CLIMATE SUMMIT

WHAT IF IT'S A BIG HOAX AND WE CREATE A BETTER WORLD FOR NOTHING?

- ENERGY INDEPENDENCE
- PRESERVE RAINFORESTS
- SUSTAINABILITY
- GREEN JOBS
- LIVABLE CITIES
- RENEWABLES
- CLEAN WATER, AIR
- HEALTHY CHILDREN
- ETC. ETC.
1027 Mines (788 derelict)
66.7 billion tonnes
7th largest coal producer
90,000 jobs
11 of 13 coal power stations in Mpumalanga
High potential arable land

- Mpumalanga: 46%
- KwaZulu-Natal: 22%
- Gauteng: 21%
- Eastern Cape: 4%
- Free State: 1%
- Limpopo: 5%
- North West: 1%
W-E-F study basin?
W-E-F Nexus related policy considerations relating to the SDGs:

- Protection of selected zones of biodiversity rich wetland systems and prime agricultural soils within the Mpumalanga Province,
- The development of the Waterberg coalfields,
- Underground verses opencast coal mining,
- R&D relating to a “Desertec” for southern Africa,
- R&D into offshore wind generation potential for southern Africa, and
- R&D into carbon capture and storage mechanisms.
72% of SA’s 66.7 billion tonnes
International Energy Agency (2016):
• “the world’s capacity to generate electricity from renewable sources has now overtaken coal” – capacity, not actual amount generated!
• “half a million solar panels were installed every day last year around the world”
• “In China ... there were two wind turbines set up every hour”
Average tariff in R/kWh (Apr-2016-R)

- Solar PV:
  - Bid Window 1: 3.65
  - Bid Window 2: 2.18
  - Bid Window 3: 1.19
  - Bid Window 4 & additional: 0.87-0.95
  - Bid Window 4 expedited: 0.62

- Wind:
  - Bid Window 1: 1.51
  - Bid Window 2: 1.19
  - Bid Window 3: 1.17
  - Bid Window 4 & additional: 0.69-0.80
  - Bid Window 4 expedited: 0.62

Source: CSIR presentation, 14 October 2016
W-E-F Nexus Tri-Indicator

- SDG I(W) = SV / (SV + SU)
- SDG I(E) = RE / (CN + RE)
- SDG I(F) = DF / (DF + IF)
- SDG I (WEF) = Area Δ – Area Δ
Fin

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Ref 2: Charles Ainger and Richard Fenner (Eds.) (2016) *Sustainable Water*, Institution of Civil Engineers publishing

Ref 3: *Evaluating the impact of coal mining on agriculture in the Delmas, Ogies and Leandra districts – With a specific focus on maize production*, Bureau for Food and Agriculture Policy (2012)

Ref 4: *Coal 2015*, published by Creamer Media’s Research Channel Africa (August 2015)

Ref 5: Martin Ferreira, PHD Thesis: *The development of methods to assess the ecological integrity of perennial pans*, University of Johannesburg


Ref 7: Voos gemyn – Beeld 22-03-2012

Ref 8: *Risk Assessment Of Pollution In Surface Waters Of The Upper Olifants River System: Implications For Aquatic Ecosystem Health And The Health Of Human Users Of The Water - Summary Report: 2009 To 2013* - J.M. Dabrowski (Editor)

Ref 9: Exxaro developing pilot digital mine – CEO. Mining Weekly

Ref 10: “What can engineers do to ensure that South Africa meets its 21st century water needs?” (Civil Engineering, June 2016:12)

Ref 11: Jeffrey, LS. *Characterisation of the coal resources of South Africa* (SAIMM, 2004)
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