



sanedi

South African National Energy
Development Institute



Driving Innovation in the Energy Sector

SANEDI's role in promoting a shift to a low carbon future



Van Staden's Wind farm, 27 MW – Round 1 project under REIPP

Please note that some photographs were removed from this presentation due to the size of the file

KM Nassiep
CEO
SANEDI

ENERGY INNOVATION FOR LIFE

Contents



 Background to Establishment of SANEDI

 SANEDI Mandate

 Modality of Operation

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History and Background of SANEDI



Reasons for SANEDI establishment

- Decline in national energy R&D
- Recognition of link between R&D and global competitiveness
- SA – diversification of its energy supply
- Identification of technologies that can contribute positively to Governments broader social and economic objectives

Preceded by SANERI and NEEA

- SANERI established by Ministerial Directive in 2005
- Established as subsidiary of CEF (Pty) Ltd
- NEEA established as division of CEF (Pty) Ltd in 2005

SANEDI established as independent statutory body

- Established under National Energy Act of 2008
- Operationalised in April 2011
- Schedule 3A entity under PFMA








Legislative Mandates



- 🌱 National Energy Act , (Act 34 of 2008)
- 🌱 White Paper on Energy Policy, 1998
- 🌱 SANEDI's mandate is derived from the authority and obligations set out in the following policies, legislation and constitutional requirements :
- 🌱 The SA Constitution , (Act 108 of 1996)
- 🌱 The following specific plans, directives and public announcements which reinforces SANEDI's responsibilities
- 🌱 Strategic Plan of the Department of Energy

Legislative Mandates



-  National EE Strategy , 2005
-  Energy Security Master Plan for Liquid Fuels, 2007
-  Energy Security Master Plan, 2007
-  Integrated Resource Plan for Energy , 2010
-  DST 10 year innovation Plan
-  M&V guideline for EE certificates (DRAFT)
-  Carbon capture and storage Road Map

STRATEGIC OUTCOME ORIENTATED GOALS-(Cont'd)

INNOVATION VALUE CHAIN- STAGES



Strategic outcome orientated goal 1

Enable well Informed and high confidence energy planning, decision-making and policy development

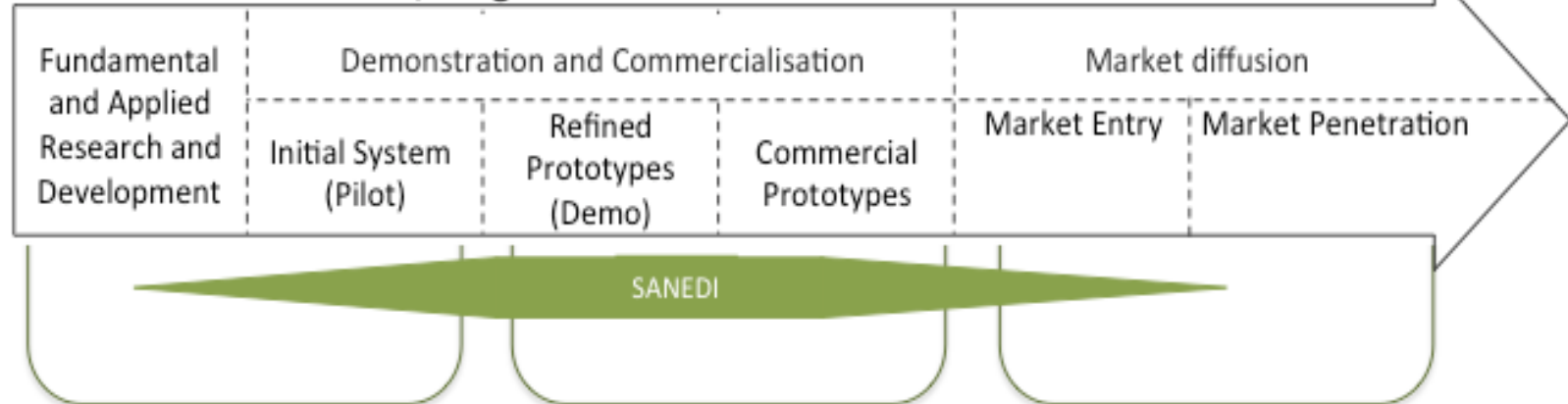
Strategic outcome orientated goal 2

Accelerated transformation to a less energy and carbon intensive economy

Strategic outcome orientated goal 3

Foster a culture of greater efficiency and more rational use of energy

Innovation Value Chain, Stages

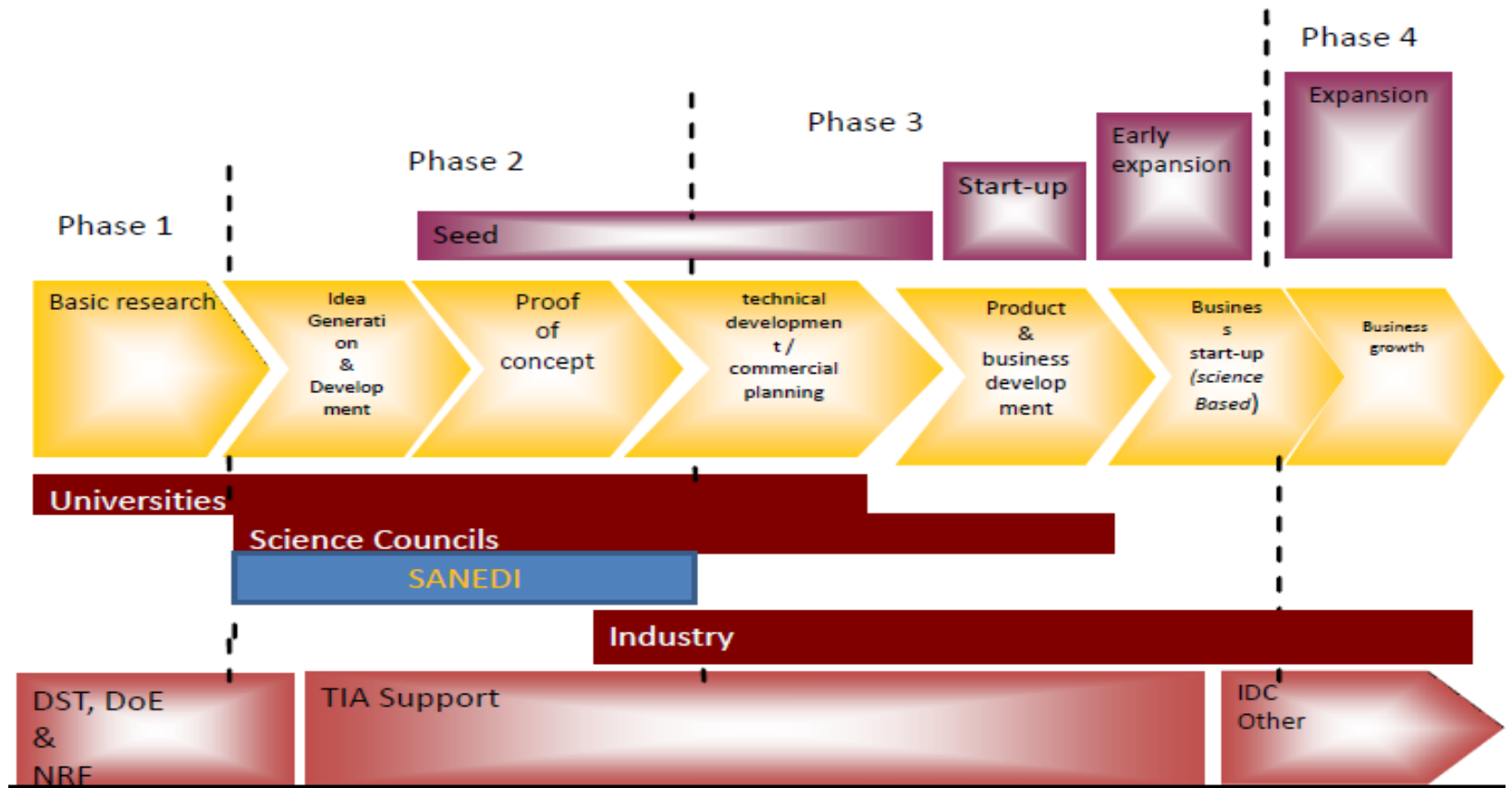


TECHNOLOGY VALUE CHAIN

ROLEPLAYERS



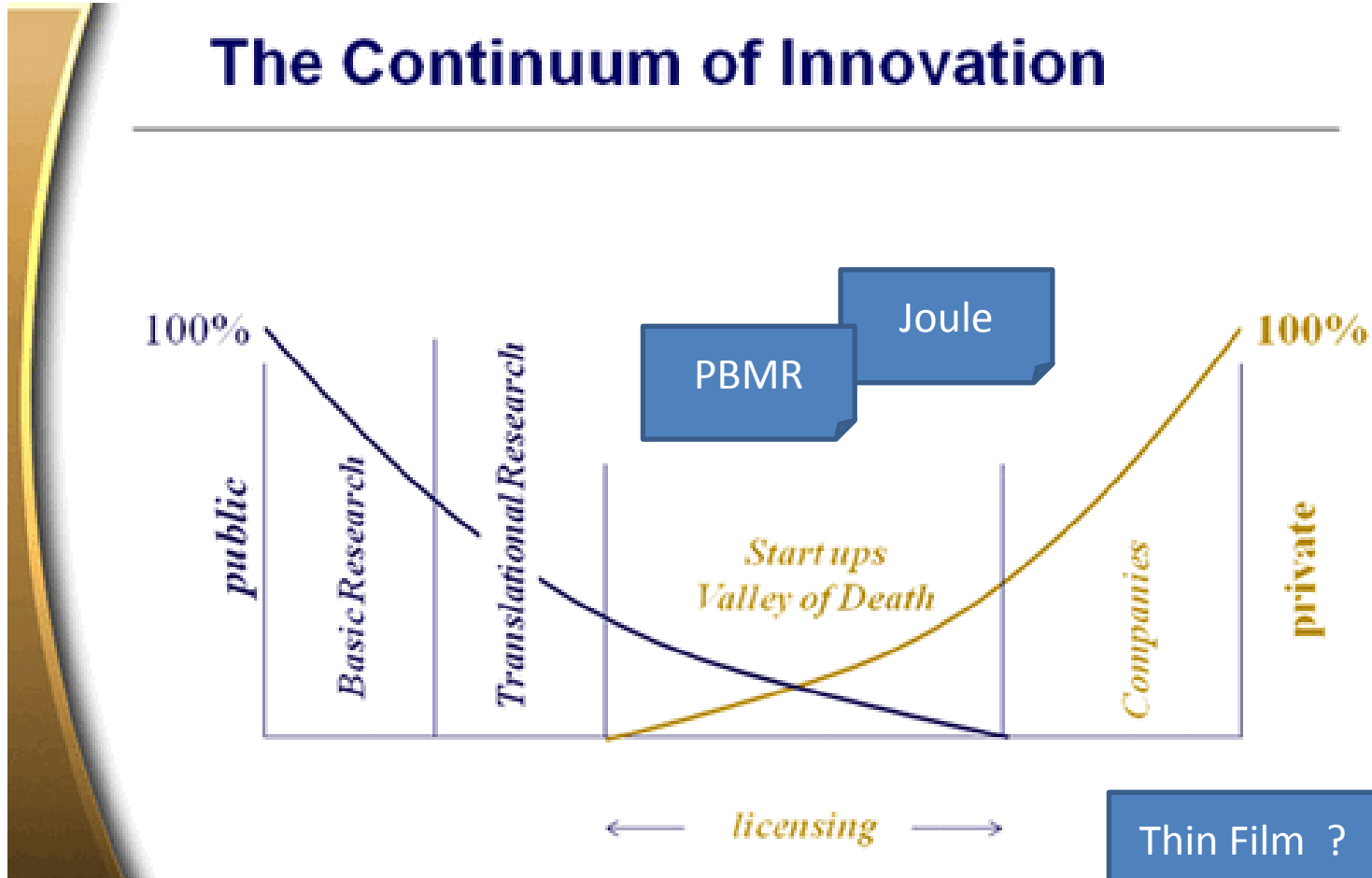
Technology Development Value Chain



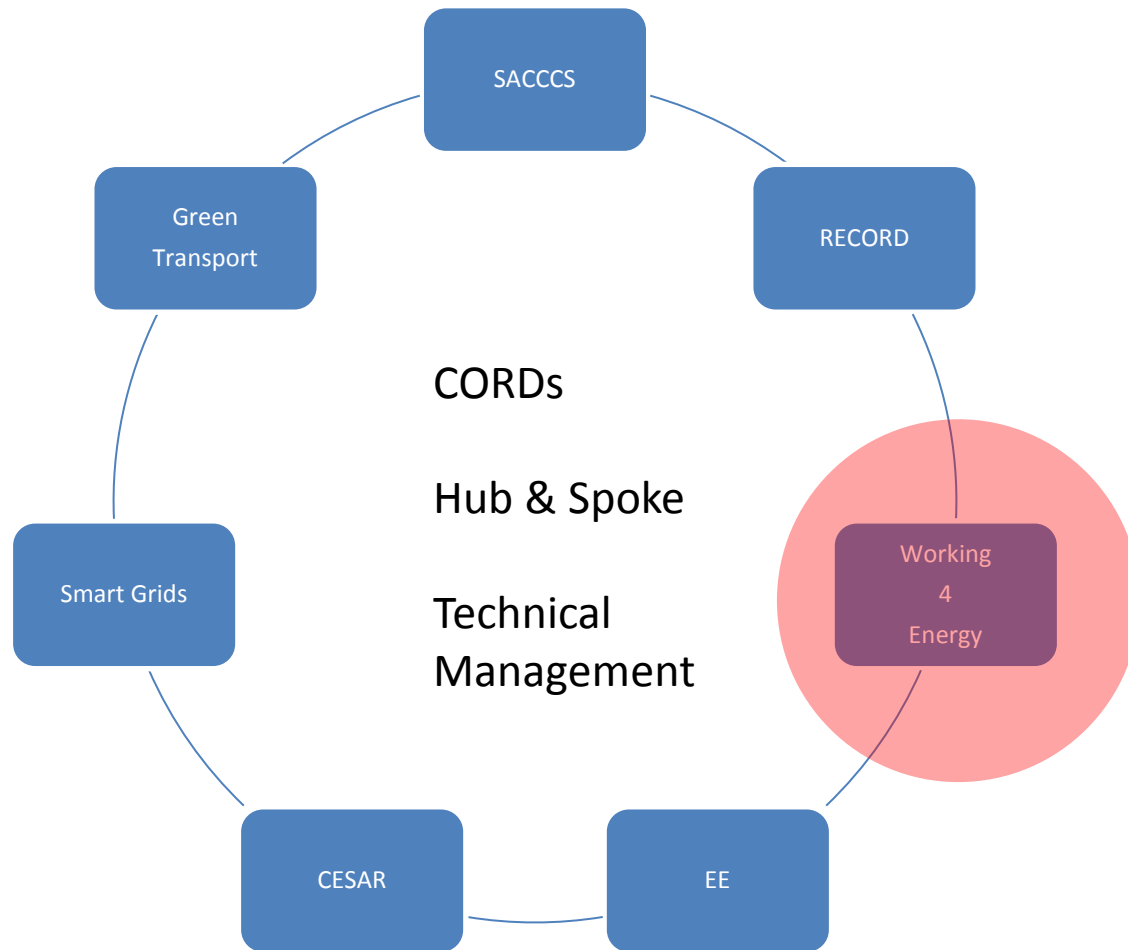
SANEDI Role in context of Valley of Death



The Continuum of Innovation



Modality of Operation




ORIGINS OF THE WORKING FOR ENERGY PROGRAMME



 The Working for Energy Programme is:


- Derived from the mandate of the Department of Energy in respect of the Energy Policy, Renewable Energy Policy and Energy Efficiency Strategy, Energy Act.
- Set in a predominantly grid based environment of the National Electrification Programme (INEP) within the context of energy diversity.
- Set to demonstrate the application of new and renewable energy technologies to address energy poverty in low income and remote areas;
- A natural progression from the Working for Water Programme's removal of invasive and alien species programme for energy production purposes.
- An essential element towards the Green Economy
- Is an essential element of job creation drive of Government under the incentivised Expanded Public Works Programme (EPWP).
- Targeting the youth, women, people with disabilities.
- Focusing on rural areas (and low income peri-urban areas), electrified and un-electrified consumers.

 Solutions so proposed by the Working for Energy Programme must therefore be:

- Feasible, Practical, Sustainable, Replicable

MANDATE OF THE WORKING FOR ENERGY PROGRAMME



-  The Working for Energy Programme is aimed at :
- Applied Research
 - Research into the availability and sustainability of renewable energy resources in targeted areas (rural areas and low income urban areas);
 - Research studies for energy poverty eradication, sustainable feedstock provisions and alternative fuel sources for low cost housing's low carbon space heating, cooking and water heating
 - Promoting and accessing the acceptability of clean energy.
 - Demonstration of Renewable Energy Technology Applications
 - **Biomass to energy** initiatives from invasive alien plants and bush encroachment;
 - Production of **charcoal** derived in an environmentally friendly manner from invasive alien plants and grasses;
 - **Biomass to bioenergy** (biogas) derived from agricultural waste for rural and non-municipal commercial application
 - Development of **mini-grid hybrid** and smart grid systems fed from various renewable based resources;



- Demonstration of Renewable Energy Technology Applications (cont'd)
 - **Mini-hydro** systems and run-of-river schemes for non-grid applications.
 - Solar powered electricity generation systems for small scale and minigrid based systems.
 - Waste to energy from **municipal and non-municipal solid waste and sewage** treatment facilities;
 - **Small wind** generation for non-grid applications, and
 - **Other** alternative fuel sources for low cost housing, space heating, cooking and water heating.

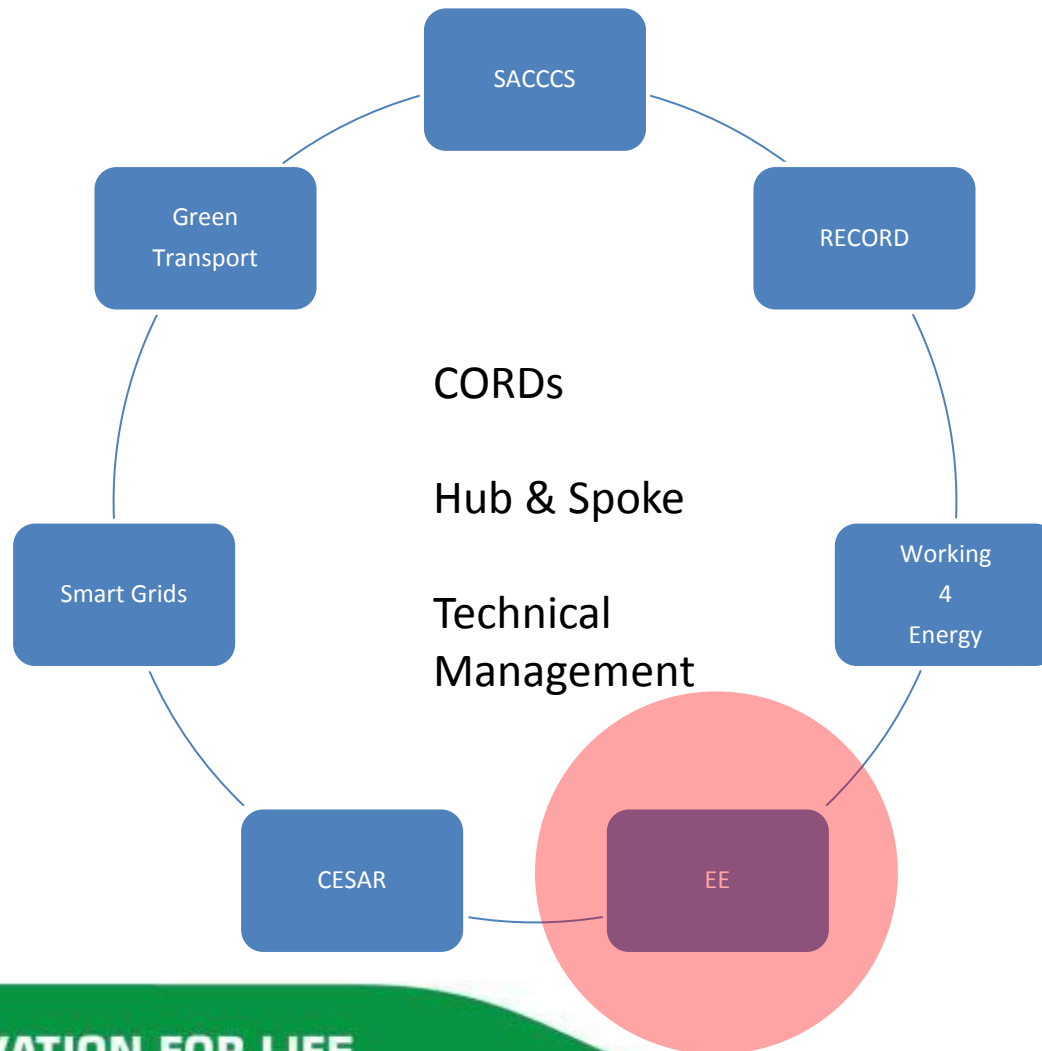
Energy management for social applications

- Solar Passive Design
- Insulations (floor, wall and roof)
- Water Heating
- Water Management (as part of energy management)

Working for Energy Outreach (with the end in mind)

- National Outreach
- Provincial Outreach
 - Management of expectations if we cant fund the future projects

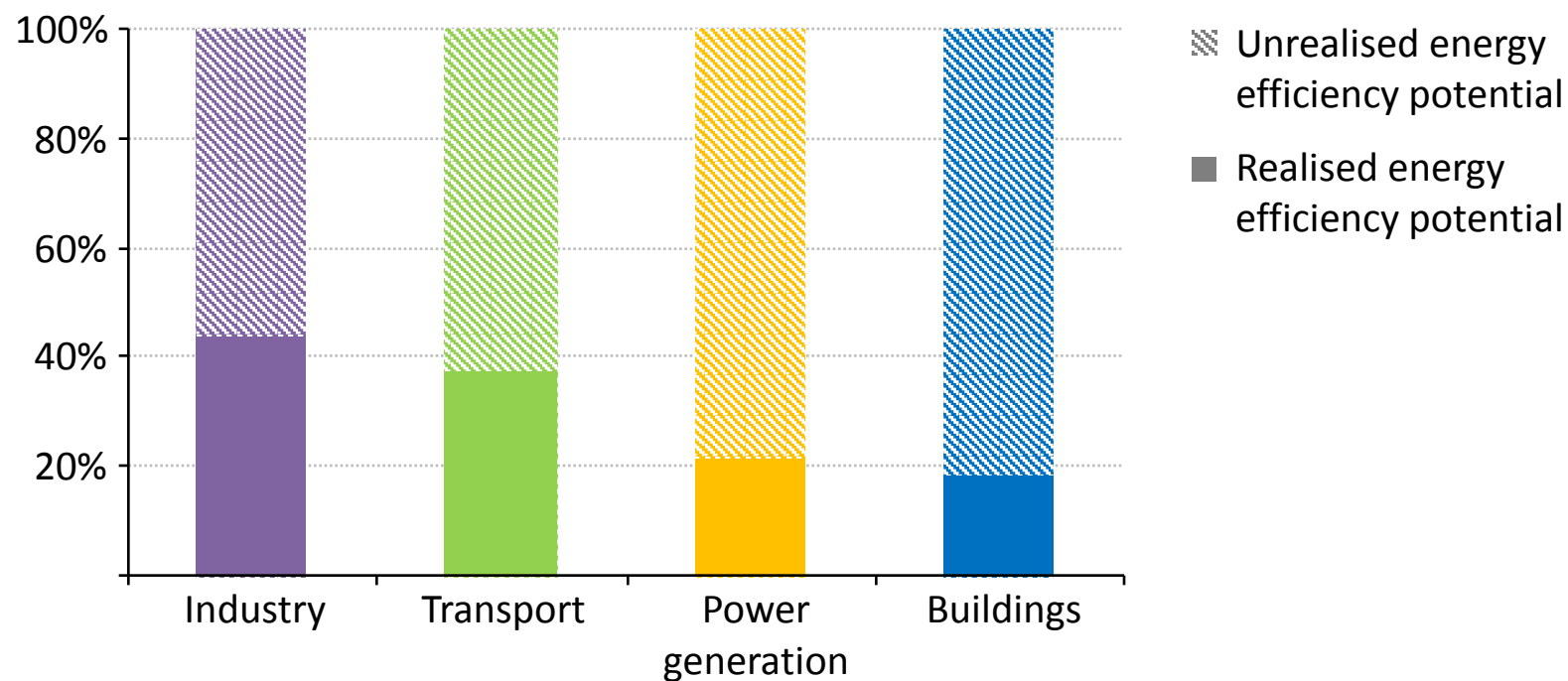
Modality of Operation



Energy efficiency: a huge opportunity going unrealised



Energy efficiency potential used by sector in the New Policies Scenario



Two-thirds of the economic potential to improve energy efficiency remains untapped in the period to 2035

Why public buildings in particular?



- 🇮🇹 Well over 120,000 buildings under National Government control..!
- 🇮🇹 Energy Performance Contracting with Public Works Dept the preferred route
- 🇮🇹 Lighting and HVAC the low hanging fruit, together with insulation
- 🇮🇹 High Mast Lighting for public lighting also a focal area – together with street lighting and solar / wind powered traffic lights

Residential Greening



Zero net energy building

Crossways Estate in E Cape



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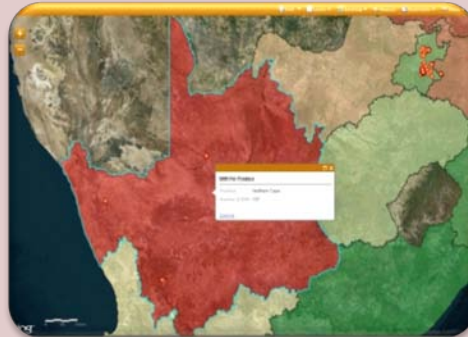
Energy Efficiency role



- Support the Income Tax Amendment relating to tax rebate for energy efficiency improvements
- Energy Efficiency & Demand Side Management Centre of Research & Development (EEDSM)
- Industry Support
- National Champion for EE
- National M & V Centre



Energy Efficiency..cont .. (Solar Water Heater Monitoring System)

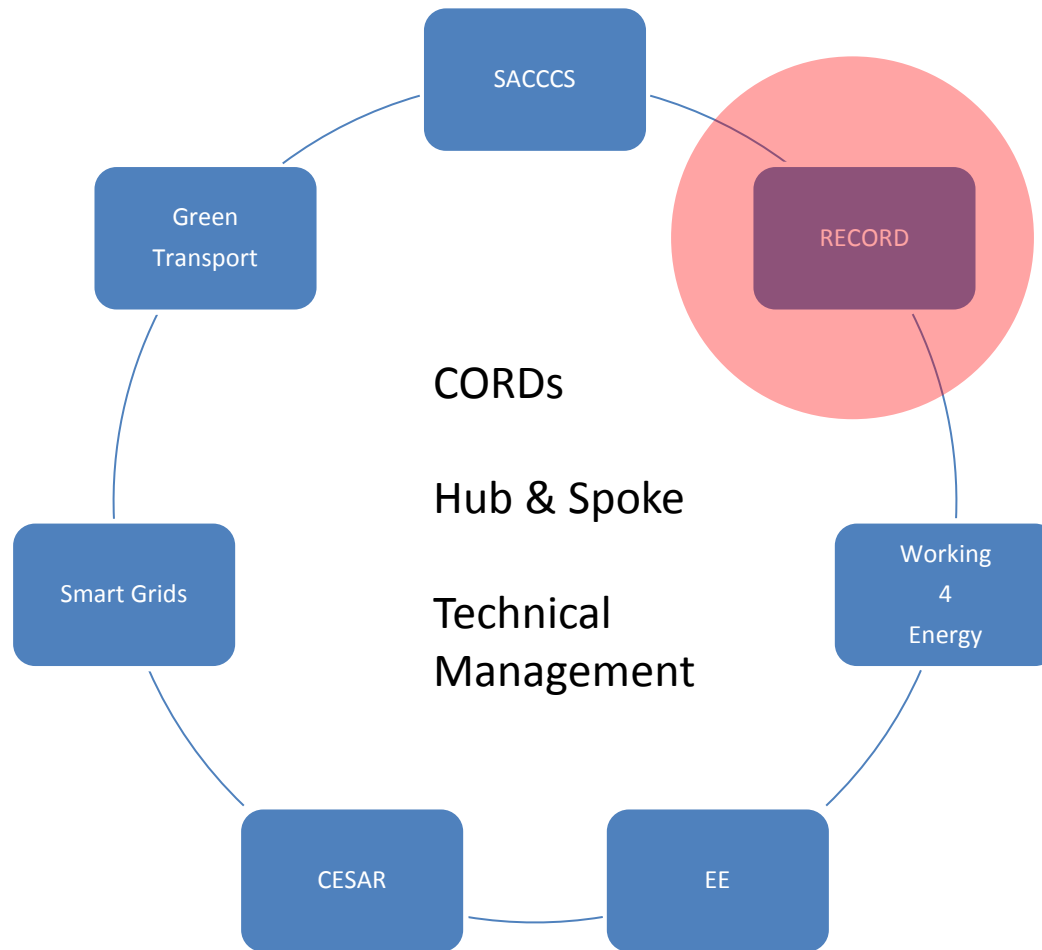


Geographical Information System (GIS) using ESRI's ArcGIS Suite & Trimble Juno 3D Device

Prototype of Web Interactive Map & Mobile Capturing Solution
Developed Data Acquisition & Integration in progress

Demonstrated to the former Minister of Energy in December 2012

Modality of Operation



RECORD work packages



- 🌱 Coordinate Renewable Energy Research
- 🌱 Facilitate RE research collaboration
- 🌱 Contribute to RE skills development
- 🌱 Support RE business development
- 🌱 Marketing and awareness creation of RECORD and RE in SA

2013/14 Plan



- 🌱 Host IEA BioEnergy (May 2013) and Ocean Energy Systems (Oct 2013) ExCos
- 🌱 Established Algal biofuel research platform on basis of completed state of algal bioenergy research study in SA

2013/14 Plan (cont.)



- 🌱 Continual relevant info shared with industry and action on special requests therefrom viz. hosting of industry association (SASTELLA, SAPVIA, SOLTRAIN) stakeholder engagements
- 🌱 RE awareness through art competition calendar and high school science club supported

2013/14 Plan (cont.)



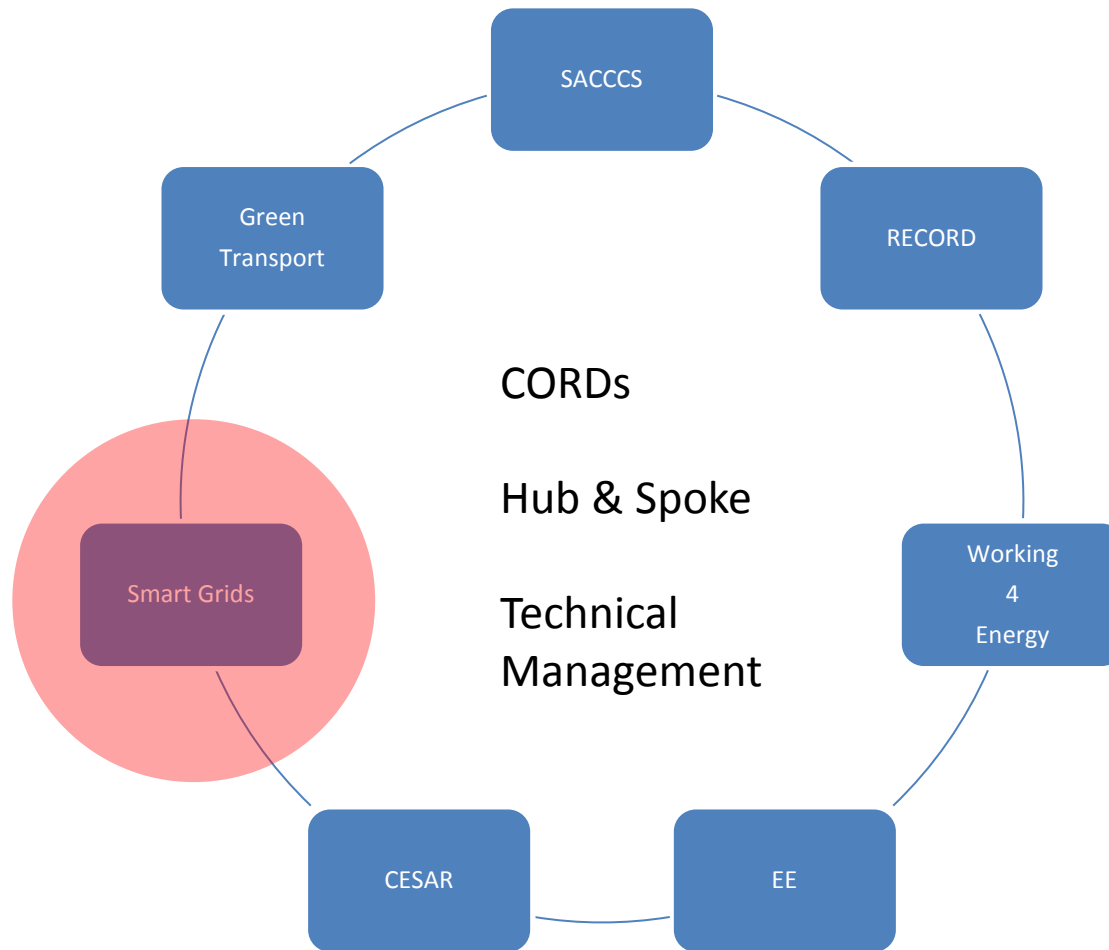
- 🌱 SARETEC established and first batch of wind energy technician trained in Germany (achieved July 2013) and first batch of train the trainer completed in Germany (due Oct-Dec 2013)
- 🌱 Support to Solar energy technology roadmap (SETRM)
- 🌱 Wind energy and radar research continued and coordinated (achieved, ongoing)

2013/14 Plan (cont.)



- 🌱 NMMU/SANEDI/RECORD PV expertise and training initiative
- 🌱 Ocean energy resource reports complete, edited and in public domain for comment
 - Establishment of MEASA (in process due in Oct 2013)
- 🌱 Eskom and SARETEC collaboration for training of 2000 wind energy technicians
- 🌱 DBREV bursary supported
- 🌱 RECORD RERE award through SANEA

Modality of Operation



Smart grids



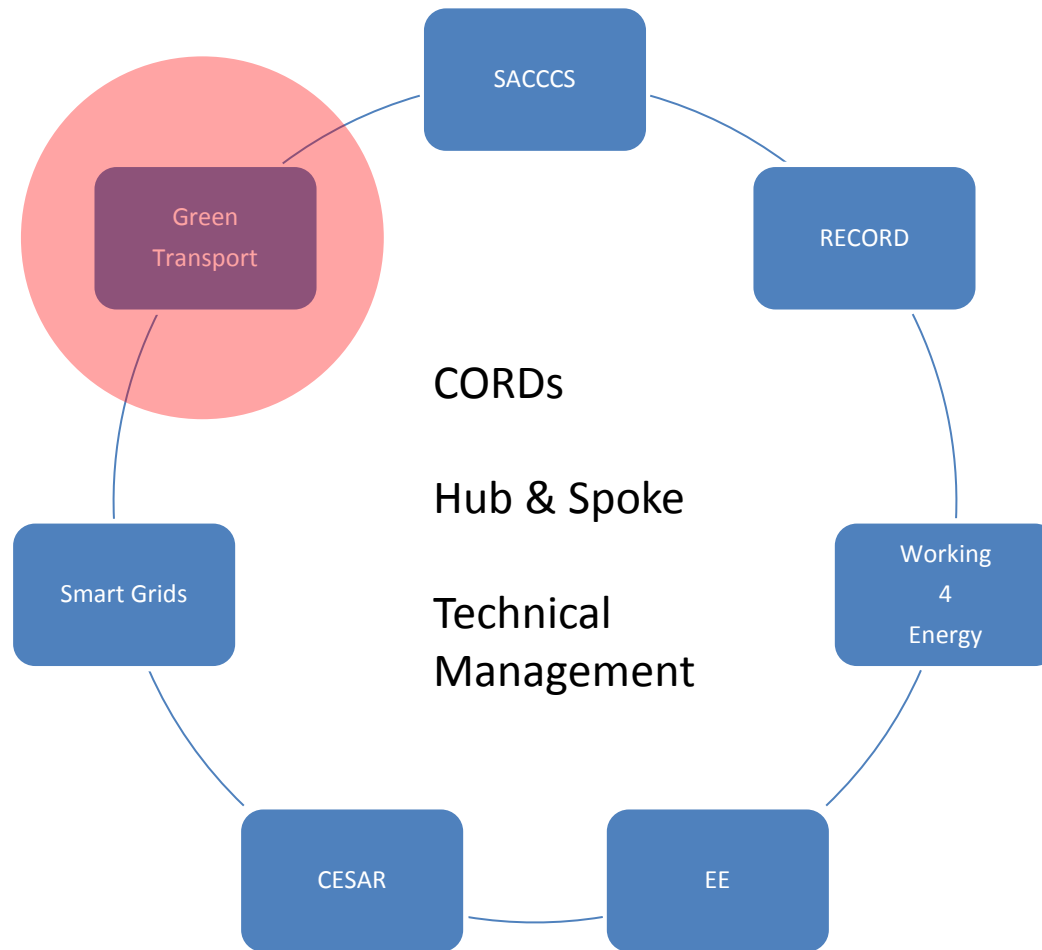
- 🌱 Development of SA smart grid vision
- 🌱 Compile current state assessment
- 🌱 Technology, governance, service and gap analysis as well as defined solutions
- 🌱 Smart Grid Business case
- 🌱 Smart grid implementation plan
- 🌱 Consolidated smart grid industry guideline

Smart metering/e-learning



- Smart meter pilot project/e learning integration
- Benefit communities
- Integration with tablets
- Aimed at improving learning
- Access to web based classes
- Able to download text books and other learning material

Modality of Operation

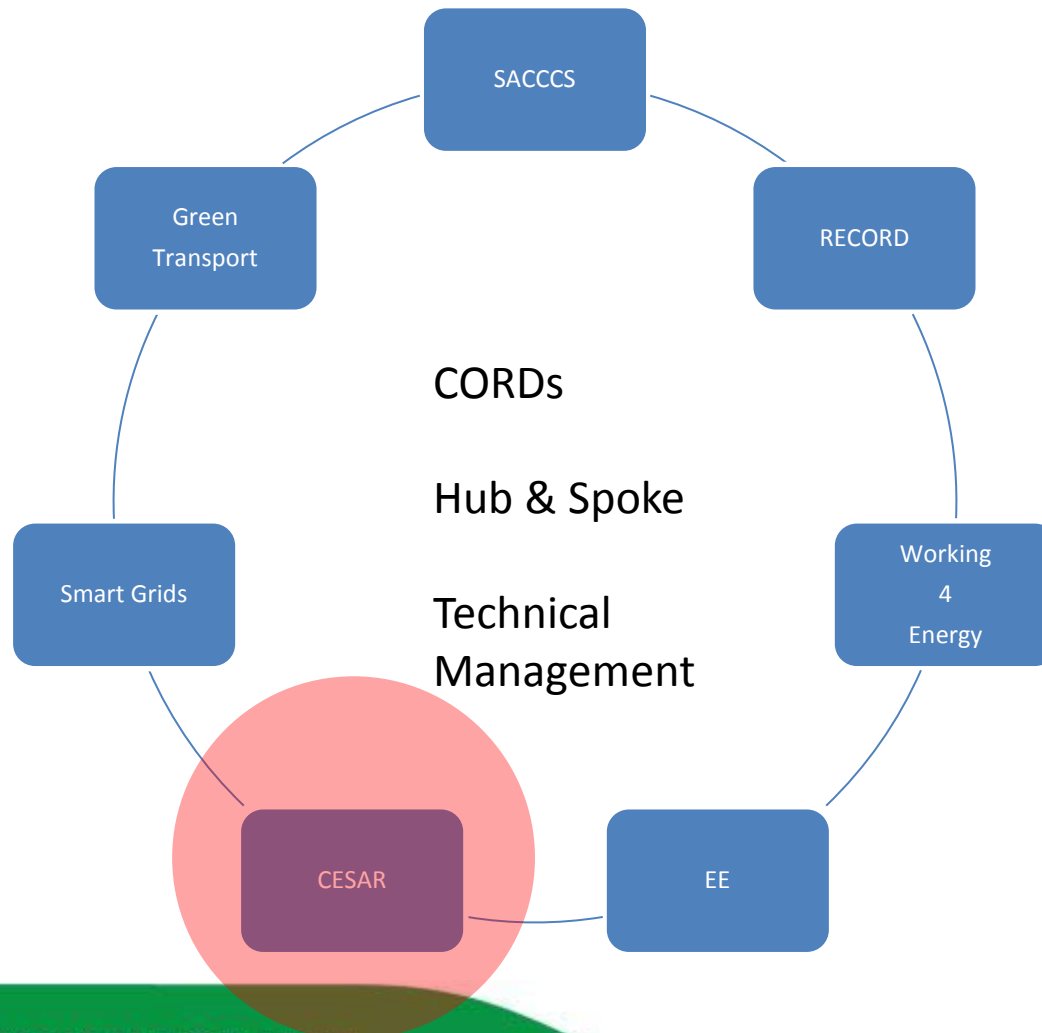


Green Transport Programme



- 🌱 Develop a national Green Transport strategic vision and technology development plan
- 🌱 Develop a technology development incubation centre to offer “soft start” facilities to companies and technology partners
- 🌱 Develop and implement demonstration projects to test proof technology
- 🌱 Participate in knowledge clusters locally/internationally
- 🌱 Develop substantive public advocacy programme to create market acceptability for alternative fuels and propulsion systems

Modality of Operation



The Objectives of CESAR



 SANERI established the Centre for Energy Systems Analysis and Research (CESAR) as a programme within SANERI. The objectives of CESAR relate to:

- Capacity building in energy modelling and planning
- Technical know-how and knowledge, and
- Human capacity
- Collecting and maintaining an open database of energy research data
- Research and development on suitable models for the South African energy system
- Provision of research support and advice on government initiatives regarding energy data collection, energy modelling and planning
- Collaboration with international bodies regarding research on energy data, energy modelling, planning and policy development