NIASA's initial thoughts on the IEP and IRP Drafts (2016)

Presentation to IRP public hearing sessions

Gauteng: Birchwood Hotel (7 Dec. 2016)

Dr Dawid Serfontein

History

- The 2012 versions of the IEP and IRP Update both allocated some capacity to nuclear power. According to Government decision it would be 9.6 GW of new nuclear power plant capacity up till 2030.
- However this has been met with strong resistance from civil society.
- NIASA has reviewed the 2012 versions of the IEP and IRP and found several serious shortcomings, especially that externality costs were not taken into account.
- This was communicated to the Externalities sub-committee of the IEP Update process.

History

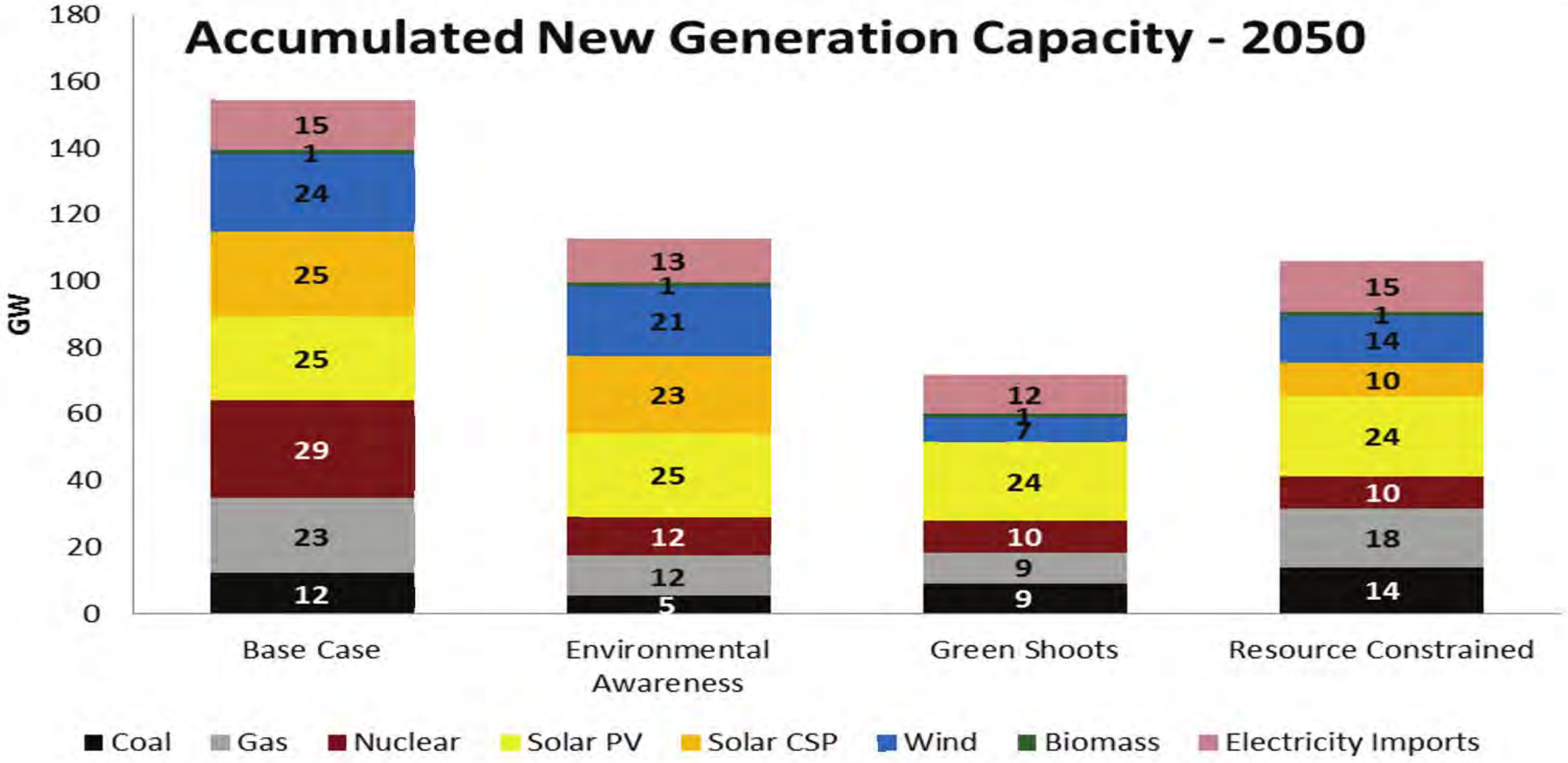
- Several well-known academics and institutions recently claimed that it will be more profitable for South Africa (SA) to replace the said new nuclear capacity with a mixture of PV-solar panels, wind turbines and gas turbines
- However, Eskom claimed that the wind and PV-solar power that DOE forces Eskom to buy through the REIPPP is largely useless, as it arrives at the wrong time of day.

IRP (2016)

- **The new IEP takes Externality Costs much more seriously:**
  - Climate change cost of CO_2 emissions up from R150/ton to R270/ton!
  - With 947.3 g CO_2 released/kWh

    = R0.26/kWh CO_2 damage cost.
  - Therefore Coal is squeezed out and nuclear and renewables are in:

    Nuclear = 10 to 29 GW by 2050, depending on the scenario selected.


Accumulated New Generation Capacity - 2050
GW
180
160
140
120
100
80
60
40
20
0
15
1
24
25
25
29
23
12
13
1
21
23
25
12
12
5
12
1
7
24
10
9
9
15
1
14
10
24
10
18
14
Base Case
Environmental Awareness
Green Shoots
Resource Constrained
Coal
Gas
Nuclear
Solar PV
Solar CSP
Wind
Biomass
Electricity Imports

IRP (2016)

- Different from the IEP, the IRP Update uses a zero carbon cost, but rather applies a maximum annual limit to CO_2 emissions.
- Coal is thus not penalised for CO_2, until the limit is reached in a decade or two!
- Therefore Coal cost is only = R0.89/kWh
- Cheaper than Nuclear = R0.97/kWh.
- Therefore nuclear squeezed out to 2037.

IRP (2016)

- However, this is unfair as Coal CO_2 is not penalised, until the limit is reached!
- Therefore, if we rightly add the R0.26/kWh CO_2 damage cost, coal's true cost moves up to = R1.15, which is much more expensive than the competing options.
- Coal would then be replaced by nuclear at = R0.97/kWh.
- Therefore nuclear should then come in well before 2037.

IRP (2016)

- IRP estimated PV and wind costs are at about R0.85/kWh, which is much higher than the minimum of R0.60 in REIPPP(4) (?)
- Yearly capacity additions restricted to 1000 MW PV and 1600 MW wind, due to the problems that their intermittency causes on the grid.
- This means that even if wind and PV were to become much cheaper than the competing options, they will only be deployed in limited quantities, which creates scope for nuclear.

NIASA
Nuclear Industry Association of South Africa

Conclusions

- Externality costs are reasonably well allocated in IEP, except for methane discharges of imported LNG and strategic risks od imported hydro power.
- Externality costs are badly allocated in the IRP, which skewed the process in favor of coal and in favor of imported LNG to support the intermittency of renewables.
- This should urgently be corrected, otherwise society will suffer.

NIASA
Nuclear Industry Association of South Africa

THANK YOU

CONTACT: Knox Msebenzi: Managing Director

Email: knox@niasa.co.za