

Implementing Energy Solutions in Municipalities

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Saldanha Bay

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Focus of the Western Cape Government

Goal statement

Enough power for growth in the Western Cape that is sustainable and low carbon

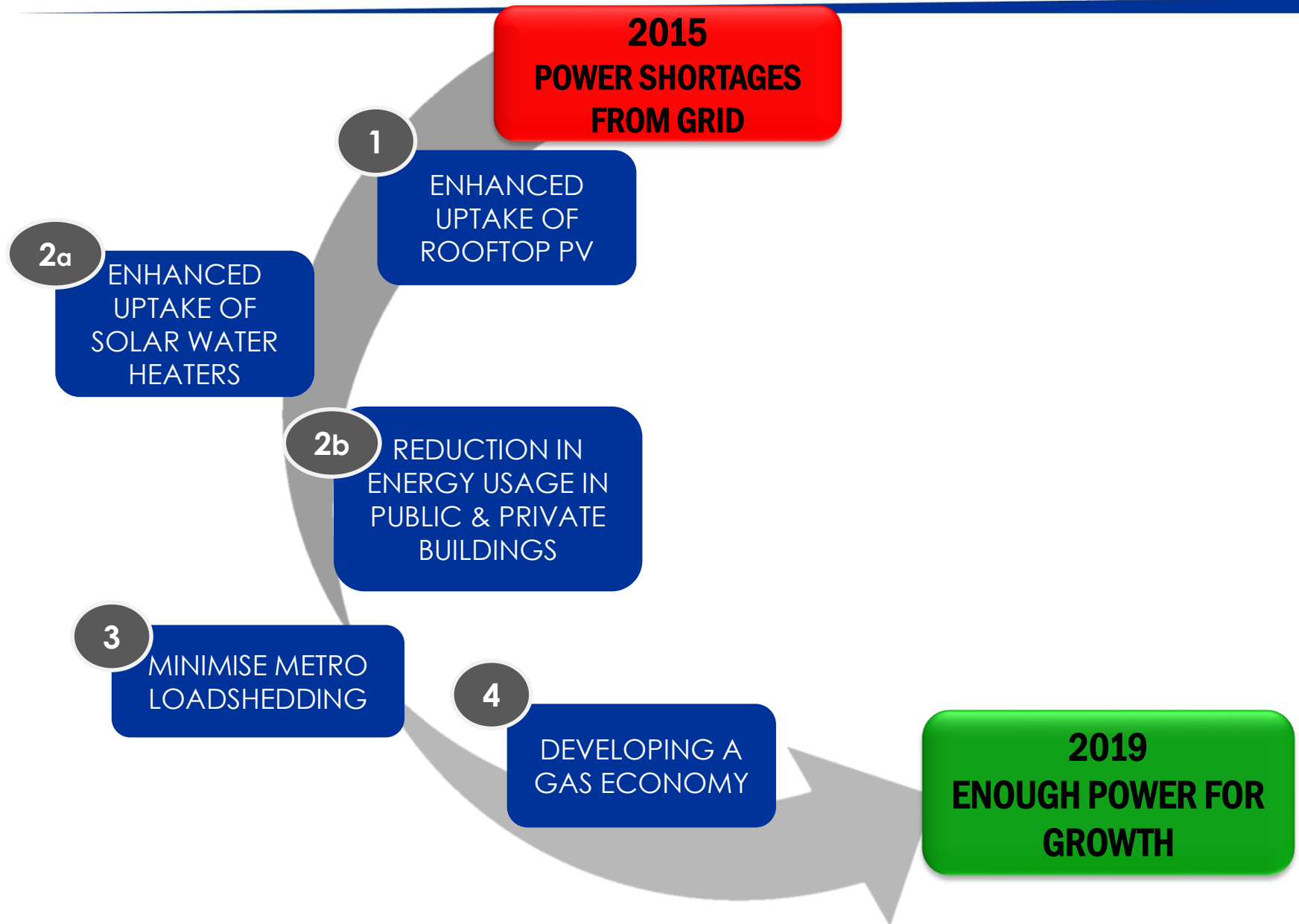
Key Performance Indicator

10% reduction in current Western Cape demand from Eskom in the next 3 years generated through alternative low carbon supply and energy efficiency measures

What does the target mean?

- 4 x Western Cape based Wind farms = 318 MWs or
- ±400 000 geysers switched off or replaced with SWH or
- ±1000 rugby fields of solar panels

How change will happen



What we will do – Lever 1 (Rooftop PV)

POWER SHORTAGES
FROM GRID

1

**ENHANCED
UPTAKE OF
ROOFTOP PV**

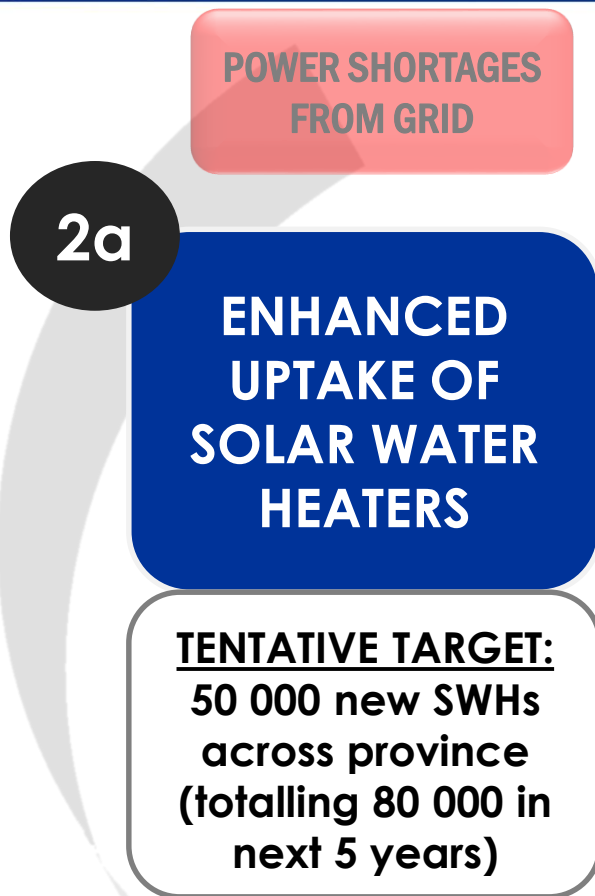
**TARGET: 120 MWs
over 3 years**

Key issues

- If Municipalities wish to allow their residents to connect legally to the grid, they will need to have the following in place by 30 June 2016:
 - SSEG Rules, regulations & application process
 - Feed-in tariffs
 - By-laws

ENOUGH POWER FOR
GROWTH

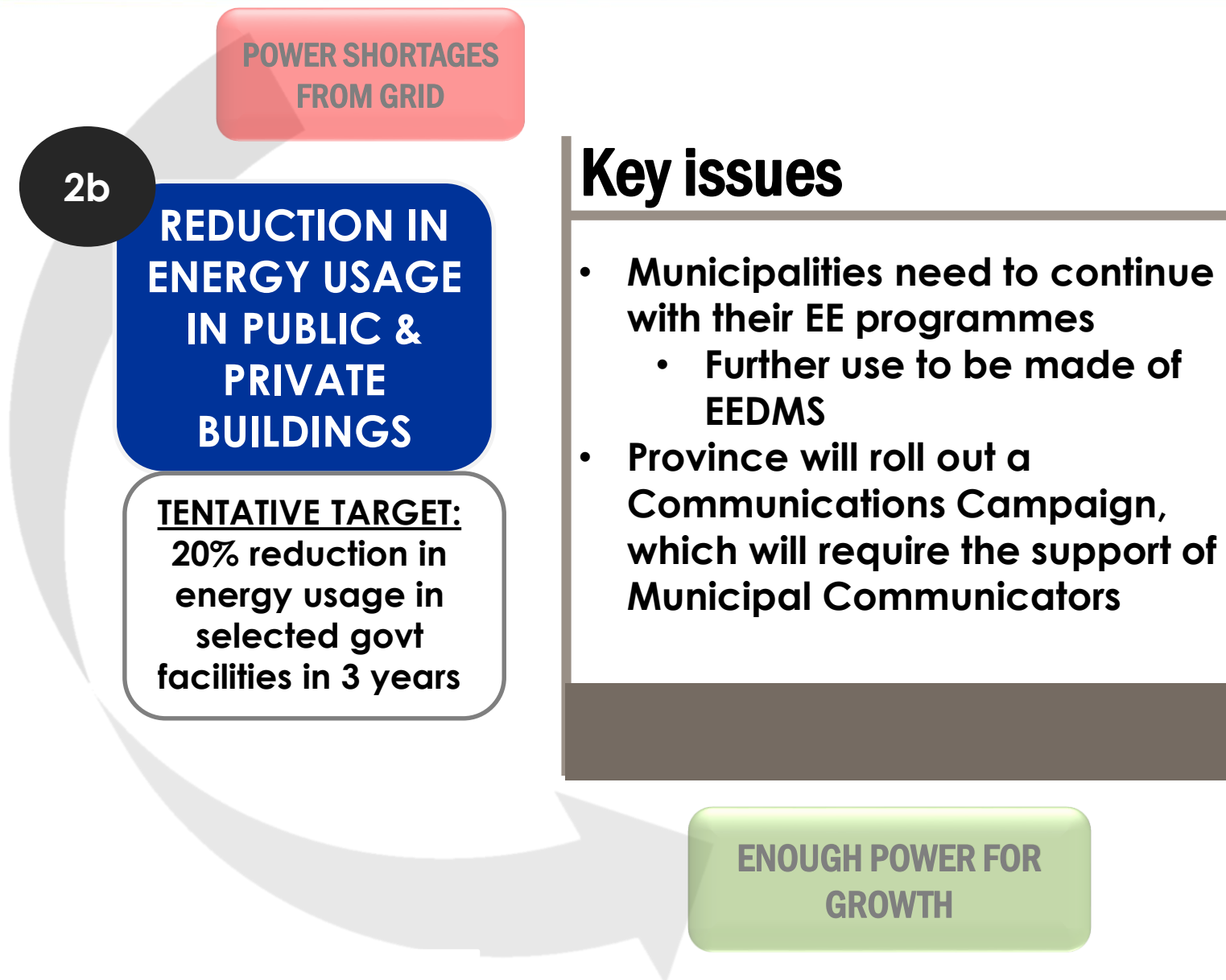
What we will do – Lever 2a (Energy Efficiency: SWHs)



Key issues

- City of Cape Town has a list of accredited suppliers, many of whom work throughout the Western Cape
- New building regulations require SWHs or heat pumps for all new buildings – is it being enforced?
- New programme: insurance industry will replace burst geysers with SWHs

What we will do – Lever 2b (Energy Efficiency: Buildings)



Why should Municipalities promote Rooftop PV?

It will reduce the electricity required from Eskom, which takes pressure off the grid

It will generate power for the Municipality (if customers can feed electricity back into the grid)

It will contribute to our low-carbon future

It will create an alternative to Eskom power without increasing the pressure on low income customers

FAQs on Small-scale Embedded Generation

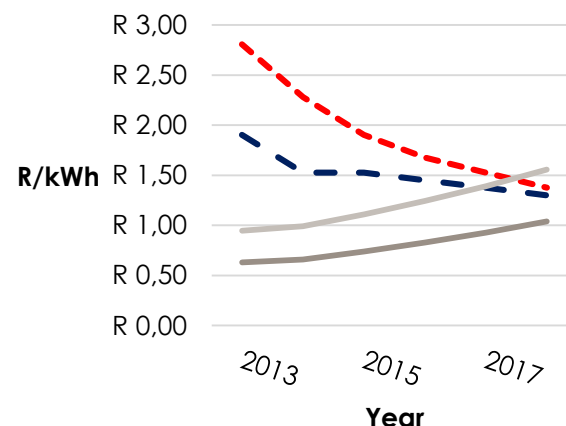
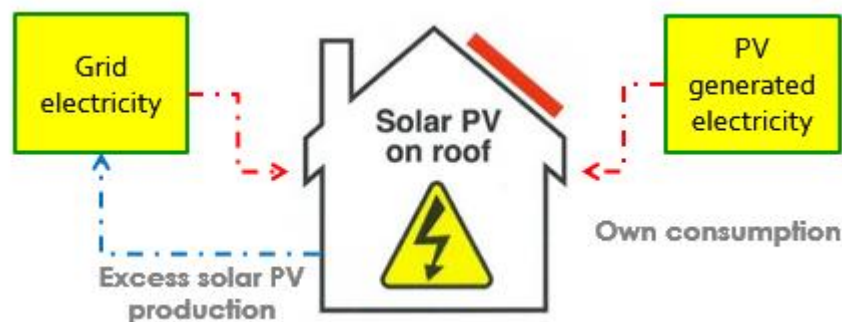
What is Small Scale Embedded Generation (SSEG) and Solar PV?

Small Scale Embedded Generation (SSEG)

- Less than 1MW, can be solar
- Located on a site where electricity is also consumed
- On the customer side of the municipal electricity meter - 'Embedded' in the municipal electrical grid

Solar Photovoltaic (PV)

- SSEG that converts solar energy into usable electricity
- System size and use varies drastically



FAQs on Small-scale Embedded Generation

What is the difference between grid-feed-in, grid-limited and off-grid PV?

SSEG system that is grid-tied without reverse flow protection:

- Connected to the municipal electrical grid
- The export of energy onto the municipal electrical grid is possible

SSEG system that is grid-tied with reverse flow protection (grid-limited):

- Connected to the municipal electrical grid
- Prevents power flowing onto the municipal electrical grid

Off-grid SSEG system:

- Not connected to the municipal electrical grid in any way

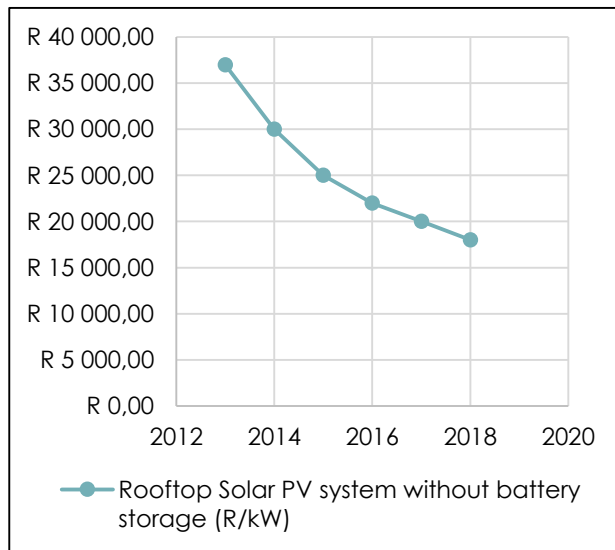
It is critical that we stop people from defecting from the grid, as the consequences for Municipal finances are very negative.

FAQs on Small-scale Embedded Generation

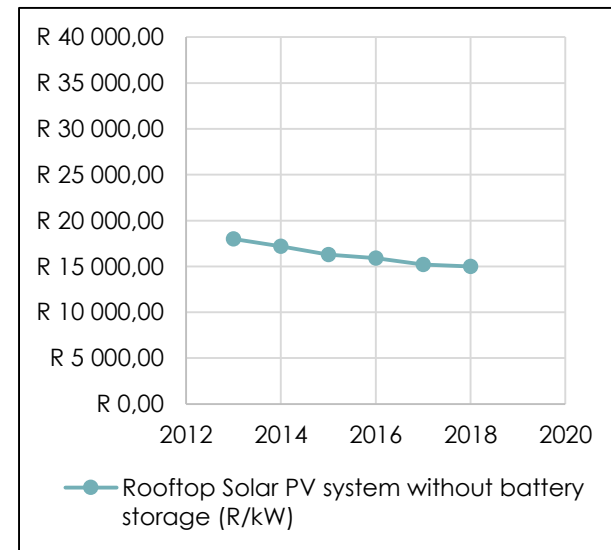
What are typical system costs and what trends are these costs following?

- PV prices are **dropping quickly...**
 - Smaller systems have experienced an approximate **40%** drop
 - Larger systems an approximate **15%** drop
- Prices will continue to drop to **+R12 000/kWp**

10 kW system



100 kW system



FAQs on Small-scale Embedded Generation

Why are rules and regulations necessary?

The parallel connection of any generator to the municipal electrical grid has numerous implications for the local electricity utility:

- **Revenue impact** and reduced bulk purchases
- **Safety** of the utility staff
- **Safety** of the **public** and the user/owner of the generator
- Impact of the **physical presence** of the generation (e.g. visual, noise)
- Impact on the **quality of the local electrical supply**
- **Metering** and **billing** issues

There is a need for **active engagement** in a space that the **municipality can control**

FAQs on Small-scale Embedded Generation

What changes need to be made to municipal by-laws?

Basic by-law changes:

- The **provision of electricity** services
- **Supply** by agreement
- **Application** for supply or generation (enforced application process)
- **Processing** of requests for supply or generation
- **Standby** supply
- Customers' alternate electricity supply **equipment** and generation
- Norms, **standards** and **guidelines**

GreenCape has provided some sample by-laws that can be adopted.

Framework for Small-scale Embedded Generation

Province and GreenCape are providing the following support:

- SSEG rules, regulations and guidelines (domestic and commercial)
- A municipal guidance document – FAQs about SSEG and PV
- Tariff guidelines (design principles)
- By-law recommendations & examples
- Application forms & process
- Supplemental Contracts and forms (commissioning & decommissioning)
- PV training for municipal officials (through DLG)



FAQs on Small-scale Embedded Generation

What are the suggested SSEG tariff principles?

Suggested SSEG tariff principles:

- **A time-of-use tariff with a service charge**
- **All customers should pay a service/network charge**
- Ensure customers **cannot reduce their bill by simply tariff switching**
- The Feed-in price should be based on what the energy is **worth to the country as a whole**
 - Value of energy (long term sustainability)
- Set a **longer term feed-in** payment duration

FAQs on Small-scale Embedded Generation

What can PV do for the municipality?

What SSEG or PV can achieve

- Diversify the energy mix
- Sustainable and cost effective
- Provide supply security
- Provide price security
- Promote changes in behaviour
- Support Eskom with room for maintenance

What SSEG or PV cannot achieve

- Stop load-shedding
- Reduce peak demand
- Protect against rising cost of peak-time energy

FAQs on Small-scale Embedded Generation

How will SSEG/PV affect municipal revenue?

- Although there may be an immediate loss in sales...
 - This can be mitigated by a **shift towards a service business** rather an energy sales business
 - It can also be mitigated by **effective tariff design**
- The **short term losses** will however give way to a **long term, sustainable and cheaper energy supply option**
 - Reduced Eskom bulk purchases
 - Cheaper energy purchases from solar PV generation
 - Savings on transmission costs

FAQs on Small-scale Embedded Generation

What are we as municipalities trying to incentivise?

1. Creating a **conducive environment** for SSEG/PV growth
2. Ensuring that **remaining grid-tied** is the most attractive option both financially and in terms of security of supply
3. Promoting installations that are **economically efficient** for the customer and **correctly sized** for the municipality
4. Ensuring **municipal adaptation** to a changing utility environment
5. Protecting municipal net surplus in a **fair** and **sustainable** way
6. Promoting **climate change mitigation and adaptation**

Energising the Western Cape together

In summary....

- **The first priority should be energy efficiency, both in Municipalities and in households and businesses**
 - **This includes promoting solar water heaters**
- **It is critical that Municipalities be proactive in ensuring people can connect their PV systems to the grid**
 - **Must avoid “grid defection” at all costs**
- **Revenue impact can be managed, if tariffs structured appropriately**
- **All rules, regulations, by-laws, and tariffs should optimally be in place by 1 July 2016**

Energise for growth & jobs

Thank You

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