



ERC

ENERGY RESEARCH CENTRE
University of Cape Town

Prepaid electricity: Evidence from South Africa

...Discussion

Hilton Trollip

12 November 2015

Discussion

- (won't go into method etc...)
- Main policy-relevant findings
- Elaborate on these findings in terms of context
- ➔ How could findings serve policy, policy-analysis/policy-formulation
 - ➔ Immediate direct advice/messages to policy makers
 - ➔ Additional work / ideas

Main findings - 1

- (...method appears to address concerns and limit itself to findings that can be reliably asserted)

1. Prepaid meters in low-income households lead to decreased consumption / forced limited consumption

WHO

- a. Households with history of poor-payment or debt on credit meters have larger reductions
- b. Also, “full fare” customers have larger reductions
- c. Reductions limited for ‘lifeline-tariff’ customers
→ But clustering

Main findings - 2

2. Prepaid meters in low-income households lead to decreased consumption / forced limited consumption

WHY

- a. (prepaid forces)
- b. Household with limited liquidity reduce more
- c. Bunching at tariff 'block-increase-point' suggests customer sensitivity to price

Main findings - 3

3. Customers say

Benefits - helps manage consumption

Disadvantage - hassle of buying electricity

BUT, only 18% use on-line/phone buying

...it seems customer knowledge of tariff, monthly consumption very low

Combining findings

2. Prepaid meters in low-income households lead to decreased consumption / forced limited consumption

WHY

- a. (basic functionality of the technology)
- b. Household with limited liquidity reduce more
- c. Bunching at tariff 'block-increase-point' suggests customer sensitivity to price, but this is achieved 'reactively'... in response to 'more expensive electricity later in month'

Policy context

- Prepaid has facilitated extension of access from 30% (apartheid era) to 80%
- ➔ Cannot overemphasize the importance of this
 - ➔ South Africa has technically functional, robust pre-paid system
- ...moving to Current Policy Issues
- ➔ Prepaid continues as above
 - ➔ Except for non-technical losses, ...unsolved and increasing rapidly recently
- ➔ ...new issues, next slides



Current issues

- financial, economic, and technology combined
 - Poverty and energy poverty: 45% of population live below upper-bound-poverty level, 40% effective unemployment
 - Cost recovery / profit
 - Tripling in bulk supply costs, ditto for tariffs, but much lower for lifeline
 - Cross subsidies
 - Within electricity tariff
 - Of other services
 - Flat consumption growth
 - New connections
 - Theft
 - Own generation in sector that provides the cross subsidy
 - Grid parity of first PV, then PV+storage

Electricity re-distributor energy profits

...sector is bankrupt

	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
R million						Medium-term estimates	
Category A (Metros)	2 888	3 211	3 350	2 454	2 945	2 166	1 151
Category B (Locals)	1 487	1 473	1 251	795	608	-331	-1 282
<i>Secondary cities</i>	815	618	577	341	339	-87	-785
<i>Large towns</i>	310	406	374	151	214	-92	-285
<i>Small towns</i>	304	372	253	252	37	-80	-205
<i>Mostly rural</i>	58	77	46	50	17	-72	-7
Category C (Districts)	-21	-28	-48	-25	4	-4	-7
TOTAL	5 840	6 129	5 803	4 018	4 165	1 500	-1 421

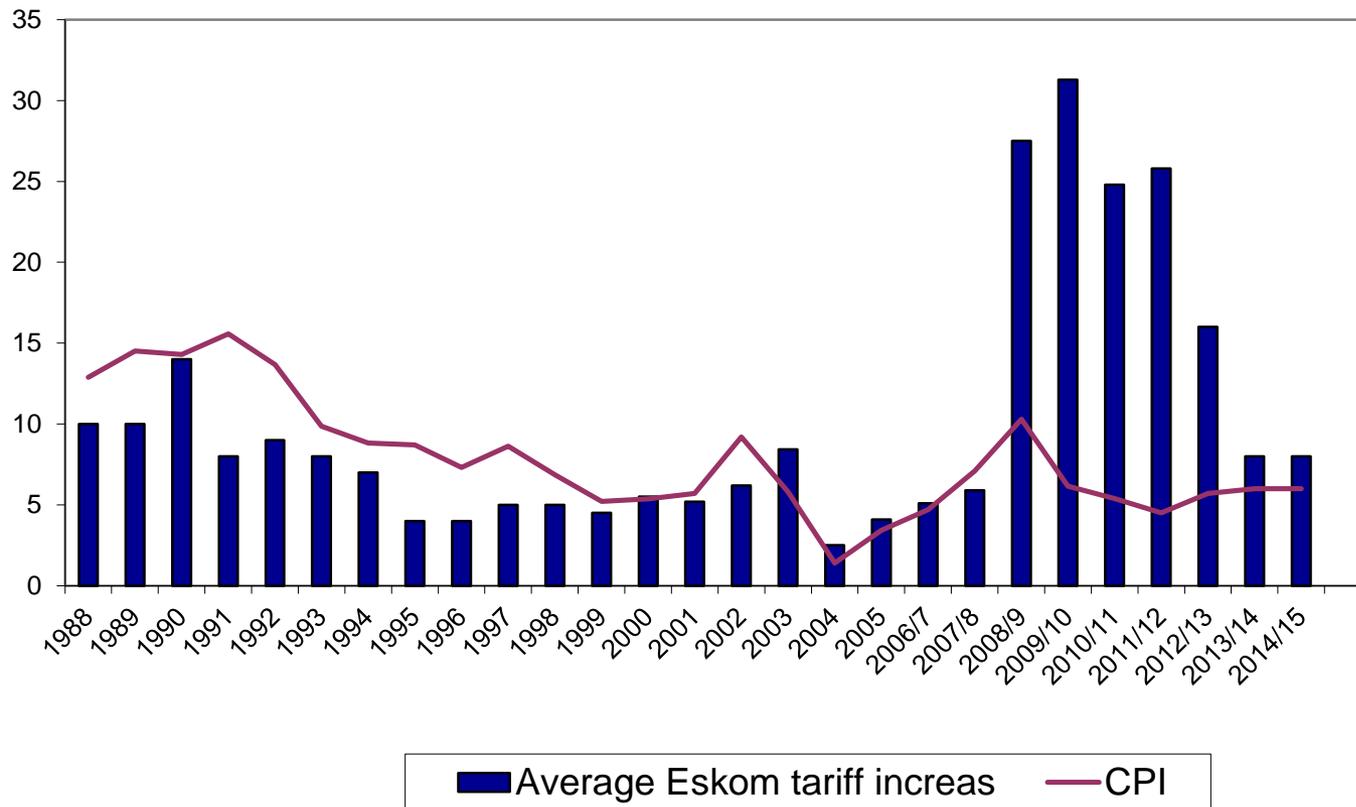
Table LG1 – Local government electricity distributors financial viability under threat - Net surplus on electricity sales (South African National Treasury 2013)

➔ Cumulative aggregate maintenance backlog of some ZAR 50Bn

Bulk electricity tariff**

[** tariff NE cost]

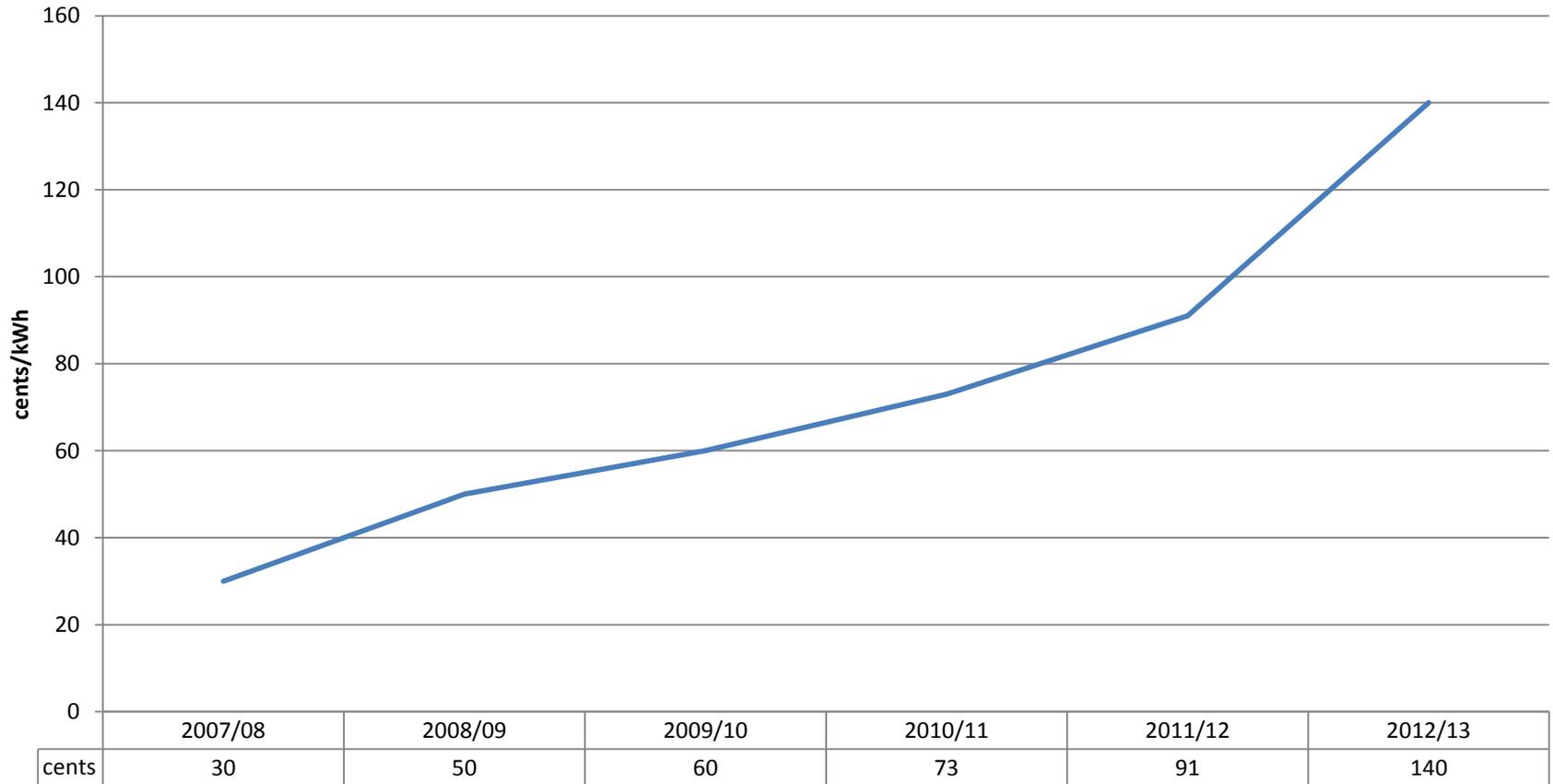
Bulk electricity tariff [Eskom 2015]



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

Cape Town retail electricity tariff

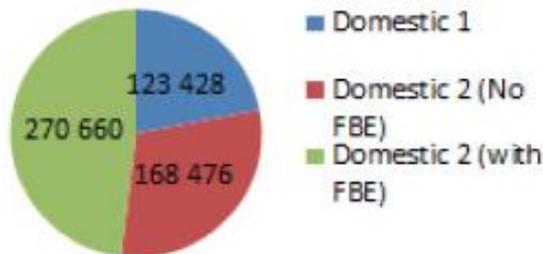
Domestic tariff for >60kWh p.m. user



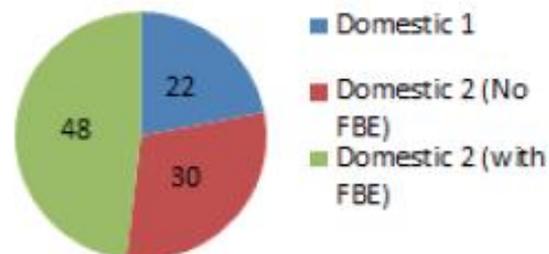
UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

Electricity re-distributor energy served and revenues

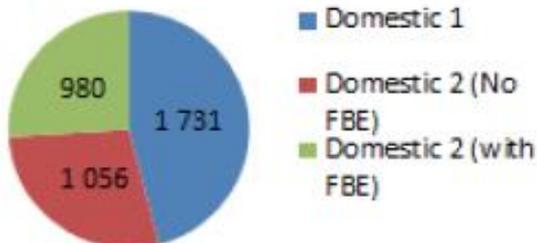
Number of customers in each segment 2009/2010



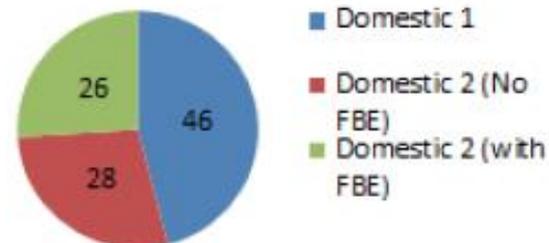
Number of customers in each segment percent



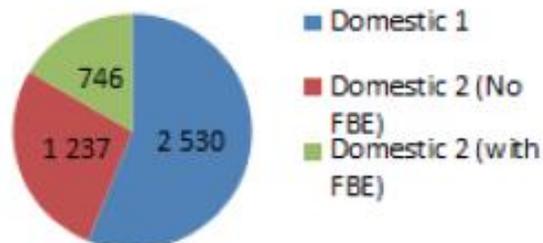
Total energy consumption by each segment GWh/year 2009/2010



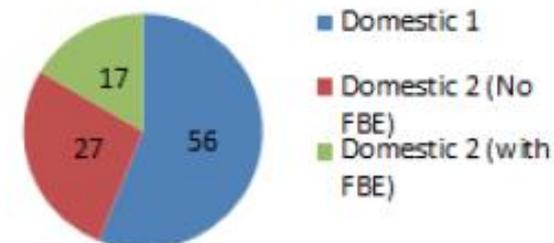
Total energy consumption by each segment percent



Estimated revenues from each segment ZAR 2012/2013

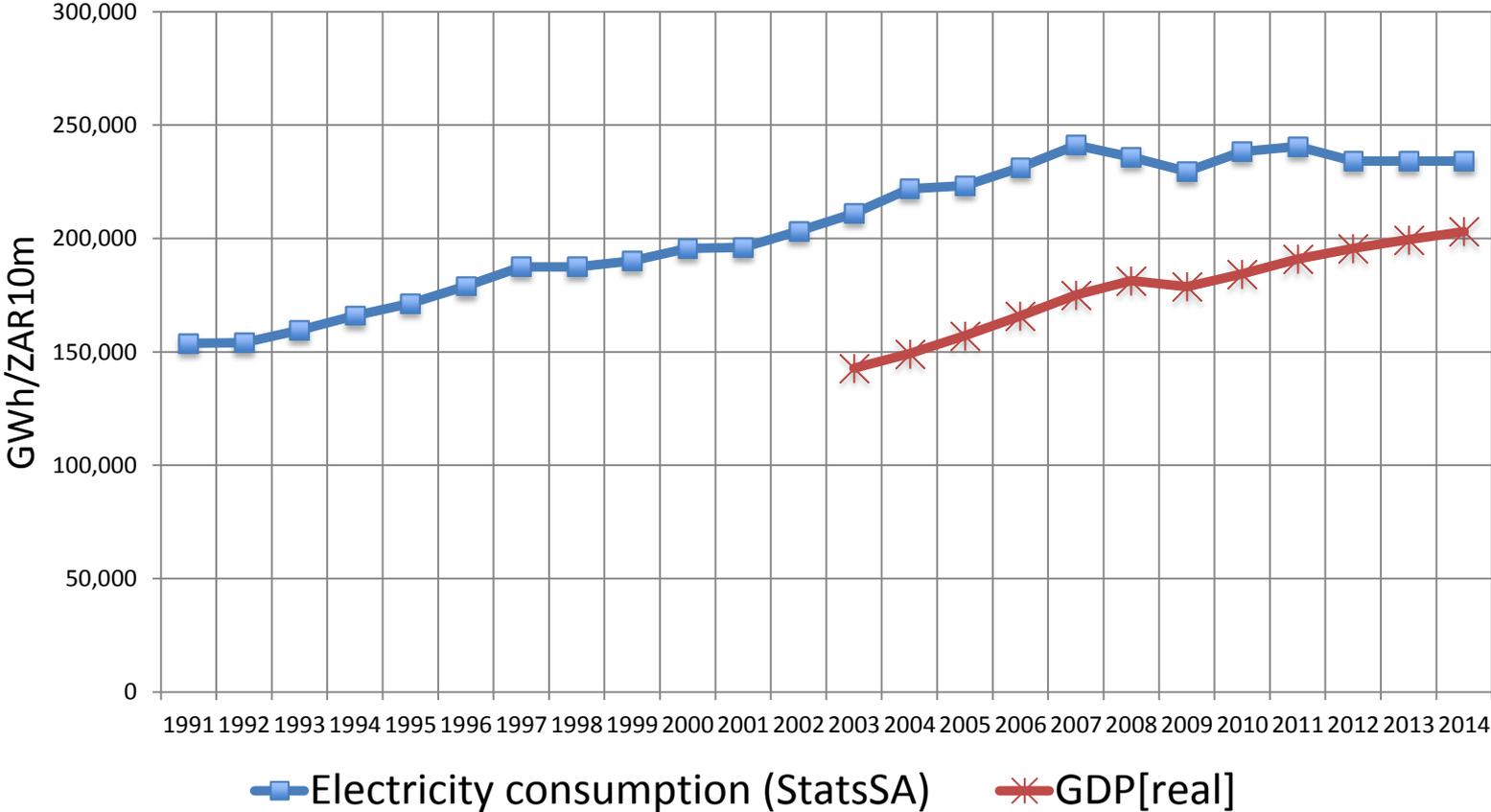


Estimated revenues from each segment: percent



South African electricity consumption

National electricity consumption



City of Cape Town System Energy



Soooo...., Findings plus Context: ?? Policy/?? Research

- Poverty

- [Prepaid has been and remains **key** to providing access to grid electricity for poor]
- From study: pre-payment assists poor to manage electricity expenditure
 - But in quite a “rough” way – (i) forced (ii) reactive...
 - ➔ ? Options for better information, ? Impacts/effects
- From study: demand for basic electricity energy services inelastic: additional knowledge does not reduce consumption much in ‘lifeline’ tariff customers
 - ➔ ?? What is elasticity, ?? What is affordable
 - ➔ ?? What alternative options are there: efficiency, LPG, PV, storage (combos) ...(overlaps with financial sustainability)
 - ➔ (social costs of non-supply not an option)

Soooo...., findings plus context: ?? Policy/?? Research

- Poverty

- [Prepaid has been and remains key to providing access to electricity]
- Disadvantage – transaction costs
- ➔ ?? More details of cash-flows in poor households
- ➔ ?? Options for on-line/innovative payments methods
- ➔ ?? Combining innovative payments methods with better information on tariffs/consumption/budgeting

Soooo...., findings plus context: ?? Policy/?? Research

- Cost recovery / financial sustainability / profit
 - Facing up to the overall situation which the study helps clarify: especially needs and behavior of lifeline group
 - ?? Viability/economics of cost reflective tariffs
 - ?? Future BAU scenarios to inform public policy processes
 - ?? Options within overall financial position and cross-subsidy: especially alternative scenarios to achieve financial sustainability
 - ?? Key research on behavior of other customer segments
 - mid-income (full fare)
 - mid-high income (milk-cows)
 - Commercial
 - Industrial
 - Role of milk-cows and 10% profit in maintaining perverse incentives, including institutional (dis)incentives to find/implement solutions

Last word

- The study surfaces very useful information on one customer segment
 - Because South Africa already has a comprehensive prepaid grid connected system, with large dynamics, provides 'field' for detailed studies
- ➔ The current study useful purely in its own right
- ➔ And provides details of needs for further research in this segment and
 - ➔ In other segments, other 'fields'
 - ➔ Linked to options for future policies within an overall economic / financial / institutional sustainability analysis

Thank-you !