



WWF's Renewable Energy vision for South Africa

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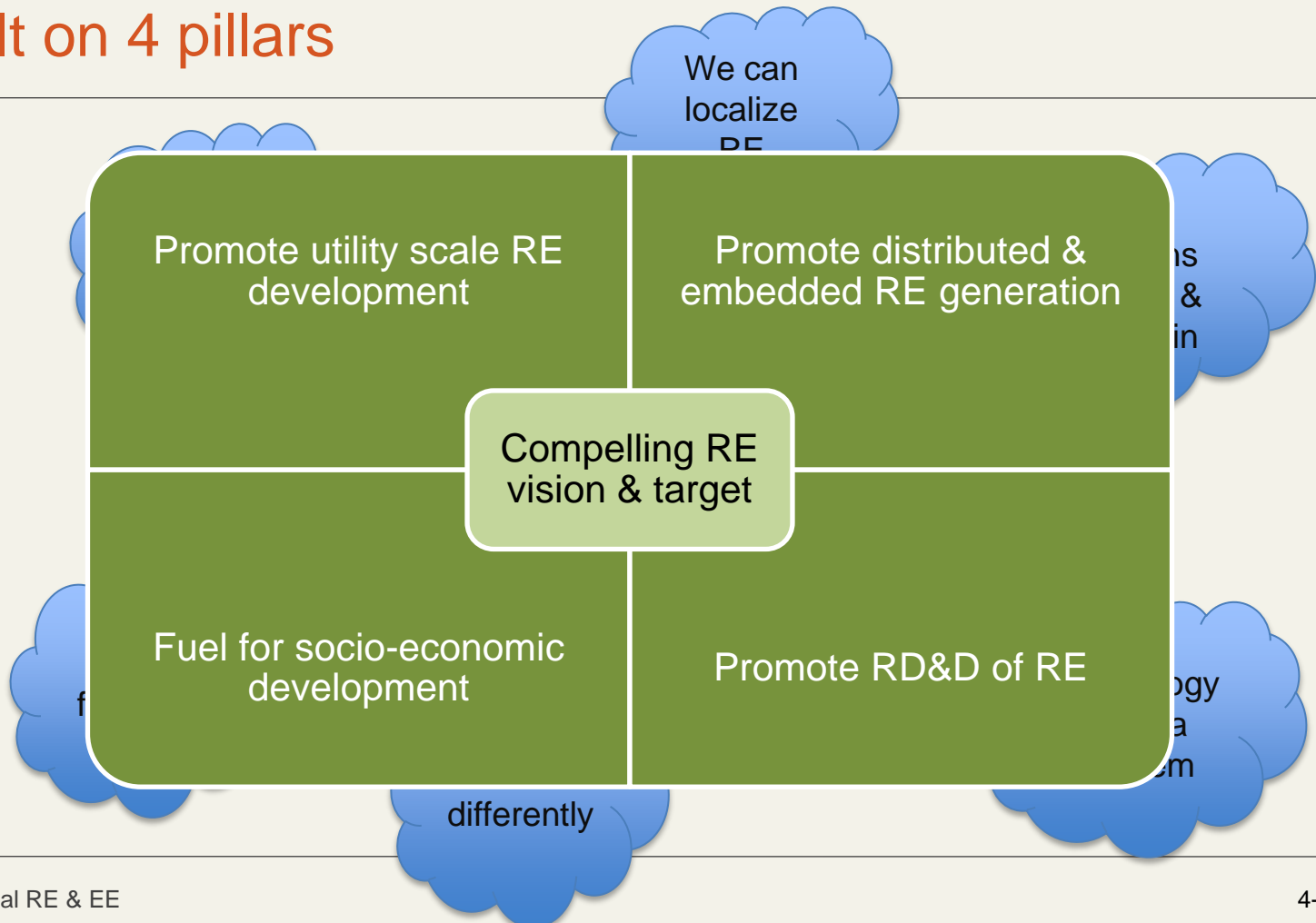
Local & sub-national
renewable energy & energy
efficiency
August 4-5 2015,
Johannesburg



WWF's RE vision for South Africa

Helping South Africa remain an 'Energy Rich Nation'

WWF's RE work strategy is built on 4 pillars





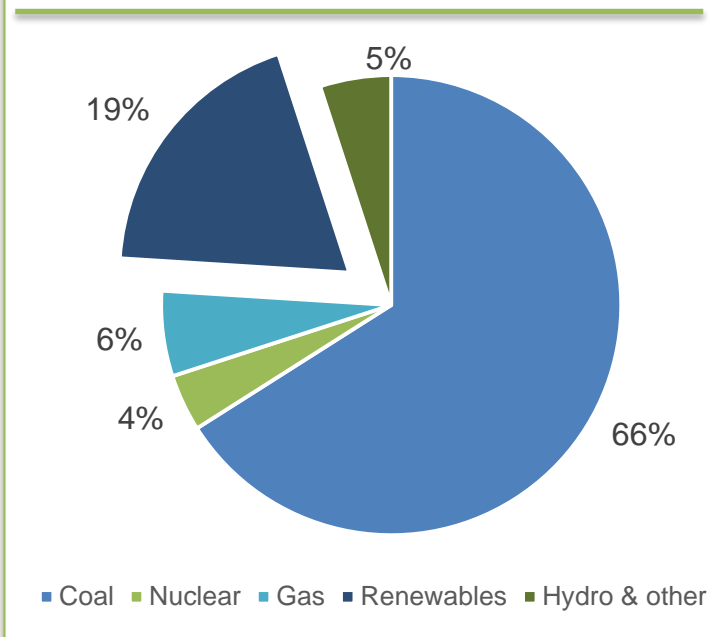
WWF's RE vision for South Africa

Utility Scale RE

A 19% share of RE in SA's electricity capacity by 2030

- IRP provides for 11-19% share of RE by 2030 instead of proposed 6-9%
- No further investment in coal or nuclear
- When possible, old coal-fired power stations should be decommissioned to lower emissions.
- Gas is acceptable as a bridge fuel: high ramp rates, lower emissions
- Intermittency and dispatchability issues for RE countered by storage and flexible gas turbine generation

SA's electricity capacity 2030
(WWF vision high growth scenario)



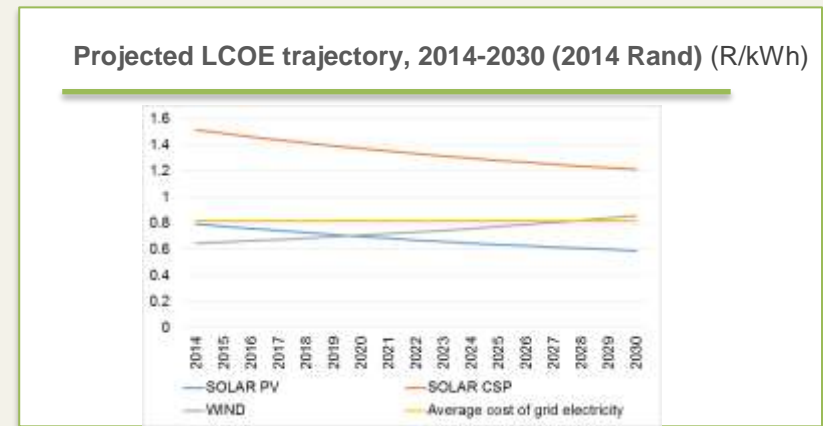
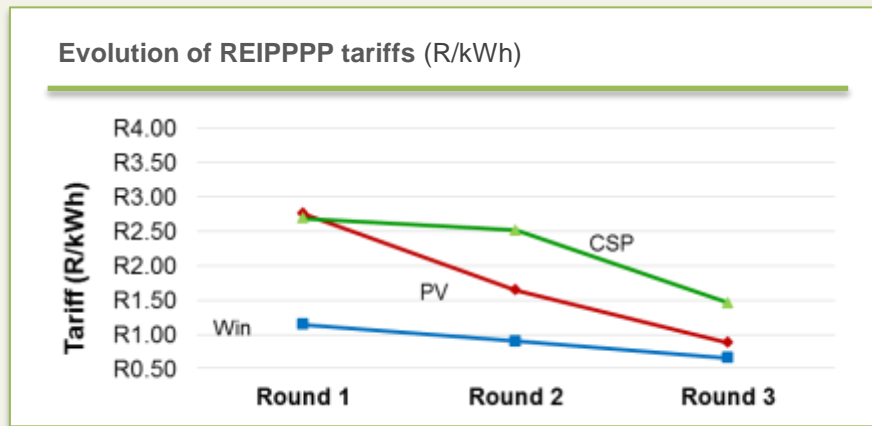
Sager for WWF 2014



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Vision is affordable

RE technologies are already achieving grid parity



Papapetrou for WWF (2014)

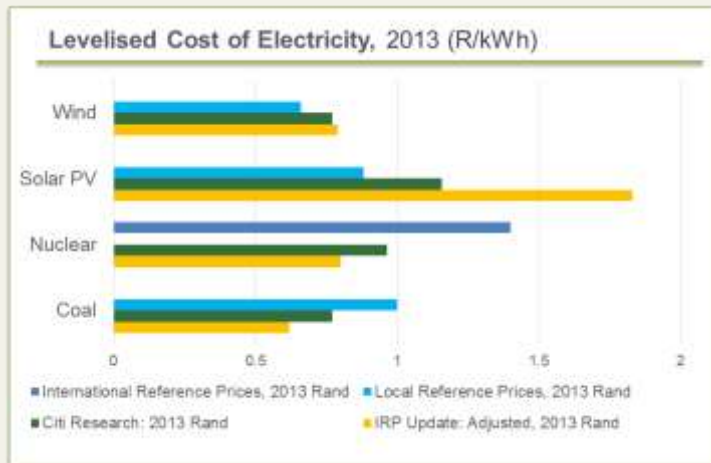
- Average cost of grid electricity = R0.82/kWh in 2013
- Wind at R0.82 per kWh - already cheaper
- CSP at R3.94 per kWh - cheaper than peaking supply diesel-powered open-cycle gas turbines at R5 per kWh



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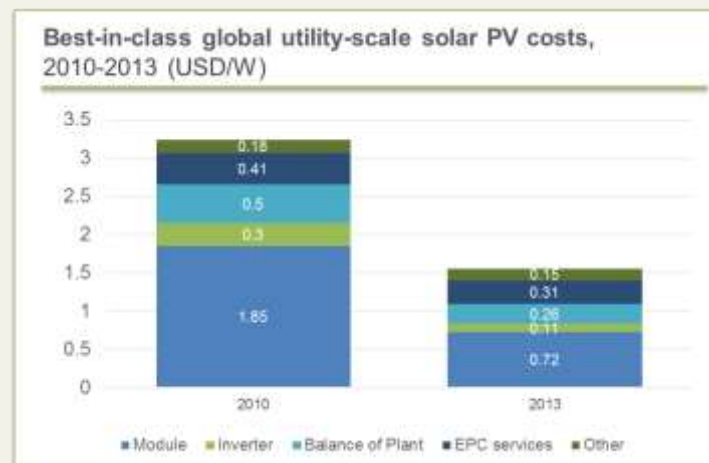
Vision is affordable

RE technologies don't require a price premium to conventional technologies



DOE (2013); Citi Research (2013); Papapetrou for WWF (2014); Sager for WWF (2014)

- LCOE for Britain's Hinkley Point nuclear plant at R1.75/kWh, ~ double IRP Update estimate
- Current estimate for Medupi & Kusile at R1.05/kWh



BNEF (2014)

- USD price of utility-scale solar PV halved in last 3 years



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Vision can be financed

Retirement funds with R3 trillion in assets can play a critical role in channelling capital flows towards RE

- R540 bn required to scale up to 19% RE by 2030 - R405 bn of which will be debt
- Debt requirement over next 15 years equivalent to a third of SA wholesale banks current net loans & advances
- Banks unlikely to exceed 10% exposure
- DFIs expected to refocus on empowerment debt financing
- Only 0.3-0.7% pension funds total assets estimated to be invested in RE

Projected additional feasible holdings of RE project-level debt, 2015-2030 (Bn, 2014 Rand)



Sager for WWF (2015)

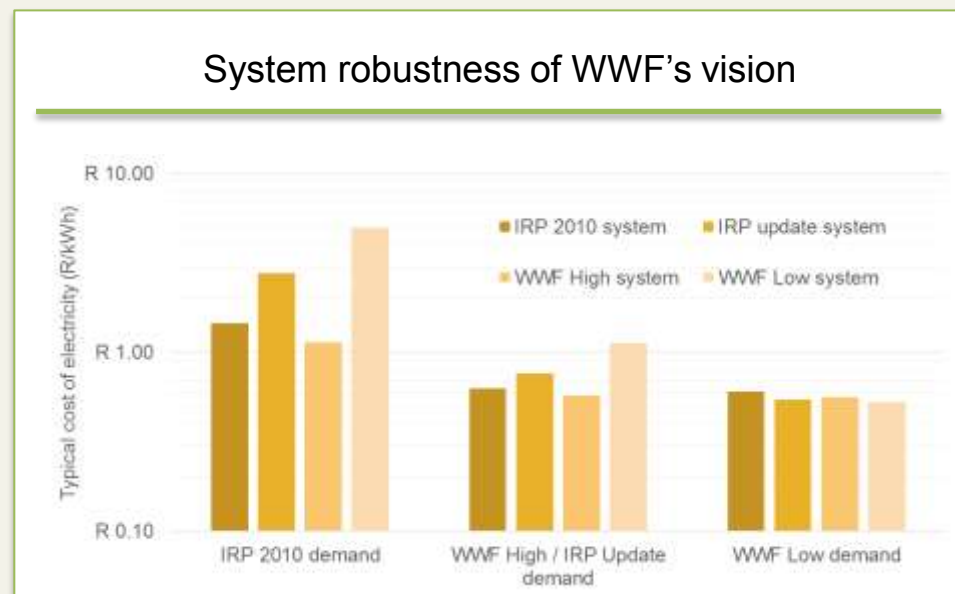


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Vision is technically achievable

Spatial temporal analysis suggests Vision is not only feasible but also more sensible

- Significant uptake of RE feasible within 20 km of existing grid
- Electric system that prioritises RE within proximity of transmission infrastructure is economically feasible, lower cost
- High resilience to changes in demand & fuel price volatility
- No major infrastructure upgrades required to grid



Gauche, Rudman & Silinga for WWF (2015)



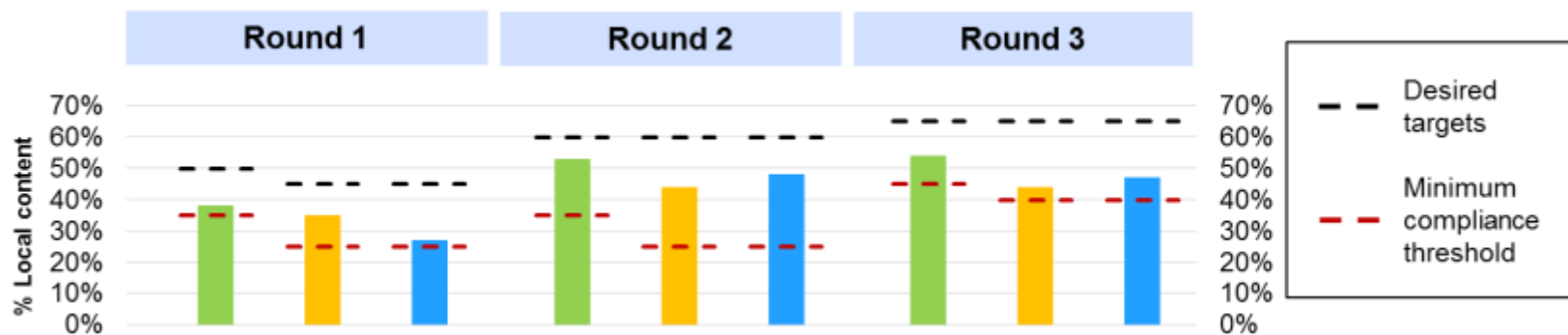
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RE delivers socio-economic development

RE can deliver local economic development and boost manufacturing

- Private sector is taking REI4P socio-economic development requirements seriously
- R1.17bn will be available for local community over next 20 years
- Local content has increased with each round of REI4P & has exceeded minimum thresholds

Local content: minimum requirements & targets versus actual content achieved



Papapetrou for WWF (2014)



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Local Scale RE

Distributed RE can help municipalities to generate own electricity & lessen dependence on coal electricity

- Municipalities can maximise benefits of RE based embedded generation
- Short term potential impact of private PV installation on municipal income generated from electricity sales likely to be less than commonly believed
- Municipalities can protect financial viability by ensuring that the cost of network connectivity of each customer is recovered, & that the cost at which energy is bought from a PV exporter is no more than the equivalent cost paid to Eskom

Potential for integration of distributed solar PV in Drakenstein municipality

- Installation of 24 MWp of rooftop PV will in the worst case translate into less than 3% of electricity revenue
- Eskom bill for Drakenstein would be reduced by R 23million p.a, if 24 MWp of PV was installed
- Good potential for municipality to install PV systems on the roofs of their own buildings, with a feasible financial outcome

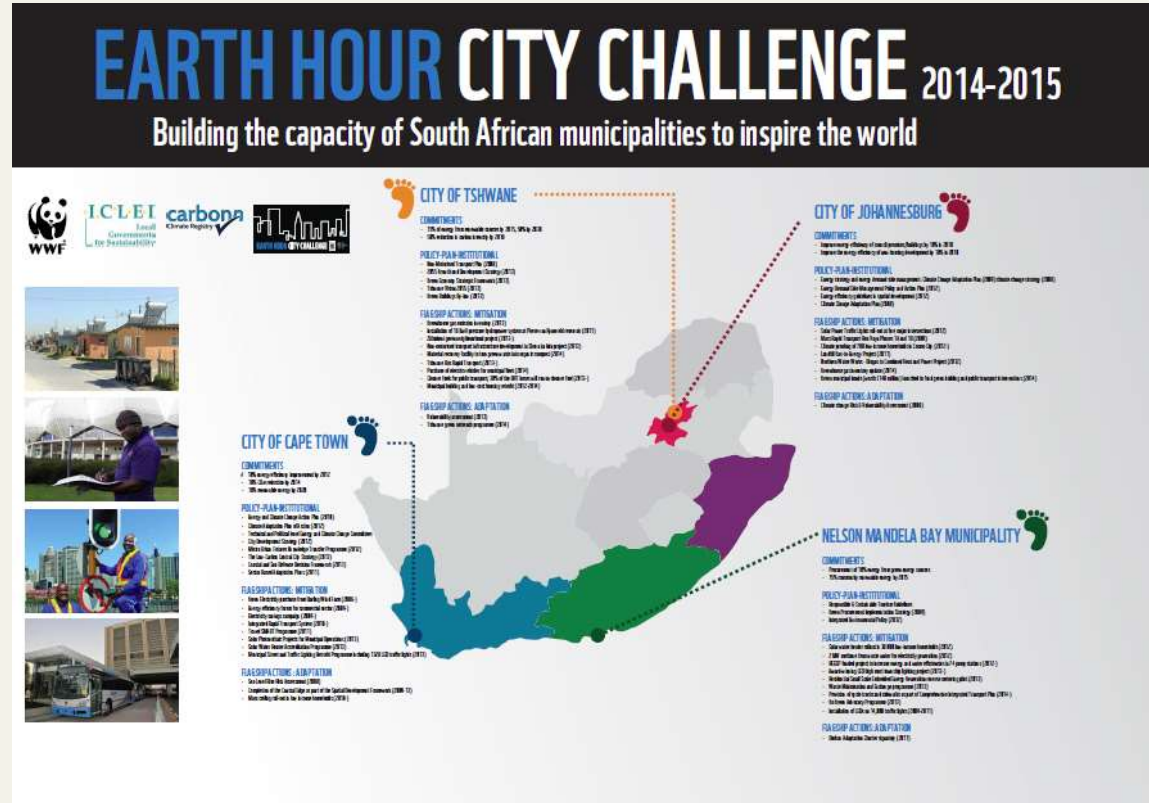
Kritzing et al for WWF (2015)

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Local Scale RE

Municipalities need support for capacity building and innovative financing mechanisms

- Strengthen existing engagements with metros
- Focus on building capacity in secondary municipalities that have expressed interest in the competition, but lack necessary quantitative climate change targets
- Work with secondary municipalities - through workshops & development of a briefing paper on distributed RE with focus on WTE on sub-national level to provide guidance and elaborate on financing challenges & opportunities
- Commission & implement solar PV study for one municipality awarded national award



EARTH HOUR CITY CHALLENGE 2014-2015
Building the capacity of South African municipalities to inspire the world

CITY OF TSHWANE
 COMMITMENTS:

- 100% energy from renewable sources by 2017, 90% by 2020
- 100% electricity to water & sewage by 2017

 POLICY-PLAN-INTENTIONAL:

- Water Resources for People (2008)
- 2012 Green Book: Water Conservation Strategy (2012)
- Water Conservation Strategy (2012)
- Water for People (2012)

 FAST-TRACK ACTIONS: MITIGATION:

- Improve power generation efficiency (2012)
- Installation of 10 Mw photovoltaic system at Pretoria International Airport (2012)
- Climate Change Adaptation Strategy (2012)
- Water conservation program in all municipal buildings (2012)
- Water for People (2012)
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 FAST-TRACK ACTIONS: ADAPTATION:

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- Water for People (2012)

CITY OF JOHANNESBURG
 COMMITMENTS:

- 100% energy from renewable sources by 2017, 90% by 2020
- 100% electricity to water & sewage by 2017

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CITY OF CAPE TOWN
 COMMITMENTS:

- 100% energy from renewable sources by 2017, 90% by 2020
- 100% electricity to water & sewage by 2017

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NELSON MANDELA BAY MUNICIPALITY
 COMMITMENTS:

- 100% energy from renewable sources by 2017, 90% by 2020
- 100% electricity to water & sewage by 2017

 POLICY-PLAN-INTENTIONAL:

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WWF's RE vision for South Africa

Role for all types of RE, not either or approach

Scaling up of renewables will require addressing risks and challenges

Challenge – Long term vision key for scaling up utility scale RE

- Address structural constraints in the electricity sector – lack of choice, effectiveness of carbon tax
- Long term grid planning grid & innovative finance models for grid extension
- Clear vision and implementation support for IPPs on non-price economic development components – WWF, Green Cape & industry players
- Creation of secondary market for refinancing of RE
- Management of BBBEE interests in the event of refinancing

Challenge - Stimulate long term distributed generation market without putting municipalities' financial stability & public interest at risk

- Long term revenue risks for municipalities from high-end &/or large consumers that are investing in RE
- 'Illegal' or under the radar distributed RE - financial risk for municipalities & threat for grid safety & stability
- Impact on municipalities depends on consumer profile, revenue derived from electricity & RE resource potential
- Challenges for meeting the electricity needs of disadvantaged sections of population
- Stimulate farming & industrial RE applications



WWF's RE vision for South Africa

Our current work

Financing

- Exploring the role of retirement funds in achieving RE Vision 2030
- Development of a secondary market for financing of RE

Grid

- Spatial temporal analysis of RE vision 2030

REIPPPP

- Assessment of REIPPPP non-financial and financial aspects

Socio-economic development

- Review of local community development requirements under REIPPPP

Distributed / Embedded Generation

- Engagement on NERSA's Regulatory Framework for Small Scale Embedded Generation
- Technical analysis of potential for municipalities to produce electricity from RE using Drakenstein Municipality as a case study

Awareness

- RE festival

Localization

- CSP localization

