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BACKGROUND

- Nuclear Energy Policy approved in June 2008
  - Focus on ring-fencing nuclear activities and giving them dedicated focus
  - Contributes towards climate change mitigation
  - Contributes towards security of supply efforts through diversification of the electricity generation mix
INTERGRATED RESOURCE PLAN

- Full Plan covering the period 2010 to 2030
- It seeks to outline how South Africa will meet its energy needs while ensuring that this is achieved in an affordable manner
- Nuclear to provide 9.6 GW by 2030
SOUTH AFRICAN CONSIDERATIONS

- Targeted Application
- Economics and Financing
- Reliable electricity production
- Infrastructure and Implementation
- Nuclear Safety, Environment
- Technical Requirements
- Proliferation Resistance
- Waste management
- Physical Protection
- Public perception
Targeted Applications

➢ Electricity Off-Grid Solution:
  ➢ Rural areas with high grid expansion cost
  ➢ Rugged terrain areas where grid penetration difficult/impossible

➢ Process Heat for Energy Intensive Users
  ➢ High energy intensity industries – mines, smelters, refineries, coal gasification
  ➢ Can be used for electricity production
  ➢ Modular for easy expansion
Economics and Financing

➢ Proven technology:
  ➢ Demonstrated construction and schedule and cost (>2 reactors built with learning effect)
  ➢ Demonstrated economics of operation (>10 full power years in current licensing regime)
  ➢ Not based on speculation or paper reactor designs
  ➢ Cost comparative with grid expansion or renewable+storage solution
  ➢ Known cost and plan for D&D

➢ Localisation Potential (>70% after 5 reactors)
  ➢ Component manufacture (>50%)
  ➢ Operations and Maintenance (>90%)
  ➢ Construction (>80%)

➢ Technology Transfer (>80%)

➢ Reduce Foreign Debt
Reliable Electricity Production

- Off-grid
  - High >98% Reliability factors (proven)
  - No maintenance for at least 3 year cycles
- Assurance of components for spares, and technical support.
- Man-Machine Interface not complex and remote monitoring of system essential for off-grid.
Infrastructure and Implementation

Off-grid Electricity
- Sufficiency of Transport routes for equipment
- Emergency planning – communication and transport
- Support for regulatory review & oversight

• Fuel supply for future – MOX, thorium capability with minor modification of design.
Nuclear Safety, Environment

- Regulatory support from vendor country
- Higher level of safety than large reactors
- Longer intervention time for off-grid market
- Limited and safe plant releases of only gases during operation preferred (encapsulated unit for off-grid market)
- Suitable for most site locations – resistant to typical environmental hazards such as flooding, landslide or subsidence.
Licensing

- Modular standardised design for once-off Design Certification within 3 years with modest regulatory staff
- International Standard for Design Certification?
- Minimum site requirements – quicker site license, more flexibility.
Spent Fuel and Waste

- Off-grid:
  - No Waste management during operation
  - Removable for Decommissioning and Dismantling

- Clear solution for High Level Waste Management – waste volume per kwh similar to LWR
Proliferation Resistance

- Intrinsic in design
  - Low enriched fuel
  - Long fuel residence time in core
Physical Protection

- Proven Resistance against terrorist attack
- Secure deployment feature (e.g., underground)
- Reduced need for large scale deployment of security forces.
Thank You!