Can Ethiopia’s Modernization be Green?

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Ethiopia’s policy focus: *Green structural transformation*

- Green industrialization
- Sustainable urbanization

Challenges

Pathways
Ethiopia has started implementing a very ambitious Climate Resilient Green Economy strategy.

“Nothing like it has been tried before, much less in one of the world’s largest and poorest nations.”

Scientific American, Oct. 13, 2015
Pillars of the CRGE

I. Improve agricultural production activities for higher food security while reducing emissions

II. Protect and re-establish forests for their economic and ecosystem services

III. Expand renewable power generation

IV. Transit to modern and energy-efficient technologies in transport, industry and buildings
Pillars of the CRGE

Emissions per year\textsuperscript{1}, Mt CO\textsubscript{2}e

- **Agriculture**
  - 150
  - 75
  - 55
  - 5

- **2010**
  - 1.8

- **2030 BAU**
  - 3.0
  - 400
  - 185
  - 90
  - 5

- **Forestry**
  - 90

- **Transport**
  - 130
  - 10

- **Industry**
  - 20
  - 5

- **Buildings**
  - 145

- **Green Economy 2030**
  - 1.1

- Additional abatement potential of \textasciitilde19 Mt CO\textsubscript{2}e from exporting green power to regional markets

\textsuperscript{1} Rounded numbers
\textsuperscript{2} Currently estimated emissions from buildings and waste
Where Ethiopia is right now

>> Just starting on transformation: both a huge opportunity and enormous challenge

Percent of people living in urban areas
Annual urban population growth

<table>
<thead>
<tr>
<th></th>
<th>Percent</th>
<th>Annual Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethiopia</td>
<td>19</td>
<td>5.4</td>
</tr>
<tr>
<td>Africa</td>
<td>40</td>
<td>1.1</td>
</tr>
</tbody>
</table>

170 Million by 2050!!

Data from World Bank
Green industrialization: challenges

Access to cheap and green electricity is **not YET** an opportunity for green industrialization!
Green industrialization: challenges

(WBES, 2015)
Green industrialization: challenges

Cost of Industrial Energy Consumption in Ethiopia, 2012/13 (CSA, 2013)

<table>
<thead>
<tr>
<th>Industrial Group%</th>
<th>Percentage of Total Energy Costs%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Electricity</td>
</tr>
<tr>
<td>Food &amp; Beverages%</td>
<td>22.0%</td>
</tr>
<tr>
<td>Textiles%</td>
<td>21.9%</td>
</tr>
<tr>
<td>Wearing Apparel%</td>
<td>8.2%</td>
</tr>
<tr>
<td>Tanning &amp; Leather%</td>
<td>35.6%</td>
</tr>
<tr>
<td>Chemicals &amp; Products%</td>
<td>20.6%</td>
</tr>
<tr>
<td>Non-Metallic mineral products%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Structural Products%</td>
<td>44.9%</td>
</tr>
<tr>
<td>Cement, Lime &amp; Plaster%</td>
<td>12.4%</td>
</tr>
<tr>
<td>Concrete, Cement &amp; Plaster articles%</td>
<td>11.1%</td>
</tr>
</tbody>
</table>
Green industrialization: challenges

Electricity Outage in Ethiopia’s Manufacturing sector (WBES, 2015)

- Number of electrical outages in a typical month: 12.1
- Duration of a typical electrical outage (hours): 10.5
- Losses due to electrical outages (% of annual sales): 7.7
- Proportion of electricity from a generator (%): 21.2
Green industrialization: challenges

Even at the current very low stage, pollution is becoming a big problem.
Green industrialization: challenges

• The leather and textile industry is the source of significant water and air pollution;

• 1,847,288 m$^3$ of hazardous liquid waste and 19,150 tonnes of solid hazardous wastes were generated from industrial sectors in 2006 (EPA);

• Coffee processing plants discharge waste water into rivers that harm aquatic ecosystem;

• Footwear and leather industries discharge 547,860 m$^3$ waste to the Akaki river in Addis Ababa.
Green industrialization: challenges

Source: World Bank
Green industrialization: challenges

Ethiopia’s main polluters are micro and medium enterprises (MSEs). Very difficult to green.

But the policy focus is on developing eco-industrial parks.

Source: World Bank
Green industrialization: pathways

Policy, regulation and investment

Developing eco-industrial parks

Addressing industrial pollution
Solving bottlenecks for PS

Greening Micro and Small Enterprises
Sustainable urbanization: challenges

Not just about cities: important to have a holistic perspective...

Sustainable mobility

Sustainable Cities

Resilient infrastructure
Sustainable mobility challenges

• **Structural labor challenge** >> Ethiopia’s land tenure system could be a key constraint

• **Challenges to rural-to-urban migrants** (unemployment, housing problems >> slum development)
Cities: key challenges

**Waste**

• Solid and liquid waste problems are major issues in urban Ethiopia, with households being the main source (76%).

• About 35% of the solid waste generated in Addis Ababa is dumped on open sites, drainage channels, rivers, valleys and streets; thereby greatly contributing to the pollution of rivers and streams in and around the city.

• Addis Ababa is the only city with municipal sewerage system and serves only 5% of the population.

• There is hope: Reppi waste to energy project
Cities: key challenges

Air Pollution

• Ethiopia is among the 20 worst-affected countries by indoor pollution, causing more than 72,000 deaths a year.
• There is a prevalence of 23.9% Acute respiratory infections (ARI’s) among children under 5 years old.
• The main cause of outdoor air pollution is the emission from vehicles. Very old vehicles.
Cities: key challenges

Inefficient land ‘market’ and uncontrolled sprawl

• Allocation of land at below-market value, combined with large lot-size regulations, has led to a decline in density even as the urban population increases.

• The resulting horizontal expansion of urban areas, in Addis Ababa and secondary cities, exacerbates the challenges of providing infrastructure and services.
It could have a lot to do with taxes and duties!

<table>
<thead>
<tr>
<th>Type of car</th>
<th>Taxes</th>
<th></th>
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<th>Cumm.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Custom tax</td>
<td>Excise tax</td>
<td>Sur tax</td>
<td>Vat</td>
<td>WHT</td>
<td></td>
</tr>
<tr>
<td>&lt; 1300 CC</td>
<td>35%</td>
<td>30%</td>
<td>10%</td>
<td>15%</td>
<td>3%</td>
<td>125%</td>
</tr>
<tr>
<td>&gt; 1300cc &amp; &lt; 1800cc</td>
<td>35%</td>
<td>60%</td>
<td>10%</td>
<td>15%</td>
<td>3%</td>
<td>176.24%</td>
</tr>
<tr>
<td>&gt; 1800 CC</td>
<td>35%</td>
<td>100%</td>
<td>10%</td>
<td>15%</td>
<td>3%</td>
<td>244.55%</td>
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Tax reduction

<table>
<thead>
<tr>
<th>Service period since manufactured</th>
<th>Reduced amount in %</th>
</tr>
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<tbody>
<tr>
<td>&lt; 1 year</td>
<td>0%</td>
</tr>
<tr>
<td>1 year</td>
<td>10%</td>
</tr>
<tr>
<td>2 years</td>
<td>20%</td>
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<tr>
<td>3 years and above</td>
<td>30%</td>
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Sustainable cities: pathways

Planned urbanization

Eco-effective activity clusters
- Natural resource efficiency
- Climate and disaster resilience
- Low carbon development

Socially productive systems
- Access to social infrastructure / services
- Culturally inclusive
- Strong rural-urban linkages

A national urban structure that serves Ethiopia’s development plan

Engines of growth
- Competitive cities
- Access to international markets
- Developed and thriving MSME sector

Well designed places
- Infrastructure connectivity
- Spatially balanced urban network
- High urban quality of life

Well designed city system
- Socially productive places

An eco-effective city network

Global Green Growth Week 2016
GREEN GROWTH Knowledge Platform
PwC
Sustainable cities: pathways

• Efficient land use planning (consider quick-planning?)
• Investing in green and resilient infrastructure (there are clear economic gains!)
• Reform of duty and tax rules