

Comments on the Integrated Resource Plan 2016 Draft

South African Integrated Resource Plan 2016 public hearing

Ministerial Advisory Council on Energy (MACE)

Johannesburg, 7 December 2016

MACE IRP 2016 Working Group

Mike Levington (Chair)

Prof Johan van Dyk

Prof Anton Eberhard

Dr Tobias Bischof-Niemz

Agenda

Process

IRP Analyses

MACE Recommendations

Process

Ministerial Advisory Council on Energy (MACE) met on 16 September 2016 in Pretoria

- IRP Base Case was presented to full MACE
- MACE articulated concerns regarding the IRP Base Case, specifically with respect to artificial limits on renewables
- The Minister of Energy established a MACE Working Group consisting of four members to interrogate the IRP assumptions on behalf of MACE, such that MACE can report back to her

MACE Working Group subsequently requested information from the DoE IRP team, which was partially received

The information provided by the DoE IRP team included the “Unconstrained Base Case” – Base Case, but RE limits lifted

MACE Working Group, with input from MACE, submitted a memo to the Minister on 31 October 2016, recommending

1. To lift the artificial new-build limits for renewables and make this unconstrained model the Base Case
2. To re-run the model with corrected relative costing for solar PV and wind
3. To quantify and report back on cost implications of any constraint that leads to a deviation from the unconstrained least-cost Base Case under 1.

The IRP 2016 Draft, published on 22 November 2016, did not take into account any of MACE’s recommendations

The MACE Working Group requested from the Minister of Energy the permission to make the memo dated 31 October 2016 part of the public consultation process of the IRP 2016, which was subsequently granted by the Minister

Agenda

Process

IRP Analyses

MACE Recommendations

Agenda

Process

IRP Analyses

- Artificial limitations on Solar PV and Wind
- Too high relative costing for Solar PV and Wind
- Quantification of cost implications of any deviation from least-cost

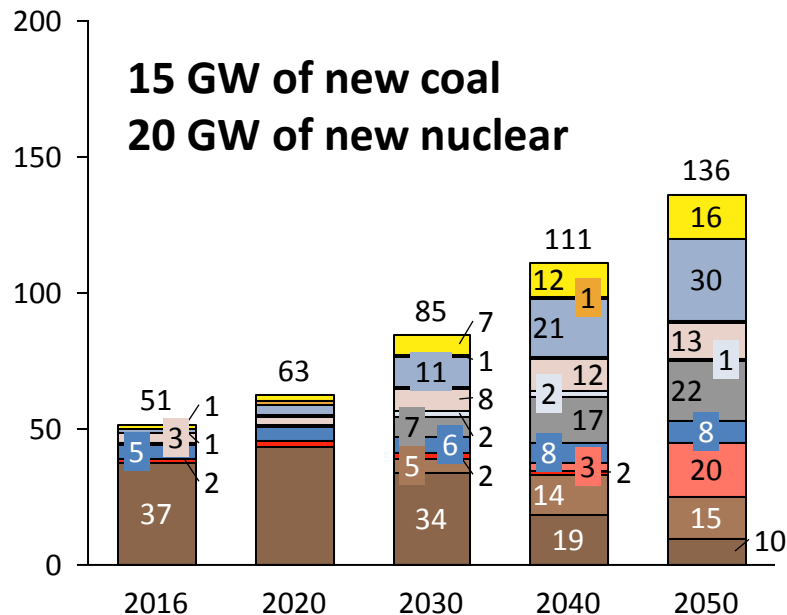
MACE Recommendations

Limits on renewables → significant consequences for electricity mix

Comparison of generation capacity for IRP 2016 Base Case and IRP 2016 Base Case without RE constraints

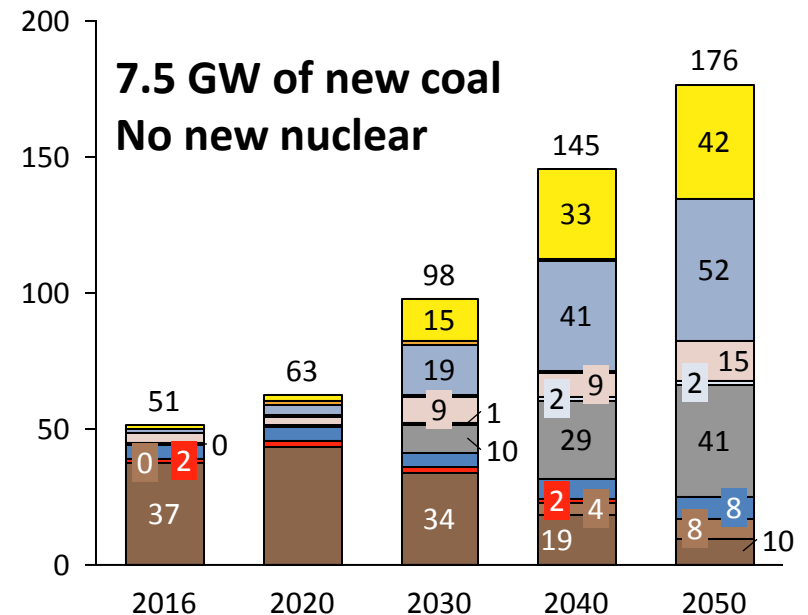
IRP 2016 Base Case: least cost with RE Limits

Total installed net capacity in GW

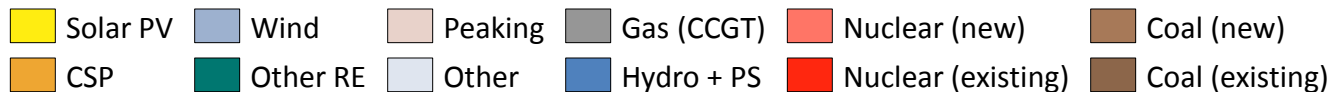


IRP 2016 Base Case: least cost without RE limits

Total installed net capacity in GW



Only change:
Removal of
RE limits



IRP 2016: Annual new-build limits for solar PV and wind are constant in absolute terms but decrease relative to the size of the power system

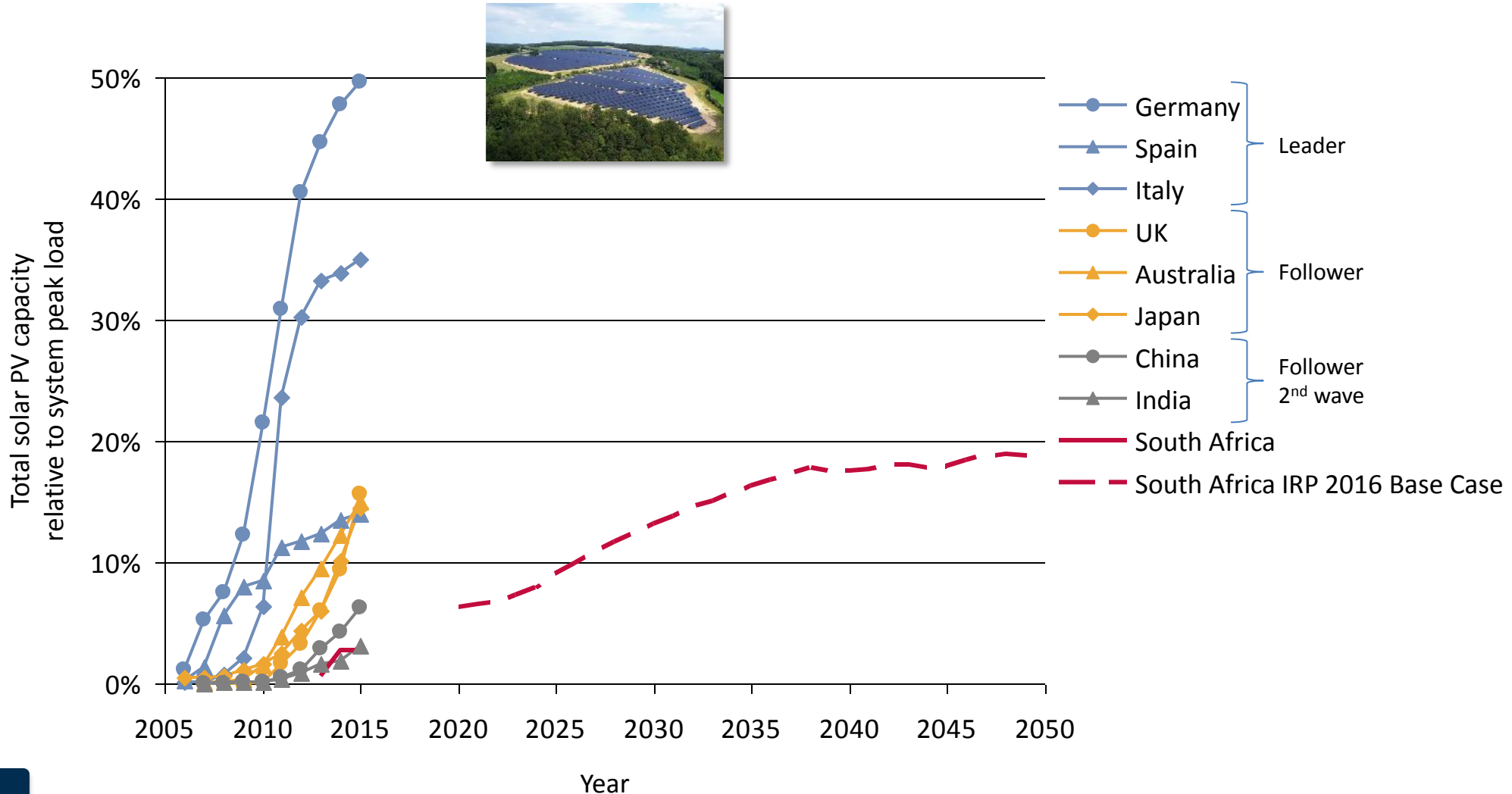
IRP 2016 Base Case

The imposed new-build limits for solar PV and wind mean that the IRP model is not allowed in any given year to add more Solar PV and Wind capacity to the system than these limits

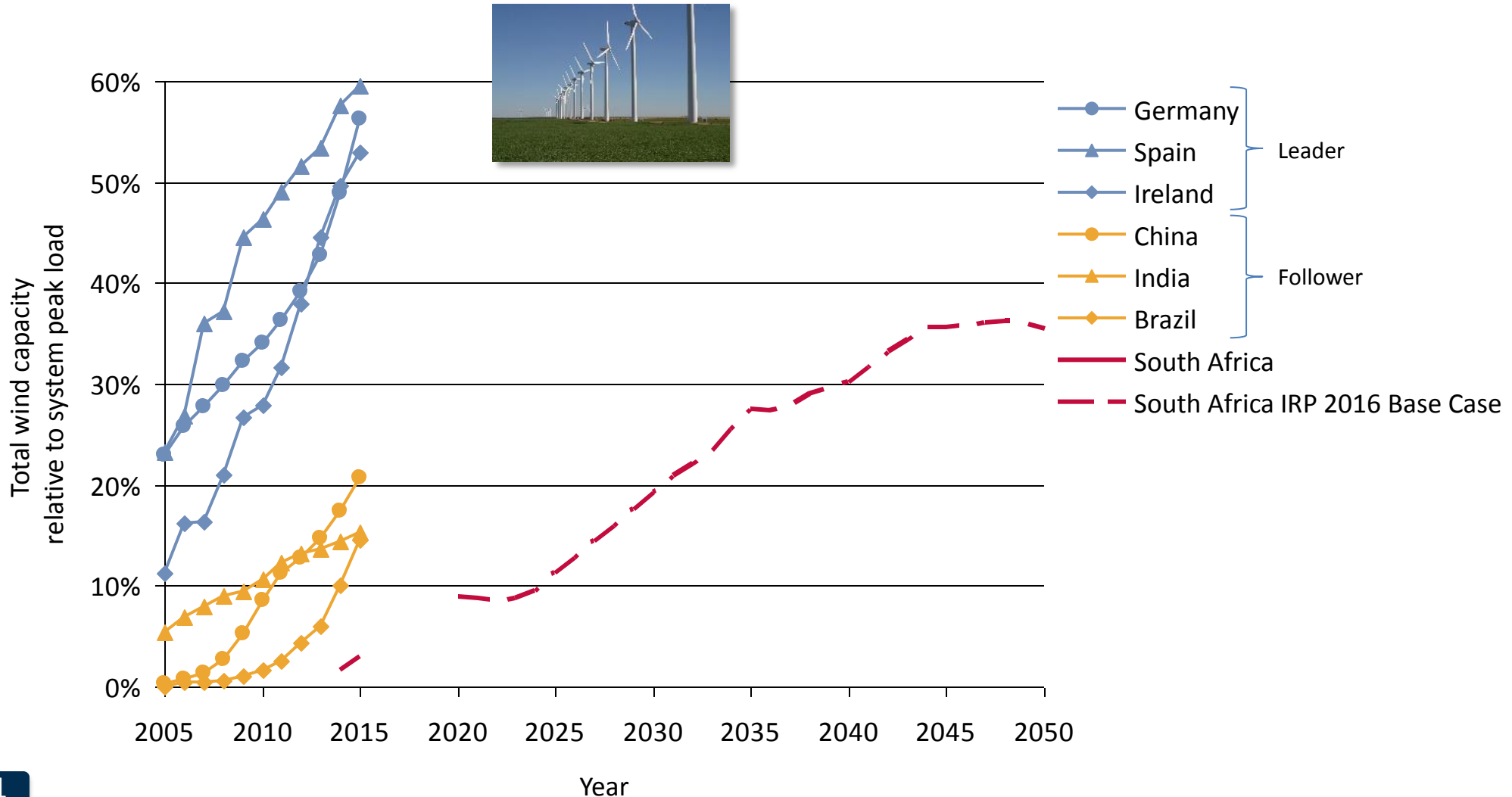
No such limits are applied for any other technology. No technical justification is provided for these limits. No explanation is given why these limits are constant over a 30-year period while the power system grows.

Year	System Peak Load in MW	New-build limit Solar PV in MW/yr	Relative new-build limit Solar PV	New-build limit Wind in MW/yr	Relative new-build limit Wind
2020	44 916	1 000	2.2%	1 600	3.6%
2025	51 015	1 000	2.0%	1 600	3.1%
2030	57 274	1 000	1.7%	1 600	2.8%
2035	64 169	1 000	1.6%	1 600	2.5%
2040	70 777	1 000	1.4%	1 600	2.3%
2045	78 263	1 000	1.3%	1 600	2.0%
2050	85 804	1 000	1.2%	1 600	1.9%

Today: Solar PV penetration in leading countries 2.5 times RSA's plan for 2050 – follower countries already today almost at RSA's 2050 level



Today: Wind penetration in leading countries almost twice RSA's plan for 2050 – follower countries already today at 60% of RSA's 2050 level



Agenda

Process

IRP Analyses

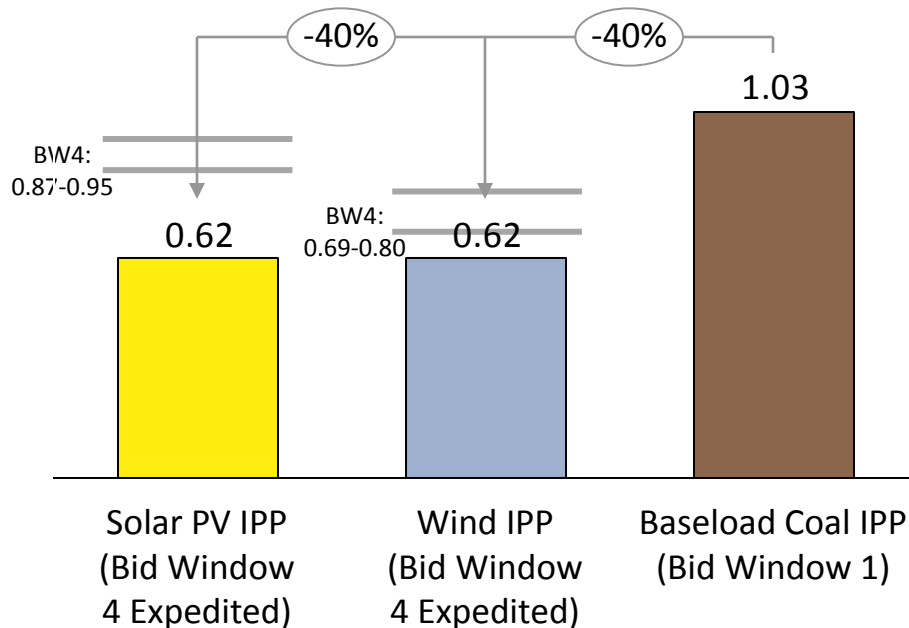
- Artificial limitations on Solar PV and Wind
- Too high relative costing for Solar PV and Wind
- Quantification of cost implications of any deviation from least-cost

MACE Recommendations

Actual tariffs for new solar PV and wind are 40% cheaper than new baseload coal, whereas IRP 2016 assumes similar LCOE for all three

Actual tariffs from RE IPP and Coal IPP Procurement Programme

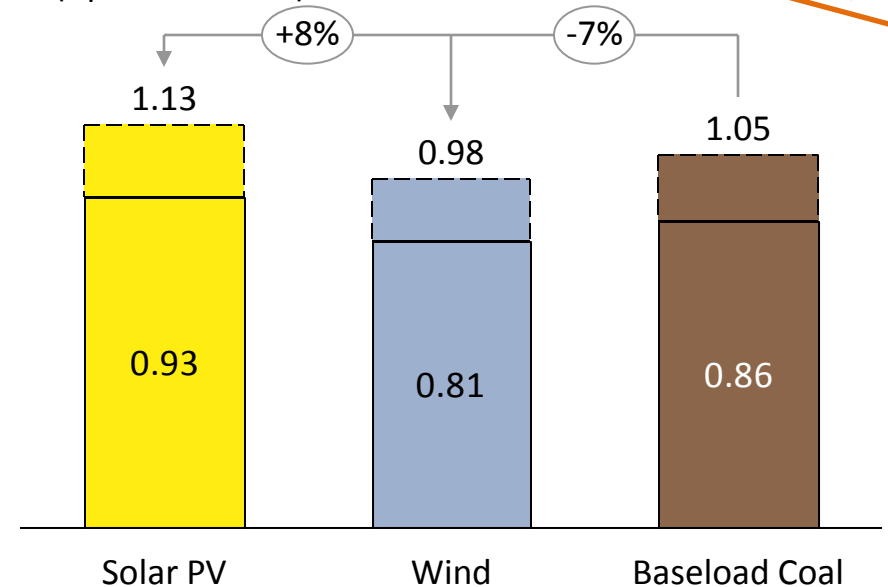
Actual average new-build tariffs in R/kWh (Apr-2016-Rand)



IRP 2016 cost input assumptions

IRP 2016 model input assumptions in R/kWh (Apr-2016-Rand)

As per IRP 2016, inflated to April-2016-Rand, ODCs + grid connection added



Agenda

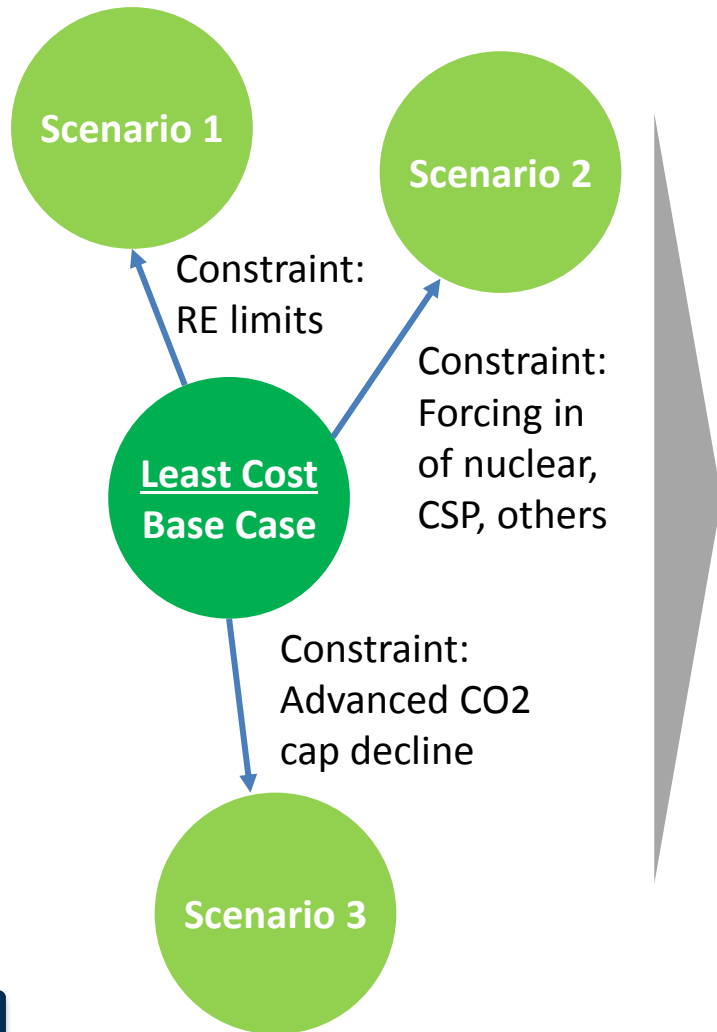
Process

IRP Analyses

- Artificial limitations on Solar PV and Wind
- Too high relative costing for Solar PV and Wind
- Quantification of cost implications of any deviation from least-cost

MACE Recommendations

IRP Base Case should be least-cost without any artificial constraints



Case	Cost
Base Case	Base
Scenario 1	Base + Rxx bn/yr
Scenario 2	Base + Ryy bn/yr
Scenario 3	Base + Rzz bn/yr
...	...

- 1) Public consultation
- 2) Policy adjustment of Base Case
- 3) Final IRP

Agenda

Process

IRP Analyses

- Artificial limitations on Solar PV and Wind
- Too high relative costing for Solar PV and Wind
- Quantification of cost implications of any deviation from least-cost

MACE Recommendations

MACE makes three recommendations for the IRP 2016

- 1 The Base Case of the IRP 2016 should be least-cost and without any artificial constraints**
 - Consistent with the approach used in IRP 2010, the scenario that forms the Base Case must be least cost and free of any policy adjustments
 - MACE therefore recommends that the annual new-build limits imposed on solar PV and wind are removed and this unconstrained scenario forms the Base Case for the IRP 2016
- 2 The relative costing of solar PV and wind should be revisited**
 - The relative cost assumptions in the IRP 2016 for solar PV and wind compared to new coal are too high
 - MACE therefore recommends to adjust the costs of both solar PV & wind downwards to correctly reflect South African actual tariffs as well as anticipated cost reductions as per IRP 2010 (solar PV)
- 3 The cost implications of any deviation from the least-cost Base Case should be quantified and reported on**
 - Any deviation from least-cost Base Case will lead to an increase in electricity tariff and any potential benefit of doing so must be balanced with the associated increase of cost in the electricity sector
 - MACE therefore recommends that
 - the model be re-run without annual new-build limits and with correct solar PV and wind costs
 - the cost implication (i.e. cost increase) of any deviations from this least-cost Base Case in form of constraints or pushing in a certain technology should then be quantified and reported on

Ha Khensa

Re a leboha

Siyathokoza

Enkosi

Thank you

Re a leboga

Ro livhuha

Siyabonga

Dankie