



NANOTECHNOLOGY IN SA

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**science
& technology**

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REPUBLIC OF SOUTH AFRICA



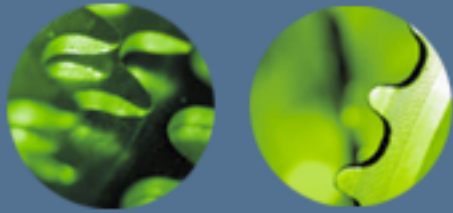
OUTLINE

- Overview of SA's Nanotechnology Strategy
- Key Research Focus Areas
- Strategic Research and Needs
- Key Enablers of Implementation Plan
- Challenges
- Proposed Interventions



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Overview of SA's Nanotechnology Strategy

Human Capital

Research Capacity

Public Awareness

Products & Processes

Outcomes

National Nanotechnology Strategy

Driver

Implementation Plan

Key Pillars

Research Plan

Advisory Board
&
Standards
Committee

Awareness Plan



KEY RESEARCH FOCUS AREAS

Social Development

WATER

HEALTH

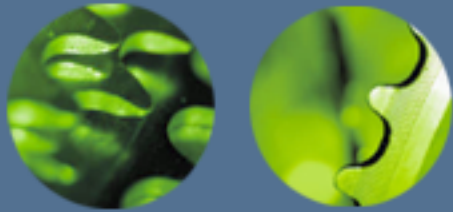
ENERGY

Industrial Development

CHEM & BIO-
PROCESSING

MINING &
MINERALS

ADV MAT &
MANUFACTURING



STRATEGIC RESEARCH AND NEEDS

Water



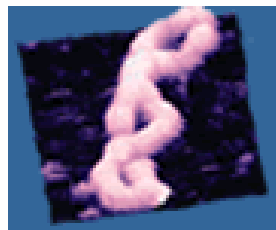
- Effluent treatment
- Purification
- Clean water supply to rural and arid areas

Energy

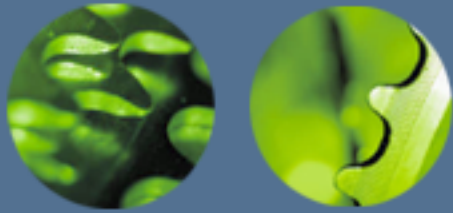


- Africa needs distributed energy
- More than 60% do not have electricity
- Low cost solar cells and batteries crucial

Health

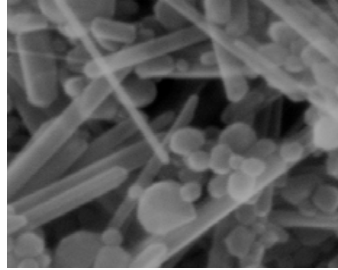


- Solutions to AIDS, Malaria and TB
- Alternative drug delivery systems
- Slow release drugs for preventative medicine



STRATEGIC RESEARCH AND NEEDS

Materials



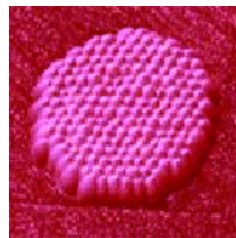
- ☀ Coatings and paints for harsh African environments
- ☀ New materials for a competitive industry
- ☀ Nano-engineered catalysts
- ☀ Nanofibers

Minerals & Mining

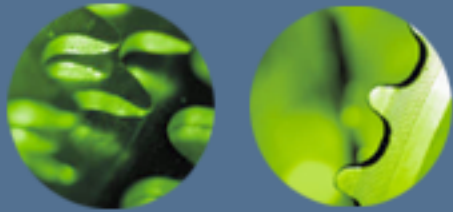


- 🔴 Advanced tools using super hard nanomaterials e.g. Nano diamonds
- 🔴 Remediation of mine waste streams
- 🔴 Beneficiation of Minerals
- 🔴 Nanocomposites

Processing

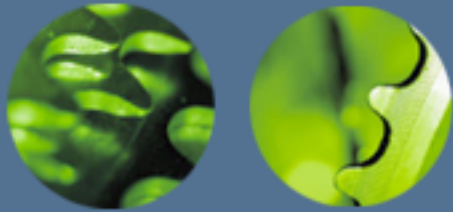


- 🌿 Nano catalysts e.g. Gold, Cobalt, Fe
- 🌿 Cleaner production
- 🌿 Electrospinning
- 🌿 Plasma synthesis



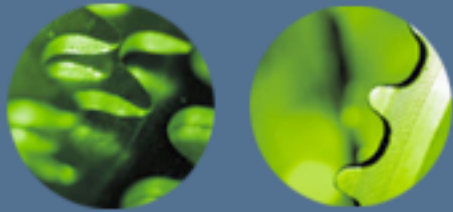
KEY ENABLERS: IMPLEMENTATION PLAN

- **Human Capital Development**
 - University Chairs
 - Post-graduate programs and bursaries
- **Infrastructure Development**
 - Equipment Acquisition Programme
 - Two Nanotechnology Innovation Centres Established
 - ❖ CSIR Center: Materials and Energy
 - ❖ Mintek: Health and Water



IMPLEMENTATION PLAN (Cont.)

- **Responsible Development**
 - Public Awareness
 - Ethics Committee
 - Health & Safety Research Projects
- **Research Plan**
 - Focus research to deliver on strategic areas
- **Special initiatives - flagship projects**
- **International collaboration - FP7, IBSA, SA-France and SA-Argentina**



Challenges: Development of Nanotechnology in SA

- Teaching and Training courses in Nanoscience and Nanotechnology
- Development of expertise in BioNano
- Nanotechnology Advanced Characterization Tools and Manufacturing Facilities
- Industry Participation for manufacturing, production and job creation
- Crossing the “innovation chasm” in Nanotechnology value chain



PROPOSAL

- **Human Capital Development**
 - Sandwich training programmes - joint degrees
 - Exchange Programmes for researchers and students - short to medium term visits
- **Infrastructure**
 - Establishment of Nanotechnology Microscopy Centre



THANK YOU!!!



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