systems or hazard mapping)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Agriculture and forestry (such as terrestrial ecosystems management or agroforestry)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Water (such as rainwater harvesting or seawater desalination)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Very weak capacities	Somewhat weak capacities	Somewhat strong capacities	Very strong capacities
Adaptation: Human health (such as heat wave plans or insecticidal bed nets)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Infrastructure and urban planning (such as sewerage infrastructure or building codes)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Coastal zones (such as storm surge barriers or coastal monitoring)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Marine and fisheries (such as fisheries management or artificial reefs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Governance and planning (such as assignments of responsibility and oversight)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Financial management (such as accessing funding and managing budgets)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Monitoring and reporting (such as standardized data collection and analysis and establishing indicators of progress)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Communication (such as using social media and customizing messages for different groups)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Legal and regulatory (such as revising regulatory structures and protecting intellectual property)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Very weak capacities Somewhat weak capacities Somewhat strong capacities Very strong capacities

Cross-cutting: Engaging affected stakeholders (such as involving local communities, indigenous peoples, and the most vulnerable in project planning)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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Cross-cutting: Gender responsiveness (such as reporting differential impacts of technologies on women and men)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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11. Please list up to five areas in which you think your country needs to enhance its capacities to develop new technologies; to adapt existing technologies to local needs and conditions; or to help implement your NDCs, NAPs, or national priorities. You may use the list from the previous question or describe something different.

Area 1.

Area 2.

Area 3.

Area 4.

Area 5.

12. Rate the level of your country's needs for skills and knowledge relating to endogenous capacities and technologies. Leave blank any areas in which you have no opinion.

No needs Weak needs Moderate needs Strong needs Very strong needs

Assessing local community needs for climate technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Selecting appropriate technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Importing technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Installing technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintaining technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adapting technologies to local needs and conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Operating technologies safely and efficiently	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recycling technologies at end of use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	No needs	Weak needs	Moderate needs	Strong needs	Very strong needs
Improving supply chains	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making development more sustainable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drafting legal and regulatory approaches to technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dealing with intellectual property issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluating the social, economic, and environmental impacts of technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing interdisciplinary teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working with external industries and consultants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing finances relating to technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Encouraging development and adaptation of technologies to meet local needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avoiding unintended consequences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Estimating useful lives of technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engaging various stakeholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Utilizing local and indigenous knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Empowering social capital	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assessing gender impacts of technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Boosting national and community ownership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Please list up to five challenges that are likely to hinder your country's development of new technologies or modification of existing technologies to meet local needs and conditions.

Challenge 1:

Challenge 2:

Challenge 3:

Challenge 4:

Challenge 5:

14. In the previous TEC survey, NDEs indicated a need to enhance their own capacities. Please describe any areas in which you would like to enhance your own skills and knowledge in relation to your role(s) in the UNFCCC process.

Participation

15. Findings from the previous TEC survey indicated that adopting a participatory approach could enhance endogenous capacities and technologies. To what extent have each of the following groups been involved in the planning, development, and deployment of climate-related technologies in your country? Please leave blank any area in which you have no opinion.

	Not at all involved	Slightly involved	Somewhat involved	Significantly involved
National government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local and municipal governments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intergovernmental organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Civil society	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Indigenous peoples and local communities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Women	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Business and industry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Entrepreneurs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial institutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People most vulnerable to climate impacts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Universities and other research institutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

Enabling Environments for Endogenous Capacities and Technologies

Previous TEC work and other studies have identified factors that can enable or present challenges to environments for enhancing climate and technologies. In some cases, the same factor was identified as both an enabler and a challenge. This section focuses on enablers.

16. For each of the following, please indicate the degree to which strategies in that area can enable environments for enhancing climate capacities and technologies in your country. Leave blank any area for which you have no opinion.

	Does not enable	Enables slightly	Enables moderately	Enables significantly
Collaboration: Internal (such as collaboration among national and local governments, civil society, indigenous peoples, businesses, and others within your country)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaboration: External (such as collaboration with researchers, funders, or practitioners from outside your country)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Economic issues: (such as market conditions or the high cost of capital)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financing: (such as access to funding for capacity building, planning, and technologies)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Legal and regulatory structures: Domestic (such as property rights, liability, and environmental laws)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Legal and regulatory structures: International (such as trade agreements and intellectual property rules)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Institutional and organizational issues (such as policies, programmes, and organizational structures)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information: Research (such as access to relevant data and up to date information)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information: Contextual (such as the social, cultural, economic, and other characteristics of communities)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Does not enable	Enables slightly	Enables moderately	Enables significantly
Human resources: Technical skills (such as installing, running, and maintaining technologies)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human resources: Management skills (such as supervising workers, interacting with different sectors, and overseeing project implementation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human resources: Analytical skills (such as collecting, organizing, and summarizing qualitative and quantitative information)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Governance: Decision-making (such as assignment of responsibilities, lines of authority)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Governance: Financial (such as where funds are deposited, procedures for budgeting and spending)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Education: Domestic (such as school programs or training targeted to specific skills, groups, or levels)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Education: International (such as student exchanges, attending school or workshops outside the country)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communication: (such as raising awareness about climate-related problems and sharing best practices)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="text"/>			

17. Please describe up to five factors that significantly contribute to enabling environments to enhance climate capacities and technologies in your country. You may use the categories listed above, or describe a different enabler.

Enabler 1:

Enabler 2:

Enabler 3:

Enabler 4:

Enabler 5:

18. How important are the measures listed below to enhancing your country's capacities to *develop new climate technologies*?

	Not at all important	Slightly important	Moderately important	Very important
Access to additional funding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training in the research, development, and innovation process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Educational programs in engineering, social science, and other fields	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative projects with academic researchers in other countries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative projects with industries in other countries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public/private partnerships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participation on international collaborative teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to peer-reviewed literature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to existing databases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exchange programs for students and faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fellowships for student and faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travel to international conferences for researchers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to deal with intellectual property rights	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

19. How important are the measures listed below to enhancing your country's capacities to *adapt existing technologies to local needs and conditions*?

	Not important	Slightly important	Moderately important	Very important
Access to additional funding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training in the research, development, and innovation process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Educational programs in engineering, social science, and other fields	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative projects with academic researchers in other countries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative projects with industries in other countries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public/private partnerships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participation on international collaborative teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to peer-reviewed literature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to existing databases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exchange programs for students and faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fellowships for student and faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travel to international conferences for researchers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to deal with intellectual property rights	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

Other

20. Please use this space for anything else you can tell us that would help to enhance endogenous capacities and technologies in your country.

21. Please describe any successful projects or programs that your country has developed that enhance climate technology capacities or technologies. Please include links to websites.

Many thanks for taking the time to complete this survey. The preliminary findings will be presented to the TEC at its next meeting.

Be sure to click on the "Done" button below to submit your responses.

Survey 2: Members and Observers

The Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC) has directed the Technology Executive Committee (TEC) to continue work on endogenous capacities and technologies. This survey is designed for current and former members and observers of the TEC, the Climate Technology Centre and Network Advisory Board (CTCN-AB), the Paris Committee on Capacity Building (PCCB), and other relevant constituted bodies; and other people knowledgeable about endogenous capacities and technologies. The TEC is turning to you for information on how endogenous capacities and technologies can effectively support the implementation of climate action to achieve the goals of the Paris Agreement. This survey will specifically focus on identifying needs, gaps, challenges, and enabling environments to promote endogenous capacities and technologies.

We hope you will take the time to complete the survey. *Please respond in your personal capacity as someone knowledgeable about climate technologies, capacity building, and endogenous capacities and technologies.* You need not complete the survey all at once. You can go back to answer more questions and change responses until the end date, as long as you use the same device and web browser each time. *Please be sure to click on "Done" at the end to submit your responses when you have completed the survey.*

The TEC considers climate technologies to include a broad range of strategies to address mitigation, adaptation, and cross-cutting issues, including:

- **Hardware:** Physical tools
- **Software:** Processes, knowledge, and skills needed to install and manage technologies
- **Orgware:** Institutional mechanisms to support the acquisition and management of technologies

Definitions

Endogenous capacities and technologies. Surveys conducted in 2018 asked about the scope and components of "endogenous capacities and technologies." In its 2019 report to the COP, the TEC identified elements that stakeholders often include in their understanding of endogenous capacities and technologies. Based on those findings, we ask you to use the following definitions as you respond to the questions in this survey.

- "Endogenous technologies" are those that have been:
 - Developed within the country or by a team of in-country and external people, or
 - Developed elsewhere but modified and adapted within the country or by a team of in-country and external people to meet the country's needs and conditions.
- "Endogenous capacities" include the capacities to:
 - Assess climate-related technology needs from the individual to the national level,
 - Identify appropriate technologies to assist in meeting identified needs, and
 - Adapt technologies to local needs and conditions.

In-country. "In-country" skills, knowledge, and practices include those contributed by people from governments at all levels, local communities and indigenous groups with traditional knowledge, academia, businesses, and others located within the country.

SURVEY FOR MEMBERS AND OBSERVERS OF TEC, CTCN-AB, PCCB, AND OTHER RELATED BODIES

Respondent and Country Characteristics

1. Which country are you from?

2. In which region is your country located?

- African States
- Asian States
- Eastern European States
- Latin American and the Caribbean States
- Western Europe and Other States

3. Who is your primary employer? Please check only one option.

- National government
- Sub-national government (such as a state, provincial, or local government or planning authority)
- Intergovernmental organization
- Academia
- Business or industry
- Non-governmental organization
- Consulting firm
- Other (please specify)

4. What is your primary role with this employer?

5. If you work for more than one entity, please check any other types of organizations for whom you currently work.

- National government
- Sub-national government (such as state, provincial, or local government or planning authority)
- Intergovernmental organization
- Academia
- Business or industry
- Non-governmental organization
- Consulting firm
- Other (please specify)

6. In which of the following roles do you currently serve or have you formerly served? Please check all roles involving climate technologies in which you currently serve.

- TEC member
- TEC observer
- TEC task force member
- CTCN AB member
- CTCN AB observer
- PCCB member
- PCCB observer
- Country negotiator
- Other role related to the UNFCCC (please specify)

7. What languages do you speak? (Check all languages that you speak.)

- Arabic
- Chinese
- English
- French
- Russian
- Spanish
- Other (please specify)

8. Which United Nations language do you feel most comfortable using? (Please select only one UN language. Feel free to skip this question if you prefer not to respond.)

- Arabic
- Chinese
- English
- French
- Russian
- Spanish

Needs, Gaps, and Challenges

9. Using the definitions of endogenous capacities and technologies described at the beginning of this survey, please provide your perceptions about the level of country capacities in the climate technology areas listed below. Leave blank any area in which you have no opinion.

	Very weak capacities	Somewhat weak capacities	Somewhat strong capacities	Very strong capacities
Mitigation: Carbon fixation and abatement (such as oil and gas flaring reduction or CO2 capture and storage)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Transport (such as modal shift or electric vehicles)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Very weak capacities	Somewhat weak capacities	Somewhat strong capacities	Very strong capacities
Mitigation: Energy Efficiency (such as efficient lighting or energy management systems)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Renewable energy (such as solar PV or renewable energy resource mapping)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Waste management (such as landfill aeration or recycling)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Forestry (such as afforestation or carbon stock measurement)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Agriculture (such as N2O/CH4 reduction or minimizing food waste)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Industry (such as fuel switch or power plant rehabilitation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Early warning and environmental assessment (such as early warning systems or hazard mapping)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Agriculture and forestry (such as terrestrial ecosystems management or agroforestry)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Water (such as rainwater harvesting or seawater desalination)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Human health (such as heat wave plans or insecticidal bed nets)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Very weak capacities	Somewhat weak capacities	Somewhat strong capacities	Very strong capacities
Adaptation: Infrastructure and urban planning (such as sewerage infrastructure or building codes)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Coastal zones (such as storm surge barriers or coastal monitoring)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Marine and fisheries (such as fisheries management or artificial reefs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Governance and planning (such as assignments of responsibility and oversight)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Financial management (such as accessing funding and managing budgets)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Monitoring and reporting (such as standardized data collection and analysis and establishing indicators of progress)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Communication (such as using social media and customizing messages for different groups)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Legal and regulatory (such as revising regulatory structures and protecting intellectual property)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Engaging affected stakeholders (such as involving local communities, indigenous peoples, and the most vulnerable in project planning)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Very weak capacities Somewhat weak capacities Somewhat strong capacities Very strong capacities

Cross-cutting: Gender responsiveness (such as reporting differential impacts of technologies on women and men)

Other (please specify)

10. Please list up to five areas in which you think countries need to enhance capacities to develop new technologies; to adapt existing technologies to local needs and conditions; or to help implement NDCs, NAPs, or national priorities. You may use the list from the previous question or describe something different.

Area 1.

Area 2.

Area 3.

Area 4.

Area 5.

11. Rate your perceptions of the level of country needs for skills and knowledge relating to endogenous capacities and technologies. Leave blank any areas in which you have no opinion.

No need Weak need Moderate need Strong need Very strong need

Assessing local community needs for climate technologies

Selecting appropriate technologies

Importing technologies

Installing technologies

Maintaining technologies

Adapting technologies to local needs and conditions

Operating technologies safely and efficiently

Recycling technologies at end of use

Improving supply chains

Making development more sustainable

	No need	Weak need	Moderate need	Strong need	Very strong need
Drafting legal and regulatory approaches to technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dealing with intellectual property issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluating the social, economic, and environmental impacts of technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing interdisciplinary teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working with external industries and consultants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing finances relating to technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Encouraging development and adaptation of technologies to meet local needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avoiding unintended consequences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Estimating useful lives of technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engaging various stakeholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Utilizing local and indigenous knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Empowering social capital	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assessing gender impacts of technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Boosting national and community ownership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="text"/>				

12. Please list up to five challenges that are likely to hinder in-country development of new technologies or modification of existing technologies to meet local needs and conditions.

Challenge 1:

Challenge 2:

Challenge 3:

Challenge 4:

Challenge 5:

Participation

13. Findings from the previous TEC survey indicated that adopting a participatory approach could enhance endogenous capacities and technologies. To what extent do you believe each of the following groups should be involved in the planning, development, and deployment of climate-related technologies? Leave blank any area in which you have no opinion.

	Should not be involved	Should be slightly involved	Should be somewhat involved	Should be significantly involved
National government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local and municipal governments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intergovernmental organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Civil society	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Indigenous peoples and local communities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Women	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Business and industry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Entrepreneurs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial institutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People most vulnerable to climate impacts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Universities and other research institutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

Enabling Environments for Endogenous Capacities and Technologies

Previous TEC work and other studies have identified factors that can enable or present challenges to environments for enhancing climate capacities and technologies. In some cases, the same factor was identified as both an enabler and a challenge. This section focuses on enablers.

14. For each of the following, please indicate the degree to which you think strategies in that area can enable environments for enhancing endogenous climate capacities and technologies.

	Does not enable	Enables slightly	Enables moderately	Enables significantly
Collaboration: Internal (such as collaboration among national and local governments, civil society, indigenous peoples, businesses, and others within your country)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaboration: External (such as collaboration with researchers, funders, or practitioners from outside your country)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Economic issues: (such as market conditions or the high cost of capital)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financing: (such as access to funding for capacity building, planning, and technologies)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Legal and regulatory structures: Domestic (such as property rights, liability, and environmental laws)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Legal and regulatory structures: International (such as trade agreements and intellectual property rules)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Institutional and organizational issues (such as policies, programmes, and organizational structures)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information: Research (such as access to relevant data and up to date information)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Does not enable	Enables slightly	Enables moderately	Enables significantly
Information: Contextual (such as the social, cultural, economic, and other characteristics of communities)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human resources: Technical skills (such as installing, running, and maintaining technologies)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human resources: Management skills (such as supervising workers, interacting with different sectors, and overseeing project implementation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human resources: Analytical skills (such as collecting, organizing, and summarizing qualitative and quantitative information)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Governance: Decision-making (such as assignment of responsibilities, lines of authority)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Governance: Financial (such as where funds are deposited, procedures for budgeting and spending)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Education: Domestic (such as school programs or training targeted to specific skills, groups, or levels)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Education: International (such as student exchanges, attending school or workshops outside the country)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communication: (such as raising awareness about climate-related problems and sharing best practices)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="text"/>			

15. Please describe up to five factors that you believe contribute significantly to enabling environments to enhance in-country climate capacities and technologies. You may use the categories listed above, or describe a different enabler.

Enabler 1:

Enabler 2:

Enabler 3:

Enabler 4:

Enabler 5:

16. How important do you think the measures listed below are to enhancing endogenous capacities to *develop new climate technologies*?

	Not at all important	Slightly important	Moderately important	Very important
Access to additional funding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training in the research, development, and innovation process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Educational programs in engineering, social science, and other fields	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative projects with academic researchers in other countries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative projects with industries in other countries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public/private partnerships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participation on international collaborative teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to peer-reviewed literature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to existing databases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exchange programs for students and faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fellowships for student and faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travel to international conferences for researchers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to deal with intellectual property rights	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

17. How important do you think the measures listed below are to enhancing endogenous capacities to *adapt existing technologies to local needs and conditions*?

	Not important	Slightly important	Moderately important	Very important
Access to additional funding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training in the research, development, and innovation process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Educational programs in engineering, social science, and other fields	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative projects with academic researchers in other countries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative projects with industries in other countries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public/private partnerships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participation on international collaborative teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to peer-reviewed literature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to existing databases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exchange programs for students and faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fellowships for student and faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travel to international conferences for researchers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to deal with intellectual property rights	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

Other

18. Please use this space for anything else you can tell us that would help countries to enhance their endogenous capacities and technologies.

19. Please describe any project or program that you believe has significantly enhanced endogenous climate technology capacities or technologies. Please include links to websites.

Many thanks for taking the time to complete this survey. The preliminary findings will be presented to the TEC at its next meeting.

Be sure to click on the "Done" button below to submit your responses.

Survey 3: Practitioners

The Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC) has directed the Technology Executive Committee (TEC) to continue work on endogenous capacities and technologies. This survey is designed for practitioners who have worked directly with climate technologies in various countries. The TEC is asking you to share your practical experience to provide information on how endogenous capacities and technologies can effectively support the implementation of climate action to achieve the goals of the Paris Agreement. This survey will specifically focus on identifying needs, gaps, challenges, and enabling environments to promote endogenous capacities and technologies.

We hope you will take the time to complete the survey. Please respond based on your experience as a practitioner who has worked on the ground with various issues relating to climate technologies.

You need not complete the survey all at once. You can go back to answer more questions and change responses until the end date, as long as you use the same device each time. *Please be sure to click on "DONE" at the end to submit your responses when you have completed the survey.*

The TEC considers climate technologies to cover a broad range of strategies to address mitigation, adaptation, and cross-cutting issues. The TEC considers climate technologies to include:

Hardware: Physical tools

Software: Processes, knowledge, and skills needed to install and manage technologies

Orgware: Institutional mechanisms to support the acquisition and management of technologies

Definitions

Endogenous capacities and technologies. Surveys conducted in 2018 asked about the scope and components of "endogenous capacities and technologies." In its 2019 report to the COP, the TEC identified elements that stakeholders often include in their understanding of endogenous capacities and technologies. Based on those findings, we ask you to use the following definitions as you respond to the questions in this survey.

- "Endogenous technologies" are those that have been:
 - Developed within the country or by a team of in-country and external people, or
 - Developed elsewhere but modified and adapted within the country or by a team of in-country and external people to meet the country's needs and conditions.
- "Endogenous capacities" include the capacities to:
 - Assess climate-related technology needs from the individual to the national level,
 - Identify appropriate technologies to assist in meeting identified needs, and
 - Adapt technologies to local needs and conditions.

In-country. "In-country" skills, knowledge, and practices include those contributed by people from governments at all levels, local communities and indigenous groups with traditional knowledge, academia, businesses, and others located within the country.

For the purposes of this survey, please focus on the one country where you have worked that has provided you with the best understanding of endogenous capacities and technologies.

SURVEY FOR PRACTITIONERS INVOLVED WITH CLIMATE TECHNOLOGIES

Respondent and Country Characteristics

1. Which country are you from?

2. In which region is your country located?

- African States
- Asian States
- Eastern European States
- Latin American and the Caribbean States
- Western Europe and Other States

3. Who is your primary employer? Please check only one option.

- National government
- Sub-national government (such as a state, provincial, or local government or planning authority)
- Intergovernmental organization
- Academia
- Business or industry
- Non-governmental organization
- Consulting firm
- Other (please specify)

4. What is your primary role with this employer?

5. If you work for more than one entity, please check any other types of organizations for whom you currently work.

- National government
- Sub-national government (such as state, provincial, or local government or planning authority)
- Intergovernmental organization
- Academia
- Business or industry
- Non-governmental organization
- Consulting firm
- Other (please specify)

6. Are you a CTCN Network member?

- Yes
- Not sure
- No

7. Please check all activities involving climate technologies in which you have experience.

- Designed or developed project involving climate technologies
- Implemented project involving climate technologies
- Represented climate technology company
- Researched climate technologies
- Developed new climate technologies
- Adapted climate technologies to meet local needs and conditions
- Trained people in using climate technologies
- Collaborated in public/private partnership involving climate technologies
- Collaborated in South-South or triangular cooperation involving climate technologies
- Promoted good practices in use of climate technologies
- Other activities related to climate technologies. (please specify)

8. In which country have you had the most experience with endogenous capacities and technologies?

9. In which region is this country located?

- African States
- Asian States
- Eastern European States
- Latin American and the Caribbean States
- Western Europe and Other States

10. What languages do you speak? (Check all languages that you speak.)

- Arabic
- Chinese
- English
- French
- Russian
- Spanish
- Other (please specify)

11. Which United Nations language do you feel most comfortable using? (Please select only one UN language. Feel free to skip this question if you prefer not to respond.)

- Arabic
- Chinese
- English
- French
- Russian
- Spanish

Needs, Gaps, and Challenges

12. Using the definitions of endogenous capacities and technologies described at the beginning of this survey, please provide your perceptions about the level of the capacities in the climate technology areas listed below, focusing on the country where you have the most experience. Leave blank any area in which you have no

opinion.

	Very weak capacities	Somewhat weak capacities	Somewhat strong capacities	Very strong capacities
Mitigation: Carbon fixation and abatement (such as oil and gas flaring reduction or CO2 capture and storage)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Transport (such as modal shift or electric vehicles)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Energy Efficiency (such as efficient lighting or energy management systems)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Renewable energy (such as solar PV or renewable energy resource mapping)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Waste management (such as landfill aeration or recycling)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Forestry (such as afforestation or carbon stock measurement)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Agriculture (such as N2O/CH4 reduction or minimizing food waste)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigation: Industry (such as fuel switch or power plant rehabilitation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Early warning and environmental assessment (such as early warning systems or hazard mapping)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Agriculture and forestry (such as terrestrial ecosystems management or agroforestry)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Very weak capacities	Somewhat weak capacities	Somewhat strong capacities	Very strong capacities
Adaptation: Water (such as rainwater harvesting or seawater desalination)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Human health (such as heat wave plans or insecticidal bed nets)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Infrastructure and urban planning (such as sewerage infrastructure or building codes)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Coastal zones (such as storm surge barriers or coastal monitoring)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptation: Marine and fisheries (such as fisheries management or artificial reefs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Governance and planning (such as assignments of responsibility and oversight)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Financial management (such as accessing funding and managing budgets)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Monitoring and reporting (such as standardized data collection and analysis and establishing indicators of progress)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Communication (such as using social media and customizing messages for different groups)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-cutting: Legal and regulatory (such as revising regulatory structures and protecting intellectual property)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Very weak capacities Somewhat weak capacities Somewhat strong capacities Very strong capacities

Cross-cutting: Engaging affected stakeholders (such as involving local communities, indigenous peoples, and the most vulnerable in project planning)

Cross-cutting: Gender responsiveness (such as reporting differential impacts of technologies on women and men)

13. Please list up to five areas in which you think the country you are focusing on needs to enhance capacities to develop new technologies, to adapt existing technologies to local needs and conditions, or undertake other climate actions. You may use the list from the previous question or describe something different.

Area 1.

Area 2.

Area 3.

Area 4.

Area 5.

14. Rate your perceptions of the need for skills and knowledge relating to endogenous capacities and technologies, focusing on the country you have chosen. Leave blank any areas in which you have no opinion.

No need Weak need Moderate need Strong need Very strong need

Assessing local community needs for climate technologies

Selecting appropriate technologies

Importing technologies

Installing technologies

Maintaining technologies

Adapting technologies to local needs and conditions

Operating technologies safely and efficiently

Recycling technologies at end of use

	No need	Weak need	Moderate need	Strong need	Very strong need
Improving supply chains	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making development more sustainable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drafting legal and regulatory approaches to technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dealing with intellectual property issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluating the social, economic, and environmental impacts of technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing interdisciplinary teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working with external industries and consultants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing finances relating to technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Encouraging development and adaptation of technologies to meet local needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avoiding unintended consequences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Estimating useful lives of technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engaging various stakeholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Utilizing local and indigenous knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Empowering social capital	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assessing gender impacts of technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Boosting national and community ownership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Please list up to five challenges that you believe are likely to hinder endogenous development of new technologies or modification of existing technologies to meet local needs and conditions.

Challenge 1:

Challenge 2:

Challenge 3:

Challenge 4:

Challenge 5:

Participation

16. Findings from the previous TEC survey indicated that adopting a participatory approach could enhance endogenous capacities and technologies. To what extent do you believe each of the following groups should be involved in the planning, development, and deployment of climate-related technologies? Leave blank any group for which you have no opinion.

	Should not be involved	Should be slightly involved	Should be somewhat involved	Should be significantly involved
National government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local and municipal governments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intergovernmental organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Civil society	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Indigenous peoples and local communities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Women	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Business and industry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Entrepreneurs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial institutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People most vulnerable to climate impacts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Universities and other research institutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

Enabling Environments for Endogenous Capacities and Technologies

Previous TEC work and other studies have identified factors that can enable or present challenges to environments for enhancing climate capacities and technologies. In some cases, the same factor was identified as both an enabler and a challenge. This section focuses on enablers.

17. For each of the following, and based on your experiences in your focus country, please indicate the degree to which you think strategies in that area can enable environments for enhancing endogenous climate capacities and technologies.

	Does not enable	Enables slightly	Enables moderately	Enables significantly
Collaboration: Internal (such as collaboration among national and local governments, civil society, indigenous peoples, businesses, and others within your country)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaboration: External (such as collaboration with researchers, funders, or practitioners from outside your country)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Economic issues: (such as market conditions or the high cost of capital)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financing: (such as access to funding for capacity building, planning, and technologies)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Legal and regulatory structures: Domestic (such as property rights, liability, and environmental laws)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Legal and regulatory structures: International (such as trade agreements and intellectual property rules)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Institutional and organizational issues (such as policies, programmes, and organizational structures)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information: Research (such as access to relevant data and up to date information)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Does not enable	Enables slightly	Enables moderately	Enables significantly
Information: Contextual (such as the social, cultural, economic, and other characteristics of communities)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human resources: Technical skills (such as installing, running, and maintaining technologies)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human resources: Management skills (such as supervising workers, interacting with different sectors, and overseeing project implementation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human resources: Analytical skills (such as collecting, organizing, and summarizing qualitative and quantitative information)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Governance: Decision-making (such as assignment of responsibilities, lines of authority)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Governance: Financial (such as where funds are deposited, procedures for budgeting and spending)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Education: Domestic (such as school programs or training targeted to specific skills, groups, or levels)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Education: International (such as student exchanges, attending school or workshops outside the country)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communication: (such as raising awareness about climate-related problems and sharing best practices)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="text"/>			

18. Please describe up to five factors that you believe contribute significantly to enabling environments to enhance endogenous climate capacities and technologies. You may use the categories listed above, or describe a different enabler.

Enabler 1:

Enabler 2:

Enabler 3:

Enabler 4:

Enabler 5:

19. How important do you think the measures listed below are to enhancing endogenous capacities to *develop new climate technologies*?

	Not at all important	Slightly important	Moderately important	Very important
Access to additional funding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training in the research, development, and innovation process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Educational programs in engineering, social science, and other fields	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative projects with academic researchers in other countries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative projects with industries in other countries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public/private partnerships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participation on international collaborative teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to peer-reviewed literature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to existing databases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exchange programs for students and faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fellowships for student and faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travel to international conferences for researchers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to deal with intellectual property rights	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

20. How important do you think the measures listed below are to enhancing endogenous capacities to *adapt existing technologies to local needs and conditions*?

	Not important	Slightly important	Moderately important	Very important
Access to additional funding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training in the research, development, and innovation process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Educational programs in engineering, social science, and other fields	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative projects with academic researchers in other countries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative projects with industries in other countries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public/private partnerships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participation on international collaborative teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to peer-reviewed literature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to existing databases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exchange programs for students and faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fellowships for student and faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travel to international conferences for researchers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to deal with intellectual property rights	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

Other

21. Please use this space for anything else you can tell us that would help countries to enhance their endogenous capacities and technologies.

22. Please describe any project or program that you believe has significantly enhanced endogenous climate capacities or technologies. Please include links to websites.

Many thanks for taking the time to complete this survey. The preliminary findings will be presented to the TEC at its next meeting.

Be sure to click on the "Done" button below to submit your responses.