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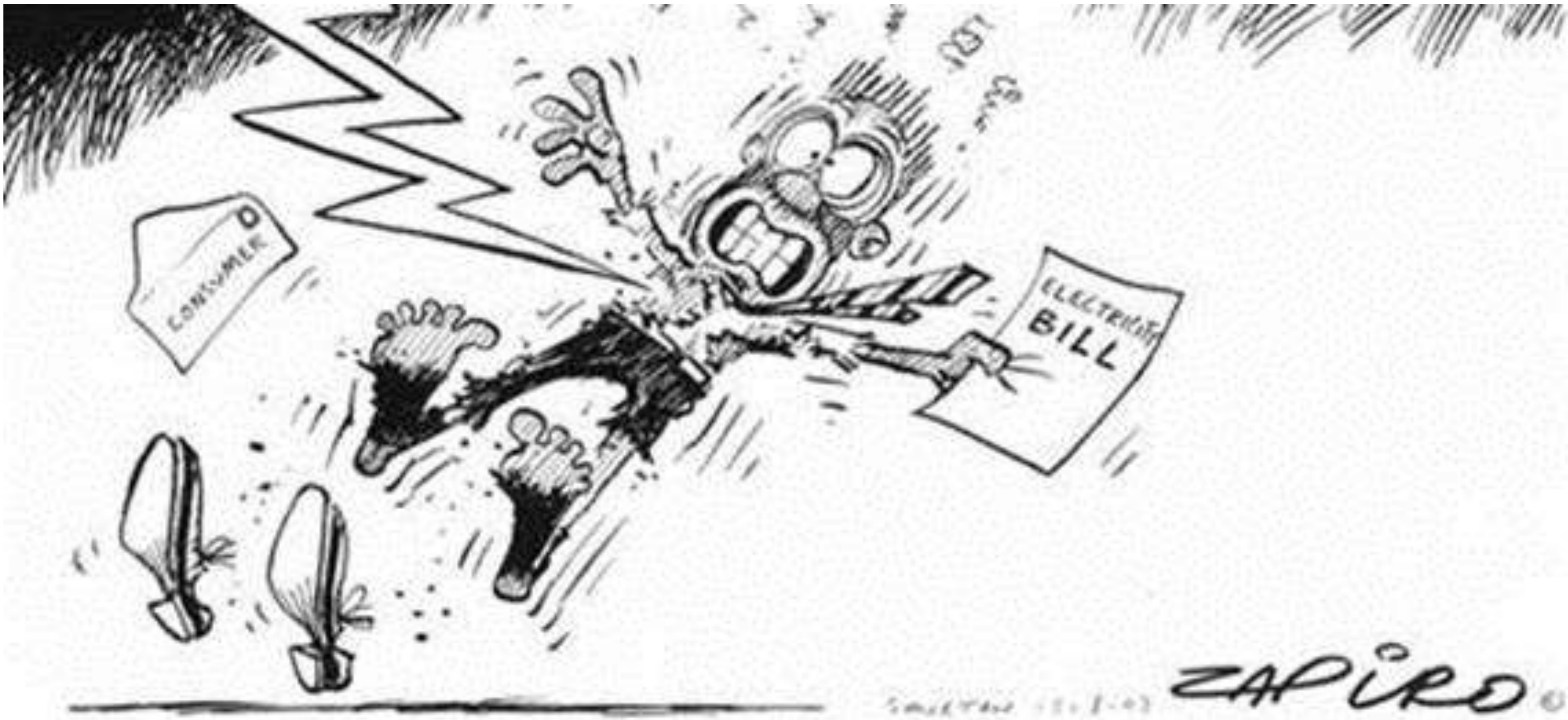
Challenges and Opportunities for Embedded Generation– a municipal perspective

Andrew Janisch
ERLN
4 August 2015

Making progress possible. Together.


CONSUMER
ELECTRICITY BILL
ZAPIRO

Change is in the air…..

"The race for renewable energy has passed a turning point. The world is now adding more capacity for renewable power each year than coal, natural gas, and oil combined"

-*Bloomberg Business, May 2015*

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Go to In

Change is in the air…..

“Battery storage for residential, commercial, and utility-scale customers is one of the most anticipated developments in the energy space.”

— *PETER RIVE, SOLARCITY*

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Change is in the air…..

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Old Forecast 3.3%	9072	9371	9681	10000	10330	10671	11023	11387	11763	12151	12552	12966	13394	13836	14292	14764	15251
New Forecast							10615	10529	10523	10401	10255	10152	10010	9910	9910	9910	10009
Actual	9134	9491	9768	9982	10278	10565	10616	10530	10523	10402	10255						
Growth		3.9%	2.9%	2.2%	3.0%	2.8%	0.5%	-0.8%	-0.1%	-1.2%	-1.4%	-1.0%	-1.4%	-1.0%	0.0%	0.0%	1.0%

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Electricity sales declining – improved efficiencies being realised

Business case for PV- Cape Town 2015/16

Break even year for PV system					
		Cash	Bond 5 Years	Bond 10 Years	Bond 15 Years
Tarrif	Residential	7	8	6	3
	Small Power User 1	7	9	10	5
	Large Power User (low voltage)	9	11	13	12
	Large Power User (medium voltage)	10	12	13	15
	Time of Use Tarriff	9	11	12	10

Impact on Electricity Revenue

- Up to 15% of retained electricity income by 2025 (as much as 38% with SWHs, EE)

	Low Projection		High projection	
Intervention	**Loss in 10yrs**	**% of retained income lost**	**Loss in 10yrs**	**% of retained income lost**
Res PV	-R 45 079 200	-2.3%	-R 154 777 488	-8%
Comm PV	-R 7 624 915	-0.4%	-R 26 133 468	-1%
Ind PV	-R 29 457 955	-1.5%	-R 109 543 364	-6%
Res SWH	-R 103 498 477	-5.3%	-R 179 275 746	-9%
Res EE	-R 114 133 847	-5.8%	-R 195 147 998	-10%
Comm EE	-R 33 967 261	-1.7%	-R 57 744 343	-3%
Ind EE	-R 9 965 580	-0.5%	-R 16 757 474	-1%
Total	**-R 343 727 234**	**-17.6%**	**-R 739 379 882**	**-38%**

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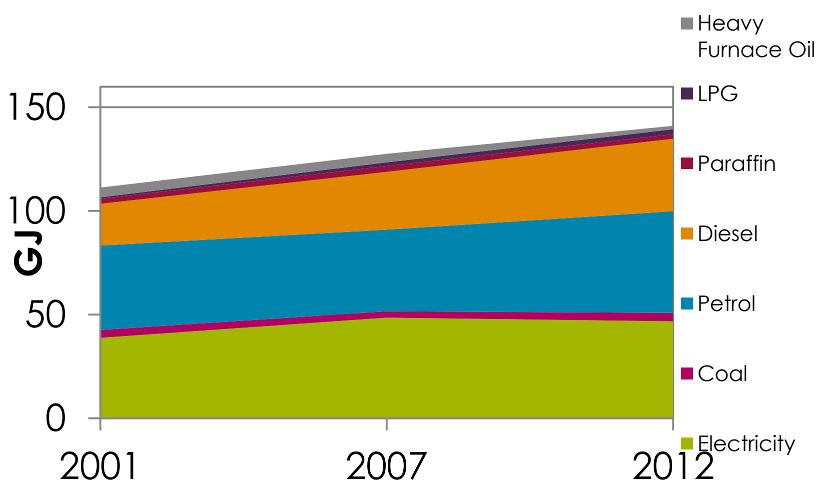
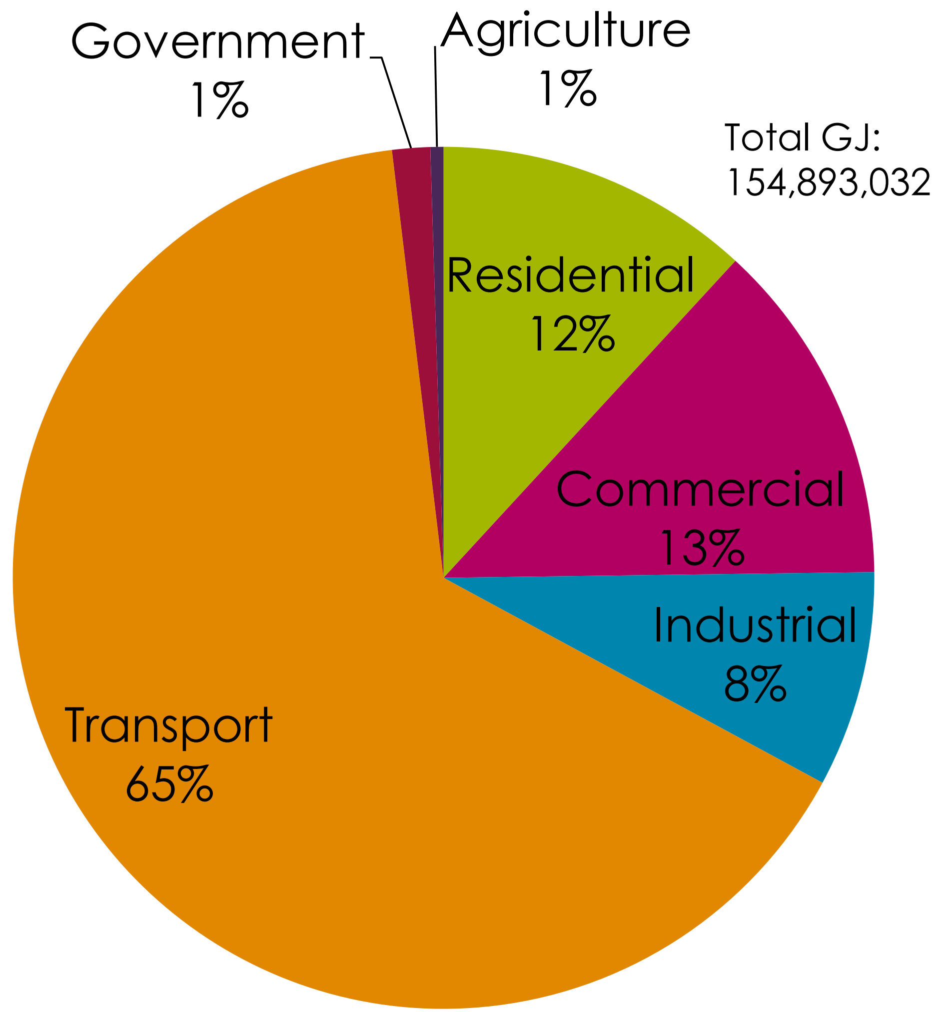
New Energy Vision for Cape Town

Business unusual in the next 10 years:

- New municipal financial model will need to be established
- Growth of the new economy
  - Need to embrace the change!
  - Will lead to
    - ✓ Job creation
    - ✓ More efficient, cleaner, resilient city

Cape Town energy use by sector 2012





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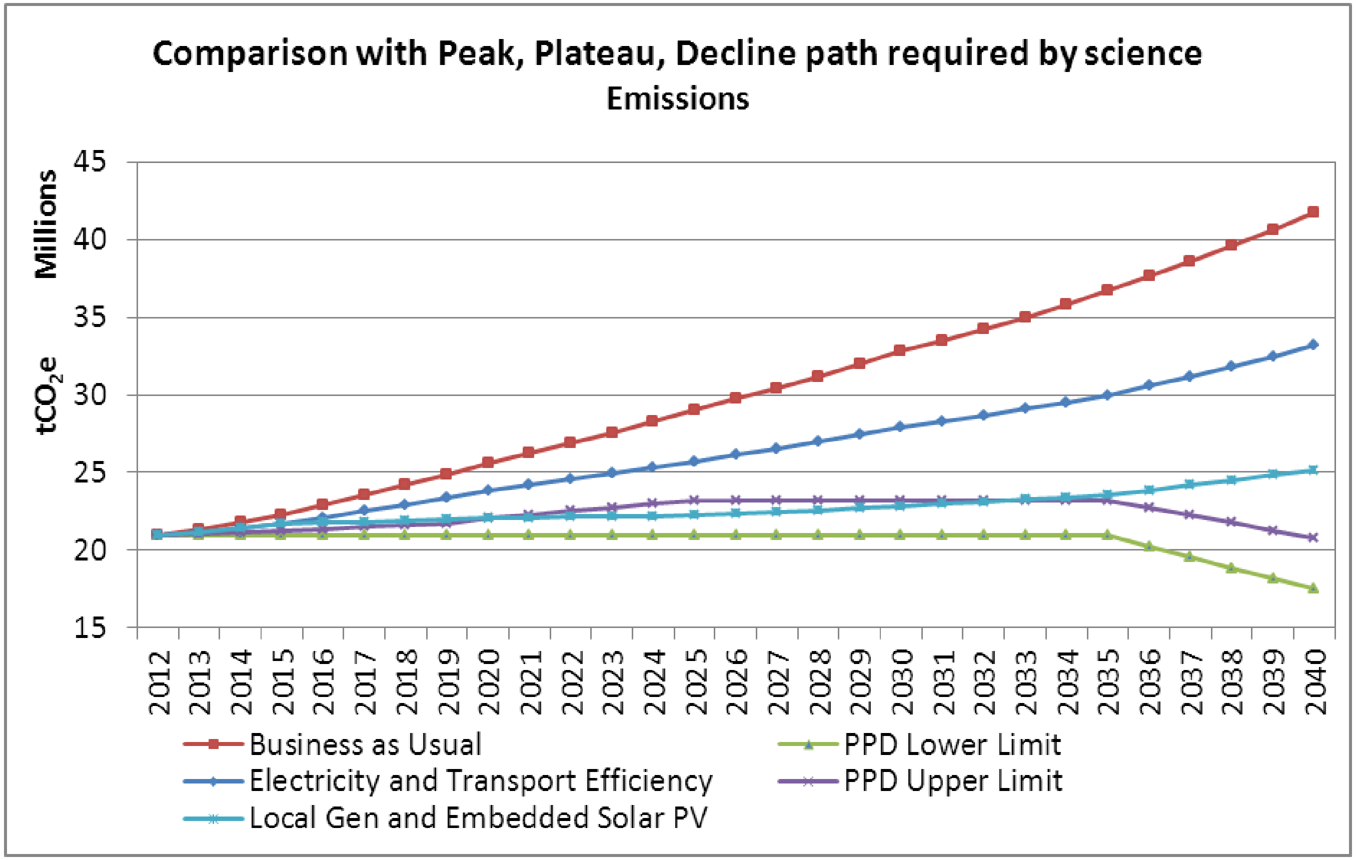
Sources: CCT

Energy 2040 Vision scenarios vs. required by science Peak, Plateau, Decline emissions pathway (2012-2040)



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SSEG in Cape Town (PV only)– Context

- Grid connection allowed
- Feeding back into the grid allowed
- Payback periods of 7-15 years

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Black River Parkway - 1.2MWp

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City owned buildings – over 200MWp installed

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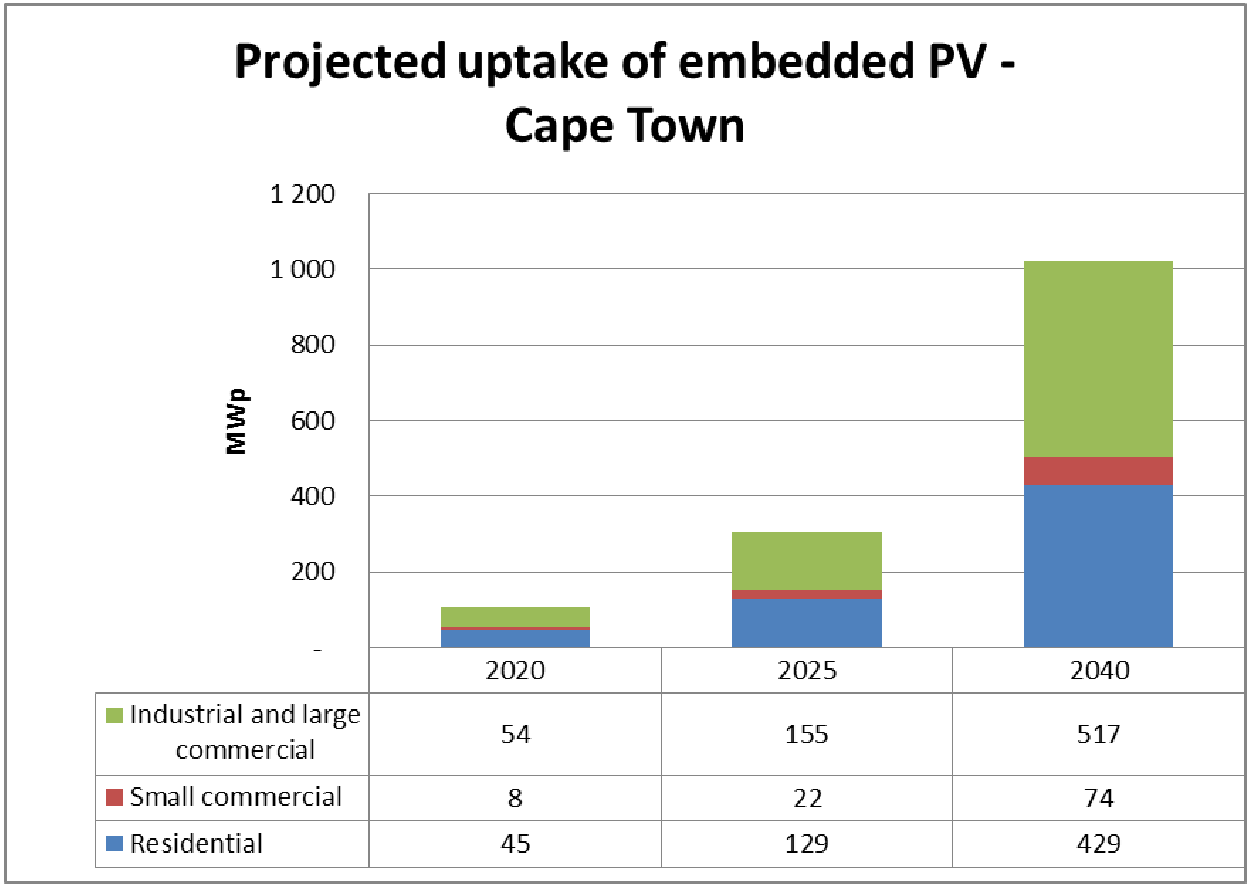
Embedded generation documents

- https://www.capetown.gov.za/en/electricity/Pages/ServiceApplicationForms.aspx
  - Application form
  - Supplemental contract
  - Guidelines

Projections into the future



	2020	2025	2040
Industrial and large commercial	54	155	517
Small commercial	8	22	74
Residential	45	129	429

- Cape Town grid has a limitation to absorb approximately 500MWp of embedded solar PV – if grid tied only.
  - This will be a concern in 10-15 years time - not an immediate challenge to managing the grid
  - Distributed battery storage will be able to increase this figure

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Zones for improvement – spatial/regulatory

Problem:

Only CCT supply area of Cape Town can grid tie

Solution:

National regulations for SSEG should speed up process– due out ? 2015

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Zones for improvement – technical/financial

Problem:
High cost of commissioning –
- PR (Eng) PR (Tech) signoff – R10 000-15 000

Poor/dangerous installations
Solution:
Training of competent persons (wireman's licence)
SANS 10142-1 has DC wiring, currently minimal installation experience in the market

Problem:
High cost of meter – R8 000 plus
Solution:
Cheaper bi directional prepaid meter/smart meter

Zones for improvement – tariffs

Problem:

Feed in tariff is substantially lower than electricity purchase tariff (for consumer - 57c sell, R1.10 buy)

Potential solution:

Utility scale battery storage , Eskom elec price higher than PV - could incentivise both City and embedded generators

Problem:

Prosumers not allowed

Solution:

Include in NERSA embedded gen regs

Zones for improvement – municipality

Problem:
Processing of PV applications

Solution:
Training of staff, additional positions to handle growth

Problem:
Municipal financial sustainability
Solution:
New municipal financial model required - 5yrs, designed to encourage EE and RE

Thank you

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