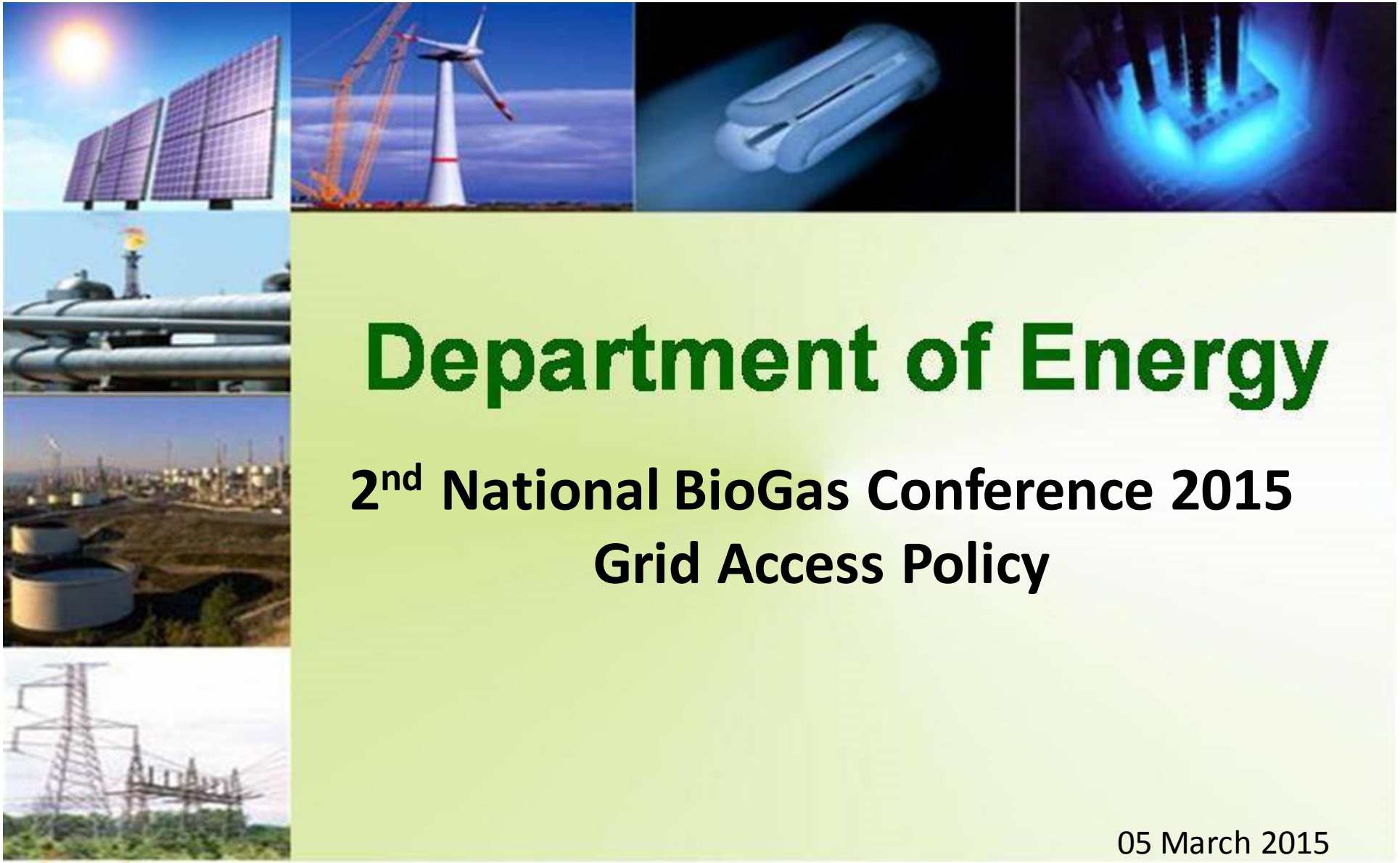

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2nd National BioGas Conference 2015
Grid Access Policy

05 March 2015

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Table of content

- Background
  - Overview of changing landscape in the RSA Electricity Supply Industry.
  - Integrated Resource Plan (20 year GX Expansion Plan)
- SA national electricity generation planning process
- Grid Focus
  - Role players in grid planning.
  - Current Grid Planning Methodology
  - Challenges in changing the historical landscape (Bid Window 1 & 2 REIPP)

Overview of a changing landscape

- Vertically integrated structure
- Most electricity is generated from coal (dominated by SoC)
- The country is faced with shortage of both Generation and Grid capacity.
- New Generation Capacity Regulations were promulgated **(in 2009)** giving legislative framework to Procurement of power from IPPs
- Integrated resource plan (IRP) was promulgated **(in 2011)** outlining the required generation capacity for the next 20 years
- The IRP 2010 advocates for a 42% renewable energy which includes Wind, Solar-PV, Solar-CSP (storage/no storage), Landfilgas, Biogass and Biomass power (**new capacity**)

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Focus on Grid Planning

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The Different Development Plans

Integrated Resource Plan

- The Department of Energy is accountable for the electricity capacity plan (IRP) as per recently published regulations.
- The Integrated Resource Plan (IRP) is intended to drive all new generation capacity development.
- NERSA licences new generators according to this determination.

Strategic Grid Plan

- The Strategic Grid Plan (Eskom) formulates long term strategic transmission corridor requirements
- Plan is based on range of generation scenarios, and associated strategic network analysis
- Horizon date is 20 years
- Updated every 2-3 years

Transmission Development Plan

- Transmission Development Plan (Eskom) presents transmission corridor requirements
- Plan covers a 10 year window
- Updated annually
- Indicates financial commitments required over 10 year period

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Integrated Resource Plan (IRP)

	New build options							
	Coal (PF, FBC, imports, own build)	Nuclear	Import hydro	Gas – CCGT	Peak – OCGT	Wind	CSP	Solar PV
	MW	MW	MW	MW	MW	MW	MW	MW
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	300
2013	0	0	0	0	0	0	0	300
2014	500[1]	0	0	0	0	400	0	300
2015	500[1]	0	0	0	0	400	0	300
2016	0	0	0	0	0	400	100	300
2017	0	0	0	0	0	400	100	300
2018	0	0	0	0	0	400[4]	100[4]	300[4]
2019	250	0	0	237[3]	0	400[4]	100[4]	300[4]
2020	250	0	0	237[3]	0	400	100	300
2021	250	0	0	237[3]	0	400	100	300
2022	250	0	1 143[2]	0	805	400	100	300
2023	250	1 600	1 183[2]	0	805	400	100	300
2024	250	1 600	283[2]	0	0	800	100	300
2025	250	1 600	0	0	805	1 600	100	1 000
2026	1 000	1 600	0	0	0	400	0	500
2027	250	0	0	0	0	1 600	0	500
2028	1 000	1 600	0	474	690	0	0	500
2029	250	1 600	0	237	805	0	0	1 000
2030	1 000	0	0	948	0	0	0	1 000
Total	6 250	9 600	2 609	2 370	3 910	8 400	1 000	8 400

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Firm commitment now

Final commitment in IRP 2012

1. Built, owned & operated by IPPs 2. Commitment necessary due to required high-voltage infrastructure, which has long lead time 3. Commitment necessary due to required gas infrastructure, which has long lead time 4. Possibly required grid upgrade has long lead time and thus makes commitment to power capacity necessary

National electricity planning process

Grid Question
(Capacity & Access)

IEP

IRP 2010-30

Feasibility Studies

Funding Plan

Allocation decision
(either Eskom or IPP)

Eskom

Designate Buyer

IPP Procurement

PPA

Build

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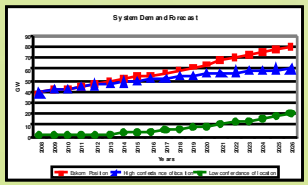
Capacity Planning vs Transmission Planning -Historical

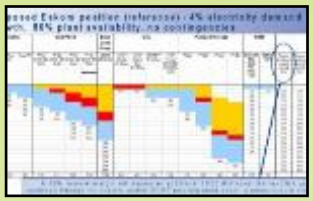
Volume & type

(a) Load Demand Forecast



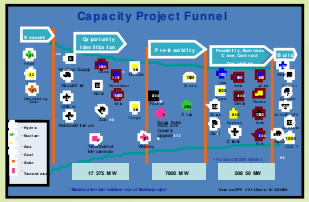
40 GW

(b) Capacity Plan

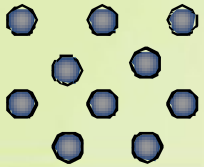


40 GW

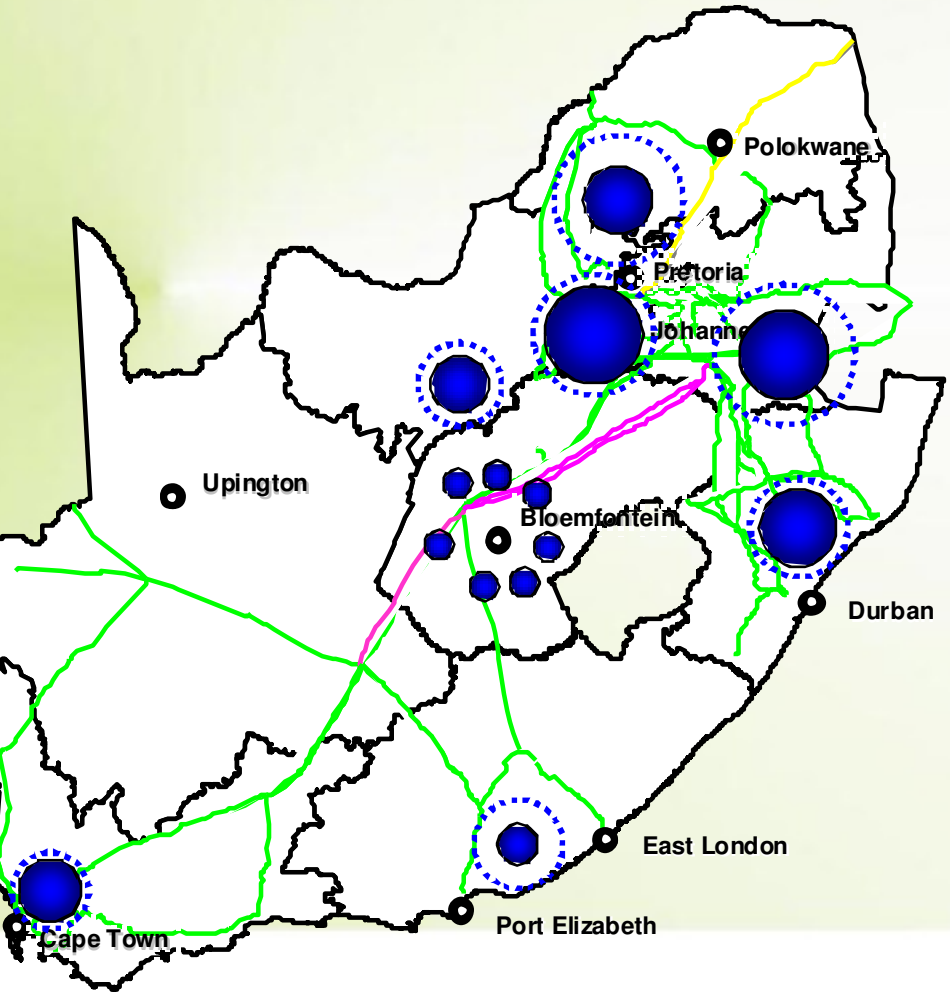
(c) Capital project funnel



>40 GW



Spatial & transportation



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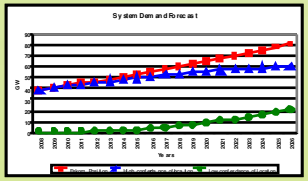
Current Transmission power flow

Current power pool

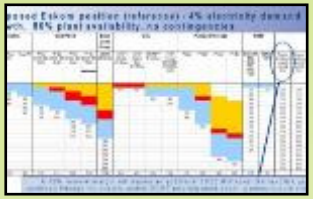
- Generation exceeds local load
- Other load centres require imports
- Tx designed to feed load centers from power pool

(a) Load Demand Forecast



40 GW

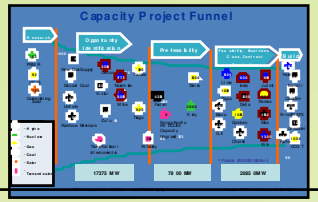
(b) Capacity Plan



40 GW

RTS Coal PS

(c) Capital project funnel



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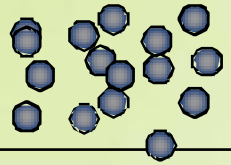

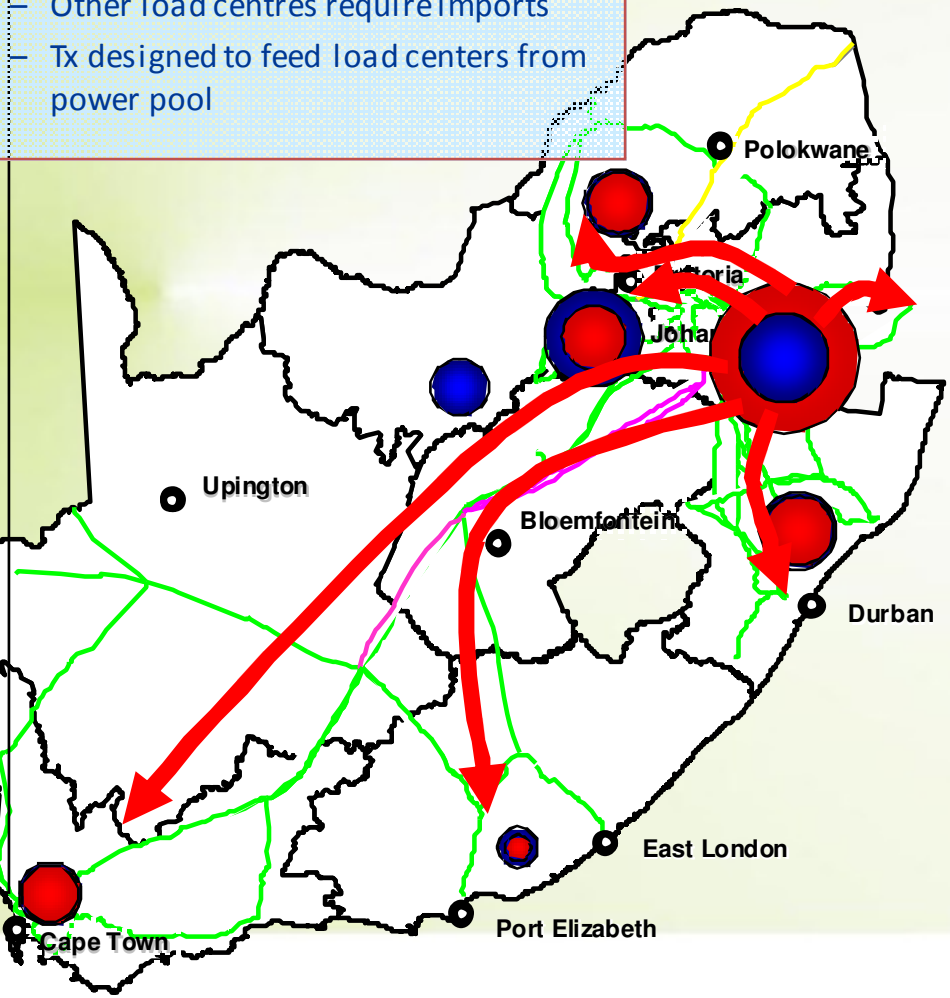

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RE-IPP BW 1 & 2 Grid Access Problems

- Access through one of the two grid owners;
  - ESKOM (Transmission level, Eskom owned Distribution)
  - MUNICIPALITY (Munic owned Distribution)
    - Only big municipalities (i.e. Metros)
    - Small municipalities simply do not have capacity.
- Challenges:
  - Initial "Connecting Plant" quotes hugely under estimated.
  - Connecting Plant construction timeframes longer that Generating Plant.
  - CoD of Connecting Plant not on schedule.
- Urgent need for coordinated grid planning across the country. <u>Policy directive required.</u>

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