Using carbon pricing revenues to finance sustainable development goals

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Parallel Session 2.1

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Motivation

Two of the most fundamental challenges in the 21st century: poverty reduction and climate change mitigation.

Jakob et al. (2014)
Reducing emissions and promoting development?

• Limited access to basic infrastructures (e.g. > 2.4 billion people world-wide without access to sanitation in 2010).

• Carbon pricing is arguably the economically most efficient policy to reduce GHG emissions.

• Revenues from carbon pricing could be used to advance human development objectives, e.g. infrastructure.

• Emission reductions and socio-economic development could be combined in the framework of the sustainable development goals (SDG).
Carbon Pricing as SDG Finance

1. Project **access gaps** in 2030 for sanitation, water, and electricity, assuming that share of population without access remains constant.

2. Compute **cost** of closing access gaps (Goal: 100% access). Global costs about 1 trn US$.

3. **Revenues from carbon pricing** from various integrated assessment models (EMF-27).

4. Divide total costs per infrastructure per country from step 2 by carbon pricing revenues for each country from step 3 to obtain the **share of revenues** needed.
Current Infrastructure Access Gaps

Water
Sanitation
Electricity

WDI (2015)

Montag, 19. September 2016
Carbon Prices and Emissions

- 7 models from EMF27.
- 450ppm full tech scenario, assuming global carbon price.
- Emissions similar, prices very different.
- We use median scenario (POLES).
Share of Carbon Pricing Revenues (2015-2030)

Water

Sanitation

Electricity

Jakob et al. (2016)

(450ppm, no redistribution)
Share of Carbon Pricing Revenues (2015-2030)

- Water
- Sanitation
- Electricity

(450ppm, redistribution based on average between population and emissions)

Jakob et al. (2016)
Fossil Fuel Subsidy Reform

Jakob et al. (2015)
Average per capita income loss (line chart) and infrastructure access gain (bar charts) at a 15 US$/tCO2 carbon tax until 2030, assuming an equitable spread on per capita basis, by rural and urban income quintiles as percentage shares (adjusted for PPP).

Carbon Pricing in Nigeria used for infrastructure expansion would be doubly progressive.

Source: own calculations based on NBS (2011)

Dorband et al. (in preparation)
Sustainable Development Finance

- Climate Finance could provide funds in exchange for carbon pricing instead of project-based finance.

- This kind of results-based finance could assist in domestic resource mobilization for SDG financing.

Steckel et al. (forthcoming)
A subsidy reduction fund?

Jakob and Hilaire (2015)
Conclusions

• Revenues from carbon pricing and fossil fuel subsidy reform could close infrastructure access gaps in many countries.

• Additional SDG-relevant areas currently under study (e.g. health, education, social security).

• International climate finance and a subsidy reduction fund could assist the implementation of carbon prices and subsidy reform.

• Distributional aspects are key, possibility of double progressivity.

• Need to understand political economy, institutional barriers and how to overcome them.

• Additional studies on political feasibility in preparation for Ecuador and Peru.
References


Assumptions

• Current share of people with access assumed constant to 2030

• Investments undertaken over a 15-year period, as envisaged by SDG process

• Annual recurrent costs averaged over 15 years

• Missing data for countries: regional averages or similar population density.
## Access Gaps

<table>
<thead>
<tr>
<th>Region</th>
<th>Water (percentage without access)</th>
<th>Sanitation (percentage without access)</th>
<th>Electricity (percentage without access)</th>
<th>ICT (percentage without access)</th>
<th>Roads (percentage unpaved)</th>
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</thead>
<tbody>
<tr>
<td>East Asia &amp; Pacific</td>
<td>8.8</td>
<td>30.6</td>
<td>4.8</td>
<td>29.3</td>
<td>40.1</td>
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<td>Europe &amp; Central Asia</td>
<td>2.0</td>
<td>6.5</td>
<td>0.0</td>
<td>14.2</td>
<td>23.1</td>
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<tr>
<td>Latin America &amp; Caribbean</td>
<td>6.2</td>
<td>18.4</td>
<td>5.2</td>
<td>23.0</td>
<td>81.8</td>
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<tr>
<td>Middle East &amp; North Africa</td>
<td>9.2</td>
<td>11.1</td>
<td>5.3</td>
<td>13.8</td>
<td>21.9</td>
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<tr>
<td>North America</td>
<td>0.8</td>
<td>0.1</td>
<td>0.0</td>
<td>1.1</td>
<td>0.0</td>
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<td>South Asia</td>
<td>10.6</td>
<td>61.8</td>
<td>25.6</td>
<td>67.9</td>
<td>46.9</td>
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<tr>
<td>Sub-Saharan Africa</td>
<td>36.7</td>
<td>69.6</td>
<td>68.1</td>
<td>59.8</td>
<td>79.6</td>
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<tr>
<td>Global</td>
<td>11.3</td>
<td>36.0</td>
<td>16.8</td>
<td>37.4</td>
<td>31.6</td>
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</tbody>
</table>

## Costs (millions of 2010 US$)

<table>
<thead>
<tr>
<th>Region</th>
<th>Electricity</th>
<th>Water</th>
<th>Sanitation</th>
<th>ICT</th>
<th>Roads</th>
<th>total costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Asia &amp; Pacific</td>
<td>22,590</td>
<td>93,145</td>
<td>79,269</td>
<td>564,210</td>
<td>2,486,253</td>
<td>3,245,468</td>
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<tr>
<td>Europe &amp; Central Asia</td>
<td>0</td>
<td>5,501</td>
<td>11,011</td>
<td>105,887</td>
<td>676,624</td>
<td>799,024</td>
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<tr>
<td>Latin America &amp; Caribbean</td>
<td>13,952</td>
<td>29,057</td>
<td>36,802</td>
<td>130,926</td>
<td>2,461,768</td>
<td>2,672,505</td>
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<tr>
<td>Middle East &amp; North Africa</td>
<td>5,170</td>
<td>18,865</td>
<td>12,462</td>
<td>54,487</td>
<td>173,124</td>
<td>264,108</td>
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<tr>
<td>North America</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3,419</td>
<td>0</td>
<td>3,419</td>
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<tr>
<td>South Asia</td>
<td>35,861</td>
<td>4,907</td>
<td>93,847</td>
<td>1,062,650</td>
<td>2,488,990</td>
<td>3,686,255</td>
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<tr>
<td>Sub-Saharan Africa</td>
<td>355,554</td>
<td>36,590</td>
<td>135,431</td>
<td>680,365</td>
<td>405,999</td>
<td>1,613,939</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>433,127</strong></td>
<td><strong>188,065</strong></td>
<td><strong>368,822</strong></td>
<td><strong>2,601,944</strong></td>
<td><strong>8,692,758</strong></td>
<td><strong>12,284,718</strong></td>
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</tbody>
</table>
Revenues under different scenarios

- Sub-Saharan Africa
- South Asia
- North America
- Middle East & North Africa
- Latin America & Caribbean
- Europe & Central Asia
- East Asia & Pacific

Average annual carbon pricing revenues (USD bn)
Revenues under different schemes

Average annual carbon pricing revenues (USD bn)

- East Asia & Pacific
- Europe & Central Asia
- Latin America & Caribbean
- Middle East & North Africa
- North America
- South Asia
- Sub-Saharan Africa

Legend:
- X=0
- X=0.5
- X=1