Presentation by BioTherm Energy

Stakeholder Plenary Session

IRP for Electricity, 2010

An overview

- The IRP2 has an overly quantitative approach in which policy imperatives and energy inevitabilities are treated as variations on a central theme rather than basic inputs into an energy master plan
- Important information in the IRP is out-dated and erroneous, alternatively informed by hope rather than pragmatism
- If externalities are excluded in the base scenario then all modelling is done on a premise which is acknowledged by all to be erroneous even quantitatively speaking
- The scale of the challenges is consequently being underestimated
- We need an outcome from the IRP2 that is based on fact, is achievable and is not a wish list

An overly quantitative approach

- An appropriate IRP2 will from the beginning take equal cognizance of all relevant factors
- To a large extent these have been identified - congratulations
- However, not all are valued and weighed appropriately (“all animals are equal but some are more equal than others”)
- The methodology stipulated in Output sheet 1 states that the Electricity Regulations on New Generation Capacity is taken as a starting point
- Least cost excluding externalities becomes the baseline scenario
- From this a prima facie outcome is modelled which is then “adjusted” for risk factors, climate change, carbon taxes/emissions caps, policy directives etcetera
- Other scenarios thus come as afterthoughts
- Inevitably the implicit premise is “we’ll find what appears erroneously to be the least cost option and make adjustments for luxuries like climate change avoidance and government policy if we can afford it – then fit it into the Base Case”

Facts we cannot wish away

- Global failure to address climate change in time will lead to dangerous and possibly catastrophic climate change
- SA will be very hard pressed to comply with LTMS/Copenhagen objectives and any slippage whatsoever means that targets will be missed
- This we cannot afford – thus a need to include a safety buffer into our efforts to ensure we get it done even if things go wrong (“precautionary principle”)
- A carbon constrained world now is a non-negotiable fact - no longer a negotiable variation on a lowest cost energy-future
- A carbon tax changes the IRP profoundly and is probably unavoidable
- Eskom’s funding gap at present is not ZAR 14 billion (IRP1) but ZAR 190 billion
- The unavoidable PCP will have a dramatic effect on the marginal price of electricity
- We have the natural resources to build large renewable sectors in wind and solar and a significant Cogen sector
- Private capital is needed in the new build programme

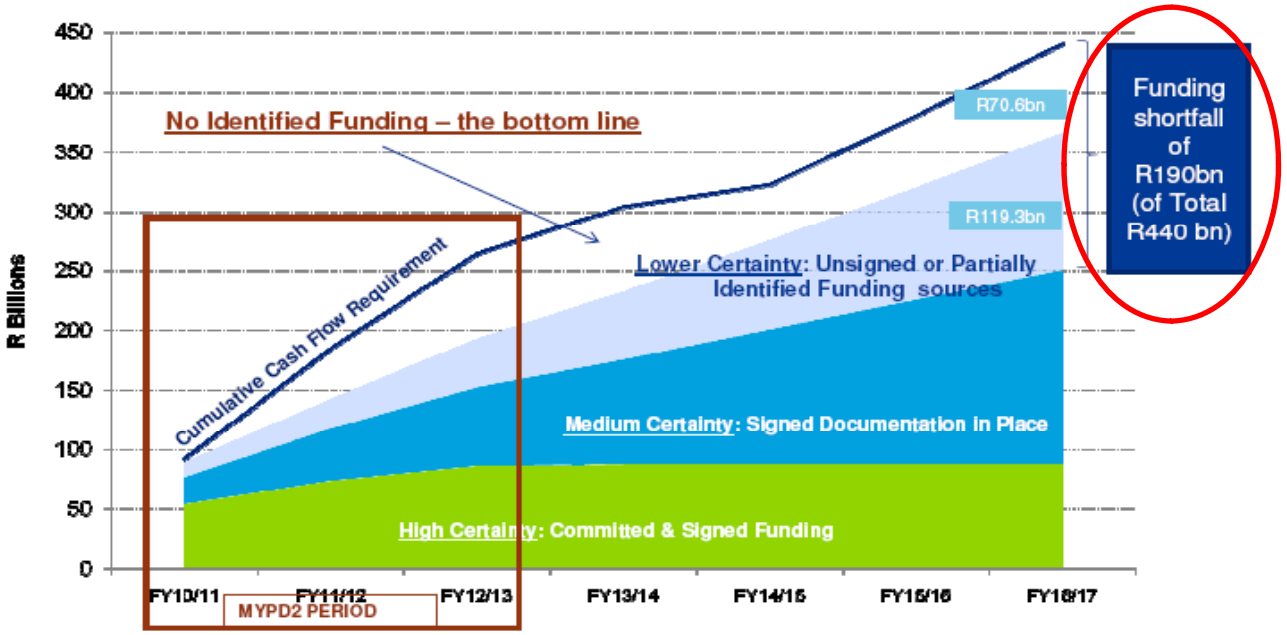
Eskom funding gap

- Eskom/DPE made a submission to Parliament on 4 May 2010

Unsigned and unidentified funding requirements amount to a total funding gap of R190 billion

Eskom

Cumulative Funding Requirement



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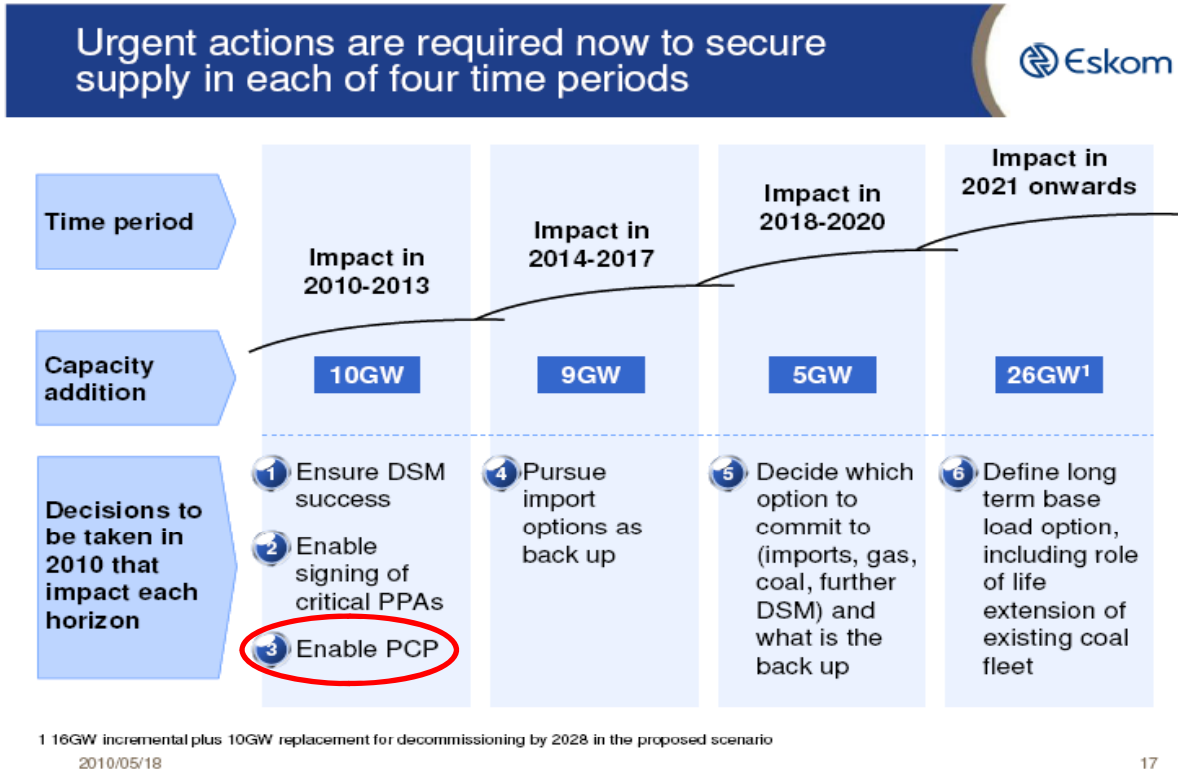
PCP

- 18 May 2010, Kannan Lakmeeharan, MD Systems Operations and Planning, Eskom, set out “Key decisions to be taken to secure electricity supply to 2028”, which included the following:



Carbon tax – not a nicety but policy

"Strategy options summary

- With reference to South Africa's mitigation strategy, Cabinet adopted the following approach:
- The Start Now strategic option, as outlined in the LTMS, will be further implemented. This is based, amongst others, on **accelerated energy efficiency and conservation across all sectors**, including industry, commerce, transport and residential, inter alia through more stringent building standards.
- Government will invest in the Reach for the Goal strategic option by **set**ting **ambitious** research and development **targets** focusing on **carbon-friendly technologies**, identifying new resources and **effecting behavioural change**.
- Furthermore, regulatory mechanisms as set out in the Scale Up strategic option will include a scaling-up of the actions taken in the early years of Start Now. In Scale Up, South Africa **achieves** this **higher level** of ambition through **regulatory decisions**. These will be combined with economic instruments such as taxes and incentives under the Use the Market strategic option, with a view to:
- Setting ambitious and mandatory (as distinct from voluntary) targets for energy efficiency and in other sub-national sectors. In the next few months each sector will be required to do work to enable it to decide on actions and targets in relation to this overall framework.
- Based on the electricity-crisis response, government's energy efficiency policies and strategies will be continually reviewed and amended to reflect more ambitious national targets aligned with the LTMS.

- Increasing the price on carbon through an escalating CO2 tax, or an alternative market mechanism……"

Source: 25degrees.net http://www.25degrees.net/index.php?option=com_zine&view=article&id=90:sa-governments-vision-strategic-direction-and-framework-for-climate-change-policy&Itemid=81

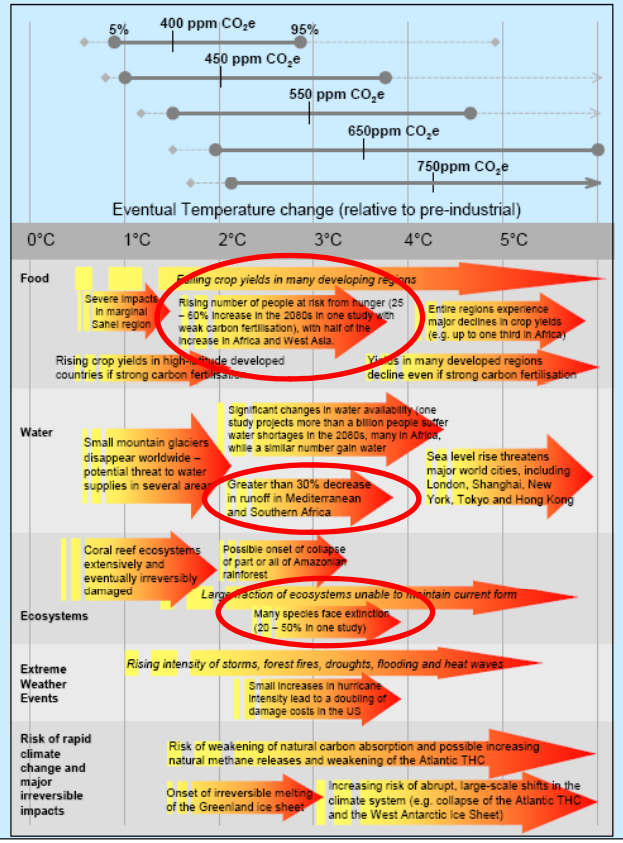
Precautionary principle

- Enshrined in SA environmental legislation and accepted globally
- Requires a cautious approach
- In grave matters like climate change and energy security a safety buffer should be built into planning to ensure targets can be reached even if some things go wrong along the way.
- Moreover: LTMS may be less than the international community and/or the evolving science asks of us.
- Other countries may default leaving us to do more
- Thus we must do more than we think we need to do, quicker than we think we need to do it.
- This is a normative/qualitative approach that is in contrast with the primarily quantitative approach to the IRP (lowest cost base case)

Science and the results of not staying within limits that avoids dangerous climate change

- The World Health Organisation estimates that climate change already causes 150,000 deaths per year (http://www.who.int/heli/risks/climate/climatechange/en/index.html)
- Stern Report and Others: **"It is less expensive to avoid profound climate change than to mitigate the effects later on."** What we can expect in addition to fatalities are crop failures, water shortages, environmental refugees, etcetera http://news.bbc.co.uk/2/shared/bsp/hi/pdfs/30_10_06_exec_sum.pdf

Figure 2 Stabilisation levels and probability ranges for temperature increases
The figure below illustrates the types of impacts that could be experienced as the world comes into equilibrium with more greenhouse gases. The top panel shows the range of temperatures projected at stabilisation levels between 400ppm and 750ppm CO_2e at equilibrium. The solid horizontal lines indicate the 5 - 95% range based on climate sensitivity estimates from the IPCC 2001[2] and a recent Hadley Centre ensemble study[3]. The vertical line indicates the mean of the 50th percentile point. The dashed lines show the 5 - 95% range based on eleven recent studies[4]. The bottom panel illustrates the range of impacts expected at different levels of warming. The relationship between global average temperature changes and regional climate changes is very uncertain, especially with regard to changes in precipitation (see Box 4.2). This figure shows potential changes based on current scientific literature.



Combination of facts we can't wish away – (1)

Cogen / wind is competitive

- Cogen priced at the MTPPP ceiling price and wind at REFIT are competitive within 5-6 years with an adjusted projected Eskom Megaflex tariff (carbon tax)
- This calculation only includes carbon pollution costs, none of the other externalities and/or pollutions costs associated with coal based power generation – see http://www.timeslive.co.za/opinion/article356158.ece
- Eskom does not have to raise the capital for these projects – IPP's will

				c/kWh	*c/kWh*	*c/kWh*	*c/kWh*			
	A	*B*	*C*	*A*	*B*	*AC*	*BC*			
Year	**% inc (worst)**	**% inc (best)**	**Add Carbon Tax**	**Tariff (No Carbon)**	**Tariff (No Carbon)**	**Tariff (With Carbon)**	**Tariff (with Carbon)**	**MTPPP Ceiling**	**REFIT Wind**	**Wind diff**
2009	32%	32%	0%	34.00	34.00	34.00	34.00	105.00	125.00	91.00
2010	25%	25%	0%	42.50	42.50	42.50	42.50	111.30	132.50	90.00
2011	25%	25%	40%	53.13	53.13	70.13	70.13	115.75	137.80	67.68
2012	25%	25%	0%	66.41	66.41	87.66	87.66	122.70	146.07	58.41
2013	25%	20%	0%	83.01	79.69	109.57	105.19	130.06	154.83	45.26
2014	25%	20%	0%	103.76	95.63	136.96	126.23	137.86	164.12	27.16
2015	25%	20%	0%	129.70	114.75	171.20	151.47	146.13	173.97	2.77

Combination of facts we can't wish away – (2)

PCP will affect prices on the margin

- With PCP unavoidable and penalties as mooted (ZAR 2,80 – ZAR 9,00/kWh) these will become the marginal electricity prices.
- All cogen and wind will be competitive (and even some solar)
- Model this if the IRP is to be a robust and useful document

Combination of facts we can't wish away – (3)

IPP's are essential

- The Eskom funding gap is significant and no viable plan has been suggested to bridge it.
- Energy security requires capital to be sourced from the private sector - IPP's must thus be encouraged.
- Significant private capital available for Cogen and renewables
- Many IPP companies are in full development mode even in the absence of an enabling regulatory framework
- Clean energy IPP's will fill the funding gap and rapidly move South Africa towards a lower carbon future.
- Full cost accounting shows this to be affordable compared to other options

Combination of facts we can't wish away – (4)

Everything fits together

- Energy security, climate change, Eskom funding all create certain challenges.
- All of the above are addressed by enabling clean energy IPP's
- This requires an IRP based on current fact – with the right balance of quantitative and qualitative inputs

A quantitative approach including the essential truths and policies will work

- The analysis above was carried out in a quantitative manner but with the inclusion of correct data and policy imperatives
- It yielded a compelling argument for clean energy
- The IRP process will also render a robust and useful outcome if the correct assumptions are made
- Sufficient weight must be given to policy imperatives
- “Willing buyer-willing seller” principle must persist
- In principle, being “in” or “out of ” the IRP should be irrelevant to getting a generation license – each case to be decided on its own facts

Thank you