

A
Climate Resilient Green Economy
Strategy
in Ethiopia: baseline setting

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Paris, France

19 September , 2011

outline

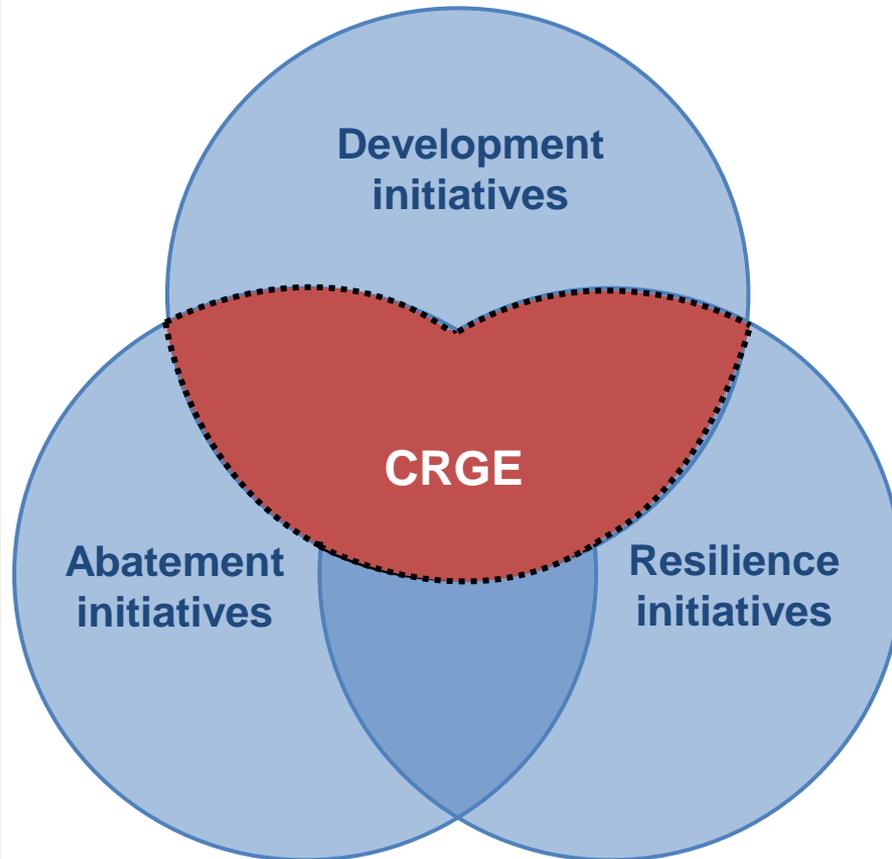
- **Introduction**
- **Setting the Vision**
- **CRGE – benefits**
- **Green Economy - processes, time line, organization**
- **Sum-up**

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

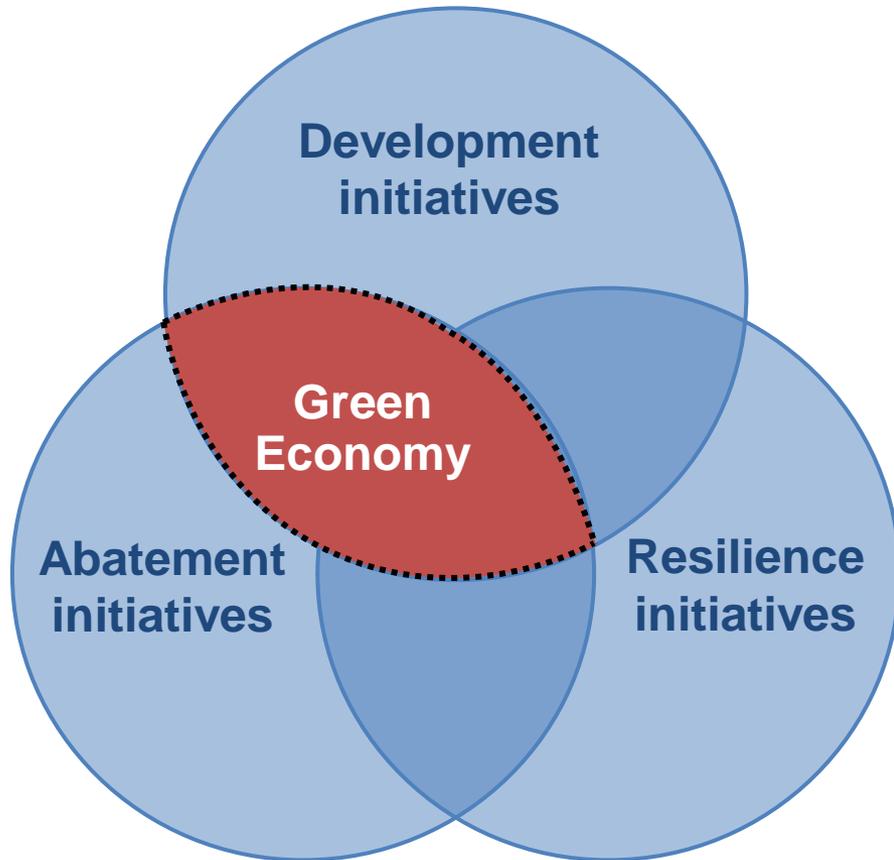
- Keeping emissions constant by applying abatement measures in sectors such as forestry, agriculture and industry
- Becoming a “green economy frontrunner” by investing into low-carbon infrastructure

Resilience

- Reducing vulnerability to climate-change-associated risks:
 - Gradual hazards (e.g., vector-borne diseases)
 - Event-driven hazards (e.g., landslides and flooding)

Developing a green economy combines economic development and abatement

Strategic framework

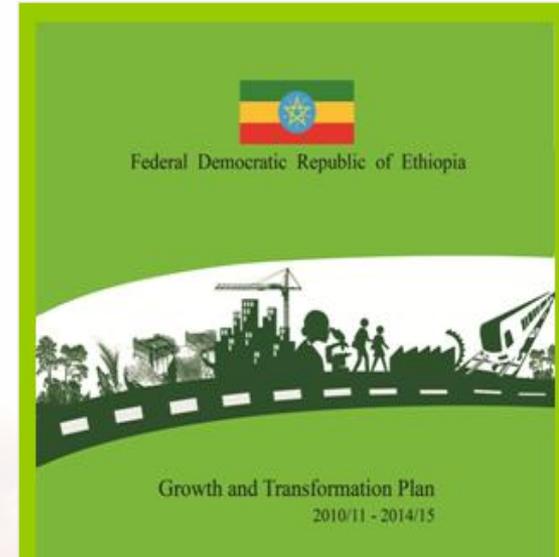


Objectives

- 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 **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

Setting the vision

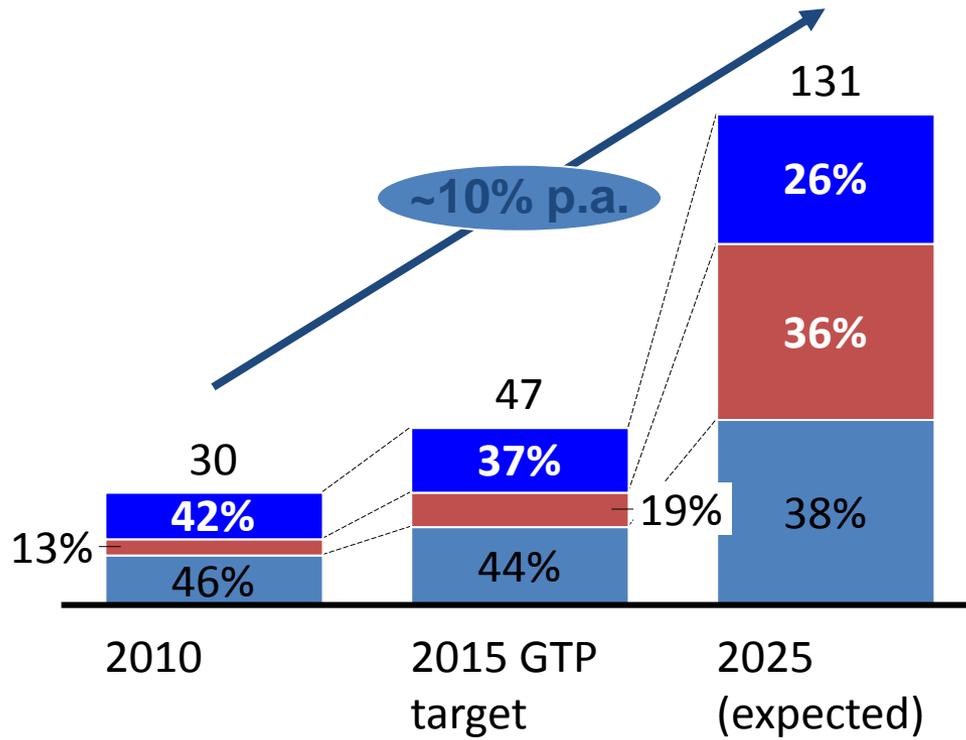


- **Ethiopia: a middle income country by 2025**
- **It reflects the govt's ambition to lift the country to middle income**
- **Net emission of GHGs to become zero/ neutral**

middle income status by 2025

GDP, USD billions

■ Agriculture
■ Industry
■ Services

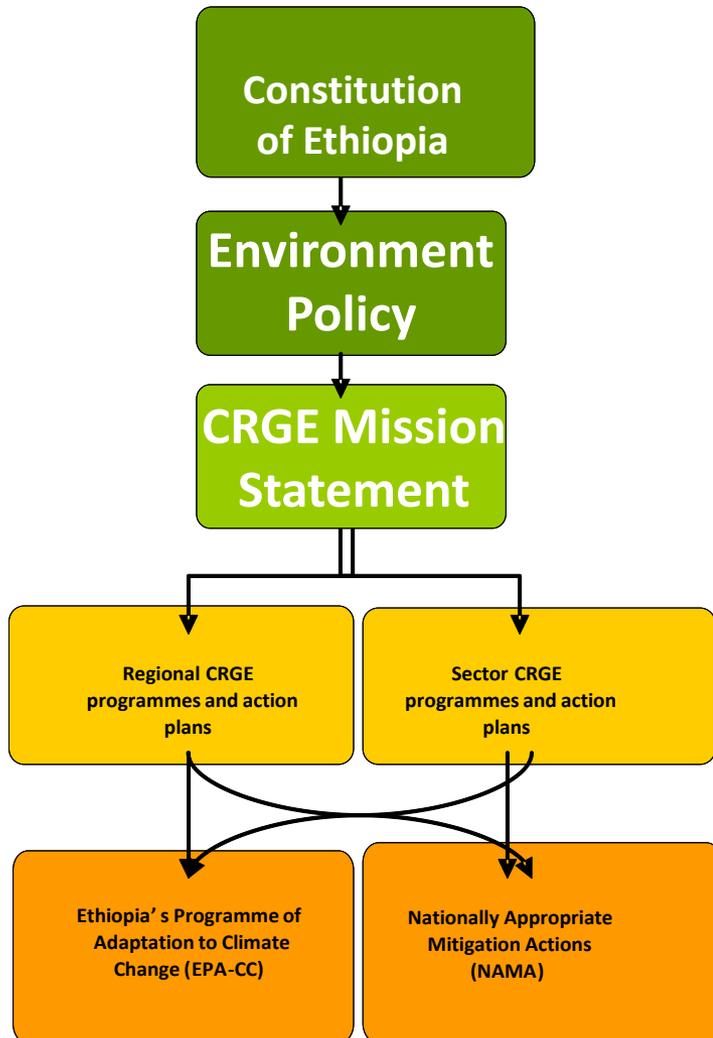


Key transitions

- 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

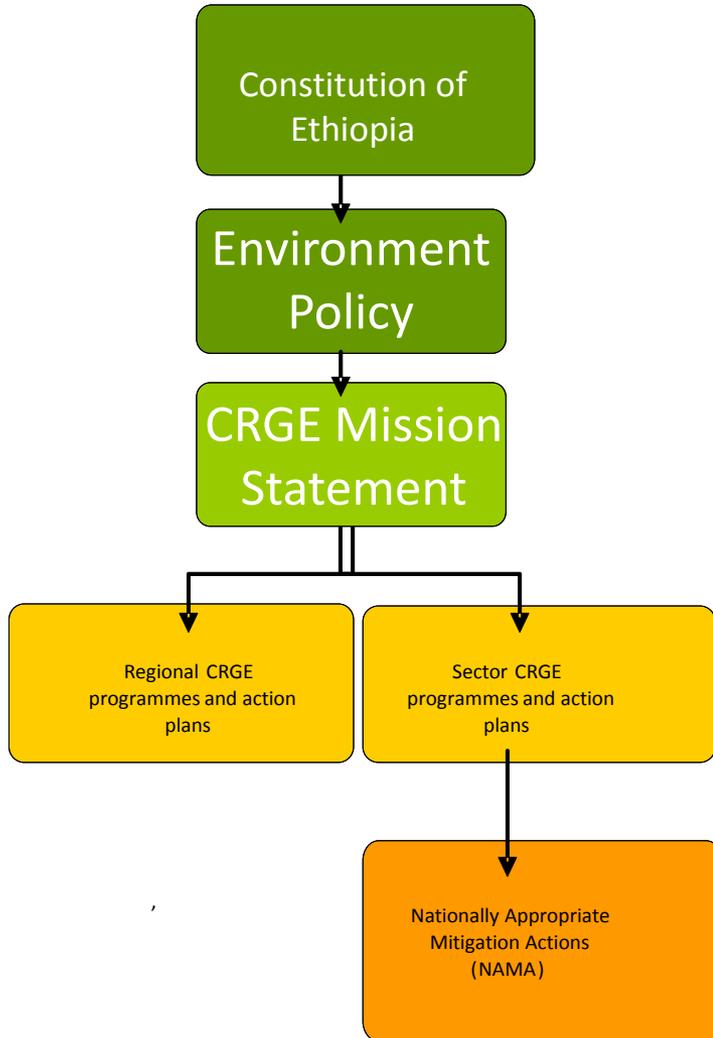
Population mln	80	91	117
GDP p.c. In USD	380	520	1,170

Climate Resilient Green Economy...



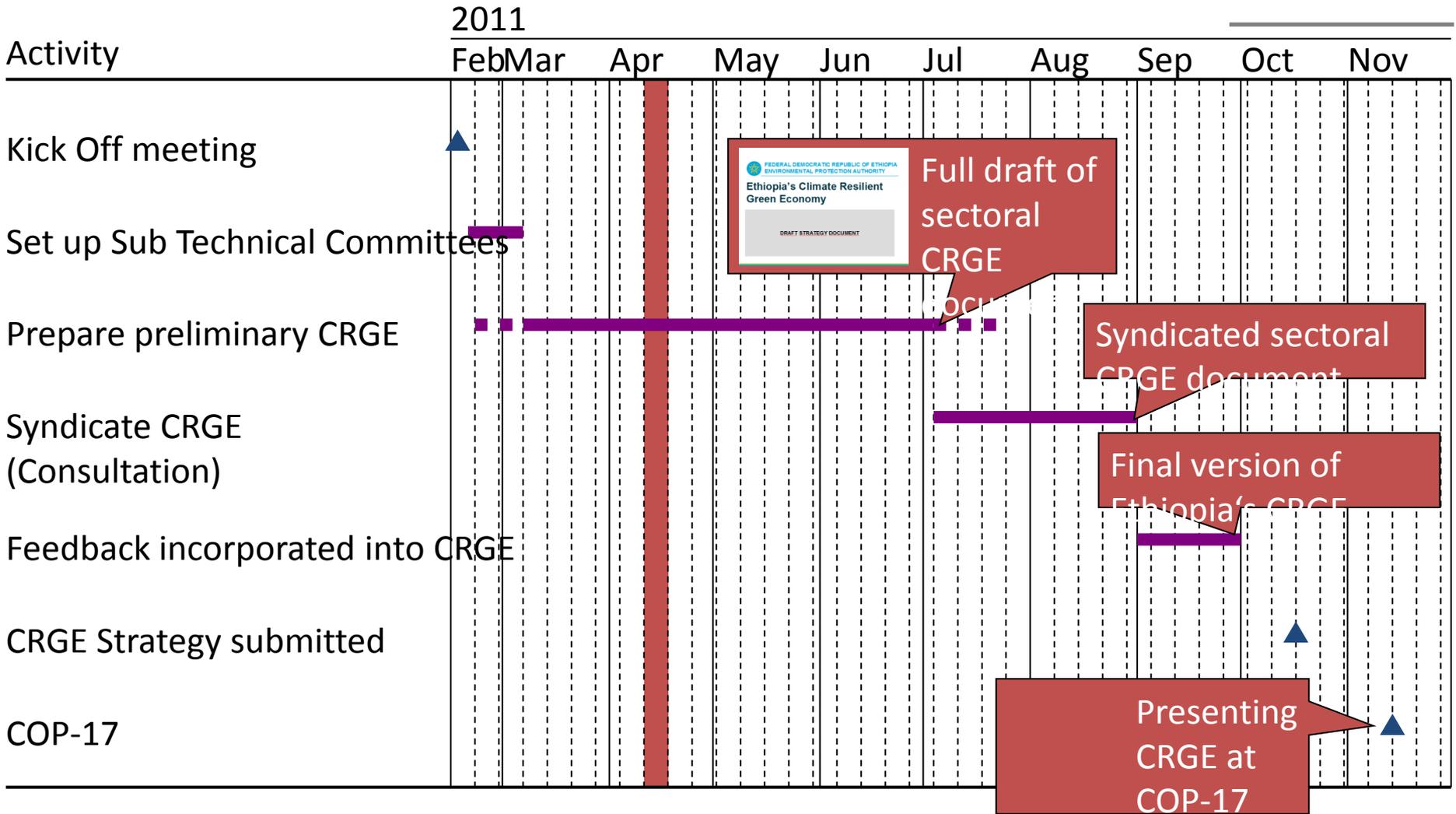
Ethiopia- CRGE by 2025

2. Climate Resilient Green Economy...



Ethiopia- CRGE by 2025

CRGE- timeline until COP-17



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 CO₂e 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.

	Traditional growth	Low carbon or green growth
	Likely outcomes if Ethiopia follows a 'traditional' growth path:	Likely outcomes if Ethiopia follows a low-carbon, 'green' growth path:
Energy	Dependence on fossil fuels High emissions Power shortages and restricted coverage	Sufficient renewable energy to support economic development Exporter of clean energy regionally Expansion of rural energy coverage
Agriculture	Reduction in soil fertility Lower yields Vulnerability to floods and droughts and increasing food insecurity	Long term land use and fertility maintained Higher yields Food security
Forestry	1.5 million hectares of forest and shrub cover at risk due to agricultural expansion and biomass energy needs Health issues through smoke inhalation	Zero deforestation and sustainable forest use Reforestation and afforestation as carbon sink Healthier sources of cooking and heating energy Watershed services maintained – fewer floods and droughts, erosion control
Transport	Congested cities Dependence on expensive imported oil and gasoline Polluting, aging, unsafe vehicle stock	Increased availability of clean transport – rail, electrical vehicles, use of biofuels. Reduced oil dependence Healthier, cheaper, safer transport
Settlements	Unplanned development Unsanitary, unmanaged waste Low quality of life and reduced wellbeing of Poor health	Coordinated and rational long term planning of settlements Healthier towns and cities providing higher quality of life and wellbeing
Economy wide	Dependent on commodities and international price fluctuations including oil price	Macroeconomic conditions bring job and wealth creation and reduce poverty

5 Steps to a Green Economy

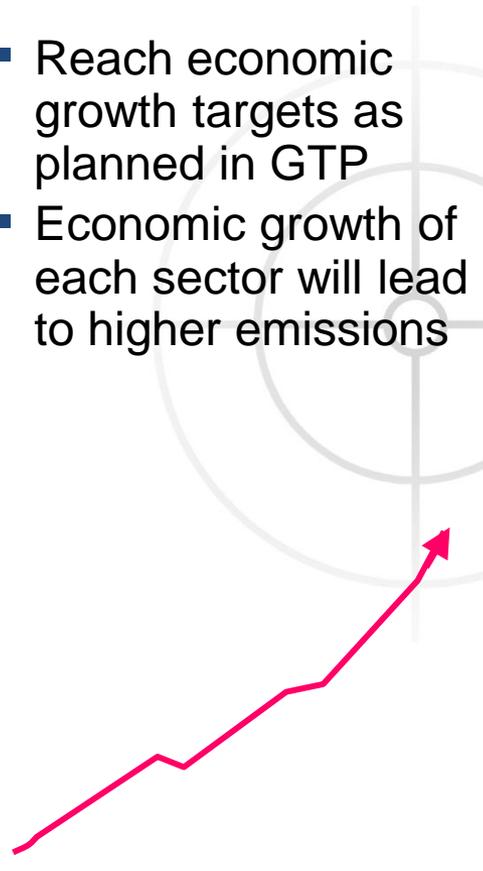


1 The green economy can significantly contribute to the goals of the GTP sectors

Goal of the sector and implications

Contribution of CRGE

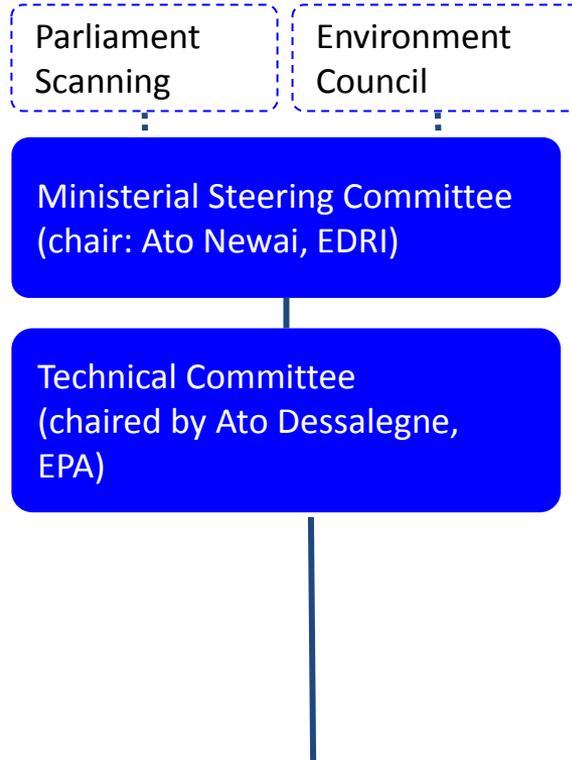
1	Power 	<ul style="list-style-type: none">Build generation capacity to satisfy growing demand
2	Buildings/ Gr. Cities 	<ul style="list-style-type: none">Reach economic growth targets as planned in GTP
3	Forestry 	<ul style="list-style-type: none">Economic growth of each sector will lead to higher emissions
4	Soil 	
5	Livestock 	
6	Transport 	
7	Industry 	



- 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



Sub-Technical Committees

Focus: GHG mitigation, economic growth and climate resilience

Power Supply

Buildings & green cities

REDD+

Soil based emissions

Live-stock

Transport

Industry

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

Sectors modelled and emissions sources counted

- Forestry (deforestation and degradation)
- Livestock (CH₄ from enteric fermentation and N₂O 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

■ Levers quantified

Levers	Description
<ul style="list-style-type: none"> ■ Increase animal value chain efficiency to improve productivity 	<ul style="list-style-type: none"> ■ Interventions aimed at improving GDP output per cattle via <ul style="list-style-type: none"> — Higher production per animal — Increased Off take rate, let by better health and marketing
<ul style="list-style-type: none"> ■ Support consumption of lower emitting sources of protein 	<ul style="list-style-type: none"> ■ Support the increase in poultry consumption (objective of 30% of meat consumption by 2030) by acting both on supply and demand aspects
<ul style="list-style-type: none"> ■ Mechanization of draft power 	<ul style="list-style-type: none"> ■ Introduction of mechanic equipment for plowing/tillage in substitution of ~50% of animal draft power
<ul style="list-style-type: none"> ■ Grazing land management and pasture improvement 	<ul style="list-style-type: none"> ■ Introduction of techniques to increase soil carbon content and productivity of pasture land
<ul style="list-style-type: none"> ■ Manure management 	<ul style="list-style-type: none"> ■ Wide range of activities including manure storage and utilization (e.g., for electricity generation through biogas)
<ul style="list-style-type: none"> ■ Modify ruminant ecology 	<ul style="list-style-type: none"> ■ Additives, diet mix ■ Manipulating ruminant flora ■ Vaccines to stop activity of methane producing organisms
<ul style="list-style-type: none"> ■ Low emitting cattle breeds 	<ul style="list-style-type: none"> ■ Select low emitting breeds

Forestry – List of identified abatement

Macro levers	Levers	Description
<ul style="list-style-type: none"> Reduce pressure from agriculture on forests 	<ul style="list-style-type: none"> Agriculture intensification on existing land 	<ul style="list-style-type: none"> Decrease requirements for new agricultural land by increasing yield and value of crops
	<ul style="list-style-type: none"> Prepare new land for agriculture through medium and large scale irrigation 	<ul style="list-style-type: none"> Shift of new agricultural land from forest to degraded land brought into production thanks to irrigation
	<ul style="list-style-type: none"> Prepare new land for agriculture through small scale irrigation 	<ul style="list-style-type: none"> Shift of new agricultural land from forest to degraded land brought into production thanks to irrigation
<ul style="list-style-type: none"> Reduce demand for fuelwood 	<ul style="list-style-type: none"> Fuelwood efficient stoves 	<ul style="list-style-type: none"> Reduce wood requirements thanks to efficient stoves (in rural areas mostly)
	<ul style="list-style-type: none"> Electric stoves 	<ul style="list-style-type: none"> Switch to electric stoves (in urban areas mostly)
	<ul style="list-style-type: none"> LPG stoves 	<ul style="list-style-type: none"> Switch to LPG stoves
	<ul style="list-style-type: none"> Biogas stoves 	<ul style="list-style-type: none"> Switch to biogas stoves (in rural areas)
<ul style="list-style-type: none"> Increase sequestration 	<ul style="list-style-type: none"> Afforestation and reforestation 	<ul style="list-style-type: none"> Large scale afforestation and reforestation degraded areas
	<ul style="list-style-type: none"> Forest management 	<ul style="list-style-type: none"> Large scale forest management programs

Soil – List of identified ~~measures~~ levers

Lever Categories	Example Levers	Description
<ul style="list-style-type: none"> ▪ Introduction of Lower Emitting Techniques <i>(includes 10+ levers)</i> 	<ul style="list-style-type: none"> ▪ 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 	<p>Increase soil stock of C per unit of area; decrease N volatilization, percolation, leaching and improve plants N absorption</p>
<ul style="list-style-type: none"> ▪ Agriculture Intensification <i>(includes 10+ levers)</i> 	<ul style="list-style-type: none"> ▪ Improved inputs usage ▪ Residue management 	<p>Decrease requirements for new agricultural land (coming primarily from forests)</p>
<ul style="list-style-type: none"> ▪ Creation of New Land through Irrigation 	<ul style="list-style-type: none"> ▪ Small scale irrigation ▪ Large scale irrigation 	<p>Decrease requirements for new agricultural land (coming primarily from forests)</p>

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!