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WARWICK BUSINESS SCHOOL
THE UNIVERSITY OF WARWICK

For the Change Makers

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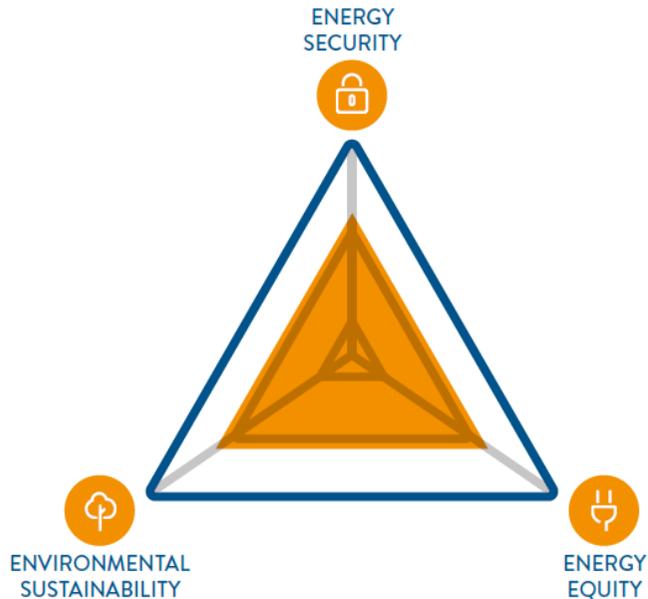
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Energy Entrepreneurship in South Africa

The Project So Far

- Lived in South Africa 2012- 16
- Prof Panos Constantinides, Manchester Alliance Business School
- Activities:
 - 2 small research projects with GIBS
 - 2 GIBS MBA students
 - Collected over 60 interviews: 2015, 2016, 2018-2019
 - Reviewed lots of secondary data
- 2 GIBS white papers
 - *Smart Cities and Smart Grids: a vision for South Africa, May 2017*
 - *Energy Entrepreneurship in South Africa, Feb 2019*
- Conference paper (ECIS 2017)
 - *Digital Infrastructure as a Platform: the case of smart electricity grids.* With P. Constantinides.
- Journal Manuscript (Journal of Business Venturing)
 - *The Constitution of Entrepreneurial Opportunities in the South African Energy Sector.* With P. Constantinides.

Reaching Out



- World Energy Council's Trilemma Index (security, equity, sustainability)
 - UK AAA (4 out of 128)
 - SA DBD (92 out of 128)
- Decarbonising South African economy through entrepreneurship
 - Vast experience in UK and expertise at University of Warwick
 - First UK quarter of low-carbon exceeding fossil fuel-based energy generation
 - Shortcut policy conversation
- Building partnerships for dissemination
 - Process model of the opportunity constitution
 - Develop links to policy, especially entrepreneurship and technology policy

Background

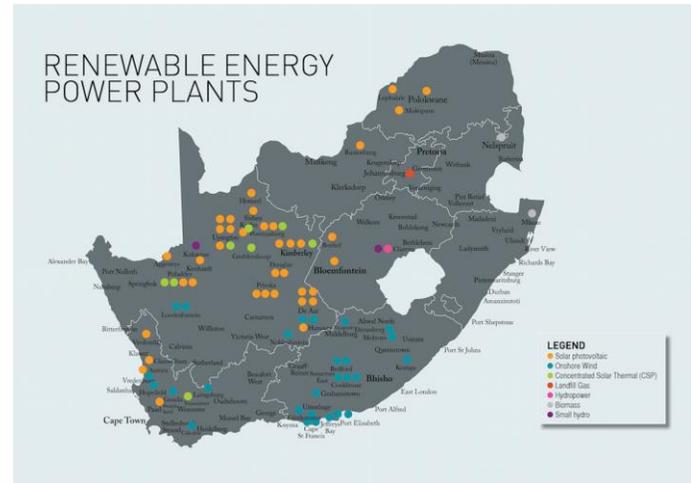
- Energy entrepreneurship – *entrepreneurs involved in the generation, transmission, distribution and efficient use of electricity*
- Early energy entrepreneurship in the 1800s
 - ESCOM established in 1923
- Renewable energy
 - Victoria Falls Power Company in 1906
 - Renewable resources
- Discovery perspective: entrepreneurial opportunities exist in the environment as objects to be discovered (Shane 2012).
 - Entrepreneurs ‘find’
- Creation perspective rests on assumption that opportunities are social constructions (Alvarez and Barney 2007).
 - Entrepreneurs ‘make’

Research Question

- *How entrepreneurial opportunities get constituted through discursive-material practices?*
 - Views of 'discovery' and 'creation' of entrepreneurial opportunity are in fact the two sides of the same coin.
 - Entrepreneurial opportunities are constituted through a process involving material practices and discourses.
- Entrepreneurial opportunities are constituted through a process of technology use and conversations about technology

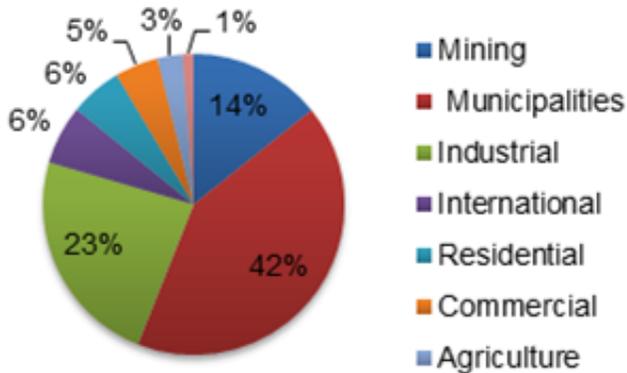
METHOD

- South African energy sector, 2007 to 2018.
- Ecosystem of actors:
 - Eskom, energy entrepreneurs, technology vendors, municipalities, consultants
- 60 interviews
 - 3 phases (August-November 2016; March-July 2017; November-December 2018)

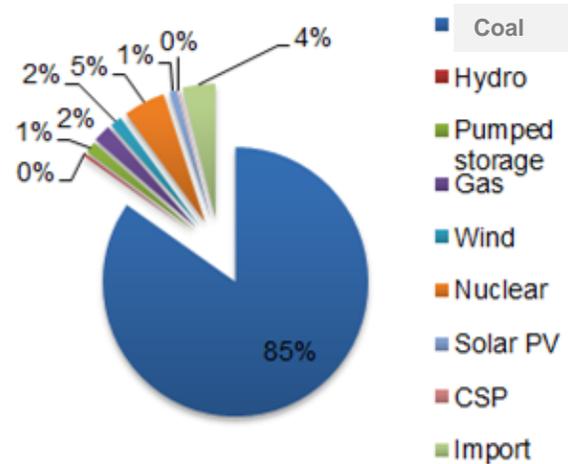


The Setting: Electricity in South Africa

Electricity Distribution per consumer group (%)



Generation Source (%)



<https://www.africa-eu-renewables.org/market-information/south-africa/energy-sector/>

Critical Energy Events

- **2007- 2008 First Energy Crisis**
 - Later days of Thabo Mbeki presidency
 - Load shedding primarily big industrial customers
- 2008 Kusile and Medupi projects initiated
- **2011 REIPP programme**
 - Eskom is single buyer through PPAs
- 2014- 2015 Second Energy Crisis
 - Organized load shedding of both industrial and residential customers
 - Increasing Eskom energy prices
 - Increasing affordability of solar PV
- **2016 Oversupply of electricity**
 - Eskom resistance to signing PPAs
 - Signed in April 2017
- 2018 'Perfect storm'
 - Cyril Ramaphosa, Feb 2018
 - More load shedding, ISMO Act to Parliament
 - \$4.9 billion bailout

Period 1: Eskom Monopoly & Auxiliary Ventures

- Technologies:
 - Improved efficiency
 - Energy substitution
 - CFL/LED light bulbs
 - Transparent roofing
 - Solar water heaters
 - Prepaid meters
- Conversations:
 - Eskom and its failings dominate the narrative
 - Defining ecosystem problems
 - Reducing energy theft
 - Educating customers on energy efficiency and energy substitutes
- *“A few years ago ESKOM ran a project where they gave 31 million CFL bulbs, those compact fluorescent lights to the general public. They went out and installed them in the home. [...] And initially I thought, wow, this is awesome, this is, you know, such a good idea. And then I realized about halfway through the project that a giant multinational had basically sold a product that was hazardous, inefficient, expensive. Basically dumped all their stock from the rest of the world, brought it here, tied it up in a pretty bow and sold us crap.”*

Technical Officer, Pillar Energy Services

Period 2: Liberalization of the Energy Market

- Entrepreneurs enter the sector and cause ripples
 - REIPP PPAs
- Configuring and Reconfiguring Technology
 - Smart meters as services platforms
 - Affordability of solar
 - Off-the grid energy generation
 - Electrification of remote communities
- Conversations
 - Revenue protection by municipalities
 - New value propositions (e.g. asset management, remote electrification)

“And so our power purchase agreement we would put an asset on their rooftop or in their grounds next to the off-taker and basically sell them electricity for own use. In some of the cases, the asset would be group tied, or the system would be group tied, meaning that it has the potential of feeding back into the grid.”

CIO, Next Renewable Generation

Period 3: New Business Models

- Entrepreneurial consortia arise
 - PPA Stalemate
- Technologies:
 - Smart grid
 - Batteries
 - Digital platforms
- Conversations:
 - *Forming networks of collaborators*
 - Shared platform model (public, private and third parties)
 - Private PPA model through consortia of entrepreneurs
 - *Leveraging the generativity of technology* (e.g. wheeling agreements, time of use tariffs, mobile payments)

- *“There are companies that have been around for numerous years. A lot of them have played in the REIPP space and now they are moving into a private space because Eskom is not signing IPP deals anymore... So that’s why we came up with the model to do the lease and the rental and the private PPAs [...]. [Y]ou can have solar without cap up front...”*

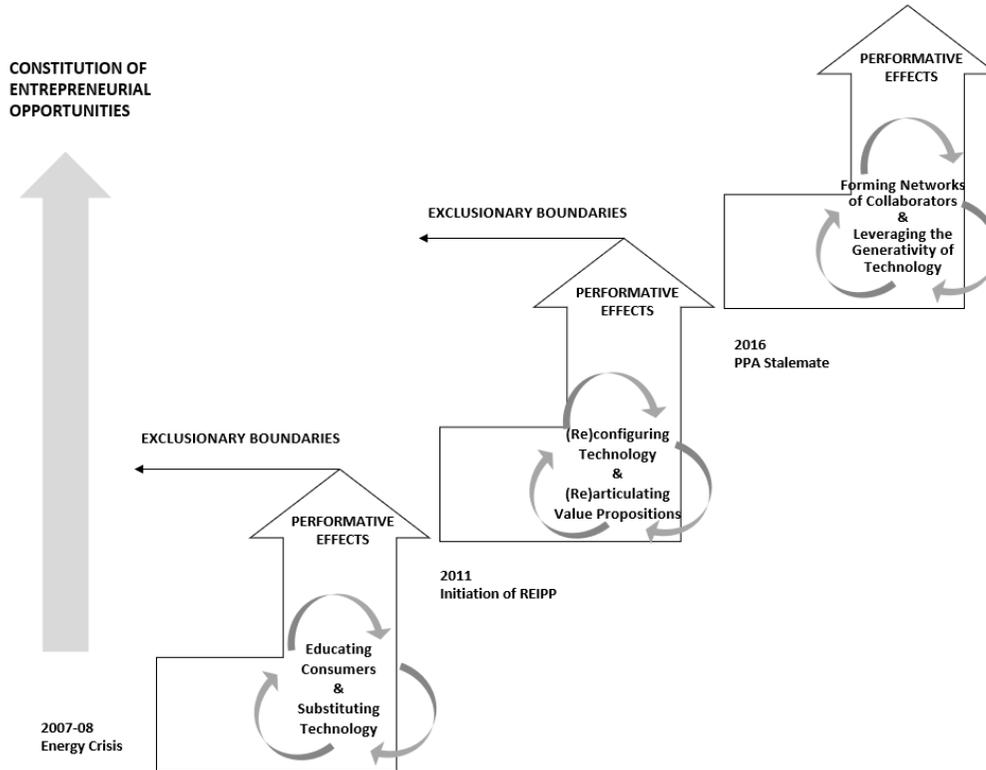
CEO, Zeroth Energy

- *“if we’re not thinking of becoming a mini-utility ourselves [we] would be crazy [...].”*

President and COO, Lamo Solar

Process model

- Entrepreneurial opportunities have been constituted over 3 periods



DISCUSSION

- Entrepreneurial Opportunities in the Energy Sector are on the Rise

How to sustain and multiply them?

How to leverage them towards:

decarbonizing?

youth development?

job creation?

energy security?

energy affordability?

- Policy Takeaways

- Support entrepreneurial ecosystems, rather than specific actors
- Opening up only the generation segment, constrains opportunities

THANK YOU!

- *“[Efficiency] until this point has been overlooked I guess because power has been freely available and cheap in this country and now that’s becoming more expensive and more of an issue [...].” [P2]*

*“Renewable energy in the past was a buzz industry because of the **environmental benefits** that had emerged, but **today it’s straight commercial case** and the fact that the environment will benefit is just an additional extra.”*

(Technical Management Unit Officer, IPP Office)

Local Energy Platforms

“So you may want to start looking at how do I create a platform ...[as] a shared service type model, not necessarily on a national scale [...] but there is no reason why we couldn’t start to look at shared services or shared platforms, you know, in a provincial context so for the North West as a province and for the 30, 40 municipalities in the North West [...]”

(Managing Director, Accenture South Africa)