68TH AMEU CONVENTION 2022

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A JUST ENERGY TRANSITION ("JET") FOR SOUTH AFRICA

Tariff Setting Principles for Hybrid Solar and Storage Embedded Generation Systems

Presented by Sinawo Sigalelana

Energy Advisor

Sustainable Energy Africa NPC

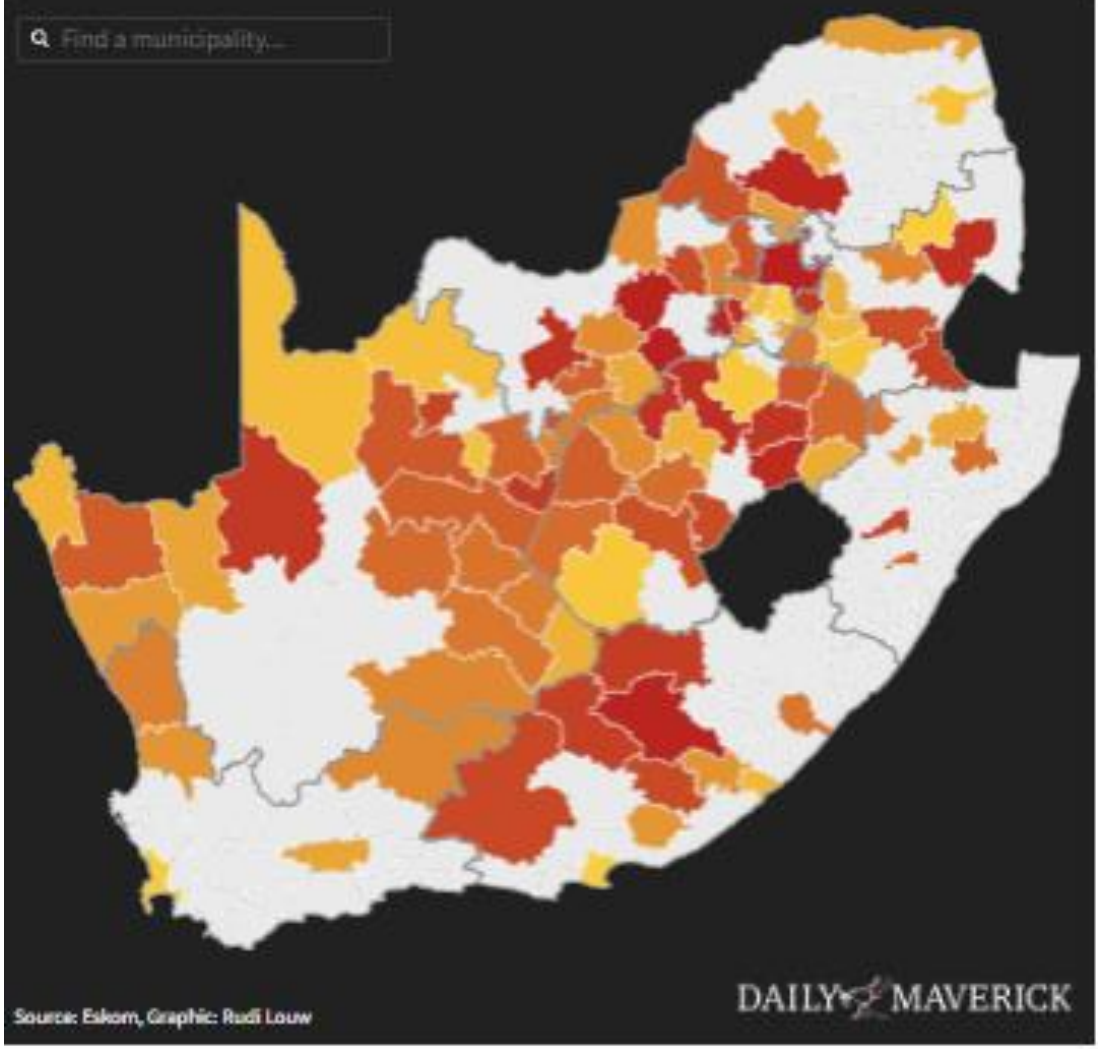
Hosted by

ETHEKWINI MUNICIPALITY

Municipalities in debt to Eskom

(as at 31 July 2022)

Click or mouse over a municipality to view results. (The darker the red the higher the debt)



Introduction

- Revenue Impact of Solar EG well understood by munics, hence municipal tariff amendments
- Loadshedding motivating factor to customer installation of BESS
- Improved functionality of Li-on batteries allows for price arbitrage and reduction in utility bill
- We interrogate the impacts of hybrid systems on municipal revenue for a range of battery algorithms.
- We propose tariff setting principles to ensure that,
  - customers can maintain their business case for installing hybrid embedded generation systems
  - that municipalities recover the costs of maintaining their grid infrastructure to enable sustainable service delivery.

Overview of Hybrid Solar and BESS

Hybrid Solar & BESS

- Demand Load Shifting
- Maximize PV Self Consumption

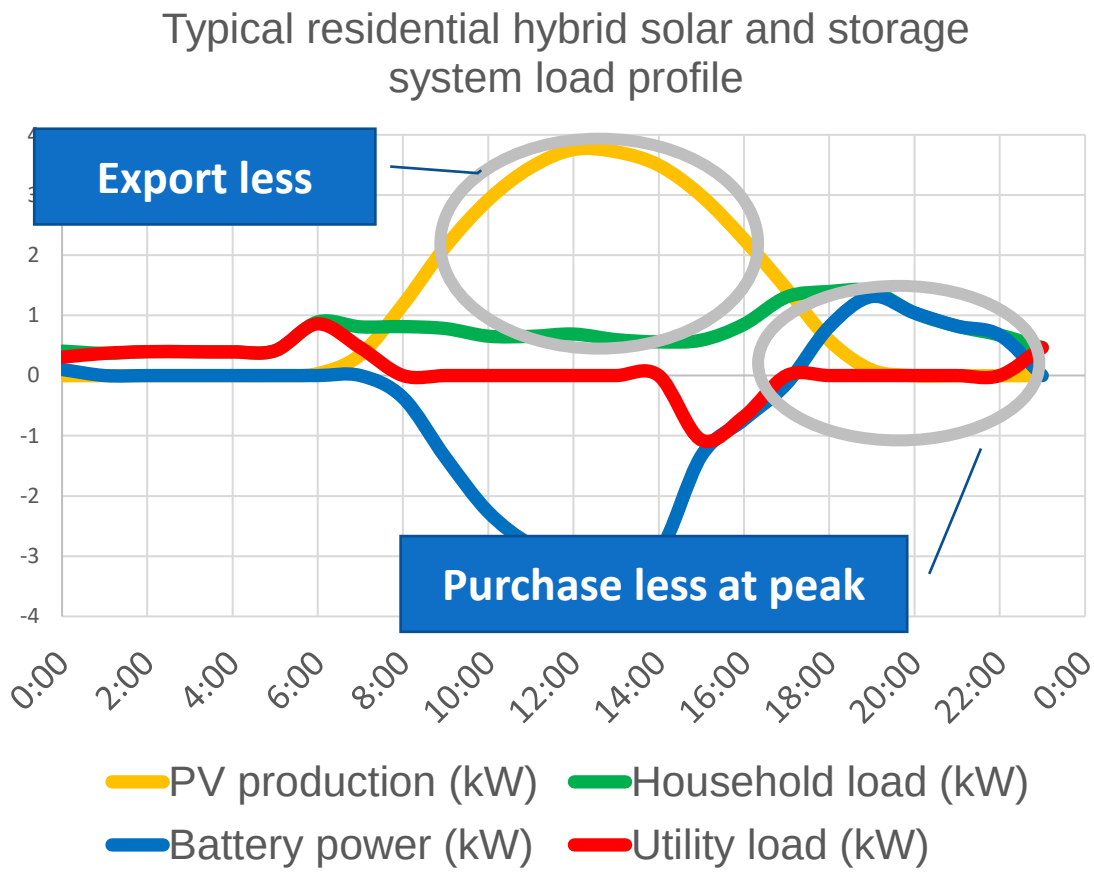
Value Stacking

- Load Shedding Backup
- Maximize PV Self Consumption

Ancillary Services

- Frequency Control
- Operating Reserves (spinning and non spinning)

How do Hybrid Solar and BESS work?



Solar Available

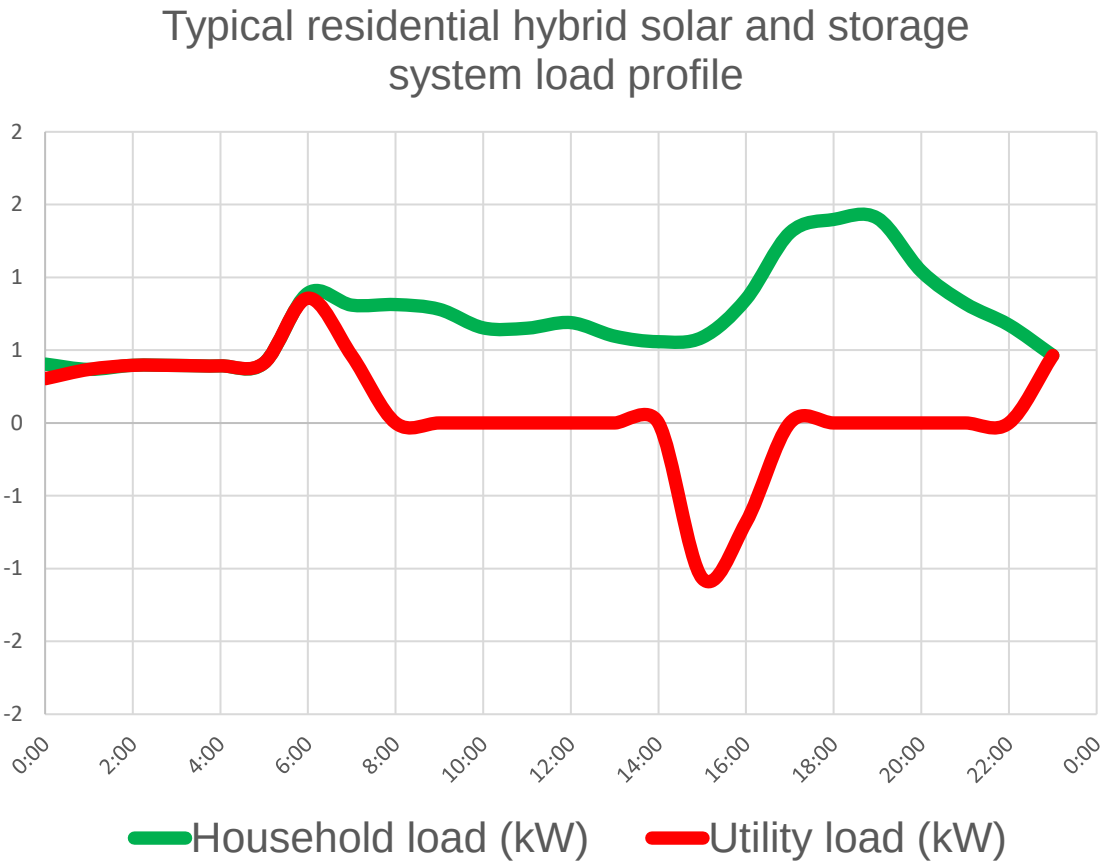
Supply load with solar	Charge battery with excess	Export to grid

Solar Unavailable

Discharge batteries to supply load	Import from grid

Need to re-evaluate tariffs

How do Hybrid Solar and BESS work?



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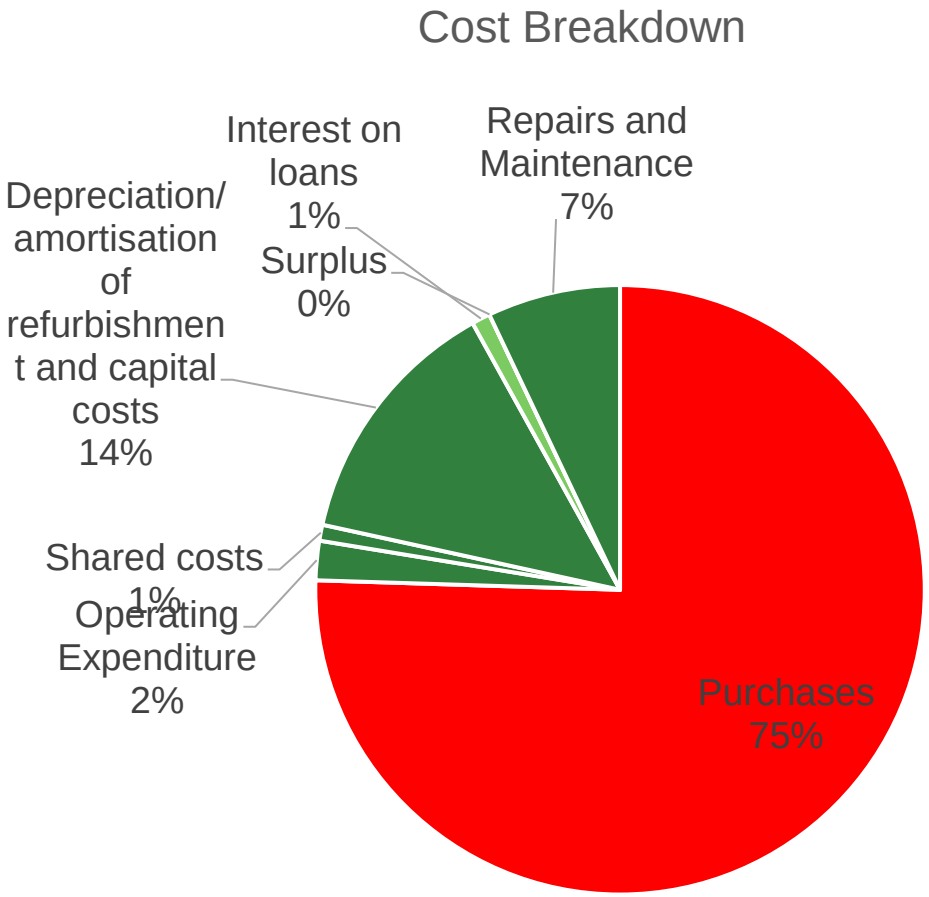
Cost of Supply Studies



Munics submitting non-compliant COS studies because:

- Outdated Asset Registers
- Incorrect data in general ledger accounts
- Inactive meters
- Lack of Capacity and financial muscle
- High municipal staff turnover etc.

Basic Charge (R/month) + Energy Charge (R/kWh) – Export Credit (R/kWh)

Export Credit Calculator

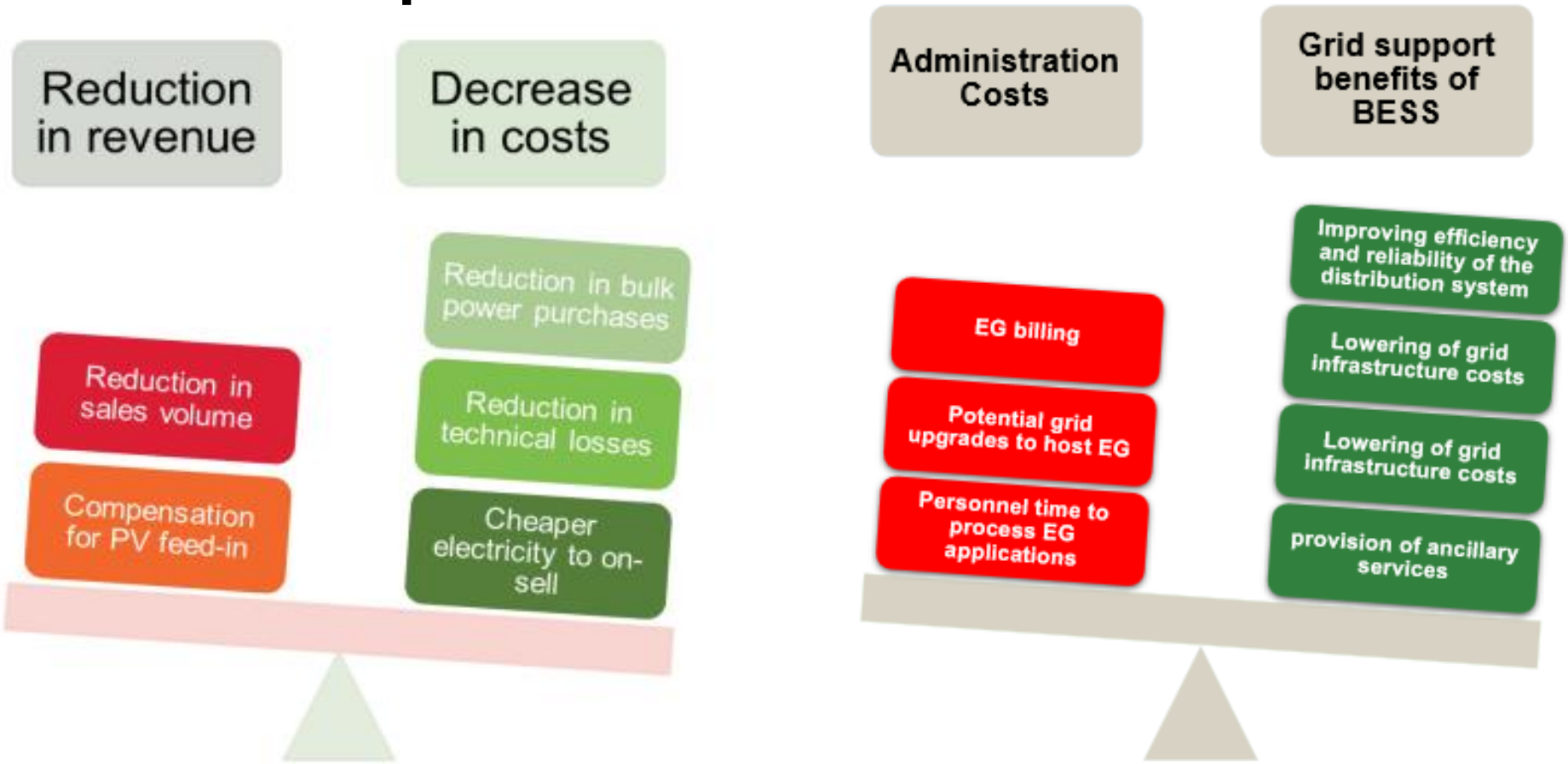
"NERSA lacks both statutory and regulatory jurisdictions over the proposed activity between municipalities and EG customers"

	Megaflex (c/kWh)	Typical solar PV output per TOU
Low Season Offpeak	66,57	19%
Low Season Standard	104,90	46%
Low Season Peak	152,42	12%
High Season Offpeak	76,89	5%
High Season Standard	141,57	15%
High Season Peak	467,25	2%
Weighted Average Avoided Purchase Costs (c/kWh)		112,66

- TOU Tariffs (EPP recommendation)
- Export Credit ± 80% Megaflex

- Flat tariff (residential)
- Export Credit ± 80% Megaflex

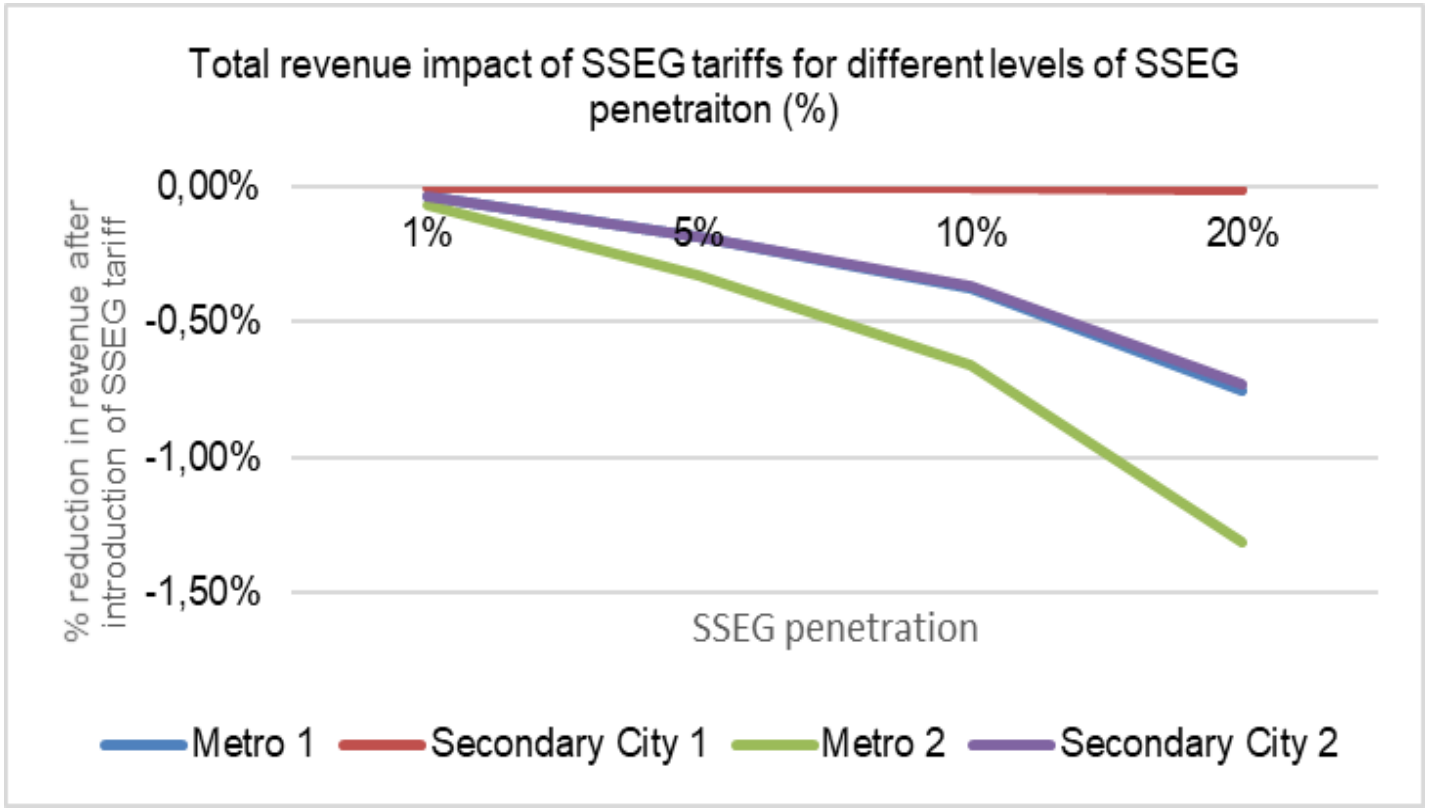
Financial Impact of EG with BESS



Architecture of the financial impact model

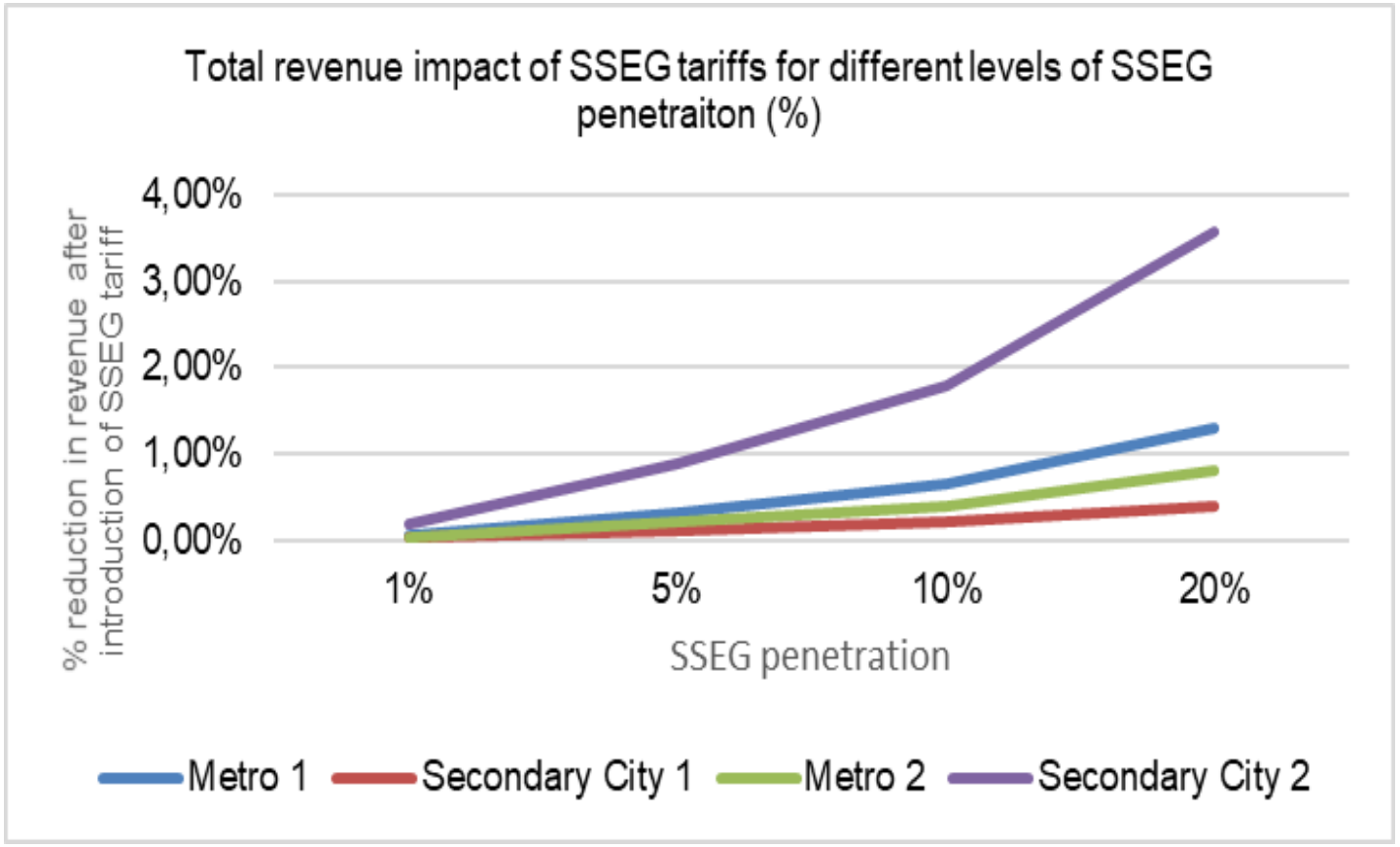
What the model does not do.

Case Studies of RSA Municipalities



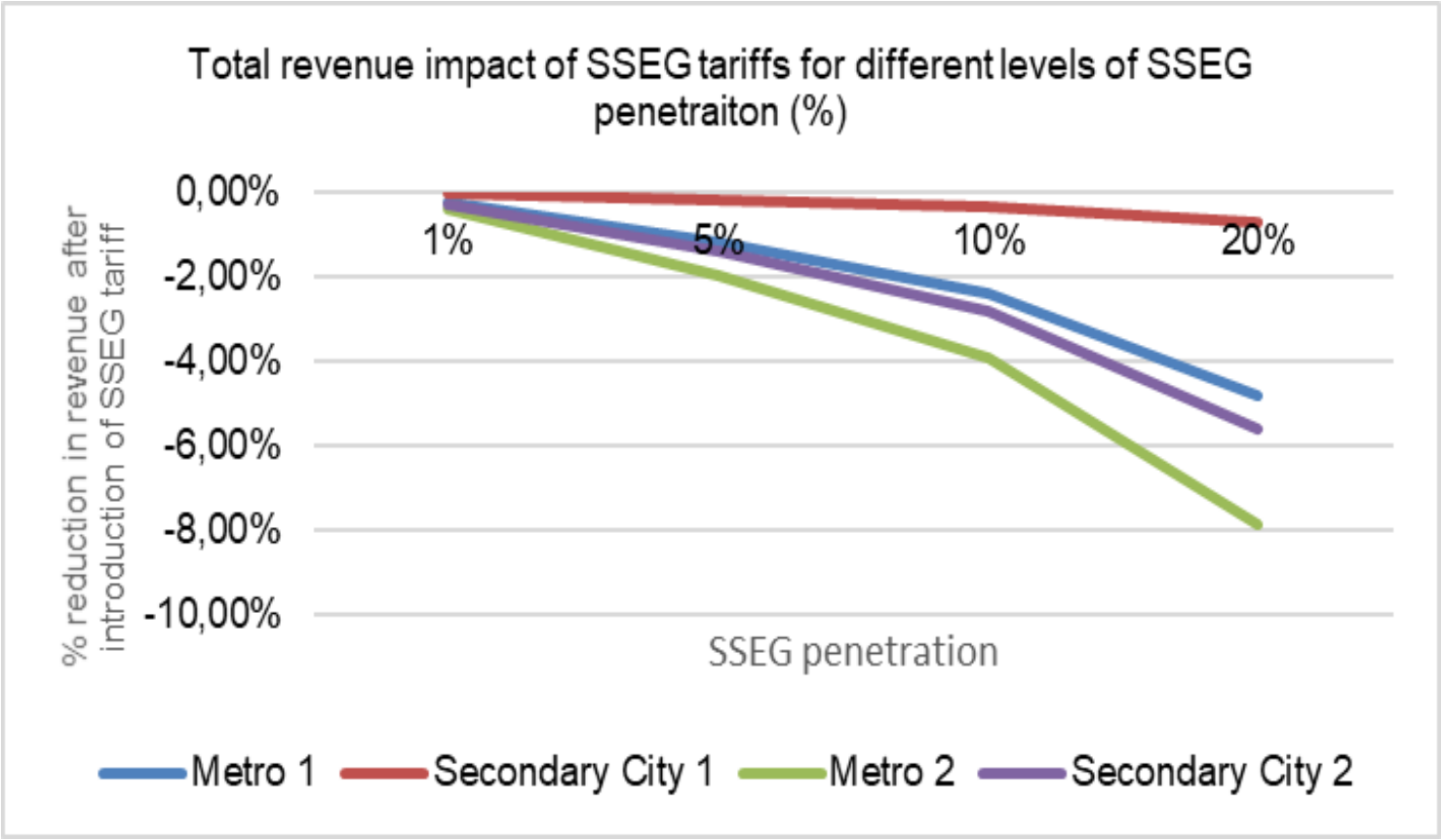
Revenue Impact of reverse feed blocking

Case Studies of RSA Municipalities



Revenue Impact of purchasing export power from EG customers

Case Studies of RSA Municipalities



Revenue impact of EG customers with BESS

Conclusions

Cost of Supply Studies & EG Tariffs

- ❑ Unbundle tariffs to recover fixed costs and variable costs
- ❑ Reverse feed blocking not beneficial to municipality
- ❑ Export credits motivate customers to register EG systems

Revenue Impact of EG & BESS

- ❑ BESS system prices will drop in near future
- ❑ Reduced sales volumes and revenue
- ❑ Storage further emphasizes the need for cost reflective tariffs
- ❑ Technical benefits of BESS vs Value Stacking

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Thank you

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