



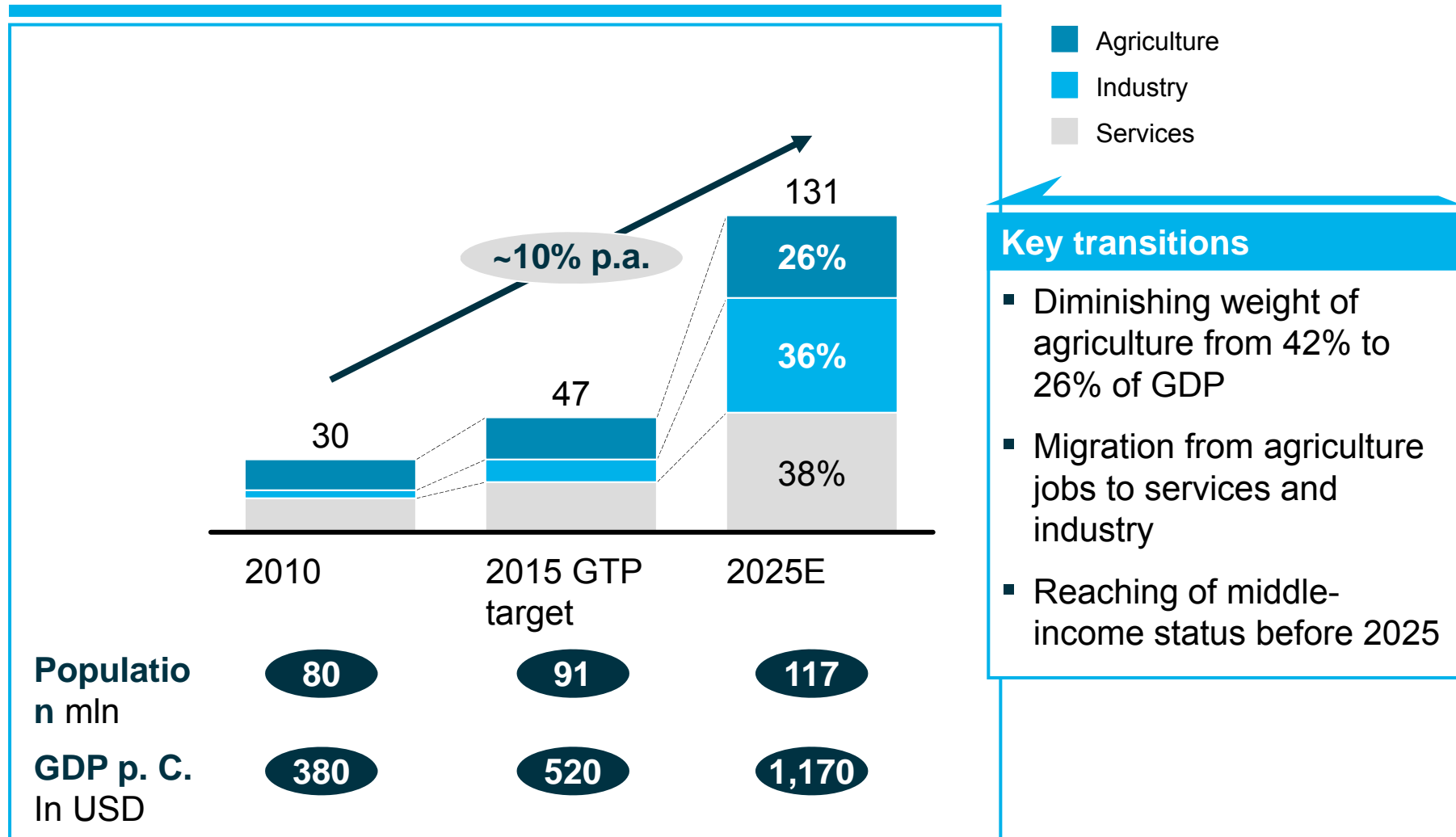
FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
ENVIRONMENTAL PROTECTION AUTHORITY

Ethiopia's Climate Resilient Green Economy

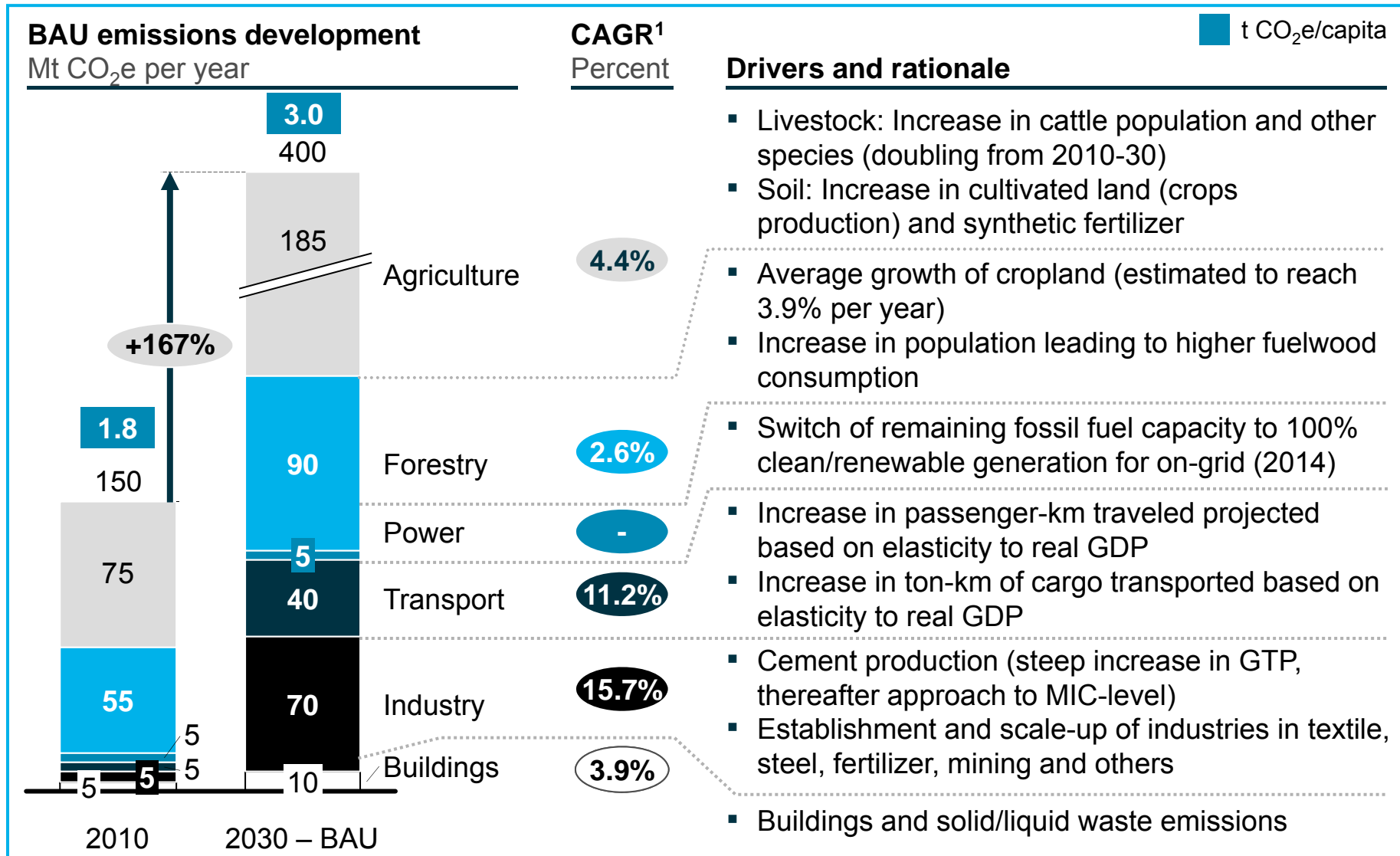


Ethiopia wants to reach middle income status before 2025

GDP, USD billions



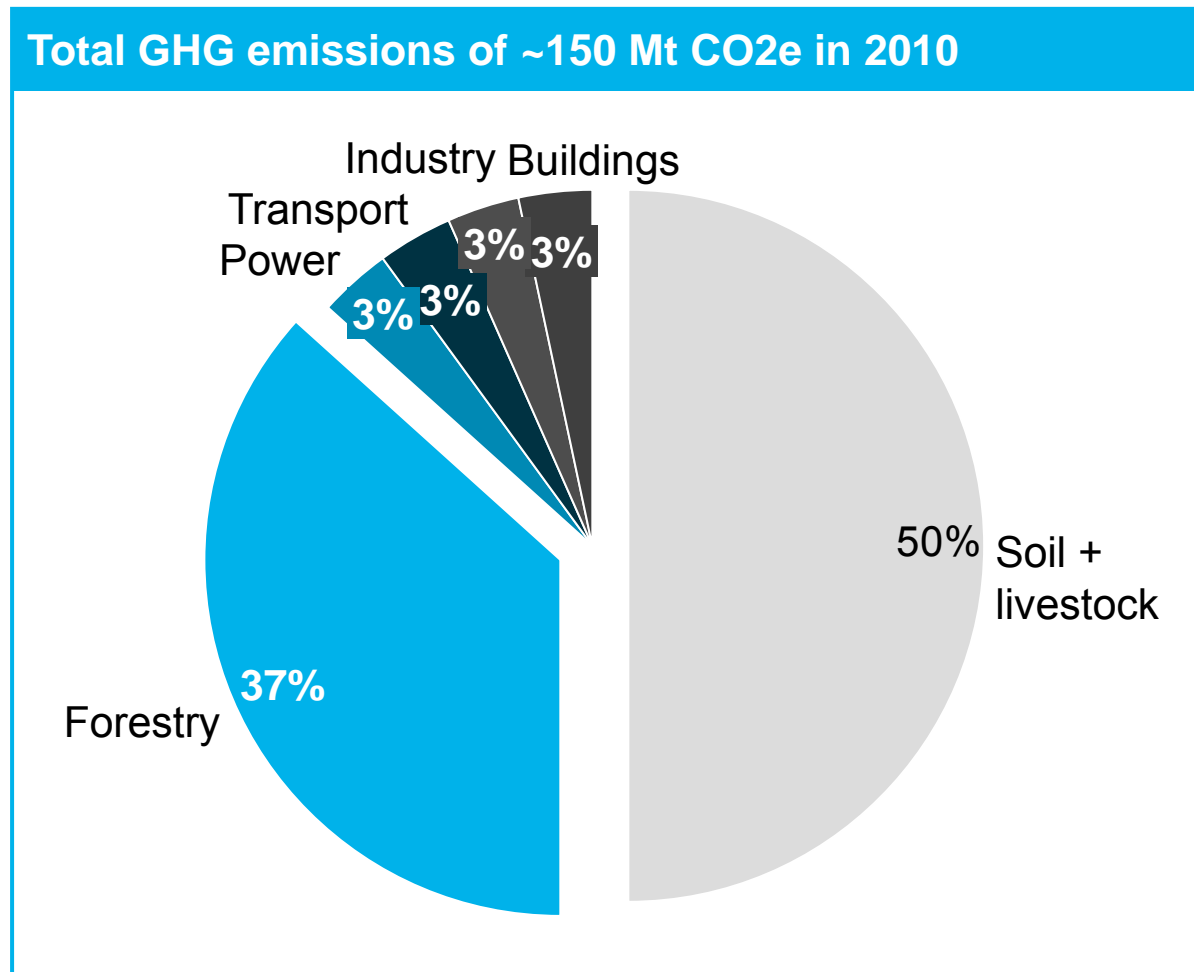
Without action, this economic growth will lead to more than double the emissions



¹ Compound average growth rate

More than 85% of GHG emissions in Ethiopia comes today from forestry and agriculture

Share of GHG emissions, 2010



Ethiopia following a typical development path would imply a number of national and global challenges and adverse effects

Characteristics of conventional growth path



Fossil fuel dependent **power supply**

- Dependency on imports
- Increased pollution



Deforestation/degradation of **forests**

- Land erosion
- Health issues from fuelwood smoke



Unsustainable **agriculture**

- Reduction in soil fertility
- Increased vulnerability to drought and floods



Rapid growth of conventional **transportation**

- Congested cities with polluting vehicles
- Dependent on oil import



Unsustainable practices in growing **industry**

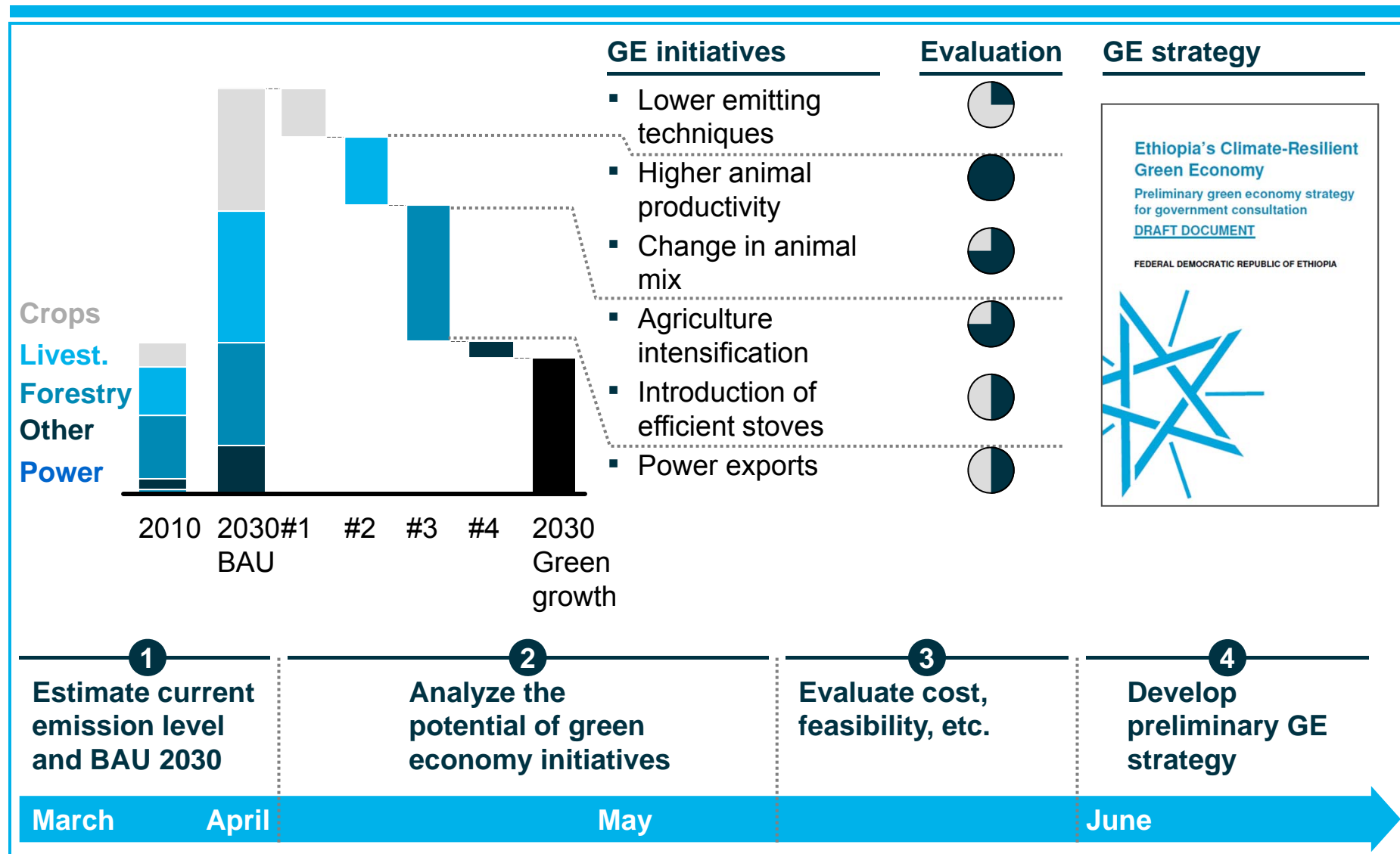
- Increase of air and water pollution
- Exhaustion of resources

Challenges

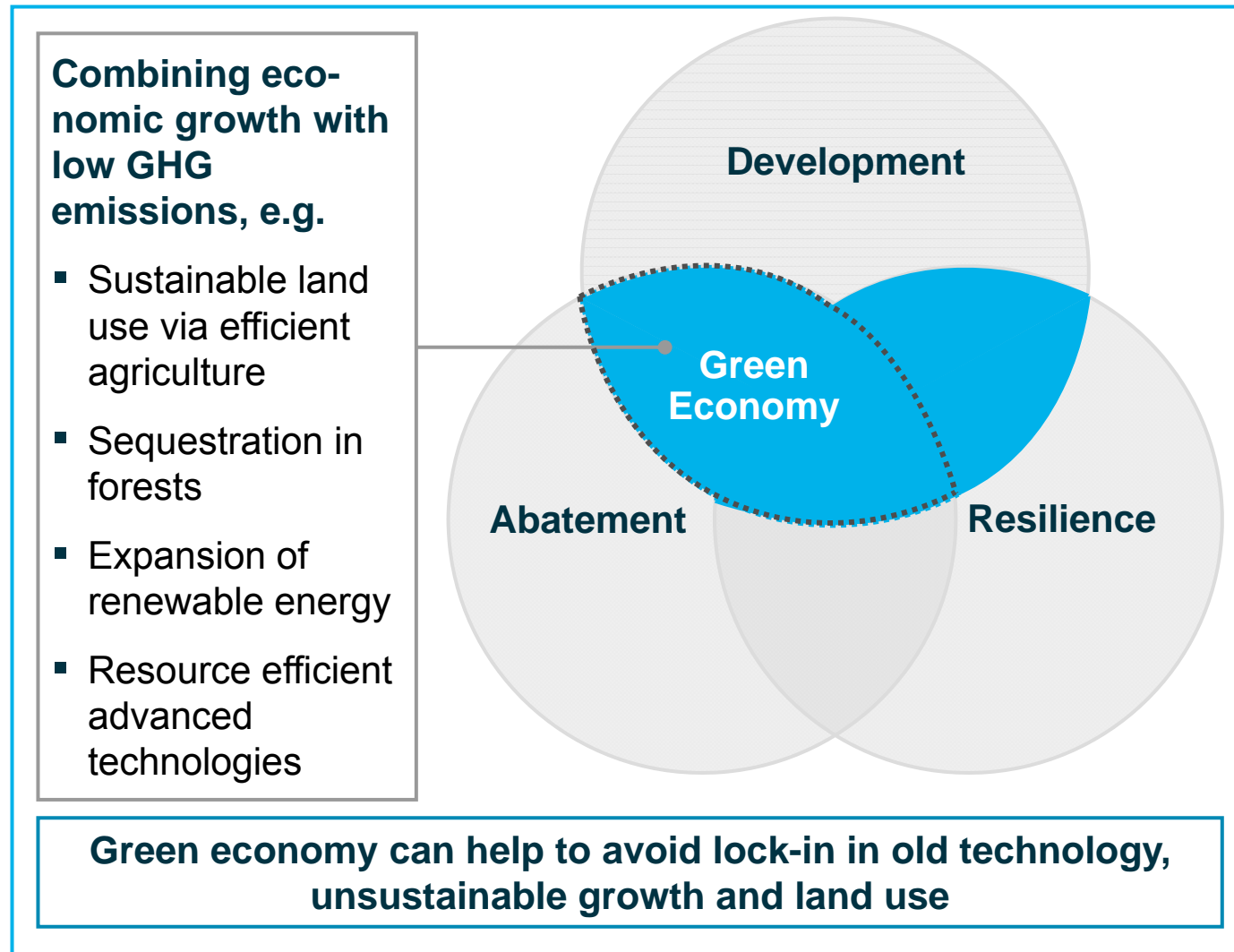
- Increased **poverty** and reduced food security
- **Reduction of quality of life** and health
- **Degradation** of air and water quality
- **Dependency** on commodities and fuel imports
- **Loss of natural assets** and biodiversity



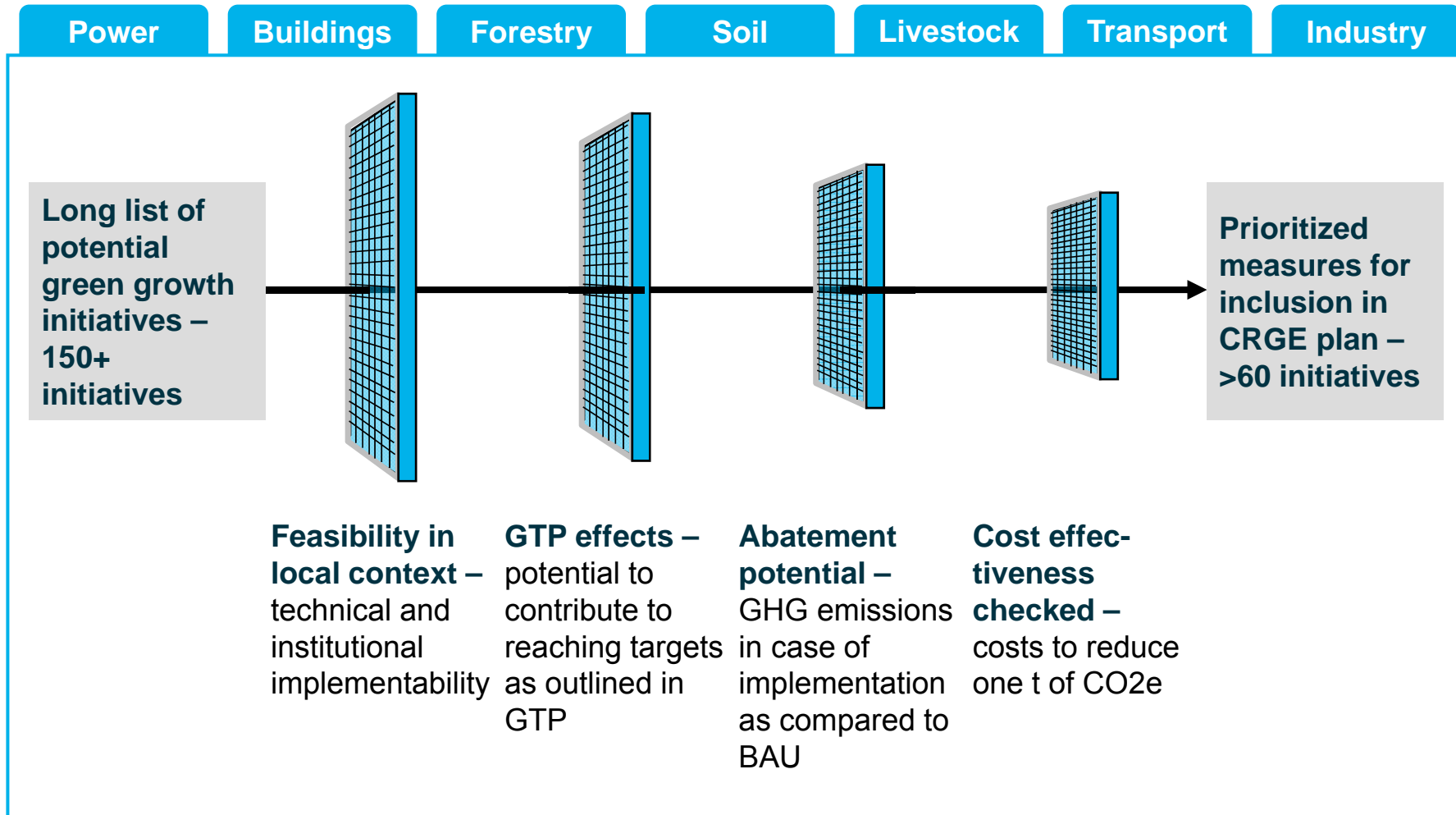
In response to this challenge, Ethiopia developed the Climate Resilient Green Economy (CRGE) Strategy



Developing a green economy combines economic development and abatement



Ethiopia has shortlisted >60 green economy opportunities



The strategy for a green economy is based on four pillars

Middle income country in 2025

Agriculture – Improving crop and livestock practices

- Reduce deforestation by agricultural intensification and irrigation of degraded land
- Use lower-emitting techniques
- Improve animal value chain
- Shift animal mix
- Mechanize draft power

Forestry – Protecting and growing forests as carbon stocks

- Reduce demand for fuelwood via efficient stoves
- Increase sequestration by afforestation/reforestation and forest management

Power – Deploying renewable and clean power generation

- Build renewable power generation capacity and switch-off fossil fuel power generation
- Export renewable power to substitute for fossil fuel power generation abroad

Industry, transport and buildings – Using advanced technologies

- Improve industry energy efficiency
- Improve production processes
- Tighten fuel efficiency of cars
- Construct electric rail network
- Substitute fossil fuel by biofuels
- Improve waste management

Green economy strategy



Pillar 1: Agriculture – Improving crop and livestock practices can abate up to 85 Mt CO₂e



 Mt CO₂e abatement potential in 2030

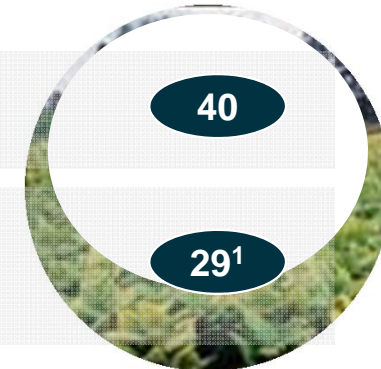
Soil

Introduce lower emitting techniques

- E.g. carbon- and nitrogen efficient crop variety, organic fertilizers

Reduce deforestation for agricultural land

- Agricultural intensification (yield & value), e.g. by improved inputs
- Create new agricultural land through irrigation of degraded areas



Livestock

Increase animal value chain efficiency

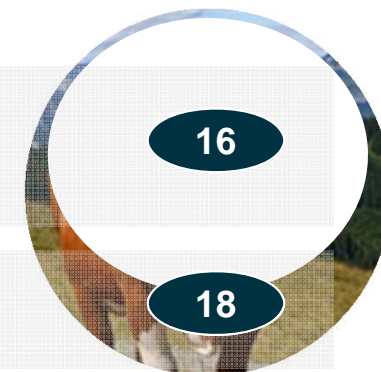
- Generate higher output per cattle, increase off-take rate, ensure better health, etc.

Change animal mix

- Promote consumption of lower emitting protein sources, e.g. poultry

Mechanize draft power

- Introduce mechanical equipment for plowing/tillage to substitute animal power



¹ Accounted for in forestry

Source: STC analysis



Pillar 2: Forestry – Protecting and growing forests can reduce nearly 120 Mt CO₂e



● Mt CO₂e abatement potential in 2030

Forestry

Reduce degradation by reducing demand for fuelwood

- Increase dissemination of fuelwood-efficient stoves
- Increase dissemination of fuel-shift stoves (e.g. electric, biogas)

50

Reduce deforestation for agricultural land

- Agricultural intensification (yield & value), e.g. by improved inputs
- Create new agricultural land through irrigation of degraded areas

29¹

Increase carbon sequestration in forests and woodlands

- Increase afforestation and reforestation
- Forest management

40

¹ Accounted for in forestry, but implemented in agriculture (soils)



Pillar 3: Power – Deploying renewable power generation for a green economy



● Mt CO₂e potential to avoid emission in 2030

Power

Increase renewable power generation to fuel economic growth

- Increase hydro, geothermal and wind capacity

Export renewable power oversupplies to regional markets

- Substitute for conventional power generation



¹ Enabler for other sectors (e.g. electric rail network in transport)



Pillar 4: Industry, transport and buildings – Reducing 40+ Mt CO₂e by using advanced technologies



● Mt CO₂e abatement potential in 2030

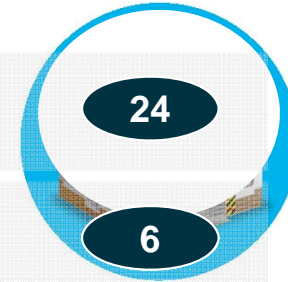
Industry

Improved technology and methods in cement production

- Promote energy efficiency, clinker substitution, carbon capture & storage

Improved technologies in other industries

- E.g. in chemicals/fertilizer, textile/leather, mining and other industries



Transport

Fuel efficiency and fuel shift in transport

- Enforce stricter fuel efficiency standards, promote adoption of biofuels, hybrid and electric vehicles

Transport mode shift

- E.g. construction of electric freight rail, urban electric rail



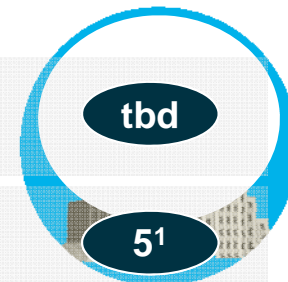
Buildings and Green Cities

Improved waste management

- E.g. landfill gas management (flaring, electricity generation)

Electricity efficiency

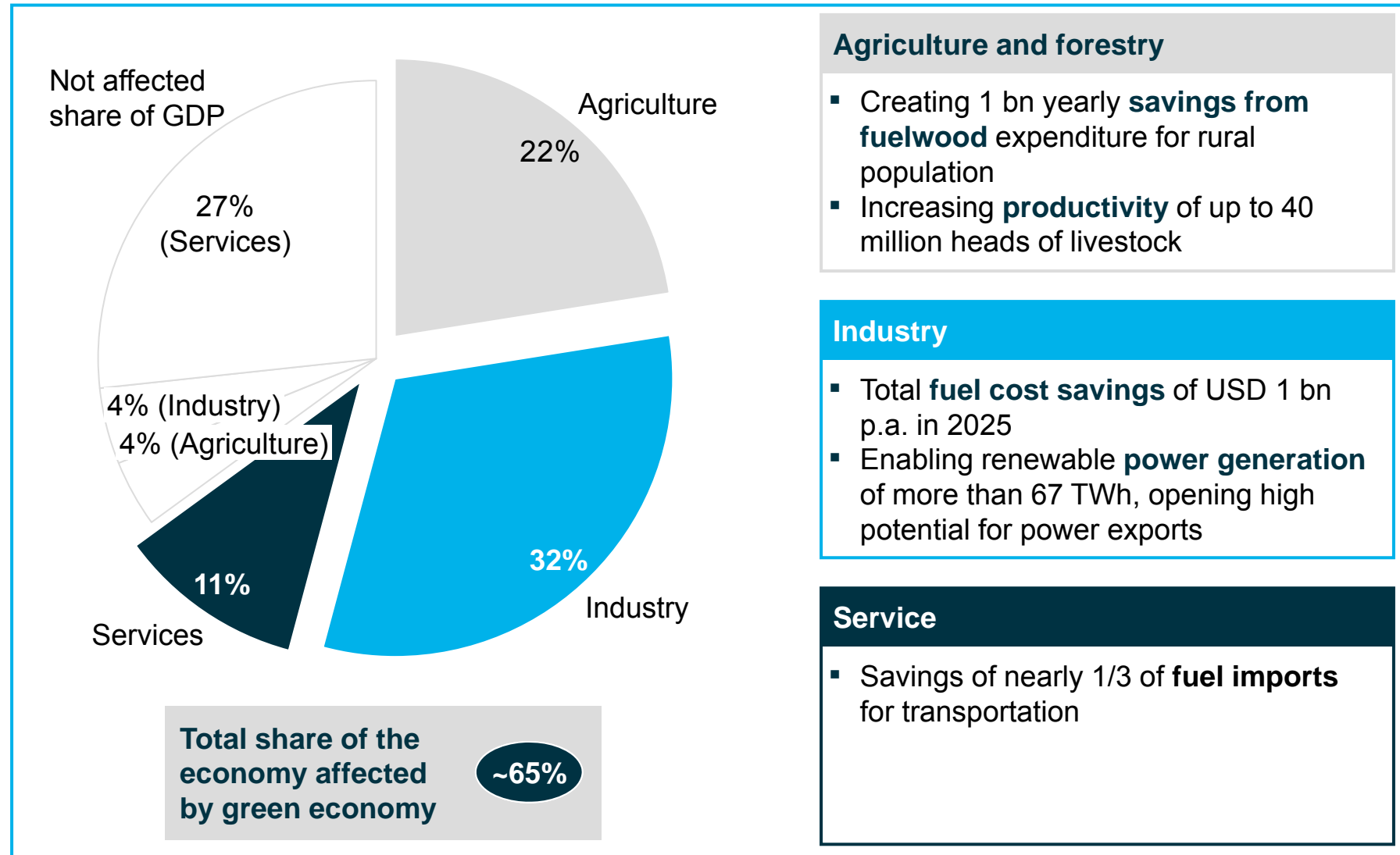
- E.g. transition to high-efficiency lightbulbs



1 Accounted for in power exports
Source: STC analysis

Around two thirds of the economy would be affected by moving to a green growth path

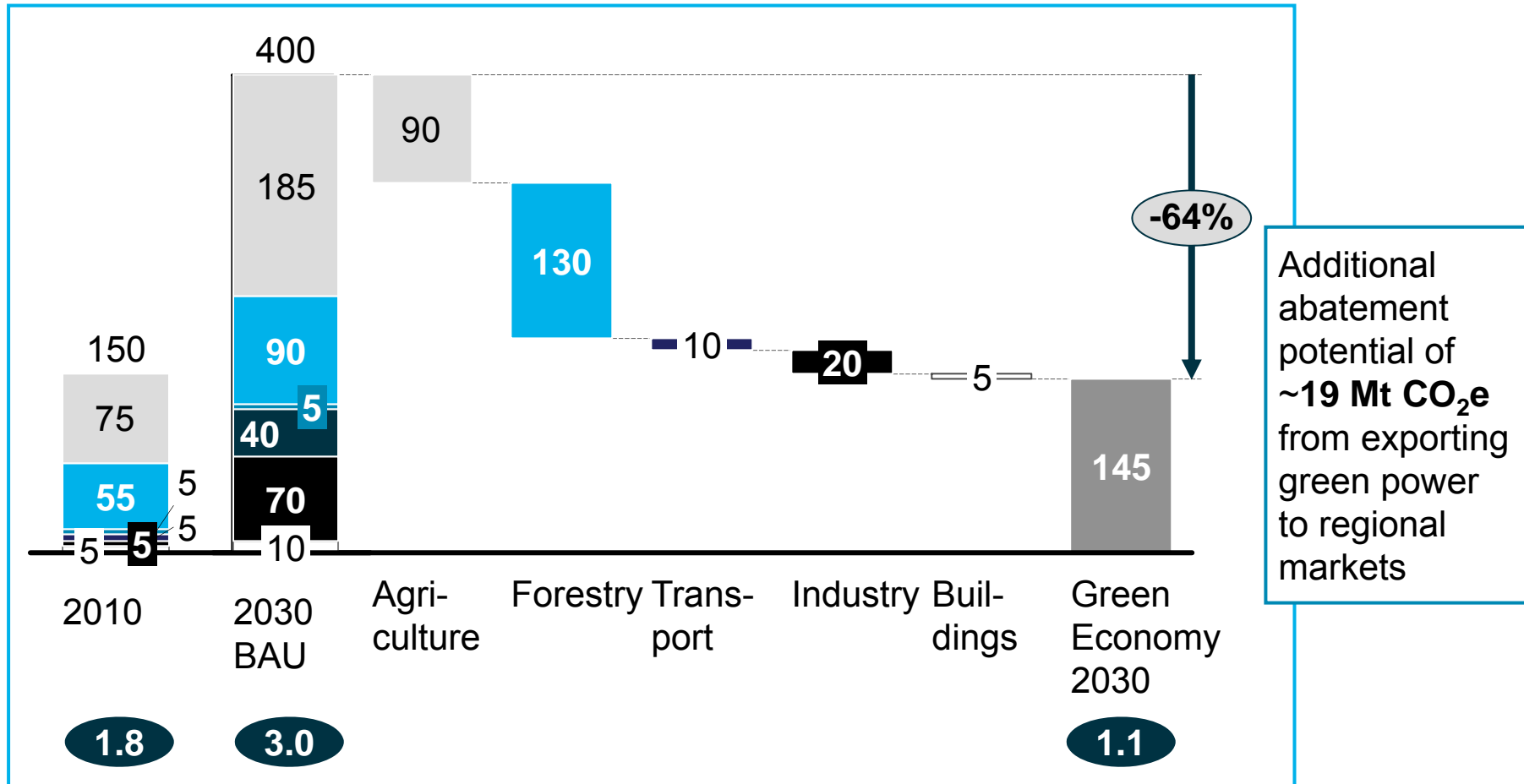
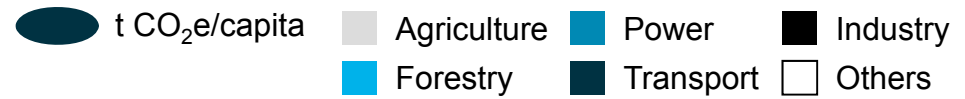
Share of GDP affected (2025) and examples for economic impact/benefits from green economy



The CRGE outlines how Ethiopia will reduce 255 mtCO₂ per year while ensuring economic growth



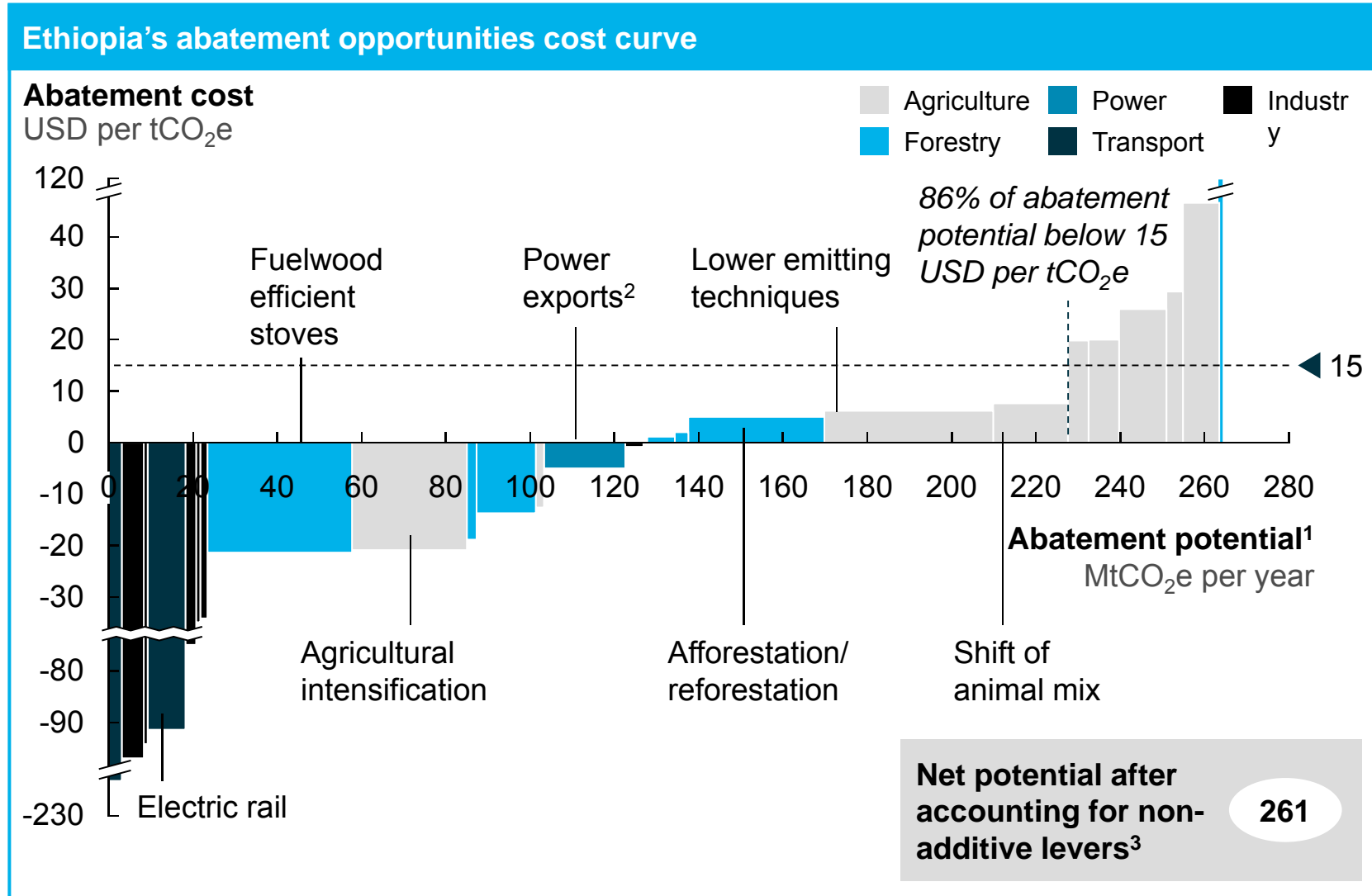
Emissions per year¹, Mt CO₂e



Additional abatement potential of ~19 Mt CO₂e from exporting green power to regional markets

1 Rounded numbers
 2 Currently estimated emissions from buildings and waste

Almost all abatement opportunities cost less than 10\$ per tCO₂e to implement while some have a positive return



1 Represents total identified gross potential, some measures are not additive (total net potential is less than sum of all gross potentials)
 2 Non-domestic potential (will arise only in importing countries)
 3 Assuming full implementation of all levers where cost has been evaluated (excluding buildings/green cities and industry other than cement)

Development of the green economy would offer further benefits outside of Ethiopia



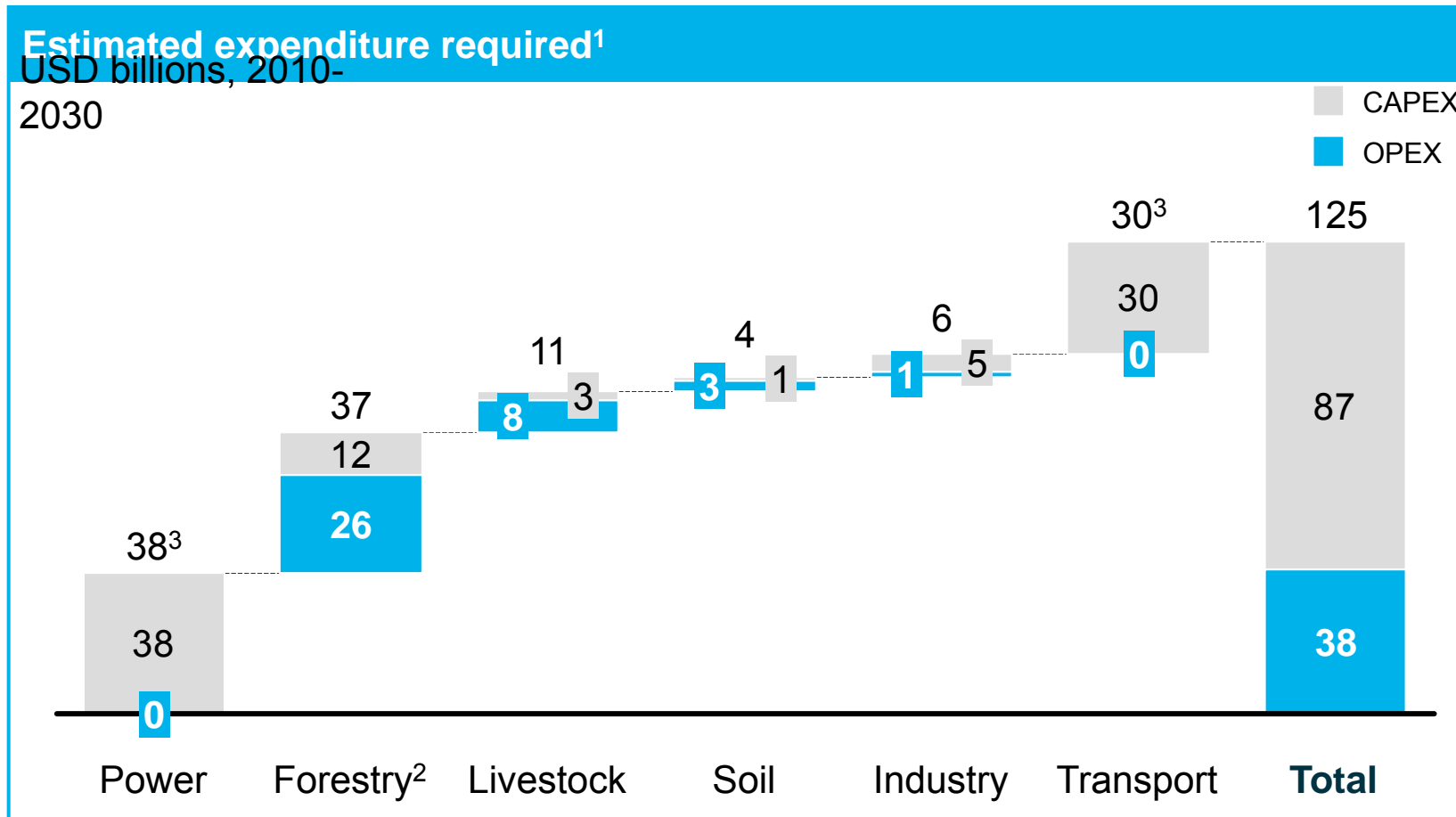
Preserve biodiversity of the planet

Assist green development of neighbouring countries by providing cheap clean electricity

Show to other countries that green growth is an achievable pathway

Contribute to global GHG emission reduction

Implementing the green economy requires USD 125 Billion over the next 20 years



1 Not including Buildings / Green Cities
 2 Including agricultural intensification and large-scale / small-scale irrigation
 3 Investment being largely already part of the broader economic development plan of Ethiopia

Both loan and grant-based funding would be required