ELA JHB: IRP2 Presentation

Contents

1. Climate Change & LTMS
2. Atomic Errors
3. Assumptions
4. Need for Flexibility
5. FBE, Poverty & Service Delivery

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1. Climate Change & LTMS

- For all its flaws, the LTMS was quite clear on what is required:

"Required by Science peaks quite early, in 2020, at around 470 Mt CO2-eq, and then declines"
--LTMS, pg.10

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1. Climate Change & LTMS

- Anything above this level will have significant cost implications
- Following Stern Review, USD85 a tonne of $CO_{2\text{-}eq}$ on a BAU scenario
- The IRP2 is required to follow this approach, in terms of the Constitution and DoE's own policy

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"Government policy is to remove distortions and encourage energy prices to be as cost-reflective as possible. To this end prices will increasingly include quantifiable externalities."

--Section 3.2.2.3, White Paper on Energy 1998

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2. Atomic Errors

- Is this really just a plan to justify nukes?
- Pg. 66 states that nuclear fleet has high risk attached, more than RE
- Overnight costs are very low, off by about R40bn per plant
- No data on maintenance cost, types of plants considered, carbon emissions, expansion of NNR, decommissioning costs (or fund), Koeberg costs, liability costs, and so on

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Table 8
Lifecycle estimates for electricity generators[a]

Technology	Capacity/configuration/fuel	Estimate (gCO_2e/kWh)
Wind	2.5 MW, offshore	9
Hydroelectric	3.1 MW, reservoir	10
Wind	1.5 MW, onshore	10
Biogas	Anaerobic digestion	11
Hydroelectric	300 kW, run-of-river	13
Solar thermal	80 MW, parabolic trough	13
Biomass	Forest wood Co-combustion with hard coal	14
Biomass	Forest wood steam turbine	22
Biomass	Short rotation forestry Co-combustion with hard coal	23
Biomass	FOREST WOOD reciprocating engine	27
Biomass	Waste wood steam turbine	31
Solar PV	Polycrystalline silicone	32
Biomass	Short rotation forestry steam turbine	35
Geothermal	80 MW, hot dry rock	38
Biomass	Short rotation forestry reciprocating engine	41
Nuclear	Various reactor types	66
Natural gas	Various combined cycle turbines	443
Fuel cell	Hydrogen from gas reforming	664
Diesel	Various generator and turbine types	778
Heavy oil	Various generator and turbine types	778
Coal	Various generator types with scrubbing	960
Coal	Various generator types without scrubbing	1050

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3. Assumptions

- Stable exchange at R7.50:USD1
- No reasons given for high localisation rating of Revised Balance Scenario
- Assumes a booming economy for the next 25 years, no provision for recessions, etc.
- Large discrepancy on CSIR vs System Operator figures in terms of GDP and demand; large enough to fit a nuclear fleet
- Not clear why SO favoured; noting difference between SO projections in MYPD2 and IRP2 for the same time period

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4. Need for Flexible Approach

- Price elasticity, transmission, distribution, location of plants are not known or represented in IRP2
- GDP and demand figures speculative
- Exchange rate uncertainty, learning rates also uncertain, climatic changes coming (less water availability), oil price shocks, etc.
- Some costs are not even known, such as nuclear costs
- Therefore a flexible approach is need; casting things in concrete is unwise, but that is what the IRP2 is seeking to do.

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Thank You

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