

INDCS and technology

A synthesis of technology issues contained in intended nationally determined contributions

Key findings

- Nearly 140 non-Annex I Parties mentioned technology in their INDCs. This is 95 per cent of all non-Annex I.
- International support for technology is a key demand. More than 100 non-Annex I Parties said they need international support for technology development and transfer to implement their INDC.
- Nearly one-third of the non-Annex I Parties mentioned specific climate technology needs, with nearly 20 per cent (26 Parties) referring to TNAs.
- One quarter of the non-Annex I Parties highlighted specific costs for the technologies of their INDC. There was less focus on technology barriers (20 per cent).

1. Introduction

In their intended nationally determined contributions (INDCs), how do Parties see technology contributing to their climate change efforts? This paper attempts to answer this question by summarizing the findings from a synthesis of information on technology contained in INDCs. As of 28 April 2016, 190 Parties had submitted INDCs to the UNFCCC secretariat in Arabic, English, Spanish and French.¹ For this paper, we reviewed each INDC to determine whether it refers to climate technology issues and in what context. From this, we extracted key findings on how Parties perceive the role of climate technology in supporting them to implement their INDC.

2. Scope of note

This paper highlights the key findings from the synthesis of INDCs with regards to climate technology. It breaks down the findings for Annex I and non-Annex I Parties. It then highlights findings for small island developing States (SIDS), the least developed countries (LDCs), and different regions.

3. Methodology

We reviewed each INDC to determine if it included information on the following technology issues:

- International support for technology implementation;
- Specific technology needs and technology needs assessments (TNAs);
- Research and development (R&D) and innovation;
- Barriers to technology development and transfer;
- Finance needs for technology;
- Technology Mechanism (including the Technology Executive Committee (TEC), the Climate Technology Centre and Network (CTCN) and national designated entities (NDEs)).

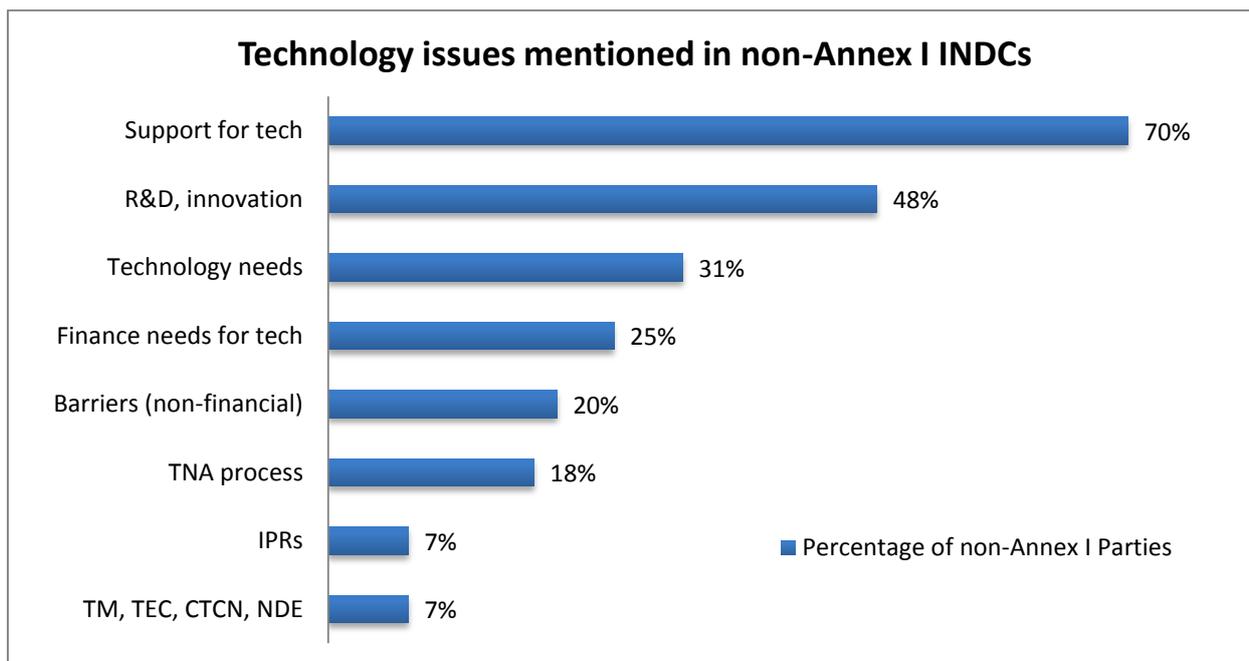
4. Results

4.1 Overall

Technology was an important element of many non-Annex I INDCs. Of the 190 Parties that submitted their INDC, more than 75 per cent mentioned technology. Approximately 25 per cent of Annex I Parties referred to technology, generally in the context of R&D and innovation to support national action. Of the 147 non-Annex I Parties that submitted INDCs (95 per cent of all non-Annex I Parties) 95 per cent mentioned technology. Figure 1 highlights the frequency with which they reported on technology issues.

¹ All intended nationally determined contributions may be found here: <<http://www4.unfccc.int/submissions/INDC>>.

Figure 1

Technology issues mentioned in the intended nationally determined contributions of non-Annex I Parties**4.2 Commentary**

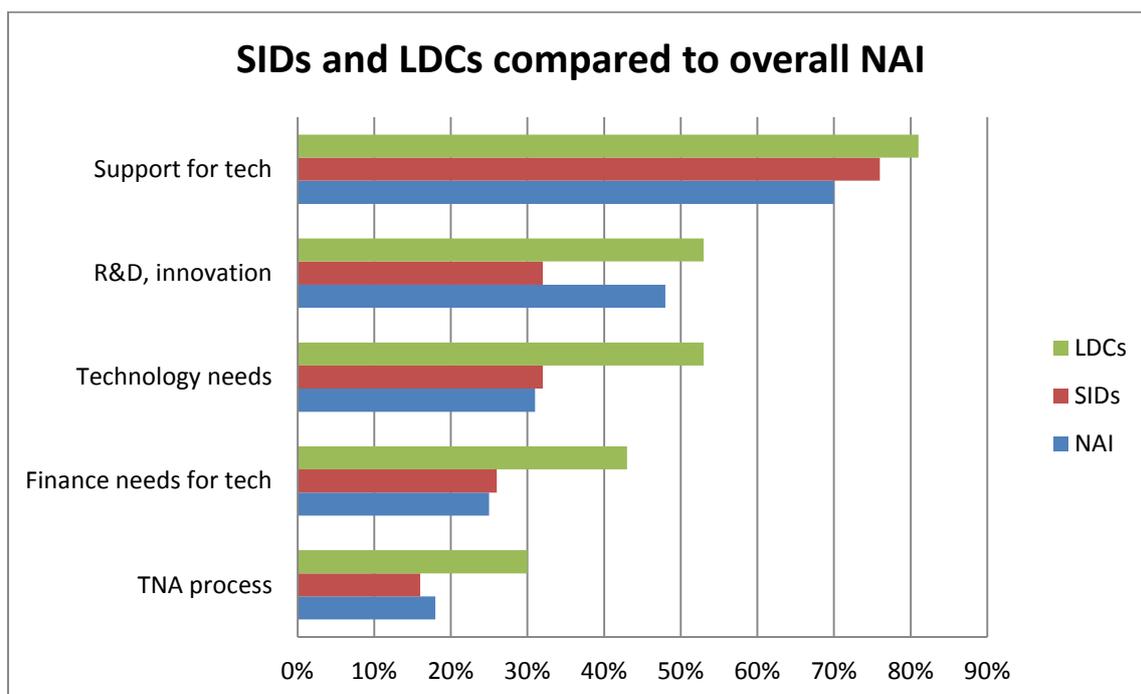
- **International support for technology is a key demand.** More than 100 non-Annex I Parties (70 per cent of all non-Annex I) highlighted that implementing their INDC is conditional upon international support for technology development and transfer.
- **Many desire to build national innovation capacity.** Almost half of the non-Annex I Parties referred to technology R&D or innovation in their INDC. This was noticeable in the INDCs of China and the United Arab Emirates, but also in those of Francophone African countries (e.g. Benin and Côte d'Ivoire).
- **Understanding climate technology needs is a matter of priority.** Nearly one-third of the non-Annex I Parties mentioned specific climate technology needs for enhancing their action on climate change. For example, Afghanistan and India provided lists of the specific technologies that they need. Nearly 20 per cent of non-Annex I Parties referred to TNAs, either on a completed TNA or the need to undertake one. For example, Vanuatu noted:
"A Technology Needs Assessment (TNA) for Vanuatu is needed as a matter of priority to look at implementing a country driven process for identifying and analyzing the priority technology needs for mitigating and adapting to climate change."
 See the annex for the actual texts where Parties refer to TNAs in their INDCs.
- **Many put a price on their technology needs.** One quarter of the non-Annex I Parties highlighted specific costs for their INDC technologies. For Togo the total cost of their identified technology transfer needs is USD 0.5 billion.
- **There was less of a focus on barriers.** 20 per cent of non-Annex I Parties referred to (non-financial) technology barriers in their INDCs. The Republic of Moldova had a detailed section on gaps and barriers to technology transfer.
- **The Technology Mechanism and its bodies were not mentioned often.** Only seven mentioned the CTCN. Two Parties (China and Cuba) referred to the Technology Mechanism and one (Congo) to national designated entities. Only Kuwait referred to the Technology Executive Committee.

4.3 Analysis of specific groups

Figure 2 illustrates the differences in frequency of technology issues reported by SIDS, LDCs and all non-Annex I Parties. In general, the SIDS and LDCs raised technology issues more often than the non-Annex I Parties as a whole.

Figure 2

Technology issues mentioned by small island developing States and the least developed countries, compared to all non-Annex I Parties



4.4 Regional analysis

For all regions the most reported issue was the need for international support for technology development and transfer. The next most reported issue for all regions was R&D and innovation. At the third level regional differences become clear. Africa focuses on finance for technology, Asia and the Pacific on specific technology needs, and the Latin America and the Caribbean on the TNA process.

Table 1

Technology issues as mentioned by countries of different regions

Africa		Asia and the Pacific	
<i>Mentioned technology</i>	100%	<i>Mentioned technology</i>	94%
Support for technology	77%	Support for technology	75%
R&D	62%	R&D	43%
Finance for technology	42%	Non-finance barrier	33%
Eastern Europe		Latin America and the Caribbean	
<i>Mentioned technology</i>	67%	<i>Mentioned technology</i>	97%
Support for technology	33%	Support for tech	66%
R&D	22%	R&D	41%
N/A	-	TNA process	16%

6. Conclusions

This paper aims to provide an insight into how Parties see technology in the context of their INDCs. Nearly all non-Annex I Parties referred to technology in their INDCs, with the most raised issue relating to international support for technology development and transfer. Other issues raised were R&D, specific technology needs and financial needs for technology. Identifying technology needs continues to be a key issue for many non-Annex I Parties, with nearly 20 per cent referring to TNAs.

Annex**Technology needs assessments and intended nationally determined contributions**

26 non-Annex I Parties referred directly to technology needs assessments (TNAs) in their INDCs:

- 30 per cent want to undertake a TNA;
- 75 per cent referred to an on-going or completed TNA;
- 50 per cent said the TNA was an input into their INDC;
- 20 per cent mentioned technology action plans.

Table 1

References to technology needs assessments in intended nationally determined contributions

Party	Reference								
Angola	Project title: Technology needs assessment. Project cost (USD): 500,000								
Cambodia	Cambodia has developed technology needs assessment for adaptation and mitigation, and technology needs also feature prominently in the sectoral climate change action plans. At the start of the INDC implementation phase Cambodia will also need to carry out a detailed technology needs assessment.								
Congo	Ces objectifs de protection nécessaires à l'adaptation exigent : <ul style="list-style-type: none"> • une nécessaire évaluation des besoins technologiques au niveau des secteurs prioritaires définis dans le projet de TCN, avec, principalement, l'appui de l'Entité Nationale Désignée (END) au Centre et Réseau des Ressources Technologiques (CRTC) de la CCNUCC et des autres partenaires stratégiques du pays 								
Costa Rica	In 2011, Costa Rica presented its Technological Needs Assessment (TNA) which posted a strategy for technological transfer and access to support greenhouse gas mitigation (GHG), and reduce vulnerability to adverse effects of climate change. In this evaluation, the following sectors and climate actions were prioritized: Public Transportation Integration and Decongestion, and Energy Conservation and Efficiency. In adaptation, two approaches were proposed, the adaptive co-management at the watershed level and detailed (sub-national) climate change scenarios. One of the approaches proposed with impacts both in mitigation and adaptation: Sustainable Agricultural Production.								
Democratic Republic of the Congo	Depuis, elle a réalisé une série d'activités dans les domaines suivants: <ul style="list-style-type: none"> • l'identification des potentialités en atténuation et les besoins technologiques en 2007 								
Dominican Republic	The country has developed a Technology Needs Assessment (TNA), which identified a number of measures and technologies whose implementation is compatible with the NDS, CCDP and the NAPA-DR.								
Georgia	Combination of various coastal zone protection technologies are recommended by the second "Technology Needs Assessment" report of Georgia to prevent the significant damage caused by the Black Sea level rise.								
Ghana	Ghana's INDC builds on other national documents prepared and submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in fulfilment of its obligations under the Convention. These include the ... Technology Needs Assessment (TNAs).								
Grenada	Grenada is currently undertaking its technology needs assessments (TNA) and has selected the water, agriculture and tourism as the focal sectors. Water was identified as the more dominant crosscutting sector. The results of the TNA will provide the necessary information on technology needs for Grenada to continue its resilience building activities.								
Haiti	Cela nécessitera: <ul style="list-style-type: none"> • des transferts de technologie s'appuyant sur des évaluations de besoins en technologie (EBT). 								
Honduras	Actualmente, la República de Honduras está realizando una evaluación de las necesidades tecnológicas que servirá de base para la creación del Plan de Acción Tecnológico. Actualmente, están en marcha una serie de procesos de planificación estratégica en cambio climático coordinados por la Dirección Nacional de Cambio Climático, entre los cuales destacan: ... Evaluaciones de Necesidades Tecnológicas...								
Lao People's Democratic Republic	Methodology for assessing base year and anticipated future emissions Please refer to the calculations presented in Lao PDR's Second National Communication ... and the Technology Needs Assessment (2013).								
Madagascar	INDC concepts continue and/or support other related UNFCCC processes, including ... the National Technological Assessment (TNA).								
Mali	Au cours de la même période, les besoins sont basés sur des objectifs de développement durable axés sur la poursuite et l'intensification des programmes ci-dessus complétés notamment par : <ul style="list-style-type: none"> • la mise en œuvre d'un plan d'action technologique pour l'adaptation et l'atténuation; Prévisions et besoins en adaptation pour la période 2015-2020 Ces besoins sont basés sur les objectifs de développement à travers la mise en place d'un Plan National de Développement Durable et des objectifs de développement durable comprenant les actions suivantes: <ul style="list-style-type: none"> • mise en œuvre du Plan d'action technologique pour l'adaptation et l'atténuation; 								
Mongolia	<table border="1"> <thead> <tr> <th>Stated contribution</th> <th>Specific measures</th> <th>Investment needs</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>Reduce building heat loss by 40% by</td> <td>Improved insulation for</td> <td>90 million USD</td> <td>Technology Needs</td> </tr> </tbody> </table>	Stated contribution	Specific measures	Investment needs	Source	Reduce building heat loss by 40% by	Improved insulation for	90 million USD	Technology Needs
Stated contribution	Specific measures	Investment needs	Source						
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	2030, compared to 2010 levels.	existing panel apartment buildings of 18,184 households in Ulaanbaatar.		Assessment (TNA), 2013
	Improved efficiency of coal fired heating plants and thermal power plants.	Improved efficiency of coal fired plants.	900 million USD	TNA, 2013
Mozambique	Mozambique is participating in the Second Phase of the Technology Needs Assessment Project (TNA), covering the following sectors: (i) energy and waste, (ii) agriculture and (iii) coastal zones, including infrastructures. This process will result in a Technological Action Plan identifying the needs, including the financial and capacity building needs in those sectors. This information is relevant to identify the necessary means to implement the proposed actions. This exercise will be concluded by the end of 2017.			
Myanmar	<p>A preliminary Technology Needs Assessment (TNA) was completed by MOECA as part of the preparation of the Initial National Communication. There is a clear need for the transfer of Environmentally Sound Technologies (ESTs) such as renewable energy and energy efficiency technologies for mitigation and flood control technology and early warning technologies for adaptation. Myanmar's technology development and transfer needs also include technologies and skills transfer which support the implementation and operation of ESTs such as those that ensure the operation, repair and maintenance of ESTs. The understanding of technology development and transfer needs in Myanmar is still developing and an additional TNA should be completed with international support to better understand these requirements.</p> <p>It is envisaged that financial support will be utilised by Myanmar in a variety of ways including but not limited to:</p> <ul style="list-style-type: none"> Financial support required for the Technology needs assessment for mitigation and adaptation activities, financial need assessment for estimation of implementation and operational and maintenance cost, identification of need assessment for capacity building for implementation and monitoring of mitigation and adaptation activities, 			
Nauru	The need for development of new technologies and transfer of existing appropriate technologies for adaptation in Nauru cannot be overstated. Technology Needs Assessment (TNA) will help countries like Nauru track their needs for new equipment, techniques, services, capacities and skills necessary to build resilience to climate change. However, TNA has not been initiated in Nauru due to various constraints including lack of institutional, human and financial capacity. The preparation of a detailed technology needs for adaptation is an important next step.			
Rwanda	Rwanda successfully completed its Technology Needs Assessment (TNA). Elements of Rwanda's TNA process included institutional arrangements for TNA, extensive stakeholders' involvement and consultations, prioritization of sectors, barrier/market analysis and Technology Action Plans (TAP). Prioritized sectors in Rwanda's TNA were agriculture and energy.			
Seychelles	The INDC process ... has highlighted synergies with other UNFCCC-related processes, including ... technology Needs Assessment (TNA).			
Sri Lanka	In response to challenges posed by climate change, Sri Lanka has taken several positive steps by introducing national policies, strategies and actions in order to address climate change induced impacts, amongst which are ... <i>the Technology Needs Assessment and Technology Action Plans for Climate Change Adaptation and Mitigation in 2014, ...</i>			
Sudan	<p>It also builds on the various adaptation-related mechanisms and processes under the Convention, including, above all, ... TNA (2013)...</p> <p>Sudan has conducted its Technology Needs Assessment (TNA) for adaption and mitigation in 2013. For mitigation the TNAs covers energy, industry and forestry sectors while two priority sectors have been covered with regard to technology for adaptation, namely agriculture and water sectors. The TNAs resulted in a Technology Action Plan (TAP), which includes some priorities with regard to technology transfer for enhancing national actions on adaptation and mitigation.</p>			
Thailand	<p>Thailand's Technology Needs Assessment (TNA) report formulated in 2012 has identified three highly impacted sectors in urgent need of adaptation technologies. These are:</p> <ol style="list-style-type: none"> (1) Agriculture, in need of forecasting and early warning system technologies, crop improvement technologies, and precision farming technologies (2) Water Resource Management, in need of networking (via pipes and canals) and management of infrastructures (including zoning), seasonal climate prediction, and sensor web using observation and/or modeling data (3) Modeling, in need of an integrated national data center, national data transfer/management process and the advanced research, weather research and forecasting (WRF - ARW) model, and an integrated model to address the need of agricultural sector and water resource management sector 			
Togo	This section describes the necessary support in the form of financing, capacity-building, technology transfers and others, linked to the implementation of the INDC... All of this information is contained in the technology needs assessment documents...			
Vanuatu	Technical A Technology Needs Assessment (TNA) for Vanuatu is needed as a matter of priority to look at implementing a country driven process for identifying and analysing the priority technology needs for mitigating and adapting to climate change. Carrying out the TNA could provide an opportunity to realize the need for new techniques, equipment, knowledge and skills for mitigating greenhouse gas (GHGs) emissions and reducing vulnerability to climate change.			
Zambia	In view of these challenges, Zambia has in the recent past developed various climate change-related policies, strategies, projects and programs in response to climate change impacts. These include: ...Technology Needs Assessment (TNA, 2013)...			

	<p>Zambia intends to reduce its CO₂eq emissions by implementing three (3) programs driven by the country's Climate Response Strategy and supported by national development policies including energy, forestry, agriculture, water, Town and Country Planning, sanitation, and transport. Further, these programs have been developed based on Zambia's plans and actions and supported by various climate-related activities such as ... Technology Needs Assessment (TNA)...</p>
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