IRP 2010 Assumptions

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Outline

- Process
- Methodology
- Parameters
  - Comments selective and limited

Process

- Current process is a very significant advance on previous electricity planning processes in South Africa.
- However, there is still a lack of integration between different planning and policy processes in the electricity sector – Renewable Energy White Paper review, Integrated Energy Plan, climate change policy process, and the already-completed nuclear energy policy.
- Concern re the speed at which the planning process is proceeding. E.g. no time to comment properly on the full EPRI report
- We would like clarity on how often the IRP will be repeated – every year, every two years? Less often?
- Need an agreed set of indicators to decide on optimal scenario – this is NOT clear currently

Process – missing data

- It is not possible to comment comprehensively on the 'assumptions' for the IRP when many critical assumptions are missing from the 'stakeholder information pack', or unclear:
- Two key sets of assumptions for the model:
  - Costs and technical parameters – differences between the EPRI executive summary and the full report – too late to comment
  - Demand forecast – not included in the assumptions
- Others
  - Key technology assumptions - build rates not stated
  - Multi-criteria decision analysis assumptions – not stated
  - Economic modeling assumptions – not stated

Methodology Issues

- Integrated Resource Plans should involve a detailed assessment of demand-side resources as well as supply-side resources – this results in a true least-cost plan for the electricity sector, since demand-side resources (energy efficiency / DSM measures) are almost inevitably cheaper than supply-side resources. The current methodology will very likely NOT result in a least-cost plan.
- It is understandable that we face severe data constraints concerning demand-side resources – if possible, energy efficiency measures should be costed in some way and compared with supply investment required for increased demand in the absence of a more ambitious energy efficiency strategy.
- Economic impact assessment – required to explore the implications of the investment plan to other policy goals, but not stated in the current assumptions
- External costs not considered – without externalities, full costs to the economy will not be taken into account.

Key Parameters - Demand

- No indication of what the demand projection will be yet, but if similar to the draft IRP 1, and the MYPD application, demand forecasts seem to be high. Significant expert dissent on demand growth assumptions, given the real price rise projected for the next 20 years or so.
- Three key issues:
  1. Extent of an energy efficiency programme – an ambitious programme could drop demand by 15-30% by 2030 in relation to a reference case, which would have a dramatic impact on investment requirements.
  2. Price elasticity – not well understood in SA. This will potentially have a very significant impact on future demand. Not clear whether this will be incorporated into the modeling.
  3. Demand is partly a function of other government policies – e.g. industrial policy, trade policy.

Modeling different demand projections

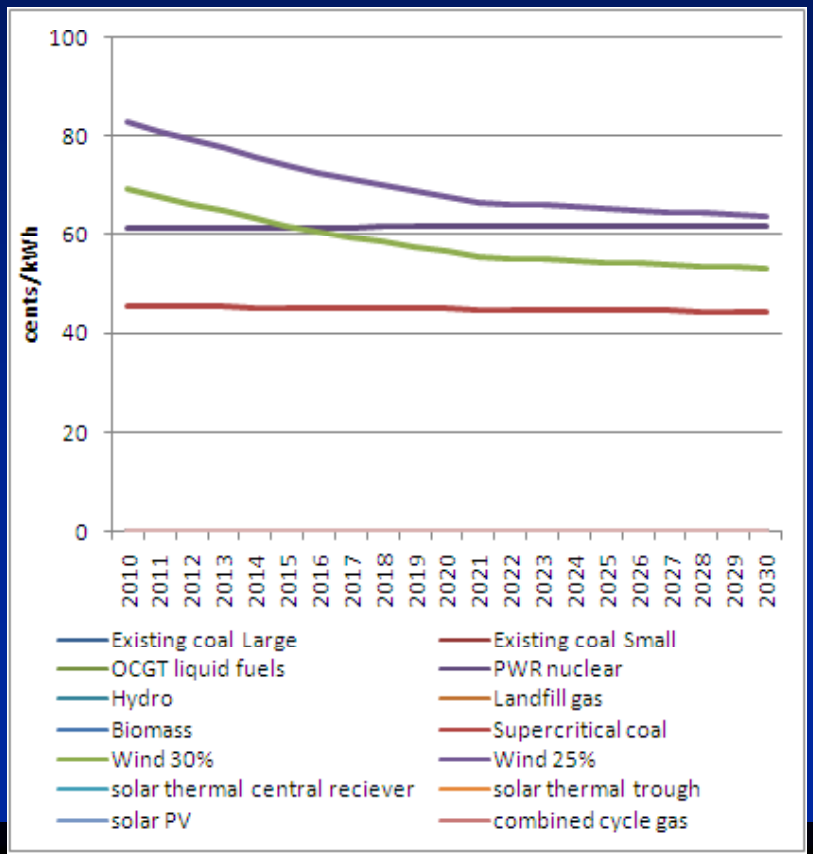
- These issues require that sensitivities be run which will take different demand growth possibilities and levels of energy efficiency into account. As is commonly done in other IRP planning processes, e.g. the US Pacific Northwest's IRP process, which models several energy efficiency demand scenarios.
- The additional investment costs of NOT implementing an aggressive energy efficiency programme should be assessed. Energy modeling for the LTMS and other subsequent electricity sector models, indicates that the avoided investment costs resulting from an energy efficiency programme are very significant.
- Demand implications of shifting industrial policy should be assessed.

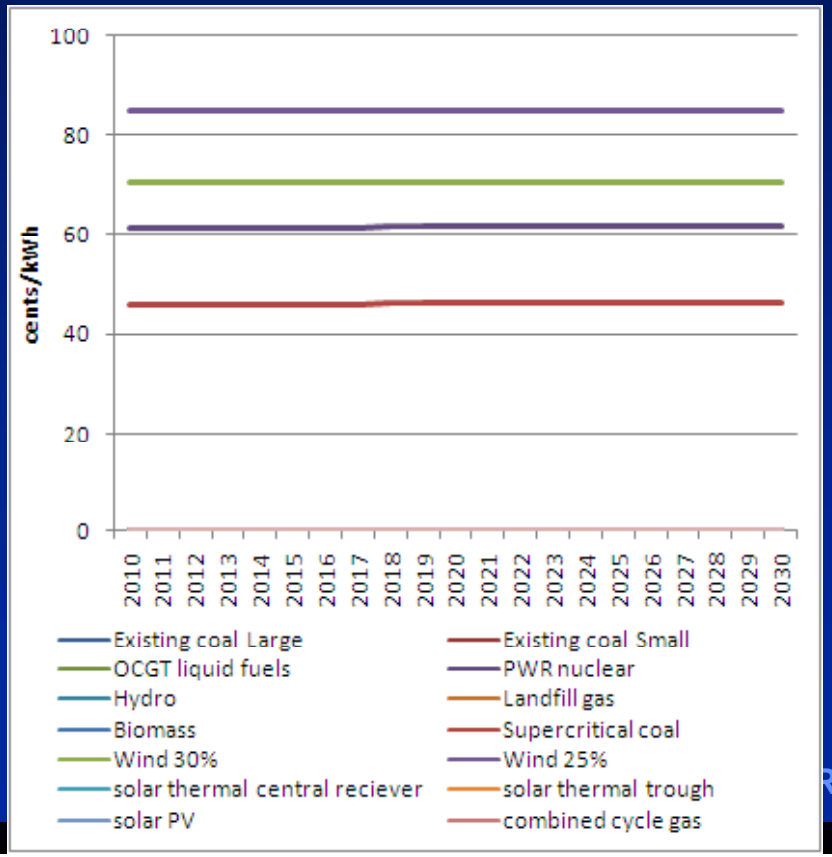
Key Parameters – Costs and Technology Parameters

- EPRI report is a good basis for debate on costs and technology parameters – independent, detailed, transparent.
- BUT – difficult to comment on the technical parameters at this stage, since
  - a) the full report has only been available since yesterday, and
  - b) there are inconsistencies between the previously-released Executive Summary, and the full report. Significant changes in costs (e.g. coal cost triples).
- Initial comments (incomplete)
  - Solar thermal costs and capacity factor – high sensitivity in models to capacity factor – lower than most other estimates with storage?
  - Solar thermal water use – very high, assuming dry cooling?
  - Nuclear plant life – 60 years is too long compared to other technologies without mid-term refurbishment?
  - Fuel price escalation – assumed to be zero – too optimistic?

Key Parameters – Costs and Learning Curves

- Technology learning is a well-recognised phenomenon, and has a significant impact on the relative costs of technologies in the long term – does not currently seem to be taken into account in the IRP process. E.g. (EPRI costs, 8% discount rate), with learning assumptions, wind become cheaper than nuclear in around 2014. Without learning, it does not compete.





Key Parameters – Carbon Constraint

- 2020 targets submitted by SA to the UNFCCC in terms of the Copenhagen Accord require that national emissions be limited from 2020 onwards.
- SA will thus have a national emissions budget. A certain proportion of this will be allocated to electricity. Historical figures, and modeling for the LTMS, indicate that, the share for electricity emissions should be between 45%, in 2020, and 35% in 2030.
- These targets would be very difficult to meet due to Medupi and Kusile, and therefore a realistic target for 2020 might be closer to 50%.

Other Parameters

- **Discount rate** – should use a social discount rate
  - IPCC recommended 3% for long-term climate mitigation planning
  - 8% (used by the Treasury) real discount rate
  - 10.3 too high?
- **Price elasticity** – unrealistically low (-0.2), but given that the electricity price is about to rise significantly, this is very important. Recent studies indicate that possible values could be -0.4 (Inglesi and Blignaut).

Other Parameters and issues

- **Energy efficiency** and other related measures – should be considered as the most important resource option, and the IRP should reinforce this.

The size of the programme should be an output of the IRP, not an input.

- **Technology input sheets** – should include sheets for coal and for separate renewable technologies, with in-depth assessments
- **Energy for poor households** – assessments of the impact of the investment plan on energy provision to poor households, and potential measures to mitigate negative impacts, should be an important part of the IRP process.

Thanks!