



FONDAZIONE ENI
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Electricity access perspectives and the Paris agreement

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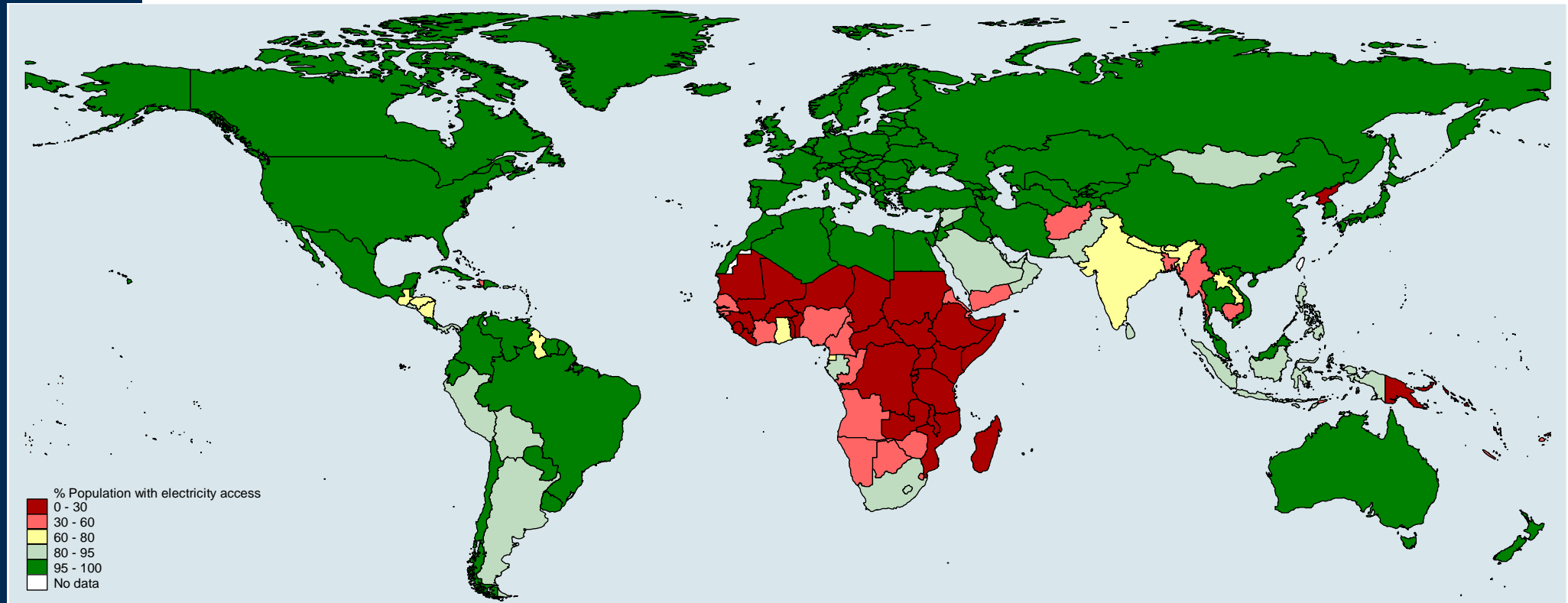
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Outline

- SDG 7.1: By 2030, ensure universal access to affordable, reliable and modern energy services
- Focus on electricity access indicator
- Combining an empirical approach with a modelling framework
- Highlighting the determinants of electricity access
- Scenario projections and interaction between electricity access and climate action (SDG 13)

Population with electricity access (%) in 2010



Datasource: WDI(2016)

- 1.2 billion people was without electricity access in 2010

Framework description

Empirical analysis on the determinants of electricity access

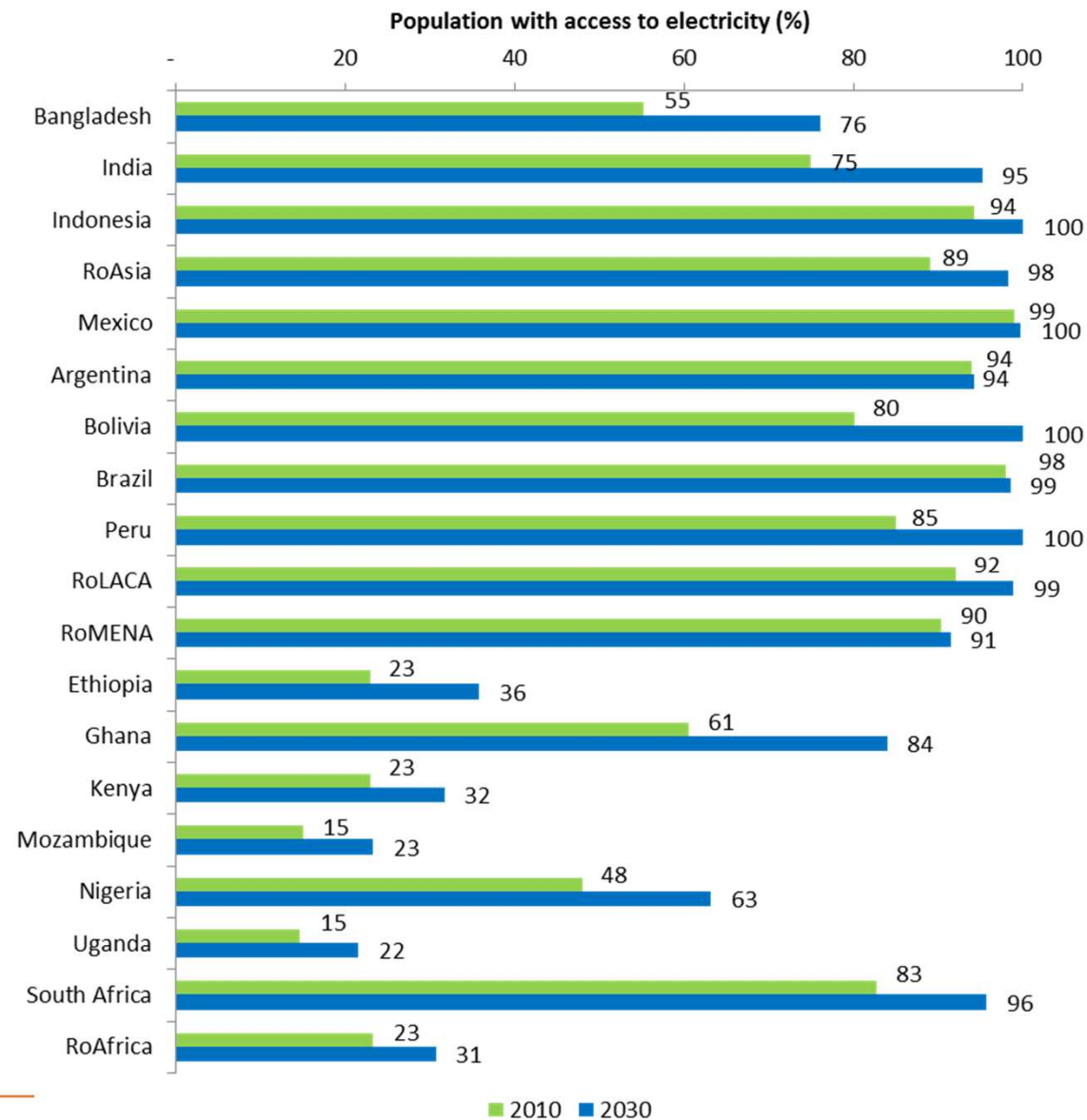
- panel regressions from 1990 to 2012 (WDI database)
- generalized linear model with country fixed effect

$$ElyAccess_{i,t} = \beta_0 + 0.12 * \ln(GDPpc_{i,t-1}) + 0.03 * \ln(ElyOutput_{i,t-1}) + \\ + 0.003 * Urban_{i,t-1} - 0.06 * \ln(Palma_{i,t-1}) + \varepsilon_{i,t}$$

Modelling framework

- Medium term analysis using ICES model : 2007-2030
- Scenario SSP2: medium population growth and medium GDP growth
- 45 countries and macro regions considered

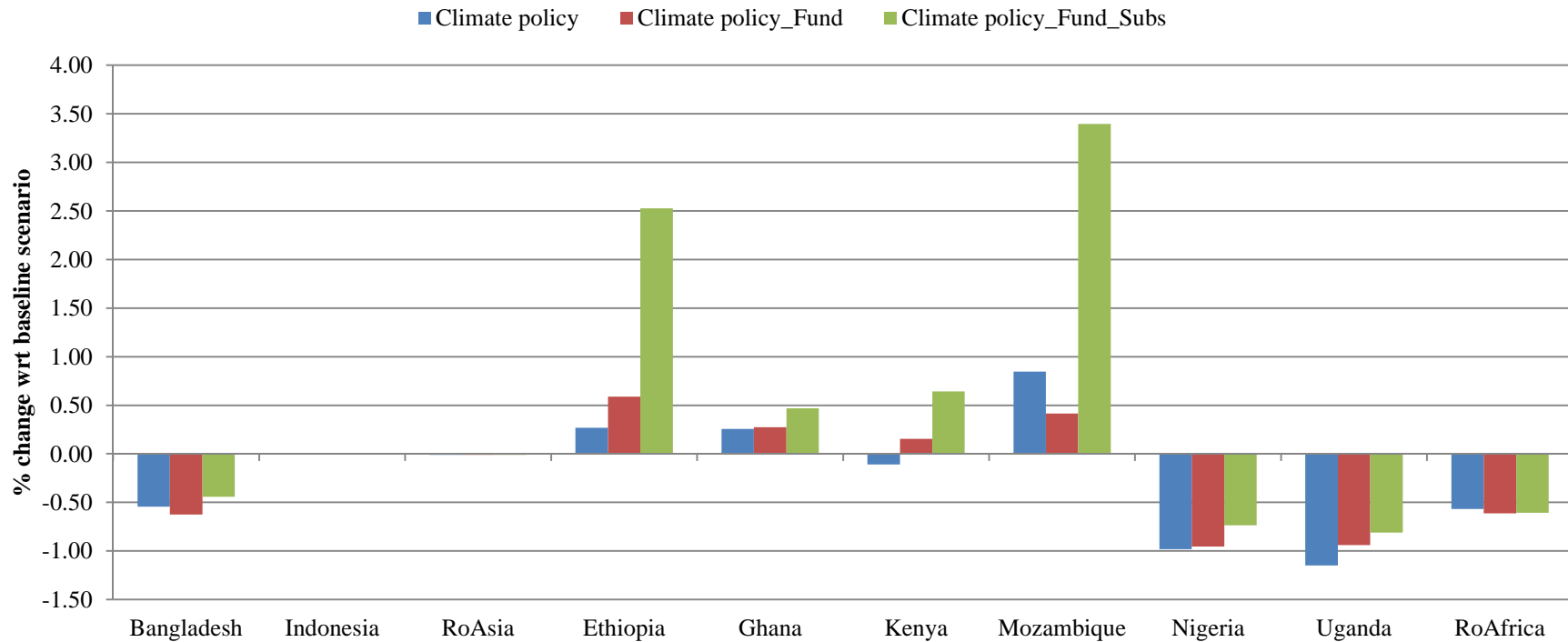
Electricity access in the baseline scenario (2010 vs. 2030)



Climate policy after COP21

- **EUETS+CTAX scenario:** considering the INDCs as binding targets and the internal recycling of the revenues:
 - EU28 achieves its target through an Emission Trading Scheme (EU-ETS)
 - The other countries impose a carbon tax
- **EUETS+CTAX+FUND scenario:** Climate policy scenario as above but considering a different recycling scheme:
 - EU28 uses 50% of revenues subsidising the Clean Electricity sector
 - 5% of revenues in EU28 flow into a fund for LDCs
 - 1% of revenues of countries with a INDCs
 - LDC countries receives a lump-sum transfer
- **EUETS+CTAX+FUND+SUB scenario:** Climate policy scenario as above but considering a different recycling scheme:
 - In LDC countries the transfer is used to subsidise Clean Electricity, Health, Education, R&D and Public Services sectors

Electricity access under different recycling schemes in 2030



- Climate policy impact can be positive due to carbon leakage (Mozambique) or changes in the electricity mix (Ethiopia)
- The fund reaches 70 bln\$ in 2030
- The recycling scheme with targeted subsidies outperforms the one with a lump sum transfer and brings the trend of electricity access back to the baseline one

Conclusions and next steps

- Linking empirically SDGs indicators to a CGE model allows assessing future trend of these indicators under different scenarios and policy interventions
- In the baseline scenario the electricity access increases of 14% compared to 2010 (150 ml people more will have access to electricity)
- Climate policy slows down this process but the final outcome strongly depends on the implemented carbon revenue recycling
- Next step: introduce a policy aiming at achieving universal electricity access by 2030 and assessing its cost



Thank you for your attention!

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