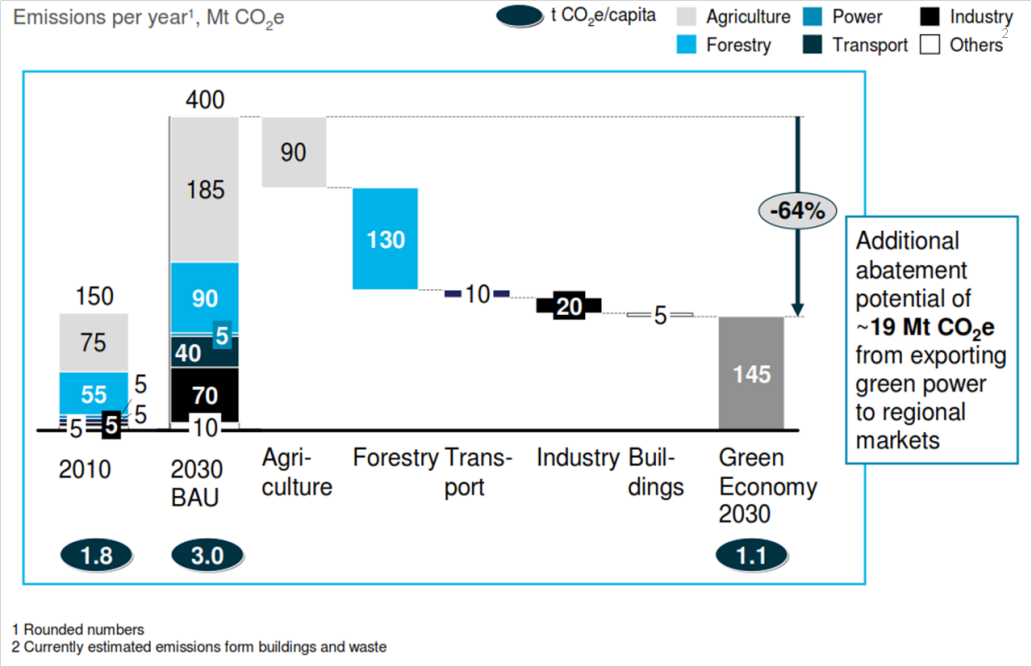
FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

Intended Nationally Determined Contribution (INDC) of the Federal Democratic Republic of Ethiopia

Ethiopia intends to limit its net greenhouse gas (GHG) emissions in 2030 to 145 Mt CO_2e or lower. This would constitute a 255 MtCO_2e reduction from the projected 'business-as-usual' (BAU) emissions in 2030 or a 64% reduction from the BAU scenario in 2030. Ethiopia also intends to undertake adaptation initiatives to reduce the vulnerability of its population, environment and economy to the adverse effects of climate change, based on its Climate Resilient Green Economy Strategy (CRGE). The CRGE is Ethiopia's strategy for addressing both climate change adaptation and mitigation objectives. The implementation of the CRGE would ensure a resilient economic development pathway while decreasing per capita emissions by 64% or more. The CRGE is also integrated into the Second Growth and Transformation Plan (the national development plan). In the long term, Ethiopia intends to achieve its vision of becoming carbon-neutral, with the mid-term goal of attaining middle-income status.



The full implementation of Ethiopia's INDC is contingent upon an ambitious multilateral agreement being reached among Parties that enables Ethiopia to get international support and that stimulates investments. The INDC will be updated periodically, as appropriate.

Mitigation contribution of GHG emissions	
Gases covered	Carbon Dioxide (CO_2), Methane (CH_4) and Nitrous Oxide (N_2O), which are considered priority gases in the Ethiopian Green Economy Strategy.
Target year	2030
Sectors	Sectors included are Agriculture (livestock and soil), Forestry, Transport, Electric Power, Industry (including mining) and Buildings (including Waste and Green Cities). The plan to mitigate GHG emissions is built on the following four pillars: 1) Improving crop and livestock production practices for greater food security and higher farmer incomes while reducing emissions; 2) Protecting and re-establishing forests for their economic and ecosystem services, while sequestering significant amounts of carbon dioxide and increasing the carbon stocks in landscapes; 3) Expanding electric power generation from renewable energy; 4) Leapfrogging to modern and energy efficient technologies in transport, industry and building sectors. The total GHG emissions of Ethiopia in 2010 were 150 Mt CO_2 e. The sectoral GHG emission sources and their quantities were the following: a. Livestock emitted methane and nitrous oxide totalling 65 Mt CO_2e, i.e. 42% of the total; b. Crop cultivation emitted nitrous oxide totalling 12 Mt CO_2e, i.e. 9% of the total; c. Deforestation and forest degradation due to cutting and burning fuel wood and due to logging totalling 55 Mt CO_2e, i.e. 37% of the total; d. Electric power generation totalling 5 Mt CO_2e, i.e.3% of the total; e. Transport sector emissions totalling 5 MtCO_2e, i.e. 3% of the total; f. Industrial sector emissions totalling 4 Mt CO_2e, i.e. 3% of the total; g. Building sector emissions totalling 5 Mt CO_2e, i.e. 3% of the total.

	The emissions reduction, which constitutes a reduction of 255 $MtCO_2e$ or 64% compared to 'business-as-usual' (BAU) emissions in 2030, includes 90 Mt CO_2e from agriculture; 130 Mt CO_2e from forestry; 20 Mt CO_2e from industry; 10 Mt CO_2e from transport; and 5 Mt CO_2e from buildings. This does not include the reduction of 19 Mt CO_2e in neighbouring countries due to the export of electric power to them from Ethiopia.
Planning processes	The Ethiopian INDC (EINDC) is aligned with the national development plan and anchored on the Climate Resilient Green Economy Vision and Strategy of Ethiopia. The EINDC was developed through an inclusive and participatory process.
Methodology	Under the CRGE, the 145 Mt CO_2e target was calculated by: • examining where emissions were headed under a 'business-as-usual' (BAU) scenario and; • identifying abatement opportunities across sectors. The methodology applied to forecast the BAU scenario was based on two steps. The first step was to forecast Ethiopia's economic development. The second step was to compute the associated emissions using the economic development targets (2010-2015), past performance and the ambition to reach middle-income status before 2025. In the second step, the projected economic growth was translated into the BAU development of GHG emissions. The BAU estimation of GHG emissions forms the baseline for the development of Ethiopia's Green Economy Strategy, quantifying what Ethiopia's domestic GHG emissions would be if no actions were taken to limit emissions. The abatement potential was then calculated and compared with the BAU projection. The resulting BAU emission level was then converted into CO_2 emissions, which added up to 400 Mt CO_2e based on the standardized methodology (IPCC 2006 Guidelines). For tracking the progress towards the target in the EINDC, the following assumptions have been made: • For metrics and methodologies Ethiopia proposes to use Global Warming Potential on a 100-year timescale in accordance with the IPCC's Fourth Assessment Report and the IPCC 2006 Guidelines.

	• The land sector is split into the agriculture and forestry sectors in the Ethiopian CRGE Strategy. Therefore, the treatment of the land sector is already included in the target presented by Ethiopia. The target has comprehensive coverage (100%) of the land sector. The Government of Ethiopia supports the development of robust rules to ensure accurate and transparent accounting of emissions from the land-sector.
Participation in international market mechanism	The Government of the Federal Democratic Republic of Ethiopia intends to sell carbon credits during the period to contribute towards achieving its Green Economy Strategy. Ethiopia supports the development of effective accounting rules under the UNFCCC to guarantee the environmental integrity of market mechanisms.
Adaptation to climate change	
Long-term goal	Ethiopia's long-term goal is to ensure that adaptation to climate change is fully mainstreamed into development activities. This will reduce vulnerability and contribute to an economic growth path that is resilient to climate change and extreme weather events. Because climate change will affect all geographic areas of the country, its solution requires the participation of the entire population, especially farmers and pastoralists. Parallel to this, Ethiopia's response to climate change aims to integrate actions that improve the status of women and the welfare of children. Furthermore, measures to address climate change will be planned and implemented in a manner that addresses the wellbeing of the elderly, persons with disabilities and environmental refugees.
Current and near-term action:	Ethiopia has undertaken several strategic and programmatic adaptation actions. The strategies and plans include: a. The National Adaptation Programme of Action (NAPA) since 2007; b. The Ethiopian Programme of Adaptation to Climate Change (EPACC 2011); c. Nine National Regional States and two City Administrations adaptation plans; d. Five sectoral adaptation plans; e. Agriculture sector adaptation strategy.

	Already several large-scale sustainable land and natural resource management programmes are ongoing, for example the Sustainable Land Management Programme and the Productive Safety Net Programme, which will contribute to building resilience to climate change. The main effort in the near-term is to build the capacity needed to mainstream adaptation to climate change into all public and private development initiatives. These efforts will build on existing good practices in order to mainstream and scale up these interventions.
Medium and long-term actions	Moving towards the long-term adaptation goal, the main effort up to and beyond 2020 is to increase resilience and reduce vulnerability of livelihoods and landscapes in three pillars; drought, floods and other cross-cutting interventions, as specified below:
	<u>Drought</u> 1. Increase agricultural productivity, minimize food insecurity and increase incomes irrespective of climate change by breeding and making available improved crop varieties, primarily from among those in Ethiopia that suit all agricultural areas where varieties that were grown in the past have become unsuitable. 2. Protecting humans, wildlife and domestic animals from extreme droughts, at least to the extent that they will have water for drinking by diverting streams, digging wells and enhancing water harvesting techniques and thereby making available dependable watering points in all rural woredas (districts). 3. Improve and diversify economic opportunities from agroforestry and sustainable afforestation of degraded forest areas. 4. Enhance irrigation systems through rainwater harvesting and conservation of water, including improved water use efficiency. 5. Ensure the uninterrupted availability of water services in urban areas to make them comfortably and productively habitable irrespective of droughts through planning and construction of dams or deep wells, deployment of water saving technologies and wastewater treatment infrastructure. 6. Improve traditional methods that scientifically prevent deterioration of food and feed in storage facilities to enable local

	communities to store food and feed in productive years and secure food supply in case of extreme weather events. 7. Create biodiversity movement corridors, especially up towards higher terrain, in areas where most of the land is under cultivation. This will minimize biodiversity loss through enabling the re-establishment and movement of plant and animal species and varieties to areas suitable for their survival when temperature rises. 8. Enhancing ecosystem health through ecological farming, sustainable land management practices and improved livestock production practices to reverse soil erosion, restore water balance, and increase vegetation cover, including drought tolerant vegetation. 9. Expanding electric power generation from geothermal, wind and solar sources to minimize the adverse effects of droughts on predominantly hydroelectric energy sector.
	<u>Flood</u> 1. Enhance the adaptive capacity of ecosystems, communities and infrastructure through an ecosystem rehabilitation approach in the highlands of Ethiopia. Rehabilitation of degraded lands/forests will also increase resilience of communities, infrastructures and ecosystems to droughts and floods. 2. Building additional dams and power stations to further develop energy generation potential from the same river flow as well as develop new dam sites on parallel rivers in order to maintain the baseline hydropower electricity generation capacity to levels attainable under a 'no-climate change' scenario. 3. Developing and implementing climate change compatible building/construction codes for buildings, roads, airports, airfields, dry ports, railways, bridges, dams and irrigation canals that are safe for human life and minimize economic damage that is likely to result from increasing extremes in flooding. <u>Other cross cutting interventions</u> 1. Developing one or more insurance systems to enable citizens, especially farmers and pastoralists, to rebuild economic life

	following exposure to disasters caused by extreme weather events (floods and droughts). 2. Reducing the incidence and impact of fire and pest epidemics on livelihoods and ecosystems through integrated pest management, early warning systems, harvesting adjustments, thinning, patrols and wider public participation. 3. Effective early warning systems and disaster risk management policies to improve resilience to extreme weather events. 4. Strengthening capacity to deal with the expansion and emergence of human, animal, crop and plant diseases known to occur in and around Ethiopia and in similar environments elsewhere and make available medicines in a sufficient quantity to deal with these diseases. 5. Strengthening and increasing the capacity for breeding and distributing disease resistant crop and fodder varieties to farmers and other land users in order to deal with the emergence and expansion of diseases and pests.
Monitoring and Evaluation	The Ministry of Environment and Forest (MEF) will regularly organize consultative dialogues to review the implementation of the national and sectoral adaptation plans. This iterative process will ensure that national and sectoral adaptation plans are regularly updated and implemented.
Fairness, equity, ambition and Means of Implementation (Cross-cutting for both mitigation and adaptation)	
Fairness, equity and ambition	Despite being a Least Developed Country, Ethiopia has already placed itself on the path to undertake a substantial national program of climate action, outlined in the Climate Resilient Green Economy Strategy (CRGE). At 1.8 tCO_2e, Ethiopia's per capita GHG emissions are insignificant compared to total global emissions. If Ethiopia's contribution is fully implemented, it would reduce per capita emissions to 1.1 tCO_2e by 2030. For a Least Developed Country, this reduction exceeds expectations for both fairness and ambition while contributing towards the achievement of the objective of the Convention. Ethiopia has already removed fossil fuel subsidies to enable

	enhanced generation and use of clean and renewable energy. 76.7% of Ethiopia's population currently lacks access to modern energy sources, relying on wood for fuel. By continuing to prioritise renewable energy under the CRGE, Ethiopia will be able to increase energy access in rural areas. In this context, substantial investments are already being made, including the construction and operationalization of the Ethiopian Grand Renaissance Dam (GERD), amounting to USD 4 Billion generated from domestic sources. Ethiopia's greatest emission reduction potential is in the agriculture and forestry sectors, constituting 85% of emissions in 2010. Therefore, one of the priority initiatives under the CRGE is the use of more efficient stoves, amounting to an emissions reduction rate of 50 $MtCO_2e$ per year by 2030. Furthermore, Ethiopia intends to increase its ambition by expanding its forest cover, beyond the initial target for the afforestation and reforestation of 7 Million Hectares, with continued involvement from local communities that are already contributing substantially to the attainment of this target. By prioritising initiatives such as these, Ethiopia is maximising its mitigation potential and contributing towards the achievement of the objective of the Convention, whilst simultaneously supporting its sustainable development goals. An important component of Ethiopia's contribution includes actions to build resilience and enhance adaptation to the impacts of climate change. Given that 80% of the population depends on agriculture for their livelihoods, increasing the resilience of agriculture is a priority for Ethiopia. This includes addressing the high levels of vulnerability of the sector to droughts and floods. Ethiopia also seeks to maximise the synergies between adaptation and mitigation, especially involving agriculture and forests. Many of the measures involving forestry and agriculture can provide substantial economic and livelihood benefits. By targeting actions in these sectors, Ethiopia is seizing the opportunities that ambitious climate action brings, helping to reduce both its future emissions and its vulnerability to climate impacts. Ethiopia recognises the negative impact of climate change on health, economic growth and natural resource conservation and that is why

	it has committed to undertake such ambitious action using its domestic resources. However, there are enormous untapped opportunities for increased action on climate change, including both mitigation and adaptation, in Ethiopia. For more than 80% of the abatement potential, abatement costs are less than USD 15 per ton CO_2e. With additional support to mobilise finance, infrastructure, technology and capacity to undertake and oversee implementation, Ethiopia can realize its full potential to act and increase its contributions even further.
Means of Implementation	The Government of Ethiopia already spends a substantial portion of its annual budget on infrastructure and the provision of social services, which contribute to addressing the negative impacts of climate change by reducing emissions and vulnerabilities. However, the full implementation of Ethiopia's INDC requires predictable, sustainable and reliable support in the form of finance, capacity building and technology transfer. <u>Mitigation of GHG emissions</u> The full and effective implementation of the Green Economy Strategy requires an estimated expenditure of more than USD 150 billion by 2030. This highlights the need for significant capital investments. Therefore, the types of contributions required to implement Ethiopia's INDC are categorized into unsupported and supported contributions. Future research will be conducted to: 1. Quantify and assign the share of unsupported contributions that are planned and fully funded by the government to limit the quantity of emissions; 2. Quantify and assign the share of supported contributions that are planned by the government but require international support to limit the quantity of emissions; 3. Identify the technical support needed to introduce new and additional policies and actions that stimulate and enable investment in limiting emission to 145 Mt or lower. <u>Adaptation to climate change</u>

	Future research will be conducted in order to: 1. Quantify the required international financial, technological and capacity building support for the implementation of vulnerability abatement measures up to and beyond 2030; 2. Identify and quantify the technical support needed for the adequate integration of climate change adaptation considerations into existing and planned policies, strategies, plans, programmes and projects; 3. Identify the required technical support to quantify the cost of countering social, environmental and economic vulnerabilities that are likely to result from the adverse impacts of climate change.

Supplementary Information

The Climate Resilient Green Economy Strategy (CRGE) issued by the Federal Democratic Republic of Ethiopia in 2011 provided an important opportunity to:

- Transform to a new economic development model, using domestic resources and global climate change finance; and
- Build resource-competitive advantages, while responding to the adverse effects of climate change.

The foundation of Ethiopia's Intended Nationally Determined Contributions (EINDC) is its CRGE Strategy. The CRGE sets out to deliver the following objectives of:

- Lifting Ethiopia to middle-income status by 2025;
- Ensuring economic development is sustainable by limiting GHG emissions;
- Creating green job opportunities;
- Protecting the Ethiopian population and economy against the adverse effects of climate change; and
- Contributing to the global effort in responding to climate change.

The EINDC has two mutually integrated components:

- Reducing greenhouse gas emission; and
- Reducing the vulnerability of the Ethiopian population, environment and economy to the adverse effects of climate change.

The emission reduction component of EINDC will help Ethiopia to achieve:

- Economic development objectives in a resource-efficient way and attract global climate finance;
- Avoid the unintended consequences of a carbon-intensive development path such as fossil fuel dependence, health issues, traffic congestion and land degradation; and
- Contribute to the ongoing global fight against climate change while advancing the welfare of Ethiopians.

Many of the emission reduction initiatives contained under the EINDC offer positive returns on investment, thus directly promoting economic growth and creating additional high-quality green jobs. The implementation of the emission reduction component of EINDC to the fullest will also lead Ethiopia to achieve carbon neutrality. Further

development co-benefits of the emission reduction component of the EINDC include, among others:

- Improved public health through better air and water quality; and
- Strengthened rural economic development through higher agricultural production, leading consequently to greater food security.

The Federal Democratic Republic of Ethiopia is taking measures to adapt to the inevitable reality of climate change, which is expected to intensify as the world's climate changes, due to both the already accumulated and anticipated global GHG emissions. In this regard, Ethiopia's Programme of Adaptation to Climate Change (EPACC) and sectoral climate resilience strategies were developed to provide a framework to build resilience to climate shocks, with emphasis on:

- Reducing the cost of countering vulnerability and ensuring adaptation to protect the population – especially in rural areas – from adverse effects of global warming; and
- Safeguarding economic development in order to ensure that Ethiopia will attain middle-income status by 2025, despite the current and anticipated climate change. The most vulnerable sectors to climate shocks include health, agriculture, water, energy, buildings and transport.

Ethiopia requires substantial resources to limit the emission of its GHGs and to build resilience to climate shocks. To this end, Ethiopia has already committed significant resources to reduce GHGs and build resilience, including for the implementation of:

- Afforestation and land rehabilitation interventions;
- Generation and distribution of electricity from clean and renewable sources;
- Investment in improved transportation systems (e.g. railway) that utilize clean and renewable energy. These investments will be complemented by urban planning transition towards mixed use, compact, and polycentric cities, resulting in shorter distances travelled to reduce transport/traffic related GHG emissions.
- Several structural measures have also been put in place including the removal of fossil fuels subsidies.

In order to realize the full potential of its mutually reinforcing EINDC objectives of reducing emission and building resilience, Ethiopia seeks to utilize existing and emerging climate finance mechanisms. Ethiopia also welcomes the continued support of bilateral and multilateral development partners, as well as the engagement of the private sector in

achieving its ambitious goals set under the EINDC. In this context, Ethiopia has already put in place a national fund, the Climate Resilient Green Economy Facility (CRGE Facility), as a mechanism to mobilize finance from various sources, and drive investments to build resilience and for green growth. The key features of the CRGE Facility are:

- Providing flexible, coordinated and predictable funding to support the achievement of national priorities set out under the CRGE;
- Blending diverse sources of climate financing and leveraging public funds to attract private funds; and
- Providing a unified engagement point where government, development partners, civil society and other stakeholders can engage and make decisions about climate change issues.

The Facility has already managed to attract resources from a number of bilateral and multilateral development partners.

Overall, the EINDC marks an important next step on the path towards sustainable development, consistent with the Principle of Common but Differentiated Responsibilities and Respective Capabilities. In this context, Ethiopia reaffirms its continued commitment to build a climate resilient green economy. This EINDC contributes to the global effort to mitigate climate change, while ensuring the realization of an equitable and resilient green economic growth nationally.