Climate Change Mitigation and Poverty Reduction (CliMiP)
Trade-Offs or Win-Win Situations?

SB 44 Side Event, May 20, 2016

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Introduction

- COP21: Crucial role of mitigation actions/low carbon development in developing countries (DC) through Intended Nationally Determined Contributions (INDCs)
- Importance of international/multilateral/bilateral policy frameworks and cooperation: Europe as a key player
- Required: **Better understanding of DC's policy options and climate politics**
  - Economic and social implications of domestic mitigation policies to assess the trade-offs and synergies between mitigation and economic/human development
  - Political economy and governance of domestic climate policies

The CliMiP project

- **Is there a trade-off between economic development/poverty reduction and climate protection or are there 'win-win policies'?**
- Detailed country case and comparative studies of four middle-income economies with high pc emissions: Indonesia, Mexico, South Africa, Thailand
- Plus European perspectives and the global context
- Three Work Packages
  - WP 1: Domestic climate governance
  - WP 2: Poverty and distributional impacts of mitigation policies
  - WP 3: Global perspective and the mitigation-development discourse

All CliMiP partners…

EGAP
Gobierno y Política Pública
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German Institute of Global and Area Studies
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Why IDN, MEX, THA, ZAF?

- Focus often on India and China justified because of their population size
- Other middle income economies are important emitters as well
  - Indonesia, the most populous emerging emitter in South-East Asia (Olivier et al. 2015)
  - Mexico: 12th largest CO_2 emitter of the world (in LAC only Brazil emits more)
  - Thailand: Highest growth rate of emission intensity of the economy among the 25 leading emitters between1992 and 2006
  - South Africa: Most important emitter of SSA
- Because the mitigation-development is highly relevant in these countries

The mitigation-development nexus in the INDCs

- Mitigation-development trade-offs
  - "To lift people out of poverty, the Government of Indonesia is promoting economic development […]." (Indonesia's INDC, second sentence)
  - "South Africa faces the challenge of climate change as a developing country, with overriding priorities to eliminate poverty and eradicate inequality." (SA's INDC)
- High costs and need for support
  - "[…] concerns that several of the proposed measures and actions in these ambitious [mitigation] plans are subject to very high investment and operating costs." (Thailand's INDC)
- Exception: Mexico's INDC

INDCs and mitigation policy instruments

- INDCs, reduction of GHG by 2030 (wrt BaU)
  - Indonesia: 29%, conditional 41%
  - Mexico: 25%, conditional 40%
  - South Africa: 42%
  - Thailand: 20%, conditional 25%
- Instruments explicitly mentioned in INDCs
  - Carbon taxes in MEX, ZAF
  - Energy sector transformation, e.g. targets for energy from renewables in IDN, THA; renewables investment in ZAF
  - Transport sector in THA

Schedule of the session

- Introduction (Jann Lay)
- Impacts of of taxing carbon (Jann Lay and Sebastian Renner)
- The Mexican carbon tax (Araceli Ortega Díaz)
- The politics of mitigation and poverty reduction (Britta Rennkamp)
- Economic implications of climate policy: Insights from the EU experience (Marinella Davide)
- Q&A and discussion

Impacts of taxing carbon

Jann Lay

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University of Göttingen

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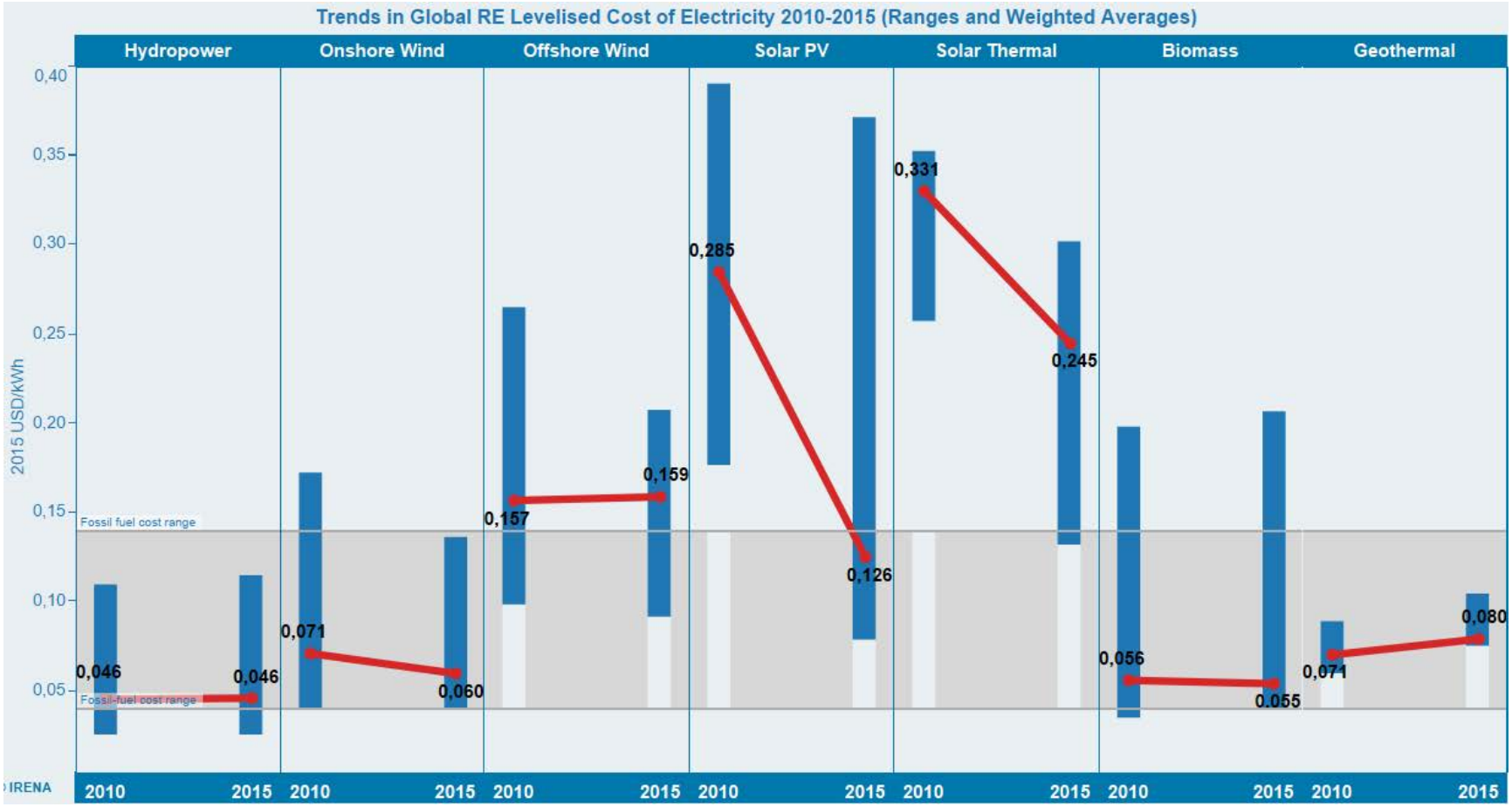
Curbing emissions by taxing carbon

- Taxing fossil fuels
  - Carbon taxes implemented in MEX and to be implemented in ZAF (politics!)
  - Fossil-fuel subsidy removal in MEX and IDN
  - Effectiveness unclear, determined also by price of renewables
- Effects
  - Energy producers: Higher costs of fossil fuel-based energy, incentive to turn to renewables → **Energy sector transformation**
  - Consumers: Higher prices of energy and energy-intensive (domestically produced) goods → **Lower energy consumption** (via less direct and indirect consumption)
  - **Welfare and poverty effects** through higher prices and other second-round effects (e.g. wages and employment)

Energy sector transformation

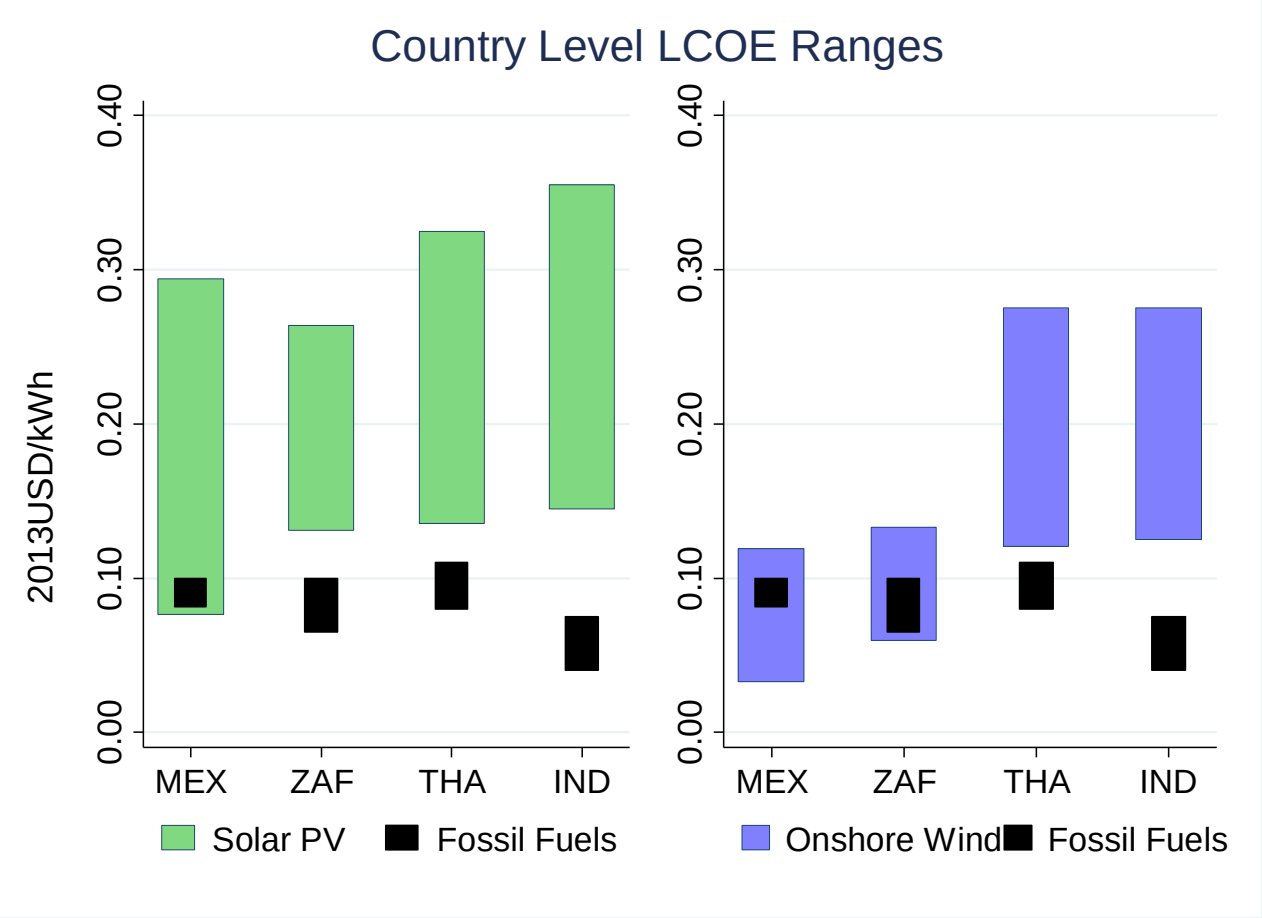
- Major determinant of cost of transforming the energy system: Relative price between renewables and fossil fuels
- Typically: Shifts towards higher share of renewables will lead to higher energy prices (see next slide)
  - As long as renewables are more expensive
  - Cost will (in part) be borne by consumers
- Effectiveness of carbon taxes
  - Again conditional on price of renewables
  - Long-term vs. short-term effects: Little effect of carbon taxes in the short-run
- Country heterogeneity important: Prices and (existing) energy system

Trends in costs of electricity worldwide



Source: IRENA (2016)

But: Country differences



Source: Authors‘ illustration based on IEA(2015), IRENA(2016) and BNEF(2014)

Price and welfare effects

- Assume for now: Carbon taxes cause higher energy prices (at least in the short-run)
- Transmission to household welfare
  - Expenditure side: Prices (taxes and subsidies) and quantities
    - Electricity and other fuel prices plus prices of other (energy-intensive) goods
    - Quantities: Energy savings and reduction of consumption (substitution)
  - Income side: Wages, employment and transfers
    - Adverse employment effects in energy-intensive sectors possible
    - Overall little knowledge on firm responses in DCs (labour demand), but “green jobs” unlikely to be of major importance
- Income and expenditure patterns determine: Who loses (or wins) most?

Price effects of carbon taxes (20 USD/tCO2)

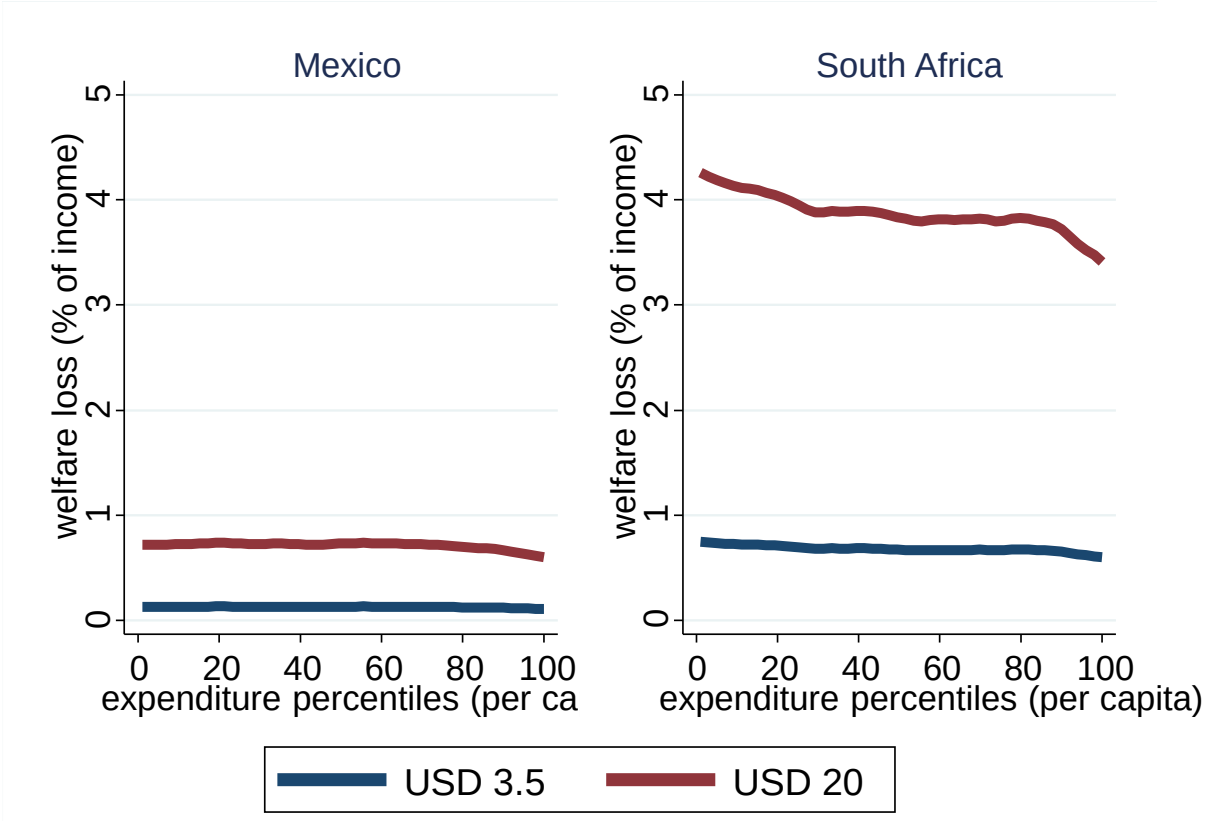
country	good	% price change	household spending (% of total)
Mexico	food	0.8	24.0
	electricity	9.8	3.3
	petroleum	2.7	6.6
South Africa	food	2.1	14.3
	electricity	54.9	5.5
	petroleum	2.8	4.8

- ZAF‘s “dirty” energy sector causes electricity price surge
- For effects consumption patterns matter

Source: Authors calculation based on ENIGH (2014), WIOD(2012), IES(2011) and GTAP(2011)

Carbon tax incidence: Who pays the carbon tax?

- ZAF with much higher average burden
- Carbon tax incidence curve
  - Flat in MEX
  - Regressive in ZAF

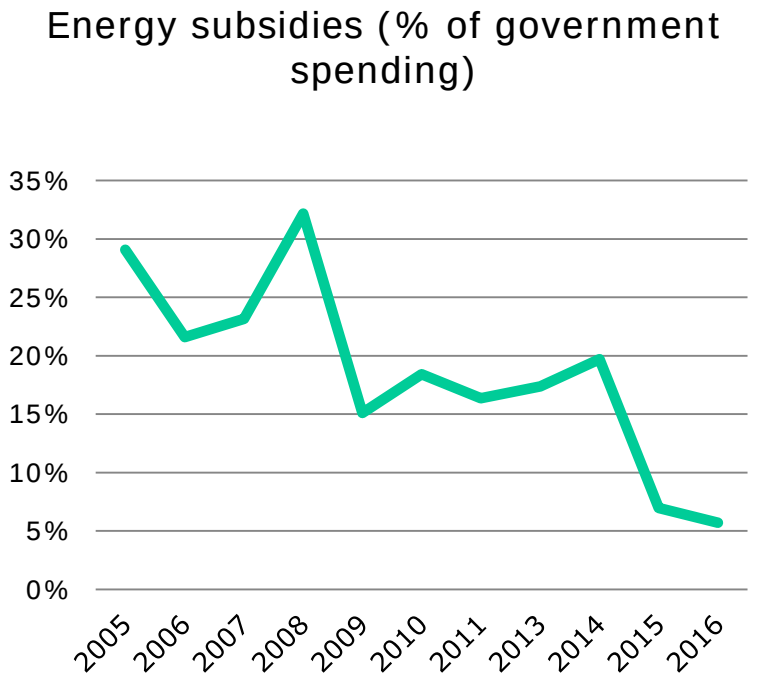


Source: ENIGH (2014) and IES(2011)

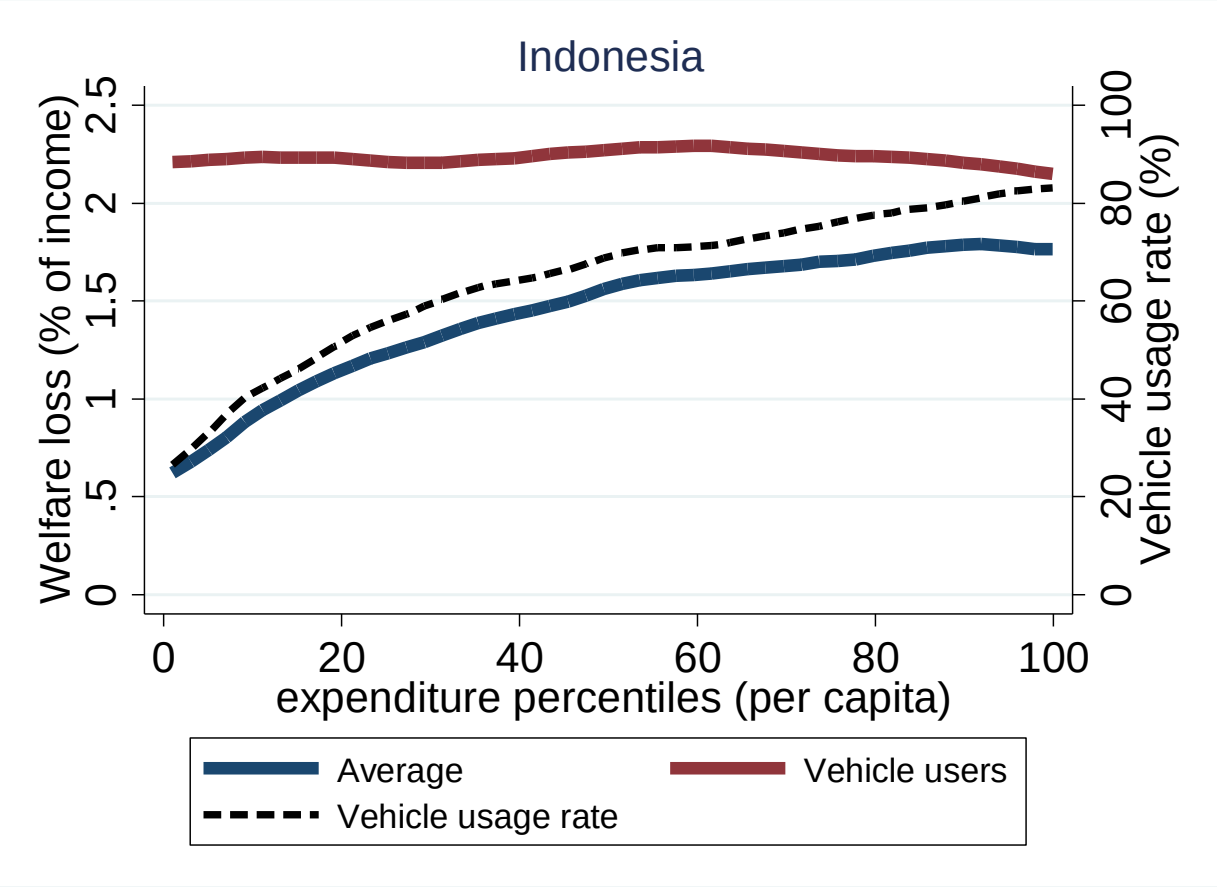
“Win-win policy”: Fossil fuel subsidy removal in Indonesia

- Indonesia with long history of energy (fuel + electricity) subsidies
- Energy subsidies are considered „lose-lose“ policies

- Indonesia abolished fuel subsidies at times of very low fossil fuel prices
- BUT: Prices may rise and negative welfare effects may materialize



Progressive welfare effects of 50% price rise of gasoline



Source: Authors‘ computation based on SUSENAS (2013)

Conclusions on taxing carbon

- High mitigation effect, but low (short- to medium run) welfare losses? … not so easily achieved
- Energy sector transformation
  - May require very high levels of carbon taxes
  - Learning by doing in setting carbon taxes and by observing prices for renewables
- Face the trade-offs implied by higher energy prices/carbon taxes
  - Effective carbon taxes have potentially large (short-term) adverse welfare effects
  - For example MEX: 20 USD carbon tax = 0.8% welfare loss = 1% CO2 emissions reduction (emissions related to household expenditure)
- Trade-offs are manageable with targeted redistribution

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