

# Renewable Energy in Africa: Findings from the Social Sciences

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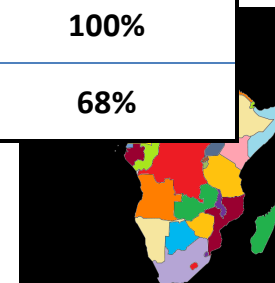
# Africa and the energy deficit

Electricity access in 2012, by region

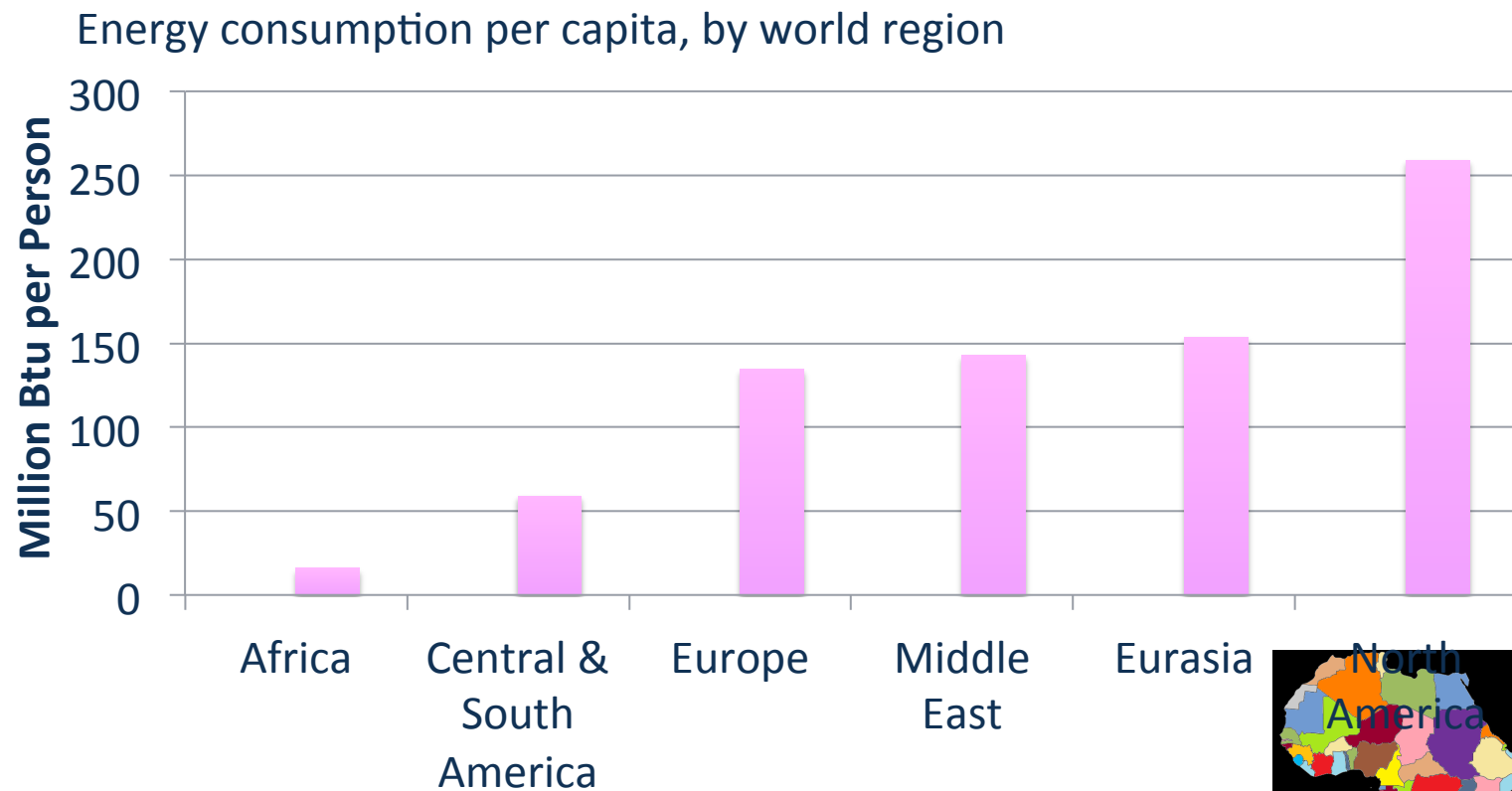
Region	Population without electricity millions	Overall electrification rate %	Urban electrification rate %	Rural electrification rate %
<b>Developing countries</b>	<b>1,283</b>	<b>76%</b>	<b>91%</b>	<b>64%</b>
Africa	622	43%	68%	26%
<i>North Africa</i>	<i>1</i>	<i>99%</i>	<i>100%</i>	<i>99%</i>
<i>Sub-Saharan Africa</i>	<i>621</i>	<i>32%</i>	<i>59%</i>	<i>16%</i>
Developing Asia	620	83%	95%	74%
<i>China</i>	<i>3</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>
<i>India</i>	<i>304</i>	<i>75%</i>	<i>94%</i>	<i>67%</i>
Latin America	23	95%	99%	82%
Middle East	18	92%	98%	78%
Transition economies & OECD	1	100%	100%	100%
<b>WORLD</b>	<b>1,285</b>	<b>82%</b>	<b>94%</b>	<b>68%</b>

Source: IEA, World Energy Outlook, 2014

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# Africa and the energy deficit

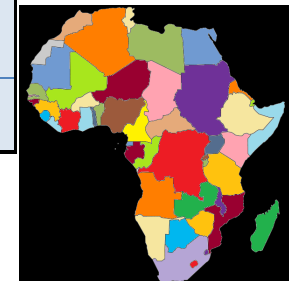


# Africa and the energy deficit

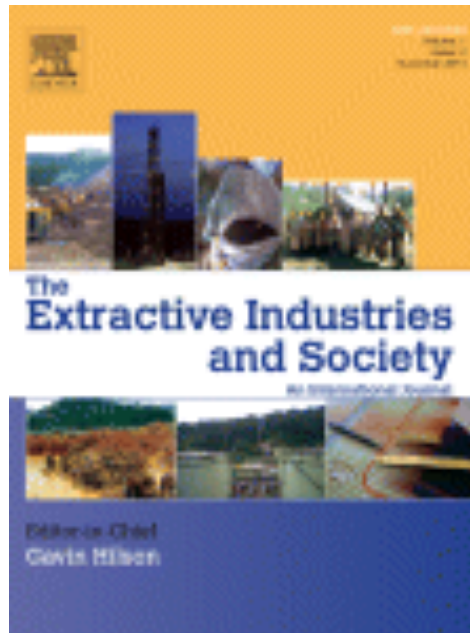
Populations Relying on Traditional Biomass, by region, 2012

Region	millions	%
<b>Developing countries</b>	<b>2,679</b>	<b>50</b>
Africa	754	68
<i>Sub-Saharan Africa</i>	<i>753</i>	<i>80</i>
<i>North Africa</i>	<i>1</i>	<i>0</i>
Developing Asia	1,895	51
<i>China</i>	<i>450</i>	<i>33</i>
<i>India</i>	<i>841</i>	<i>67</i>
Latin America	65	14
Middle East	8	4
<b>WORLD</b>	<b>2,722</b>	<b>38</b>

Source: IEA, World Energy Outlook, 2105



# Social sciences and energy and extractive industries: new peer-reviewed journals



# Special Issue: Renewable Energy in Sub-Saharan Africa

## *Energy Research & Social Science,*

### vol. 5 (Feb. 2015)

- Alli Dimple Mukasa, Emelly Mutambatsere, Yannis Arvanitis, Thouraya Triki. **"Unrealized Potential: The Development of Wind Energy in Sub-Saharan Africa"**
- Gaston Fulquet and Pelfini Alejandro. **"Emerging Powers: Brazil as a New International Cooperation Actor in Sub-Saharan Africa: Biofuels at the Crossroads between Sustainable Development and Natural Resource Exploitation."**
- Helene Ahlborg and Martin Sjöstedt. **"Electricity-driven Rapid Transformation of Village Life and Economy—A Case from Tanzania"**



- Oliver Johnson, Fiona Lambe, Marie Jürisoo, and Carrie Lee. **“Can Carbon Finance Help Transform Household Energy Markets?: A Review Of Cookstove Projects And Programmes In Kenya”**
- Sarah Colenbrander, Jon Lovett, Mary Suzan Abbo, Bernard M’Passi-Mabiala, Consalva Msigwa, and Richard Opoku. **“Building Capacity in Clean Energy Doctoral Programmes In Sub-Saharan Africa”**
- Kirsten Ulsrud, Tanja Winther, Debajit Palit, Harald Rohrer. **“How can village-level solar power supply be socially organized, sustained, expanded and scaled up? Results of action research in Kenya”**



# Three Studies

- Kenya: solar center
- Water as a “resource curse”
- Renewable energy & energy efficiency center in West Africa



# Project #1: Solar in Kenya

## Ulsrud,et al.

- Electricity access lowest in rural areas
  - Kenya: 50% in urban; 7% in rural
- Need decentralized, off-grid solutions
- Socio-technical solutions
  - Understanding local, regional, and state laws, culture, practices
- Village with 383 household; 6 wards; led by a village elder from each clan
- Advised to include all 6 clans





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# “Solar Transitions: India, Kenya, Norway”

Dept. of Sociology and Human Geography  
and University of Oslo

- [Video on Ikisaya Energy Centre](#)

 Search for people, places and things 

 Kathleen

**Ikisaya**  
Back to Album · The Solar Transitions Project's photos · The Solar Transitions Project's Page Previous · Next



The flip chart contains the following handwritten text:

TV & VIDEO SHOWS	
NEWS (7-8pm) (20) @ 5/-	→ 100/-
MOVIE (30) @ 20/-	→ 600/-
	300/-
ROOM HIRE	→ 250/-
	650/-
	950/-
TOTAL EST. DAILY REVENUE	
	3,350/-



# Challenges

- Long term project: 4 years
- Imbedded social scientists
- How to scale up?



# Project #2: Can Water Be A Curse?: The Resource Curse and Hydroelectric Power

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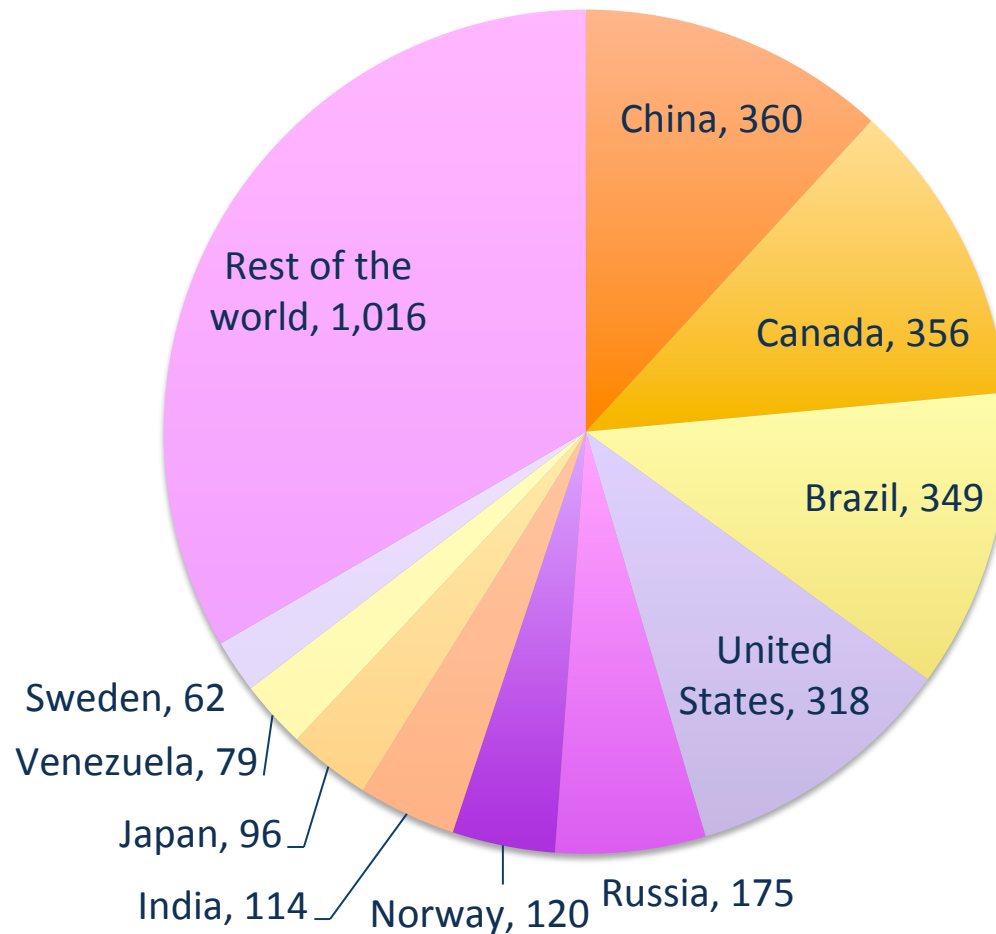


# Resource curse literature

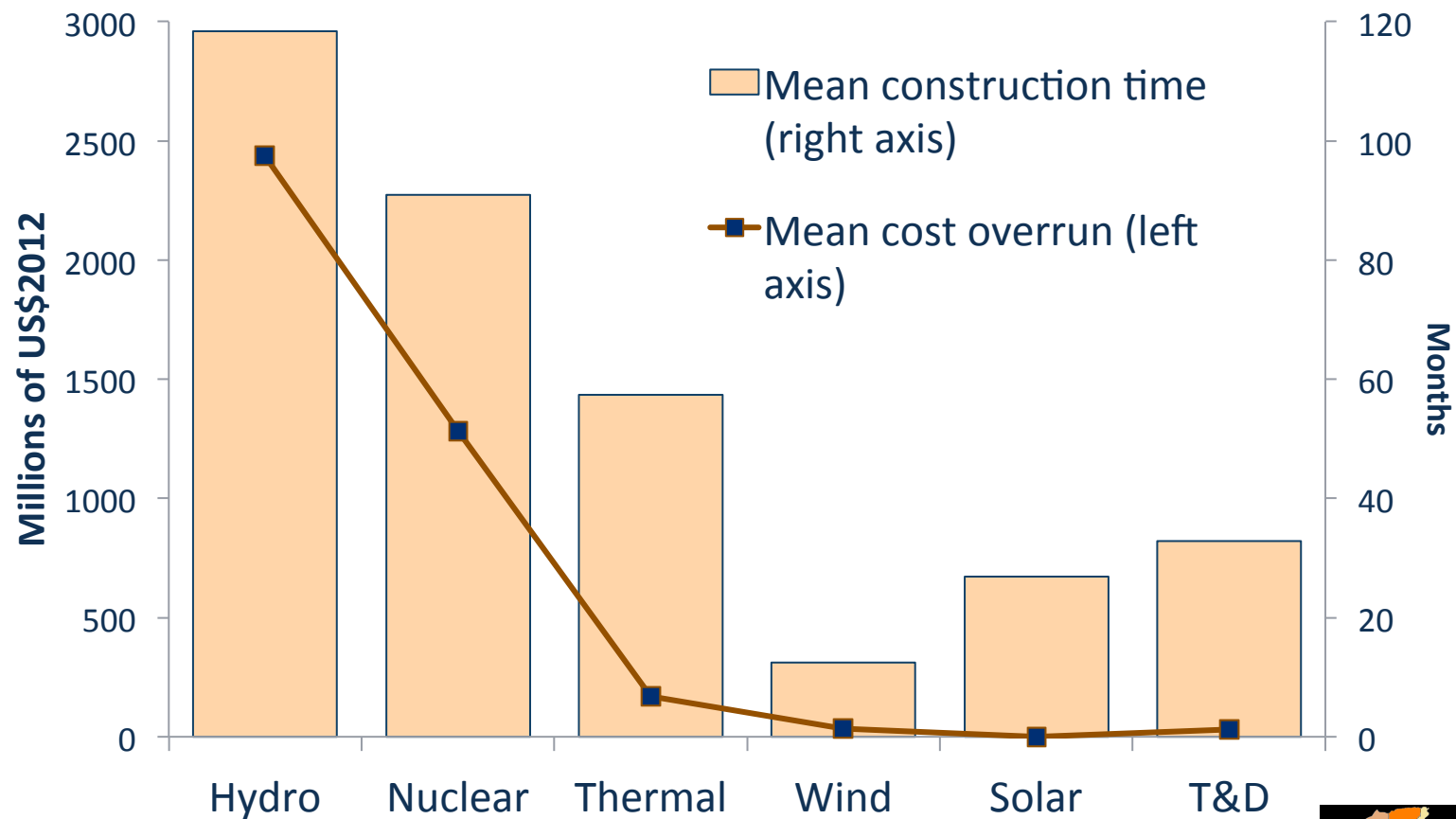
- Contested
- Lower growth rates due to
  - Dutch Disease: currency increases, pushing out other sectors, making imports cheap
  - Price fluctuations
  - Rentier state: relies on “rents” from resources
- Authoritarianism
- Gender inequality
- Income inequality



# Installed hydropower capacity based on production, terawatt hours



## Hydro projects take longer and have higher cost overruns



Note: T&D = transmission and distribution

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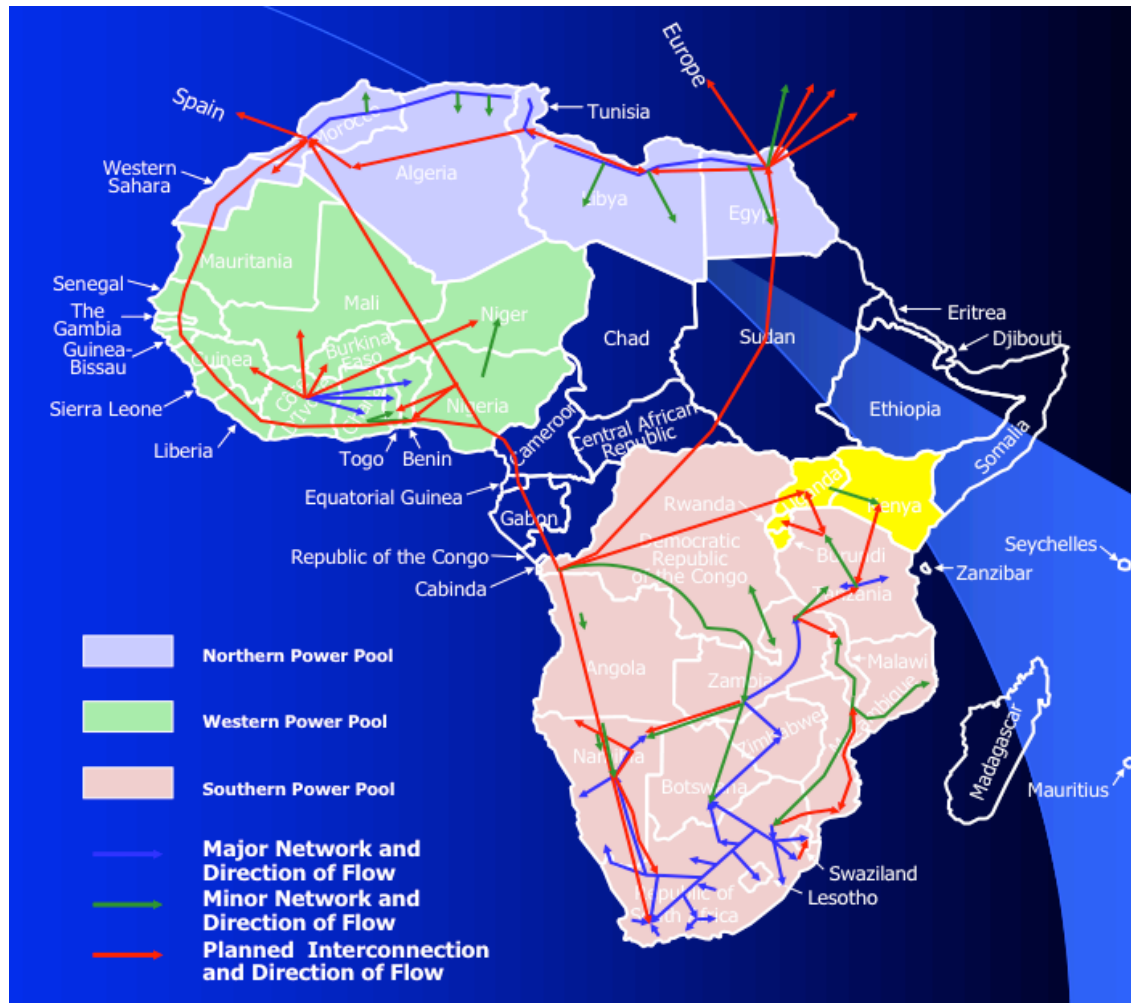


# Grand Inga Dam project in Dem. Rep. of the Congo

- 93% of potential hydropower in Africa unused
- 65% of Africans (exc. S. Africa) lack access to electricity; 92% in rural areas
- Who would benefit from Inga?
  - Copper-cobalt mining companies in Katanga Province; DRC has 10% of world's copper; 50% of cobalt
  - S. Africa
  - People of DRC?



# Regional power pools (linked electricity grids)



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# Grid to Katanga Province



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# Open Pit Mine in Katanga



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# DRC Context

- Authoritarian
- On-going civil war
- One of the poorest countries

100=best score

- 0 out of 100 on social and environmental impact assessments
- 6 out of 100 on corruption
- 8 out of 100 on accountability and democracy
- 1 out of 100 on government effectiveness
- 2 out of 100 on rule of law

Source: Revenue Watch; 100 is the best possible score



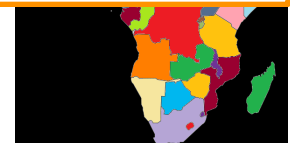
## Policy recommendations: literature on other “resource curses”

- Implement environmental bonds
- Establish natural resource funds
- Create hydro inspection panels
- Require better impact assessments
- Initiate hydropower transparency initiative
- More international involvement, pressure from international organizations



# Project #3: Renewable Energy Centers

- Centers on renewable energy and energy efficiency (RE/EE) in Africa
  - League of Arab States: CREEE
  - **Economic Community of West African States: ECREEE (2010)**
  - East African Community: EACREEE
  - South Africa Development Community: SACREEE
  - Planning: Central African Economic Community; CECREEE
  - Pacific
  - Caribbean
- Research questions
  - What explains the creation of these centers?
    - First case: ECOWAS Center → ECREEE



# What does ECREEE do?

- Policy development
- Capacity development
- Knowledge management and awareness
- Investment and business promotion
- Focus on
  - RE and EE
  - Bio-energy, solar energy, clean cooking
  - Gender mainstreaming



# Diffusion

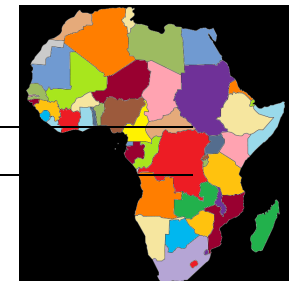
Logic of Consequence      Logic of appropriateness/ arguing		
Direct Influence	<ul style="list-style-type: none"><li>• Coercion</li><li>• Incentives and sanctions</li></ul>	<ul style="list-style-type: none"><li>• <b>Norms socialization and persuasion</b></li></ul>
Indirect diffusion/ emulation	<ul style="list-style-type: none"><li>• Competition</li><li>• Lesson-learning</li></ul>	<ul style="list-style-type: none"><li>• Normative emulation</li><li>• Mimicry</li></ul>

Sources: Risse 2016, Börzel and Risse 2012, 2009



# Potential Diffusion Agents

Category of Actor	Potential Actors
States	<ol style="list-style-type: none"> <li>1. Global great powers: the US, the EU, Japan, Germany</li> <li>2. Regional great powers: Ghana, Nigeria</li> <li>3. Former colonial powers: Britain, France, Portugal</li> <li>4a. Regular donors:<sup>1</sup> Top 10 who prioritize Africa: Portugal, Ireland, Belgium, Iceland, Spain, Netherlands, France, Finland, Denmark, UK.</li> <li>4b. Regular donors:<sup>2</sup> Top 10 by amount, excl. those in 4a: EU, US, Germany, Japan, Canada, Sweden, Norway</li> <li>5. Issue area powers, regional or extra-regional</li> </ol>
IOs	<ol style="list-style-type: none"> <li>1. IOs with related mandates (on energy and/or development, SEforALL, UNIDO, etc.)</li> </ol>
ROs	<ol style="list-style-type: none"> <li>1. RO in the same region (West Africa)</li> <li>2. ROs in the larger region (others in sub-Saharan Africa)</li> <li>3. ROs with similar mandates</li> </ol>
Firms	<ol style="list-style-type: none"> <li>1. RE/EE companies in Africa or outside Africa</li> <li>2. Financial organizations: domestic (African, European, or other private banks), regional (the African Development Bank) and global (IMF, World Bank)</li> </ol>
NGOs	<ol style="list-style-type: none"> <li>1. In region</li> <li>2. Extra-regional</li> <li>3. Trans-national</li> </ol>
Individuals	Political entrepreneurs



# Findings

- Creators
  - Austria, primary
  - Spain
  - Brazil
  - Why these states?
    - RE/EE identity: all three see themselves as leaders in RE
    - Long-term development priorities
      - EU pressure to focus on three areas
      - W. Africa for Austria and Spain
    - Brazil: south-south cooperation
- Sustainers
  - Same states + EU, development banks
  - UNIDO, etc.

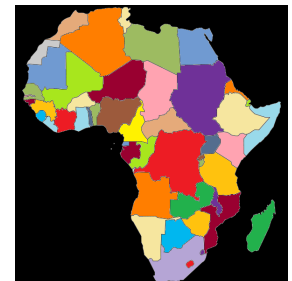


# International partnerships of ECREEE



# Why Austria: Theoretical framing

- Material
  - Jobs
  - Lobbying power beyond size
- Norms/ideas
  - image as RE leader
  - History of supporting West Africa
  - epistemic community and political entrepreneur
  - Transnational advocacy network
- Institutional/organizational structure
  - ECOWAS



# Material interests

- #1 in solar water heating
- Jobs in RE: numbers not convincing
- Power beyond the numbers? (US coal)



# Norms argument

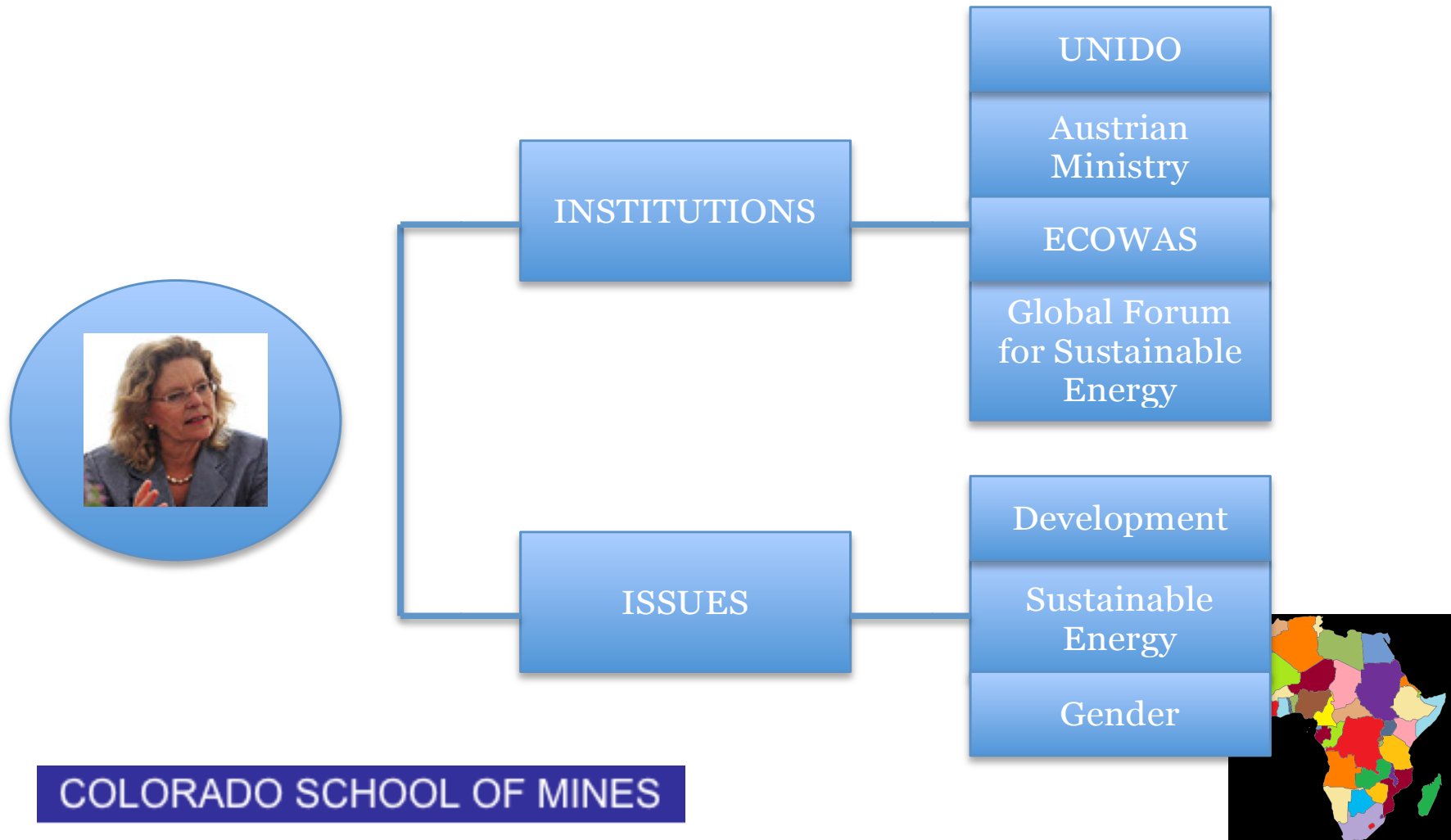
- **Austria as RE issue power**
  - 70% RE; 85% goal for 2020
  - Lower Austria province 100% RE
  - 60% of electricity from hydro (#1 in Europe)
  - Enough wind for 40% of households
- **Epistemic community**
  - Part of an epistemic community on climate change
  - “A knowledge-based network of specialists who share beliefs in cause-and-effect relations, validity tests, and underlying principled values and pursue common policy goals.” (Haas 1992)
  - Belief that we must move to RE/EE



- **Political entrepreneur** to push the policy agenda
  - Irene Giner-Reichl
  - Worked for foreign minister when ECREEE agreed to
  - UNIDO Director
  - Founder of Global Forum on Sustainable Energy
  - Long-term interest in gender



# Amb. Giner-Reichl



- Structure: ECOWAS organization
- Ideas: RE/EE
- Individuals: key political entrepreneur



# Energy Research in Africa

- More field-based research
- Interdisciplinary
- Scaling up
- Moving beyond Western influence
- Greater African capacity



# Questions?



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