



# Developments in Space Science & Technology

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**Space Science and Technology**

**Trade & Industry and  
Science & Technology  
Portfolio Committee Meeting**



**science  
& technology**

Department:  
Science and Technology  
REPUBLIC OF SOUTH AFRICA



## Outline

- SumbandilaSat
- Developments in Space Science & Technology
- Motivation for ratification of the space related Conventions



# SumbandilaSat



# About SumbandilaSat

- R26m technology demonstrator
- Payloads
  - Remote sensing imager
  - Very Low Frequency Wave Experiment
  - Software defined radio
  - Forced vibration string experiment
  - Radio amateur transponder



# SumbandilaSat Applications

- Projects Supported
  - Mineral mapping and spectral validation
  - Remote sensing air quality monitoring
  - Identification of validation sites
  - Change vector analysis for surface and groundwater monitoring
  - Educational SumbandilaSat (cds)
  - Evaluation of vegetation specific applications
  - Sumbandilabafundi (outreach)
  - Calibration and validation



# Developments in Space Science and Technology

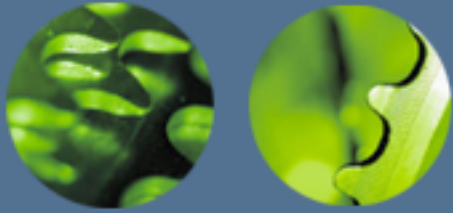


# Key Drivers

Space  
Agency

DST 10  
Year Plan

Strategy



# Latest Updates

- **Space Strategy**
  - **Implementation plan**
    - 10 year plan has been drafted
    - Currently being extended to 25 years
  - **Technology road mapping exercise**
    - Need to find synergy with DTI process
- **Space Agency**
  - **Appointment of Board of Directors**





## Mission

To address and inform national imperatives and policies through stimulating a sustainable space science and technology capability, growing human capital and applying scientific knowledge

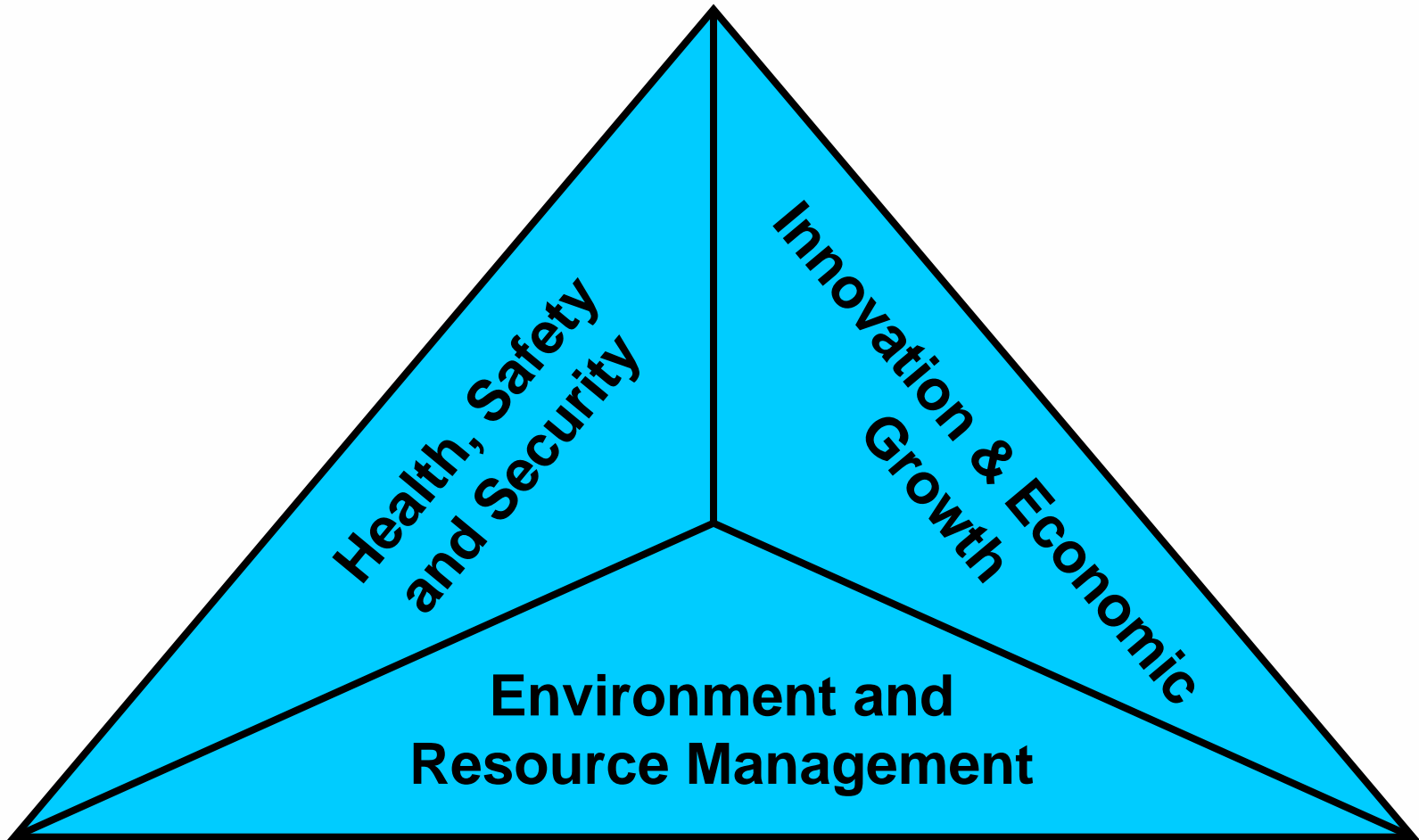


# Goals

- To capture a global market share for small to medium-sized space systems;
- To empower better decision making through the integration of space-based systems with ground-based systems;
- To use space science and technology to develop applications.



# Key Priority Areas





# Environment & Resource Management

- Environmental and geospatial monitoring
- Ocean, coastal and marine management
- Land management
- Rural development and urban planning
- Topographic mapping
- Hydrological monitoring
- Climate change mitigation and adaptation
- Meteorological monitoring



## Health, Safety and Security

- Disaster monitoring and relief
- Hazards forecasting and early warning
- Cross border risk
- Disease surveillance and health risk
- Asset monitoring
- Regulatory enforcement
- Defense, peacekeeping and treaty monitoring



## Innovation & Economic Growth

- Tourism and recreation
- Communications
- Space science and exploration
- Space technology transfer and spin-offs
- Development of the space industry

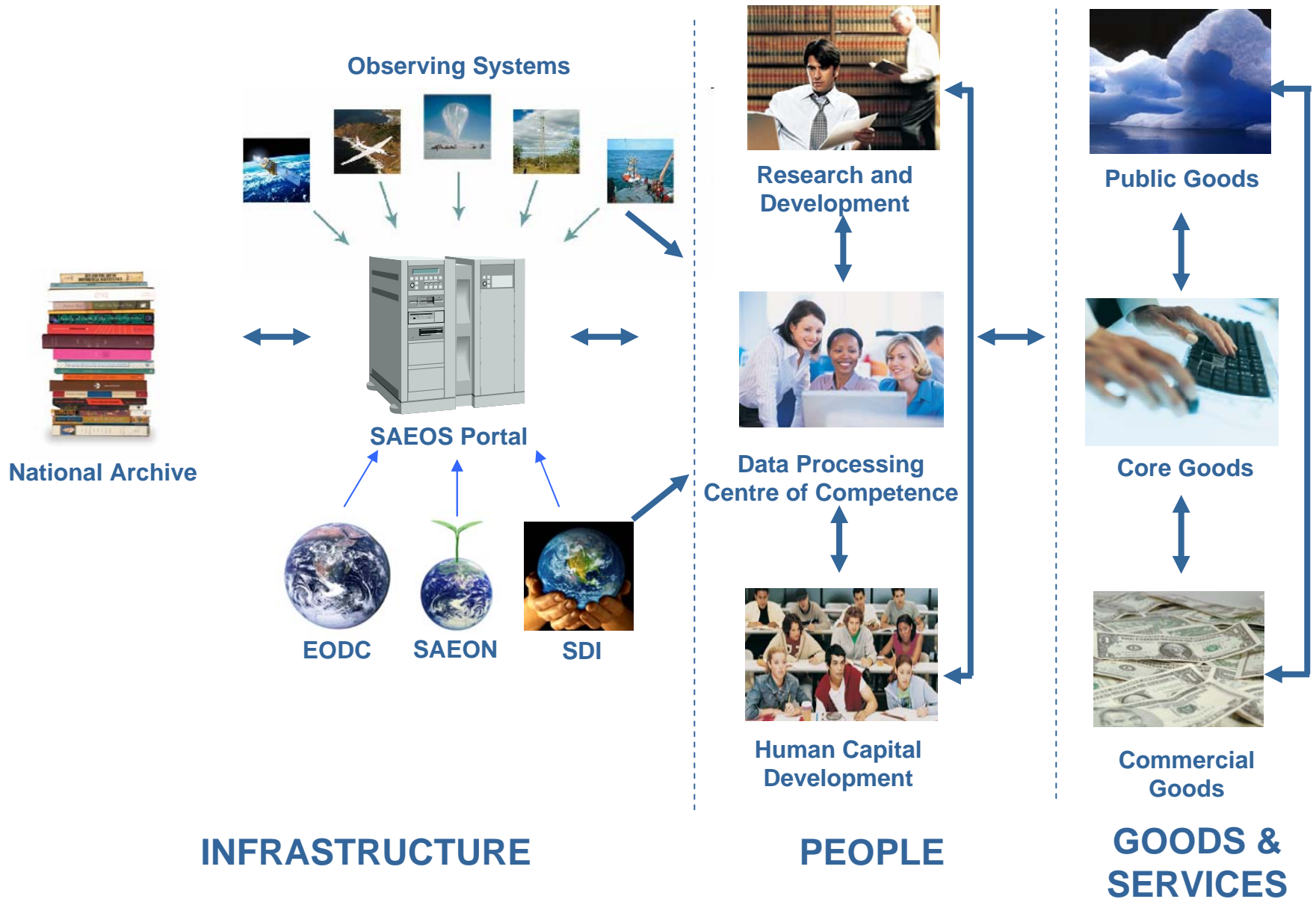


# Earth Observation

## Earth observation programmes

- Establish an earth observation data centre
- Develop a platform to integrate satellite and in-situ data
- Develop medium to high resolution payloads
- Establish centres of competence for optronics and synthetic aperture radar
- Develop the African Resource and Environmental Management Constellation in partnership with other African countries
- Consolidate the acquisition of space data for government

# SPACE APPLICATIONS VALUE CHAIN



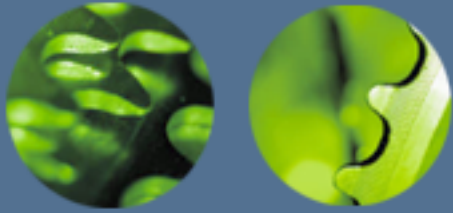




# Navigation

## Navigation programmes

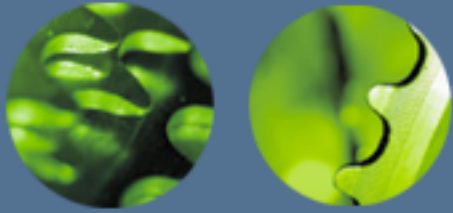
- Develop a navigation augmentation system
- Develop navigation applications to support user requirements



# Communications

## Communication programmes

- Develop technologies for low data rate payloads
- Develop technologies for applications in e-education, telemedicine and rural communication and disaster support
- Develop a geostationary (GEO) communications system
- Launch a small GEO satellite



# Space Science & Exploration

## Space Science programmes

- Build MeerKAT telescope
- Develop joint partnerships in space science payloads
- Secure Square Kilometre Array
- Establish centres of competence



# Building Blocks

**Environment & Resource Management**

**Safety and Security**

**Innovation & Economic Growth**

**Earth Observation**

**Space Science & Exploration**

**Communication**

**Navigation**

**Enabling Technologies**

**Mission Development**

**Space Mission**

**Applications**

**Infrastructure**

**International Partnerships**

**Human Capital**

**Space Awareness**



**Strategic Goals**



**Thematic Areas**



**Functional Programmes**



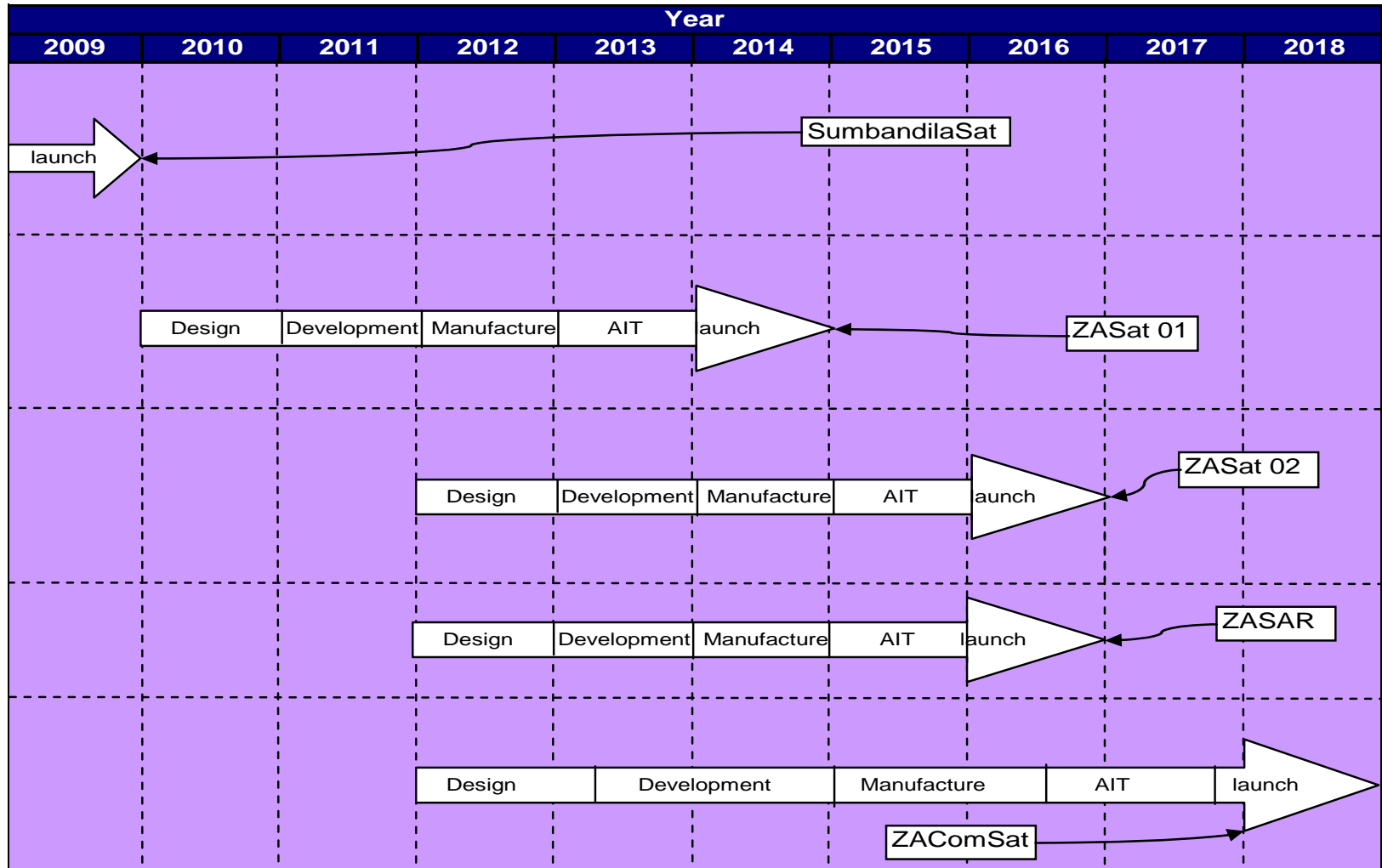
**Supporting Platforms**

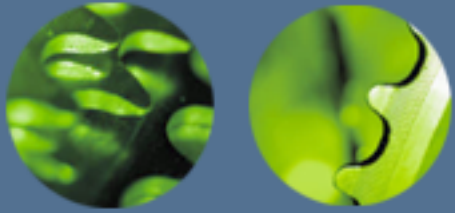


**Public Awareness**



# Planned Missions





# Space Agency

- Establishment office at the CSIR
- Finalisation of a business plan
- Appointment of Board of Directors
- Appointment of CEO
- Migration of facilities (SAC & Houwteq)



# Houwteq Infrastructure





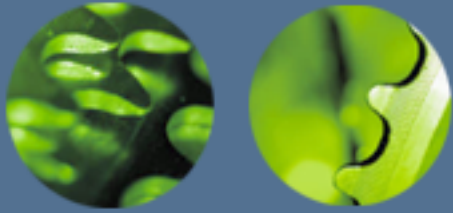
# SAC Infrastructure





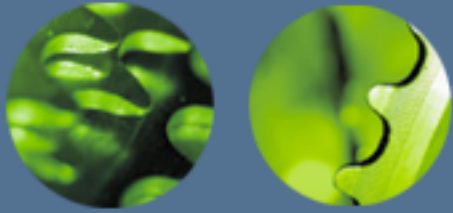


# Motivation for Ratification of Conventions



# Liability Convention

- Imposes a liability for damage incurred by a launching state
- Launching state – “state which launches or procures a launch or a state from whose territory or facility a space object is launched”
- Damage in airspace – liability to compensate is absolute
- Damage in space – damage is due to fault



# Registration Convention

- Obligation to register all space objects – information about every space object
- Mitigation of space debris



**THANK YOU**