

---

## *National TNA Committee Kick -Off Online Meeting*

*0900-1100 hrs (GMT+2), 26 January 2022, Workshop Report*

---

**Meeting link:** [Microsoft Teams](#)

### CONTEXT

Understanding our climate change technology needs is the starting point for effective action on climate change. By understanding these needs we can determine how to reduce greenhouse gas emissions and adapt to the adverse impacts of climate change. The goal of a Technology Needs Assessment (TNA) and action planning exercise is to target the transfer and diffusion of technologies for mitigation and adaptation. A TNA also supports national sustainable development, builds national capacity and facilitates the implementation of prioritized technologies. Therefore, this project seeks to update and develop a comprehensive TNA and associated action plan of climate change mitigation and adaptation needs identified in Botswana's most vulnerable economic sectors. The Ministry of Environment, Natural Resources Conservation and Tourism (MENT) through the Department of Meteorological Services (DMS), has initiated the exercise. The outcomes set out will serve as guiding for the implementation approach in the project as well as the TNA methodology (as laid out in the [TNA Step-by -Step guidance](#)) that United Nations Environment Programme (UNEP) Technical University of Denmark (DTU) Partnership has developed.

### OBJECTIVE

MENT is establishing a National TNA Committee, which will provide technical expertise in the implementation of the TNA process and vet & validate policy recommendations, as they will need to be if implemented. The Inception Meeting is designed to officially launch the National TNA Project in Botswana, bringing together (i) the technical support providers, (ii) the national project implementation team and (iii) the key stakeholder who will actively contribute to the project. More specifically, the inception meeting will:

- a) Provide a formal introduction of the National TNA project to and the implementing teams to the key national stakeholders.
- b) Present the TNA methodology and main steps to the participants;
- c) Briefly discuss the process of stakeholder engagement and the role of national stakeholders in the TNA project.

# Contents

- CONTEXT..... 1
- OBJECTIVE..... 1
- AGENDA..... 3
- MINUTES..... 4
- PRESENTATIONS ..... 6
  - Presentation 1: ..... 6
  - Presentation 2: ..... 13
  - Presentation 3: ..... 19
  - Presentation 4: ..... 26
- PARTICIPANTS LIST ..... 32

## AGENDA

Time	Activity	Responsible
09:00 – 09:05	Opening Prayer	Volunteer
09:05 – 09:15	Welcome Remarks	Deputy Permanent Secretary – Environmental Affairs
09:15 - 09:20	Introductions	All Participants
09:20 – 09:35	Presentation #1: Introduction to the TNA Project	UDP
09:35 – 09:45	Q&A round 1	All participants
09:45 – 09:55	Presentation #2: Key steps of the TNA Project	UDP
09:55 – 10:05	Q&A round 2	All participants
10:05 – 10:20	Presentation #3: Stakeholder Engagement and the Role of the stakeholders in the TNA Project	UDP
10:20 – 10:30	Q&A round 3	All participants
10:30 - 10:50	Sector Prioritisation	UDP & Sector Experts
10:50 – 11:00	Q&A round 4	All participants
11:00	Closing	Director – Department of Meteorological Services

## MINUTES

### **1. Opening, Welcome Remarks and Introductions**

The Chair of the Meeting, Mr. Gopolang from the Botswana Department of Meteorological Services, started the National TNA Committee Kick-Off meeting at 09:20 am, greeting the remote participants. Acting Permanent Secretary of Environmental Affairs, Ms. Maselesele provided welcoming remarks, highlighting the objective of the project. Hereafter the Chair further presented on the objective of the meeting and the agenda, whereafter a round of introductions between all participants was conducted.

### **2. Introduction to the TNA project**

Ms. Lucy Gregersen from UNEP DTU Partnership presented an introduction to the TNA project, the slides and information can be found in the following section "Presentations".

During the following Q & A session, a question was raised about some of the documents shared with the meeting invite (Draft National TNA Committee Constitution, Draft TNA work plan) and why generally sections in these on Mitigation preceded those on Adaptation. It was suggested that Adaptation sections should come before Mitigation. It was clarified that there was no particular reason behind this, and the comment was taken note of for future reports and deliverables. Also, it was commented that note of cross-cutting issues between sectors should be taken into account as well.

### **3. Key Steps of the TNA project**

Mr. Gordon Mackenzie from UNEP DTU Partnership presented an introduction to the methodology of the TNA project. The slides and information can be found in the following section "Presentations".

During the Q & A session, there was further discussion on the sectors that were pre-identified in the Project Readiness Proposal to the GCF. One participant commented that it is important to align and connecting the TNA project together with the NAP process that is currently ongoing in Botswana as much as possible, so that the results can add value to other climate change activities (such as the NAP) that are ongoing in the country.

There were also discussions on how the data to support the TNA methodology and analysis will be gathered, as e.g. the users of the technology should also be brought into the country process of developing the TNA. The clarifications provided were that the TNA is not a desktop study, this is only at the initial stages to gain understanding what already has been done or is underway in the country. Wide stakeholder consultation is a core part of the TNA as country-driven process, although due to the current COVID-pandemic this is currently mainly conducted virtually. But it is key to get the views of a broad range of stakeholders (such as the actual users of the technology as well, the suppliers, the industry, the policy makers etc.)

### **4. Stakeholder Engagement and the Role of the stakeholders in the TNA project**

Mr. Gordon Mackenzie and Ms. Lucy Gregersen from UNEP DTU Partnership presented on stakeholder engagement and the role of stakeholders in the TNA project. The slides and information can be found in the following section "Presentations".

During the Q & A session, there were questions about the status of establishing the National TNA Committee. The response was that the institutions presented on one slide were contacted, and most institutions have now sent official nominations of representatives for the National TNA Committee. The list of representatives nominated will be shared after meeting. But the list can be revisited, should any relevant institutions have been overlooked based on feedback from stakeholders so it is all-inclusive.

It was also clarified that the National TNA Committee will broadly be a steering committee to help with oversight of the implementation and validation of reports on the process. The sectoral working groups will function as a form of technical committee, that will work closely with the national sectoral experts on data collection and the methodology followed.

There was also discussion on what had informed the selection of the sectors pre-identified in the GCF Readiness Proposal for the project as well as the TORs for the project. Regarding the pre-identified sectors and questions to the TORs for the consultants, these were shared with participants as clarification after the meeting. Ms. Nadege Trocellier also presented that the purpose of the current project was to update the TNA conducted in Botswana in 2004, and that these sectors broadly pre-defined for the update include mainly renewable energy, energy efficiency (built environment), industrial processes for mitigation and agriculture & water for the adaptation. The TOR to be implemented, are those that have been approved by the Green Climate Fund in the [Readiness proposal](#) for the update of the TNA in Botswana. It was also highlighted that proposal for the project reflects the needs of the country and was submitted by the country to the Green Climate Fund.

## **5. Sector Prioritization**

The sectoral consultants (Mr. Elenimo Khonga, Mr. Hillary Masundire, and Mr. Peter Zhou,) presented on the sector prioritization work conducted and the stakeholders identified for the sectoral working groups so far.

There were further discussions on the sectors pre-identified in the GCF Readiness Proposal. Ms. Nadege Trocellier clarified that the GCF Readiness Proposal was drafted as a co-operation between the Green Climate Fund, the Government of Botswana through the NDA office, and CTCN. It was agreed that the TORs should be re-circulated after the meeting and that at the next National TNA Committee meeting, the NDA will be asked to give their input on the preparation and approval of the GCF Readiness Proposal, as well as the NDE as the focal point for the CTCN.

Participants also came with suggestions on which other stakeholders could be relevant to consider for the mitigation and adaptation sectoral working groups, e.g. that financial institutions should be considered. Suggestions were also welcomed after the meeting is over.

## **6. Next Steps and Closing**

Mr. Balisi Gopolang concluded by thanking the participation of the members and guests, closing the National TNA Committee Kick-Off Meeting at 11:59 am.

## PRESENTATIONS

Please find below the four presentations given during the meeting.

Presentation 1:



### TNA Committee Inception Meeting

#### Contents

- Introduction to the TNA Project
- Key Steps of the TNA Project
- Stakeholder Engagement and the role of the TNA Committee & stakeholders
- Sector Prioritisation



# Technology Needs Assessments: an introduction

UNEP DTU Partnership



## UNEP DTU Partnership

- **Collaborating Centre supporting UN Environment** for 30 years, activities fully aligned with the UNEP Program of Work
- **70 economists and scientists** from more than 27 different nations
- **Integral part of DTU Management Engineering** at the Technical University of Denmark with access to a broad range of energy scientists and specialists
- **A wide network of collaborating institutions** and partners in more than 70 developing countries
- **A non profit public institution** with highest standards on procedures, transparency and accounting

## TNA TECHNOLOGY NEEDS ASSESSMENT



## What is a Technology Needs Assessment?

TNAs are a set of nationally driven activities aimed at helping developing countries to identify and analyse their mitigation and adaptation technology priorities

Key features:

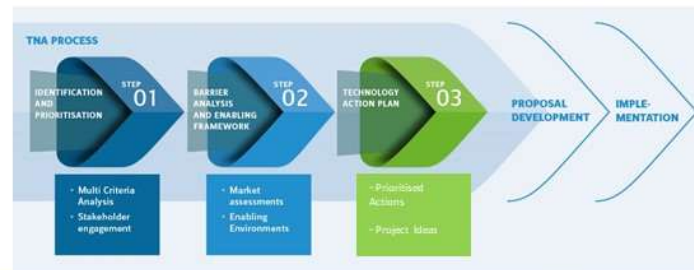
- **country driven - implemented by national TNA teams**
- **stakeholder involvement**
- **capacity building**
- **align with national development objectives**
- **explore synergies with other national processes . e.g. NDC & Green Climate Fund Country Programme**

➤ *Funded by the GCF, implemented by UN Environment – Climate Technology Centre & Network, through UNEP DTU*

➤ *UNEP and UDP have, since 2009, supported more than 80 countries in conducting their TNA*



## The 3 steps of the TNA process

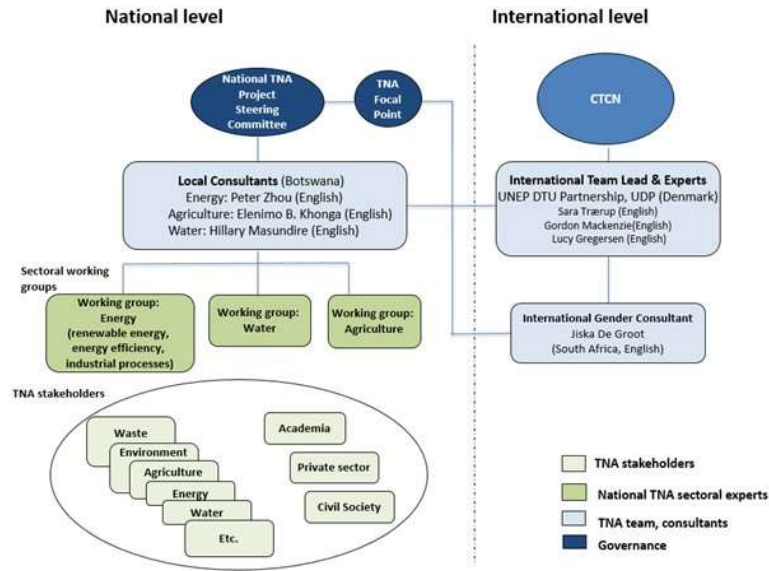


1. To **identify and prioritise** mitigation/adaptation technologies for selected sectors/sub-sectors
1. To identify, analyse and address **barriers** hindering the deployment and diffusion of the prioritised technologies including enabling the framework for the said technologies
1. To articulate, based on the inputs obtained from the two previous steps, a **Technology Action Plan (TAP)** with suggested actions presented in terms of project ideas





# Implementation structure



## TNA Botswana Project Team

### International level



Dr. Sara Trærup  
Team Leader



Dr. Gordon Mackenzie  
Technical Expert



Dr. Elenimo B. Khonga  
Agriculture expert  
[ebkhonga56@gmail.com](mailto:ebkhonga56@gmail.com)



Dr. Hillary Masundire  
Water expert  
[Masundh@ub.ac.bw](mailto:Masundh@ub.ac.bw)



Maikutlo Mokakapadi  
TNA Focal Point  
Botswana Department of  
Meteorological Services  
[Mkmokakapadi@gov.bw](mailto:Mkmokakapadi@gov.bw)



Lucy Gregersen  
Project management &  
Technical input



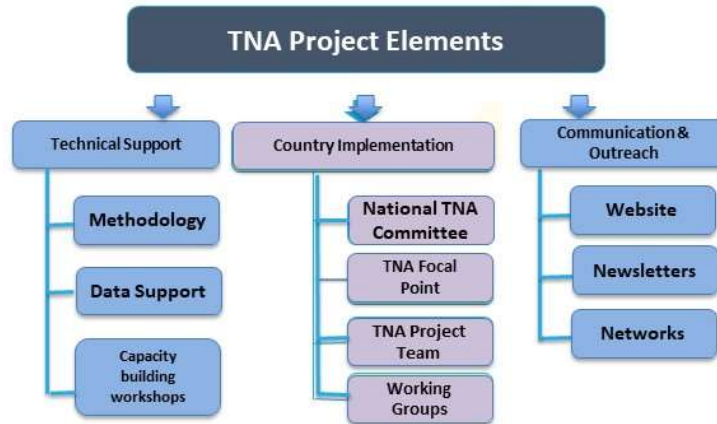
Jiska de Groot  
Gender Expert  
[jiska.degroot@uct.ac.za](mailto:jiska.degroot@uct.ac.za)



Dr. Peter Zhou  
Energy expert  
[pzhou437@gmail.com](mailto:pzhou437@gmail.com)



## How we work?



## Work plan

Milestones	Date
Activity 1.1 Training session incl. development of TNA Committee Constitution (split down into virtual sessions)	Jan/Feb 2022
Activity 1.2 Launching TNA Committee Workshop / Work plan endorsed	Jan/Feb 2022
Activity 2.1 Final sector prioritization report (part of TNA report)	Jan/Feb 2022
Activity 2.2 TNA reports & stakeholder workshops	March 2022
Activity 2.3 Development of Technology Action Plans (incl. barrier analysis)	Feb – July 2022
Activity 2.4 National Consultation Workshops	July – Aug 2022
Activity 2.5 Capacity building, market use cases & briefs	Sept – Oct 2022
Activity 3.1 Engaging private sector through workshops (6)	Till March - October 2022(TBC)



## Next steps

- Next meetings:
  - Virtual training session on the TNA process and methodology
  - First meetings with Sectoral Working Groups
- Detailed work plan & TNA Committee Constitution finalized based on input
- First draft of the Sector Prioritization Report

### Climate Change Mitigation

- Energy



### Climate Change Adaptation

- Water
- Agriculture



Explore technology priorities and reports:  
[www.tech-action.org](http://www.tech-action.org)



## Final remarks

The TNAs support:

- ✓ national strategies,
- ✓ policies,
- ✓ programmes,
- ✓ projects,
- ✓ inputs to NDCs and other processes under the Convention, such as National Adaptation Plans

More information on TNAs available at:

[www.tech-action.org](http://www.tech-action.org) and  
<http://unfccc.int/ttclear/>



# THANK YOU

## Q & A



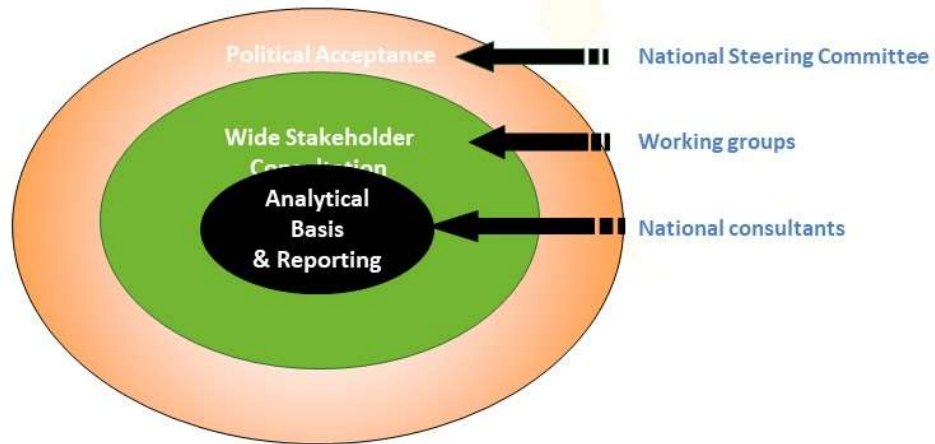
# Methodology for the Technology Needs Assessment (TNA)

## An Overview

UNEP DTU Partnership



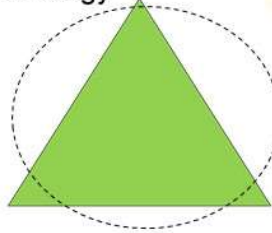
## Role of in-country institutional elements



# What is a climate technology?

- 1) **Solar home systems,**
  - 2) **Drip irrigation**
- S: system design, operation  
O: ownership, repair

Technology



- 1) **New crop rotation**
  - 2) **Zero tillage**
- S: knowledge,  
O: farm management practice

- Early warning system**
- S: data handling, analysis  
O: institutional setup, decision support

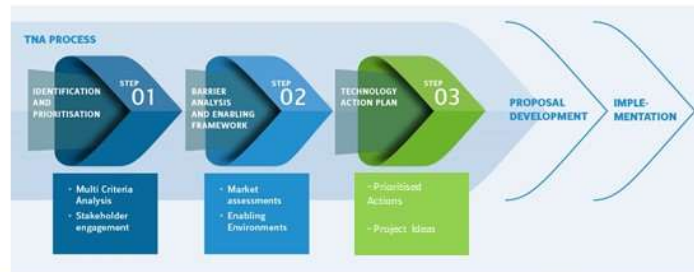


## Mitigation and Adaptation Technologies

- Mitigation - reducing GHG emissions / enhancing sinks
  - renewable energy replacing fossil fuel
  - energy savings
  - tree planting
  - agricultural / livestock practices
  - waste management
  - etc.
- Adaptation - avoiding or lessening impacts and increased resilience
  - water supply
  - land use changes
  - new crops
  - coastal zone
  - early warning
  - etc.



## The 3 steps of the TNA process



1. To **identify and prioritise** mitigation/adaptation technologies for selected sectors/sub-sectors
1. To identify, analyse and address **barriers** hindering the deployment and diffusion of the prioritised technologies including enabling the framework for the said technologies
1. To articulate, based on the inputs obtained from the two previous steps, a **Technology Action Plan (TAP)** with suggested actions presented in terms of project ideas



### Step 1: Identification and Prioritisation of Technologies

- **Objective**
  - To select a few technologies for market analysis and eventual inclusion in the Technology Action Plan
- **Inputs**
  - Review of existing planning documents (NDC, NAP, TNA, NAPA, National communications, Energy plans, Renewable energy plans, PRSP, etc)
  - Stakeholder experience and knowledge
  - Information from technology database (TechWiki)
  - Multi Criteria Analysis (MCA) conducted by groups of informed stakeholders
    - Contribution to development goals (poverty, social, environment)
    - Economically competitive compared to the baseline
    - Significant reduction potential
    - industrial development, employment



## Step 2: Barrier analysis and enabling framework

- **Barrier Analysis - objective**
  - To analyse market conditions for the each selected technology and to identify barriers for enhanced deployment
- **Methodology**
  - Facilitated workshops with sectoral and technology working groups (5-10 stakeholders)
- **Output**
  - Barriers prioritized and grouped into main categories. For example:
    - Institutional
    - Legal
    - Technical
    - Social
    - Cultural



## Step 2: Continued - enabling framework

- **Enabling Framework - objective**
  - Find possible solutions to address barriers
- **Possible solutions**
  - **Economic incentives**
    - Tax exemptions, smart subsidies, cheap financing
    - Governmental finance schemes
  - **Institutional changes**
    - Energy efficiency, renewable energy (funding agencies)
    - Flood control, coastal zone management (regional, national)
  - **Legal changes**
    - Standards, Building codes, lighting standards
    - Power purchase agreements





**Step 3: Technology action plan and project ideas**

**Prioritized set of actions to enhance market penetration and government involvement**

- Political process ensuring buy in by politicians

**Content**

- Elements of enabling environments/government involvement considered
- Responsible actors/institutions
- Timetable and milestones for implementation
- Resource requirements
  - ✓ Financing needs (external, national)
  - ✓ Specific concepts for programme funding through future technology transfer funding mechanisms



**From TNAs to TAPs**

Mitigation Technologies

Adaptation Technologies

Prioritisation

Prioritisation

Market barrier analysis and enabling framework

Market barrier analysis and enabling framework



**Technology Action Plans**  
- Prioritised policy options



## Overview of Training Materials

TNA Process Step	Main Guidance and tools	Supporting Guidance and tools	Training
	<ul style="list-style-type: none"> <li>TNA Step by Step</li> <li>Report template</li> <li>Organising the National Technology Needs Assessment (TNA) Process</li> <li>Stakeholder Guidenote</li> </ul>	<ul style="list-style-type: none"> <li>Gender responsive TNA guidebook</li> </ul>	
	<ul style="list-style-type: none"> <li>TNA Step by Step</li> <li>Report template</li> </ul>	<ul style="list-style-type: none"> <li>Gender responsive TNA guidebook</li> </ul>	
	<ul style="list-style-type: none"> <li>2 Guidance notes on MCA for adaptation and mitigation</li> <li>MCA Tool: Generic template in Excel for Adaptation and Mitigation &amp; examples</li> <li>Technology Factsheets</li> </ul>	<ul style="list-style-type: none"> <li>MCA Guidebook</li> <li><a href="#">ClimateTechwiki</a></li> <li>CBA for Adaptation</li> <li>Help Desk (RC's)</li> <li>Economic evaluation of measures guide note</li> </ul>	
	<ul style="list-style-type: none"> <li>TNA Sector Technology Guidebooks</li> </ul>		
	<ul style="list-style-type: none"> <li>Stakeholder Guidenote</li> <li>Report template</li> </ul>	<ul style="list-style-type: none"> <li>Gender responsive TNA guidebook</li> </ul>	
	<ul style="list-style-type: none"> <li>Barrier guidebook</li> </ul>	<ul style="list-style-type: none"> <li>Help Desk (RC's)</li> </ul>	
	<ul style="list-style-type: none"> <li>Technology Action Plan (including project ideas)</li> <li>Project Concept note</li> </ul>		



# THANK YOU

## Q & A



## *Stakeholder Engagement in the TNA Process*

UNEP DTU Partnership



### **Why do we need Stakeholder Engagement in the TNA process?**

- Country driven process
- TNA covers many sectors and technologies
- Different individuals and groups involved
- Expertise and knowledge resides in a broad spectrum of individuals and groups



## Why do we need Stakeholder Engagement in the TNA process?

- We need to harvest this wealth of information by engaging with these individuals
- Stakeholders provide (nationally specific information) input to the process
- Promotes national ownership and understanding of the TNA



## TNA Institutional Structure

The proposed institutional structure is intended to serve three conditions for a successful TNA process:

1. Political Acceptance
1. Wide Stakeholder Consultation
1. Analytical Basis and Reporting



## Political Acceptance

- The TNA process is not an end in itself but a **process** that aims to integrate the climate technology concept into the national strategies and plans of the countries.
- It is necessary to **scale up** this process and reach the implementation of the project ideas.
- It is therefore necessary to include a group of stakeholders **able to support** these ideas in the political arena.
- High level involvement will show the relevance of the project for decision makers.



## Wide Stakeholder Consultation

- **Legitimacy and ownership** require ample representation from different stakeholders, in order to adapt the process to the specific context of each country.
- An **inclusive space** for stakeholders with local capacity and knowledge that can provide useful insight to the process is necessary.
- Through a highly **consultative and participatory process**, stakeholders will link elements or steps of the TNA process with local projects, relevant processes and sustainable development programmes and plans.

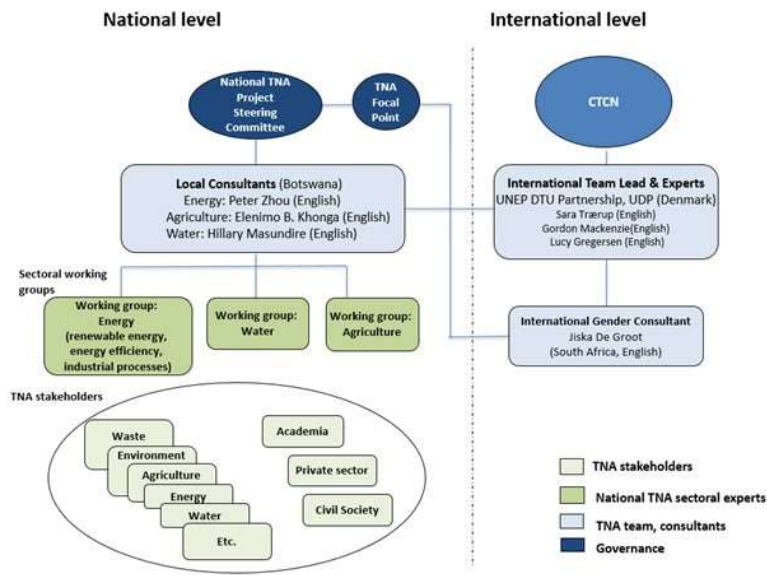


# Analytical Basis and Reporting

- Stakeholders will provide **legitimacy** to the process through technical expertise, scientific rigor utilisation of the best data available
- Since data availability is often an issue in the developing world, some of the TNA steps will require **expert judgement** and opinion.
- The inclusion of renowned experts in the process is highly beneficial for this purpose.



# Implementation structure



## National TNA Committee

- **Objective**
  - Providing relevant data and info to the TNA
  - Be active in the TNA process
  - Overseeing implementation
  - Ensuring validation of the deliverables based on agreed timelines
  - Coordinating with the broader stakeholders within priority sectors as necessary
- **Members**
  - Relevant stakeholders to the TNA process: Ministries, Departments, Private Sector Organisations, Academia, CSO, Finance institutions
  - Will meet based on agreed work plan



## TNA Committee members

### Ministries

- Ministry of Environment, Natural Resources Conservation & Tourism
- Ministry of Finance and Economic Development
- Ministry of Agricultural Development and Food Security
- Ministry of Health and Wellness
- Ministry of Investment, Trade and Industry
- Ministry of Transport and Communications
- Ministry of Local Government and Rural Development
- Ministry of Infrastructure and Housing Development
- Ministry of Nationality, Immigration and Gender

### Departments

- Department of Environmental Affairs
- Department Of Waste Management and Pollution Control
- Department of Water Affairs and Sanitation
- Department of Crops Production
- Department of Animal production
- Department of Research, Science and Technology
- Department of Facilities Management
- Department of Water Affairs
- Department of Energy

### Other

- Botswana International University of Science and Technology
- Botswana Institute for Technology, Research & Innovation
- Botswana Climate Change Network
- Botswana University of Agriculture and Natural Resources
- University of Botswana
- Statistics Botswana
- Botswana Power Corporation
- Botswana Energy Regulatory Authority
- Botswana Bureau of Standards
- Botswana Council of Non-Governmental Organisations
- Botswana Innovation Hub
- Solar Industries Association of Botswana
- Business Botswana
- Water Utilities Corporation



## Meeting Schedule

Meeting	Tentative date	Activity	Agenda
1	February 2021	1.1	- Staff Training Workshop (virtual)
2	January 2021	1.2	- National TNA Committee Workshop informing the TNA process (virtual)
3	Feb-March 2021	2.2	- TNA report stakeholder workshops (1 per sector)
4	June-August 2022	2.4	- National validation TAPs (1 per sector)
5	August 2022 - By end of project	2.5	- TBD National training seminars to support implementation of the TAP



### Sectoral Working Groups

- **Objective**
  - Formed under the National TNA Committee to allow for a wider participation of key stakeholders.
  - Provide inputs to: Identify prioritised sectors, identify prioritise technologies and validating final selection thereof, development of TAP (incl. barriers), and review TAP for each sector.
- **Members**
  - Defined based on input from Committee
  - Groups shall be organized by sector/expertise with equal gender representation.
  - Chairs of the groups can organise & convene working group meeting as necessary and are responsible for collecting feedback and opinions from group members.
- **Sectors**
  - *Indicative list of sectors and themes which working groups may be formed on:*
    - Energy (renewable energy)
    - Energy efficiency (built environment)
    - Industrial Processes
    - Agriculture
    - Water





## Technology Working Groups

- **Objective**
  - providing information to private sector stakeholders, on international and national experience with the technology in terms of economy, scale, innovative business models, support schemes, funding mechanisms
  - collecting inputs from private sector actors on which barriers for diffusion of the technology in Botswana they find most important, and on which policy measures the private sector would suggest in the Botswana context (especially on finance)
- **Members**
  - Private sector stakeholders
  - Ministry



# THANK YOU

## Q & A



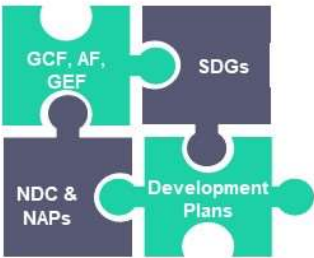
# Sector Prioritisation

UNEP DTU Partnership & Sector Experts



## ALIGNMENT

Creating linkages with actual and future programmes and policies



**TNA synergies with climate policies and strategies**



## Adaptation - vulnerabilities

- Climate change (CC) has continued to impact negatively on the environment of Botswana resulting in prolonged droughts, severe heat waves, and extreme weather patterns and shifts in the rainfall season. that adversely affect various economic sectors, such as agriculture and health.
- These adverse CC effects have affected various economic sectors such as water, agriculture and health resulting in water and food insecurity and an increase of some endemic diseases such as malaria.
- Botswana is a water scarce country, with varied rainfall and is highly susceptible to drought. The groundwater resources are mostly fossil type and caution is exercised in its exploitation to avoid their depletion. In 2015 Botswana had a population of 2.26m people, compared to 1.86m in 2005 and its population is becoming steadily more urbanized
- Water supply deficits are a common feature of the southern regions of the country which are also the highest population growth centres. Demand far exceeds natural supply and the demand-supply gap is likely to be exacerbated by climate change
- Agriculture, especially traditional, is a significant sector for the economy and focusses on crops and livestock production. These small-scale farmers require continued assistance in capacity building to commercialize agriculture. Crop production is hampered by traditional farming methods, recurrent drought, erosion, and pests.



## Adaptation

### Predetermined sectors from the GCF Readiness Process:

Agriculture & Water

### Policy Alignment:

- This sectoral and technology prioritization exercise will be informed adaptation prioritized in the **Botswana NDC (2015)**, **Vision 2036** and the **Government's Climate smart agriculture project (2015-2025)**.
- Botswana is developing a **National Adaptation Plan (NAP)** and Action Plan which will highlight all the priority areas including Climate Smart Agriculture and actions within the water sector.
- Botswana's **Third National Communication to the UNFCCC (2019)** identifies several factors that create barriers within the market that affects climate investment. Specific sectoral barriers are "lack of knowledge of water demand management".



## Proposed Adaptation Working Group Members

### Water

- Ministry of Land Management, Water and Sanitation Services (MLMWSS)
- BITRI – Water
- BIUST
- University of Botswana
- Dept. of Water Affairs
- Water Utilities Company (WUC)
- Ground Water Services Providers Body
- Private Laboratories (water quality assessments)
- Botswana Bureau of Standards
- Consumers Association

### Agriculture

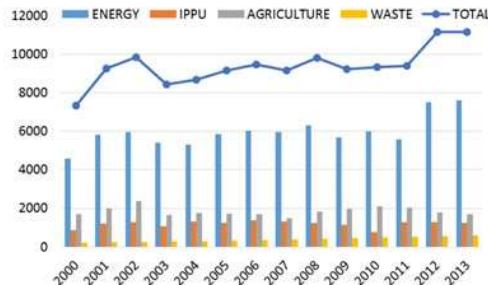
- Ministry of Agricultural Development and Food Security
  - Animal Production
  - Crop Production
- BUAN
- National Agriculture Research and Development Institute NARDI
- BITRI
- Botswana Horticulture Council (BoHoC)
- Botswana Farmers Association (BOFA) to cover small scale farmers for both livestock and crops
- Pandamatenga Commercial Farmers Association

### Others?



### Mitigation – GHG emissions

- The energy sector accounts for over 60% of the country's GHG emissions and this project will enable Botswana to progress along its low emission pathway. (GCF Readiness Proposal)
- Access to electricity is mainly through on-grid connections, covering 59% of households in 2016, up from 46% in 2012. Under current trends, grid connections are expected to reach 71% of households by 2030. The greenhouse gas emission trends by Sector (2000 to 2013) below represents energy, agriculture and industrial processes and products use (IPPU) as the most demanding sectors. The 2010 inventory represented a 105% increase in emissions from 1990-2010 (from 3047 to 8307 kt CO<sub>2</sub>eq (= GgCO<sub>2</sub>eq)).



## Mitigation – Energy Sector Selection

### GCF Readiness exercise predetermined subsectors:

- Renewable Electricity
- Energy Efficiency, the built environment
- Industrial Processes

### Policy Alignment:

**Botswana's Vision 2036** sets a target of 50% renewable energy on the system by 2036. Mitigation target: 15% GHG reduction relative to business as usual by 2030.

**Botswana's NAMA (2016)** cites a lack of enabling and conducive environment as a barrier to operations of mitigation projections in the 2004 TNA.

**NDC 2021-RE:** Adopts mitigation target of Botswana of -15% below the baseline in 2030. Solar/wind, Biogas. Retrofitting old gov't buildings, LED streetlights, Industry – ODS (nq)

**3<sup>rd</sup> National Communication (2019):** Energy and housing standards.

**Other aligned instruments** – Energy: NES, RES, SE4ALL, IRP, IRENA Readiness

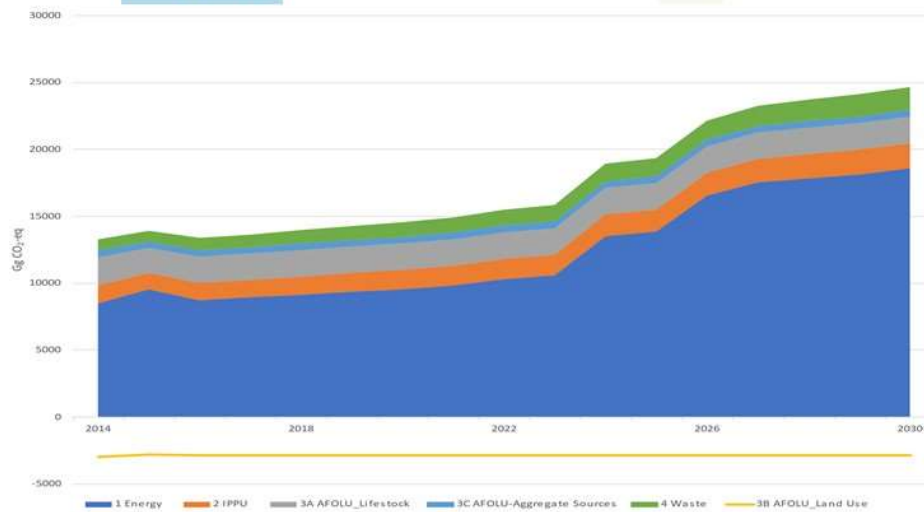
**Other instruments:** INDC, Climate Change Policy

**Other resources:** IPCC AR5/6, SADC/COMESA, REEESAP/SIEEP, CTCN



## Mitigation

### NDC 2021 version – Projection of baseline GHG emission



## Mitigation – Next Steps

- The next process will be to select two subsectors and 8-12 technologies for which technology prioritization will be conducted and eventually barrier analysis and the Technology Action Plan.
- To date a working group has been identified and approached that will be facilitated by the sector expert to prioritize the energy subsectors and the technologies themselves.



## Proposed Energy Working Group Members

- BB - private sector - Industry energy efficiency
- BOBS – Public sector - EE and RE appliance/equipment Standards
- Solar Association - private sector - RE
- BIUST - Academic Research - RE and energy audits
- BITRI - Technology, Research and Innovation- RE
- BERA - RE/EE regulation including tariff regime
- BPC - Utility (RE power plants, EE- Transmission and Distribution losses)
- DOE - Policy and implementation- better RE/EE section
- Dept of Infrastructure development (former DBES) – EE in buildings



# THANK YOU

## Q & A



## PARTICIPANTS LIST

TNA Steering committee member
TNA project team

	Institution	Full Name
1	Agriculture Expert	Mr. Elenimo B. Khonga
2	Botswana Bureau of Standards	Mr. Kago Setiko
3	Botswana Climate Change Network	Mr. Tony Gentle Sebolai
4	Botswana Energy Regulatory Authority	Mr. Malebogo Proctor
5	Botswana Farmers Association	Mr. Joseph Sekgatsa
6	CTCN	Ms. Nadège Trocellier
7	Dept. of Agric. Research Statistics and Policy Development	Ms. Daphney Keboneilwe
8	Dept. of Agricultural Research	Mr. Olaotswe Kgosikoma
9	Dept. of Crop Production	Ms. Grace G. Mafhoko
10	Dept. of Crop Production	Mr. Stanley Semetsa
11	Dept. of Environmental Affairs	Ms. Maselesele
12	Dept. of Meteorological Services	Mr. Maikutlo Mokakapadi
13	Dept. of Meteorological Services	Ms. Reginah Manyathelo
14	Dept. of Meteorological Services	Mr. Masego Baitsemang
15	Dept. of Meteorological Services	Ms. Dorcas Masisi
16	Dept. of Meteorological Services	Mr. Balisi Gopalang
17	Dept. of Meteorological Services	Ms. Janet Selato
18	Dept. of Meteorological Services	Mr. Odisitse George Keotsene
19	Dept. of Meteorological Services	Ms. Chandapiwa Sebeela
20	Dept. of Meteorological Services	Ms. Esther Jansen
21	Dept. of Meteorological Services	Mr. Edison Chaba
22	Dept. of Meteorological Services	Mr. Fanyana Gagositimologe
23	Dept. of Project and Infrastructure Planning	Mr. Bundi Jerry Tsholofelo
24	Dept. of Water and Sanitation	Ms. Onalekutlo Kenabatho
25	Dept. of Water and Sanitation	Ms. Kene Dick
26	Energy Expert	Mr. Peter P. Zhou
27	Ministry of Agriculture	Mr. Lame Ntebang
28	Ministry of Agriculture and Food Security	Mr. Kgotso Oteng
29	Ministry of Nationality, Immigration and Gender	Ms. Phemelo Maiketso
30	Private Sector Company	Mr. Douglas Machacha
31	Solar Industries Association Botswana	Ms. Karen Gibson
32	UNEP DTU Partnership	Ms. Lucy Gregersen
33	UNEP DTU Partnership	Mr. Gordon A. Mackenzie
34	Water Expert	Mr. Hillary Masundire



## NATIONAL TNA STEERING COMMITTEE MEMBERS AND CONTACT LIST

<u>Dept. of Energy</u>
<b>Mr Oagile J. Setlhare; <a href="mailto:ojsetlhare@gov.bw">ojsetlhare@gov.bw</a> - 3640230</b>
Ms Anne Leipego; <a href="mailto:aleipego@gov.bw">aleipego@gov.bw</a> - 3640222
<u>Dept. of Water and Sanitation</u>
<b>Ms Onalekutlo Kenabatho; <a href="mailto:okenabatho@gov.bw">okenabatho@gov.bw</a> – 3607100</b>
<u>Dept. of Project and Infrastructure Planning</u>
<b>Mr Bundi Tsholofelo; <a href="mailto:bjtsholofelo@gov.bw">bjtsholofelo@gov.bw</a> – 3654200</b>
<u>Dept. of Animal Production</u>
<b>Mr Shaft Nengu; <a href="mailto:snengu@gov.bw">snengu@gov.bw</a> – 3689614</b>
Ms Margaret P. Mutukela; <a href="mailto:mmutukela@gov.bw">mmutukela@gov.bw</a> – 3689359
<u>Dept. of Agric. Research Statistics and Policy Development</u>
<b>Ms Daphney Keboneilwe; <a href="mailto:dkeboneilwe@gov.bw">dkeboneilwe@gov.bw</a> – 3689756</b>
Ms R. Hange; <a href="mailto:rhange@gov.bw">rhange@gov.bw</a> – 3689756
<u>Dept. of Agricultural Research</u>
<b>Dr O. Kgosikoma; <a href="mailto:okgosikoma@gov.bw">okgosikoma@gov.bw</a> – 3668100</b>
Ms C. Nkomazana; <a href="mailto:cnkomazana@gov.bw">cnkomazana@gov.bw</a> – 3668100/35
<u>Dept. of Crop Production</u>
<b>Ms Grace G. Mafhoko; <a href="mailto:gseporogwane@gov.bw">gseporogwane@gov.bw</a> – 3689386</b>
Mr B. Jibichibi; <a href="mailto:bjibichibi@gov.bw">bjibichibi@gov.bw</a> - 3689304
<u>Ministry of Finance and Economic Development</u>
<b>Ms Catherine Matongo; <a href="mailto:cmatongo@gov.bw">cmatongo@gov.bw</a> – 3989990</b>
Ms Boineelo Sealetsa; <a href="mailto:btsealetsa@gov.bw">btsealetsa@gov.bw</a> – 3950378
<u>Dept. of Waste Management and Pollution Control</u>
<b>Ms Mildred Botho Khumalo; <a href="mailto:mbkhumalo@gov.bw">mbkhumalo@gov.bw</a> – 3934479</b>
<u>Ministry of Nationality, Immigration and Gender</u>
<b>Ms Phemelo Maitetso; <a href="mailto:pmaiketso@gov.bw">pmaiketso@gov.bw</a> – 3611502</b>
<u>Ministry of Tertiary Education, Research, Science and Technology</u>
<b>Mr Ontlametse Gaothuse; <a href="mailto:ogaothuse@gov.bw">ogaothuse@gov.bw</a> – 3631311</b>
<u>Ministry of Local Government and Rural Development</u>

<b>Ms Gaomodimo Ntlotlang; <a href="mailto:gamos@gov.bw">gamos@gov.bw</a> –</b>
Ms Lorraine Parry; <a href="mailto:lnyoni@gov.bw">lnyoni@gov.bw</a>
<u>Botswana Climate Change Network</u>
<b>Ms Tracy Sonny; <a href="mailto:tsonny25@gmail.com">tsonny25@gmail.com</a> - 3116 810</b>
Mr Tony Gentle Sebolai; <a href="mailto:gontlesebolai@gmail.com">gontlesebolai@gmail.com</a>
<u>Botswana Energy Regulatory Authority</u>
<b>Ms Malebogo Proctor; <a href="mailto:malebogo.proctor@bera.co.bw">malebogo.proctor@bera.co.bw</a> – 5317544</b>
<u>Solar Industries Association Botswana</u>
<b>Ms Karen Gibson; <a href="mailto:karen@sosolar.co.bw">karen@sosolar.co.bw</a> – 74129413</b>
<u>BOCONGO</u>
<b>Mr David Moepeng; <a href="mailto:moepengdavid@gmail.com">moepengdavid@gmail.com</a> – 71211712</b>
Mr. Seloilwe k. Seloilwe; <a href="mailto:climateandlife@gmail.com">climateandlife@gmail.com</a> – 72309751