A Climate Resilient Green Economy Strategy in Ethiopia: baseline setting

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Paris, France
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• Introduction
• Setting the Vision
• CRGE – benefits
• Green Economy - processes, time line, organization
• Sum-up
Introduction

Developing a Climate Resilient Green Economy requires the integration of economic development, adaptation and mitigation.
Introduction

Strategic framework

- Economic development
  - Achieving middle income status by 2025
- Abatement
  - Keeping emissions constant by applying abatement measures in sectors such as forestry, agriculture and industry
  - Becoming a “green economy frontrunner” by investing into low-carbon infrastructure
- Resilience
  - Reducing vulnerability to climate-change-associated risks:
    - Gradual hazards (e.g., vector-borne diseases)
    - Event-driven hazards (e.g., landslides and flooding)

Source: CRGE
Developing a green economy combines economic development and abatement

**Objectives**

1. Translating strategic GTP objectives into green, climate-resilient plan, ultimately outlining concrete growth actions

2. Articulating specific investment opportunities and engagement of donors and investors to attract international investment

3. Establishing Ethiopia as a global leader in green growth by adopting a new growth path

**Green economy**

- Can help to avoid lock-in in old technology, unsustainable growth and land use

Source: CRGE
Setting the vision

- Ethiopia: a middle income country by 2025
- It reflects the govt’s ambition to lift the country to middle income
- Net emission of GHGs to become zero/neutral
middle income status by 2025

GDP, USD billions

Key transitions
- Diminishing weight of agriculture from 42% to 26% of GDP
- Migration from agriculture jobs to services and industry
- Attainment of middle-income status before 2025

Source: GoE GTP; team analysis
Climate Resilient Green Economy...

Constitution of Ethiopia

Environment Policy

CRGE Mission Statement

Regional CRGE programmes and action plans

Sector CRGE programmes and action plans

Ethiopia’s Programme of Adaptation to Climate Change (EPA-CC)

Nationally Appropriate Mitigation Actions (NAMA)

Ethiopia - CRGE by 2025
2. Climate Resilient Green Economy...

Constitution of Ethiopia

Environment Policy

CRGE Mission Statement

Regional CRGE programmes and action plans

Sector CRGE programmes and action plans

Nationally Appropriate Mitigation Actions (NAMA)

Ethiopia- CRGE by 2025
# CRGE- timeline until COP-17

<table>
<thead>
<tr>
<th>Activity</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feb</td>
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<tr>
<td>Kick Off meeting</td>
<td></td>
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<tr>
<td>Set up Sub Technical Committees</td>
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<tr>
<td>Prepare preliminary CRGE</td>
<td></td>
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<tr>
<td>Syndicate CRGE (Consultation)</td>
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<tr>
<td>Feedback incorporated into CRGE</td>
<td></td>
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<tr>
<td>CRGE Strategy submitted</td>
<td></td>
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<tr>
<td>COP-17</td>
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</table>

- **Prepare preliminary CRGE**
- **Full draft of sectoral CRGE document**
- **Syndicated sectoral CRGE document**
- **Final version of Ethiopia’s CRGE**
- **Presenting CRGE at COP-17**

**SOURCE:** EPA
Why ... a low carbon future?

“Ethiopia’s historical contribution to greenhouse gas emissions on a global scale has been negligible and the country will not be forced to prejudice future growth and wellbeing by restricting emissions”
Why ... a low carbon future?

Climate change:

– poses significant threats,

– the international response to climate change also offers considerable opportunities,
Justifications for a CRGE

• justifications for developing a green economy:
  – natural resource assets
  – global carbon finance
  – co-benefits (for health, wellbeing, economic growth and natural resource conservation)
  – Ethiopia is well positioned to become a regional and global leader in low carbon growth which will have legacy and commercial benefit long into the future.
  – huge low carbon potential – (ex: rich in forests, hydro, solar, wind & geothermal energy.
Abatement potentials

A total abatement potential of up to 280 Mt CO$_2$e has been identified, with 75% related to agriculture and forestry.
Justifications ....contd.

....disadvantages of following a ‘traditional’ high carbon growth path and the advantages of taking a low- carbon ‘green growth’ path for Ethiopia are summarized below.
<table>
<thead>
<tr>
<th></th>
<th><strong>Traditional growth</strong></th>
<th><strong>Low carbon or green growth</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Likely outcomes if Ethiopia follows a ‘traditional’ growth path:</strong></td>
<td><strong>Likely outcomes if Ethiopia follows a low-carbon, ‘green’ growth path:</strong></td>
<td></td>
</tr>
<tr>
<td>Energy</td>
<td>Dependence on fossil fuels</td>
<td>Sufficient renewable energy to support economic development</td>
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<td></td>
<td>High emissions</td>
<td>Exporter of clean energy regionally</td>
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<td></td>
<td>Power shortages and restricted coverage</td>
<td>Expansion of rural energy coverage</td>
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<tr>
<td>Agriculture</td>
<td>Reduction in soil fertility</td>
<td>Long term land use and fertility maintained</td>
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<tr>
<td></td>
<td>Lower yields</td>
<td>Higher yields</td>
</tr>
<tr>
<td></td>
<td>Vulnerability to floods and droughts and increasing food insecurity</td>
<td>Food security</td>
</tr>
<tr>
<td>Forestry</td>
<td>1.5 million hectares of forest and shrub cover at risk due to agricultural expansion and biomass energy needs</td>
<td>Zero deforestation and sustainable forest use</td>
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<tr>
<td></td>
<td>Health issues through smoke inhalation</td>
<td>Reforestation and afforestation as carbon sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Healthier sources of cooking and heating energy</td>
</tr>
<tr>
<td></td>
<td>Dependence on expensive imported oil and gasoline</td>
<td>Reduced oil dependence</td>
</tr>
<tr>
<td></td>
<td>Polluting, aging, unsafe vehicle stock</td>
<td>Healthier, cheaper, safer transport</td>
</tr>
<tr>
<td>Settlements</td>
<td>Unplanned development</td>
<td>Coordinated and rational long term planning of settlements</td>
</tr>
<tr>
<td></td>
<td>Unsanitary, unmanaged waste</td>
<td>Healthier towns and cities providing higher quality of life and wellbeing</td>
</tr>
<tr>
<td></td>
<td>Low quality of life and reduced wellbeing of Poor health</td>
<td></td>
</tr>
<tr>
<td>Economy wide</td>
<td>Dependent on commodities and international price fluctuations including oil price</td>
<td>Macroeconomic conditions bring job and wealth creation and reduce poverty</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increased exports, reduced imports</td>
</tr>
</tbody>
</table>
5 Steps to a Green Economy

1. Identify priority growth sectors
2. Develop baseline or reference scenario
3. Enlist and elaborate measures to reduce or avoid emissions
4. Prioritize measures
   Develop sectoral plans and projects
   Identity necessary institutions and processes
5. Identify Major milestones for implementation
   Put in place enabling institutions and critical policies
The green economy can significantly contribute to the goals of the GTP sectors

Goal of the sector and implications

1. **Power**
   - Build generation capacity to satisfy growing demand

2. **Buildings/Gr. Cities**
   - Reach economic growth targets as planned in GTP
   - Economic growth of each sector will lead to higher emissions

3. **Forestry**

4. **Soil**

5. **Livestock**

6. **Transport**

7. **Industry**

Contribution of CRGE

- **Enable** infrastructure development by developing strategy to obtain financing
- Develop green growth initiatives to **achieve GTP targets** while reducing emissions
- Provide essential analytics required to secure carbon funding
  - Estimate business-as-usual (BAU) emissions
  - Develop list of green growth interventions
  - Estimate abatement, growth contributions and feasibility of interventions
  - Develop implementation plans
Work is still in progress through an inter-ministerial collaboration – EPA and EDRI.
CRGE - Organization

Ministerial Steering Committee
(chair: Ato Newai, EDRI)

Technical Committee
(chaired by Ato Dessalegne, EPA)

Sub-Technical Committees
- Power Supply
- Buildings & green cities
- REDD+
- Soil based emissions
- Live-stock
- Transport
- Industry

Focus: GHG mitigation, economic growth and climate resilience
Abatement options/ potentials compared to BAU (2030)
Methodology, baseline and projection

• The STCs have selected and quantified the abatement levers following a standardized methodology,
• Baseline – 2010
• Projected year – 2030
Methodology, baseline and projection

Historical emissions and energy data

– available data from relevant ministries, CSA, EDRI, and MOFED (population, crops production, cattle population, GDP per capita) in combination with IPCC methodology

– IPCC methodology was used where possible. If not, experts in the area were consulted to find proxies for the Ethiopian case.
Sectors modeled and emissions sources counted

- Forestry (deforestation and degradation)
- Livestock ($\text{CH}_4$ from enteric fermentation and $\text{N}_2\text{O}$ from manure left on pastureland)
- Soil (crops, fertilizers, manure)
- Transport [ passenger (inner city, intra city, and international) freight (dry cargo, liquid cargo, construction and mining)]
- Industry (Chemicals & Agro processing & paper/pulp, textile & leather, cement, mining)
- Buildings and cities (solid waste, liquid waste, off-grid fossil fuel)
- Power (conventional and renewable)
Projection methodology

• Sectors used **top down approach** (Official government projections for population, GDP etc.)

• Based on these figures the relevant emission drivers were calculated and BAU emissions were determined using relevant emission factors (**default factors of IPCC** where possible)

• The modelling technique also used direct sector specific projection (e.g. electricity production) from sector specific development plans of the government
Assumptions Used

- GDP Growth
- Population growth
- Rough expert estimation

Challenges:
- Lack of data
- Lack of support
- Mobilizing experts
Strengths and weaknesses

• Strengths: modelling framework used: relatively simple and user-friendly and covers most of the emissions within the country

• Weaknesses: The modelling tools used are not exhaustive and therefore the emission figure has to be treated as a ballpark figure
Identified abatement levers and specific examples
# Livestock-List of identified abatement levers

<table>
<thead>
<tr>
<th>Levers</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase animal value chain efficiency to</td>
<td>Interventions aimed at improving GDP output per cattle via  [- Higher production per animal  [- Increased Off take rate, let by better health and marketing</td>
</tr>
<tr>
<td>improve productivity</td>
<td></td>
</tr>
<tr>
<td>Support consumption of lower emitting</td>
<td>Support the increase in poultry consumption (objective of 30% of meat consumption by 2030) by acting both on supply and demand aspects</td>
</tr>
<tr>
<td>sources of protein</td>
<td></td>
</tr>
<tr>
<td>Mechanization of draft power</td>
<td>Introduction of mechanic equipment for plowing/tillage in substitution of ~50% of animal draft power</td>
</tr>
<tr>
<td>Grazing land management and pasture</td>
<td>Introduction of techniques to increase soil carbon content and productivity of pasture land</td>
</tr>
<tr>
<td>improvement</td>
<td></td>
</tr>
<tr>
<td>Manure management</td>
<td>Wide range of activities including manure storage and utilization (e.g., for electricity generation through biogas)</td>
</tr>
<tr>
<td>Modify rumine ecology</td>
<td>Additives, diet mix  [- Manipulating rumine flora  [- Vaccines to stop activity of methane producing organisms</td>
</tr>
<tr>
<td>Low emitting cattle breeds</td>
<td>Select low emitting breeds</td>
</tr>
</tbody>
</table>
## Forestry – List of identified abatement levers

<table>
<thead>
<tr>
<th>Macro levers</th>
<th>Levers</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce pressure from agriculture on forests</td>
<td>Agriculture intensification on existing land</td>
<td>Decrease requirements for new agricultural land by increasing yield and value of crops</td>
</tr>
<tr>
<td></td>
<td>Prepare new land for agriculture through medium and large scale irrigation</td>
<td>Shift of new agricultural land from forest to degraded land brought into production thanks to irrigation</td>
</tr>
<tr>
<td></td>
<td>Prepare new land for agriculture through small scale irrigation</td>
<td>Shift of new agricultural land from forest to degraded land brought into production thanks to irrigation</td>
</tr>
<tr>
<td>Reduce demand for fuelwood</td>
<td>Fuelwood efficient stoves</td>
<td>Reduce wood requirements thanks to efficient stoves (in rural areas mostly)</td>
</tr>
<tr>
<td></td>
<td>Electric stoves</td>
<td>Switch to electric stoves (in urban areas mostly)</td>
</tr>
<tr>
<td></td>
<td>LPG stoves</td>
<td>Switch to LPG stoves</td>
</tr>
<tr>
<td></td>
<td>Biogas stoves</td>
<td>Switch to biogas stoves (in rural areas)</td>
</tr>
<tr>
<td>Increase sequestration</td>
<td>Afforestation and reforestation</td>
<td>Large scale afforestation and reforestation degraded areas</td>
</tr>
<tr>
<td></td>
<td>Forest management</td>
<td>Large scale forest management programs</td>
</tr>
</tbody>
</table>

Source: Forestry STC analysis
## Soil – List of identified abatement levers

<table>
<thead>
<tr>
<th>Lever Categories</th>
<th>Example Levers</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Introduction of Lower Emitting Techniques (includes 10+ levers)** | ▪ Use crop cultivars known for carbon and nitrogen use efficiency  
▪ Improve application techniques for slow N-release  
▪ Promote use of organic fertilizers  
▪ Adjust fertilizer rates to crop needs (e.g., precision farming)  
▪ Conservation agriculture  
▪ Integrated use of high value tree crops on degraded land | Increase soil stock of C per unit of area; decrease N volatilization, percolation, leaching and improve plants N absorption |
| **Agriculture Intensification (includes 10+ levers)**   | ▪ Improved inputs usage  
▪ Residue management                                                             | Decrease requirements for new agricultural land (coming primarily from forests)                   |
| **Creation of New Land through Irrigation**             | ▪ Small scale irrigation  
▪ Large scale irrigation                                                            | Decrease requirements for new agricultural land (coming primarily from forests)                   |
Recommendations

• Include all relevant ministries and stakeholders from the start
  – Ensure proper institutional set up with clearly delineated responsibilities

• Ensure an exhaustive list of emission drivers before commencing calculations

• Ensure high level government support
Thank you!