

# Advanced Nuclear Research Centre

*Supporting Excellence in Nuclear Operations Globally*

**Mark Gayfer**

CEO ANRC

**BrucePower**  
Innovation at work



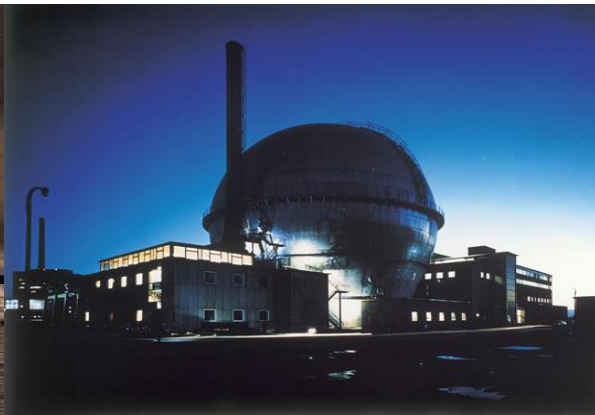
cavendish  
nuclear



**KUKA**



The  
**Alan Turing  
Institute**

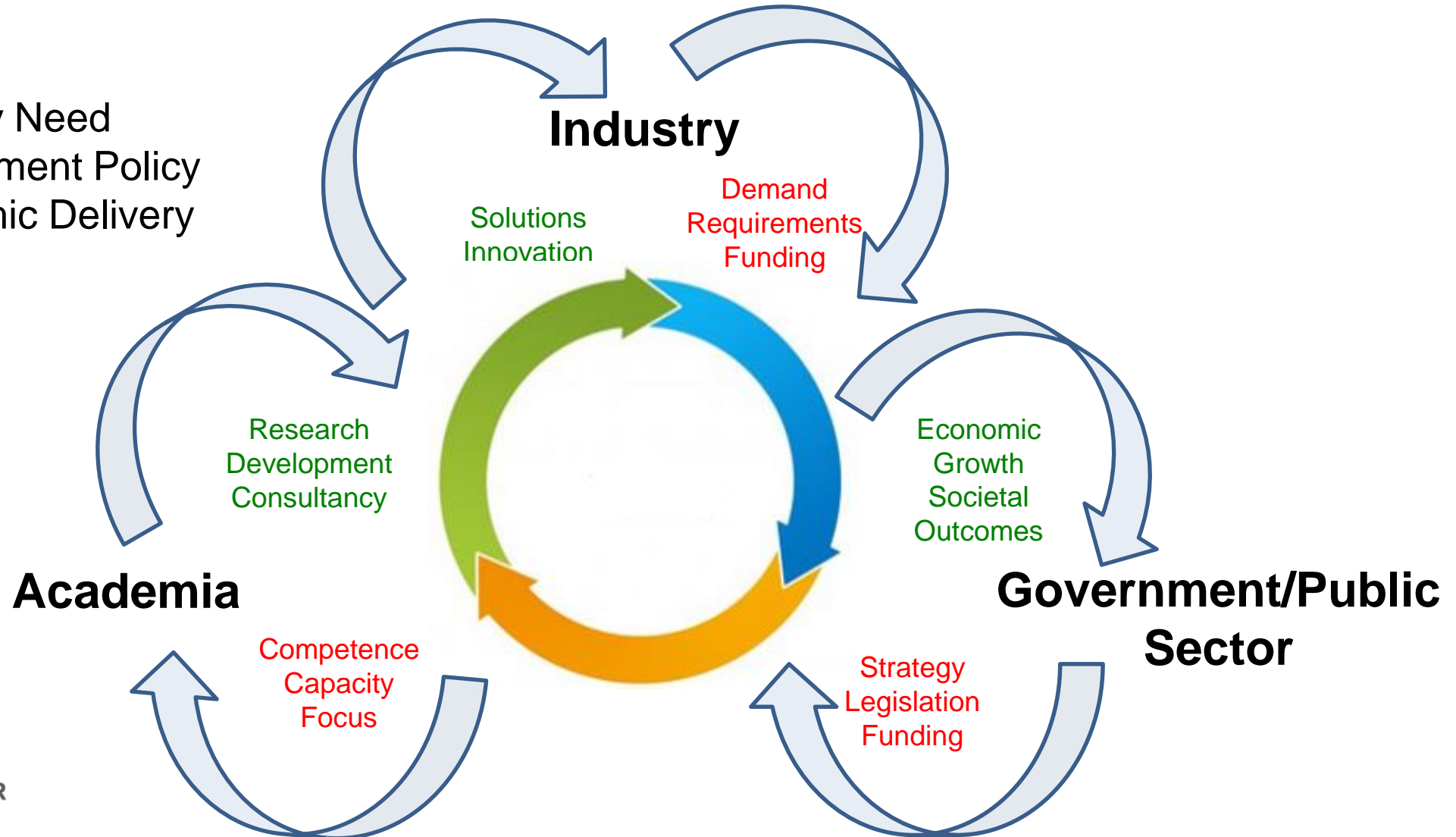


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# Translational Centres: The Triple Helix

Alignment of:

- Industry Need
- Government Policy
- Academic Delivery



# ANRC: The Model

- Member led centre, open to all
- Pool funds from research grants and industry to provide >6:1 leverage for member
  - 100% of membership fees, plus leveraged funding is spent on projects agreed by the ANRC Board
- Bridge the gap between research and application, strengthening the links between universities and industry

## ***Driven by Industry for Industry***

ANRC is a leading international centre of excellence focused on accelerating the development and deployment of new technology, delivered with the aim of reducing through life costs and timescales in the nuclear sector

# ANRC: Our Mission

## *Driven by Industry for Industry*

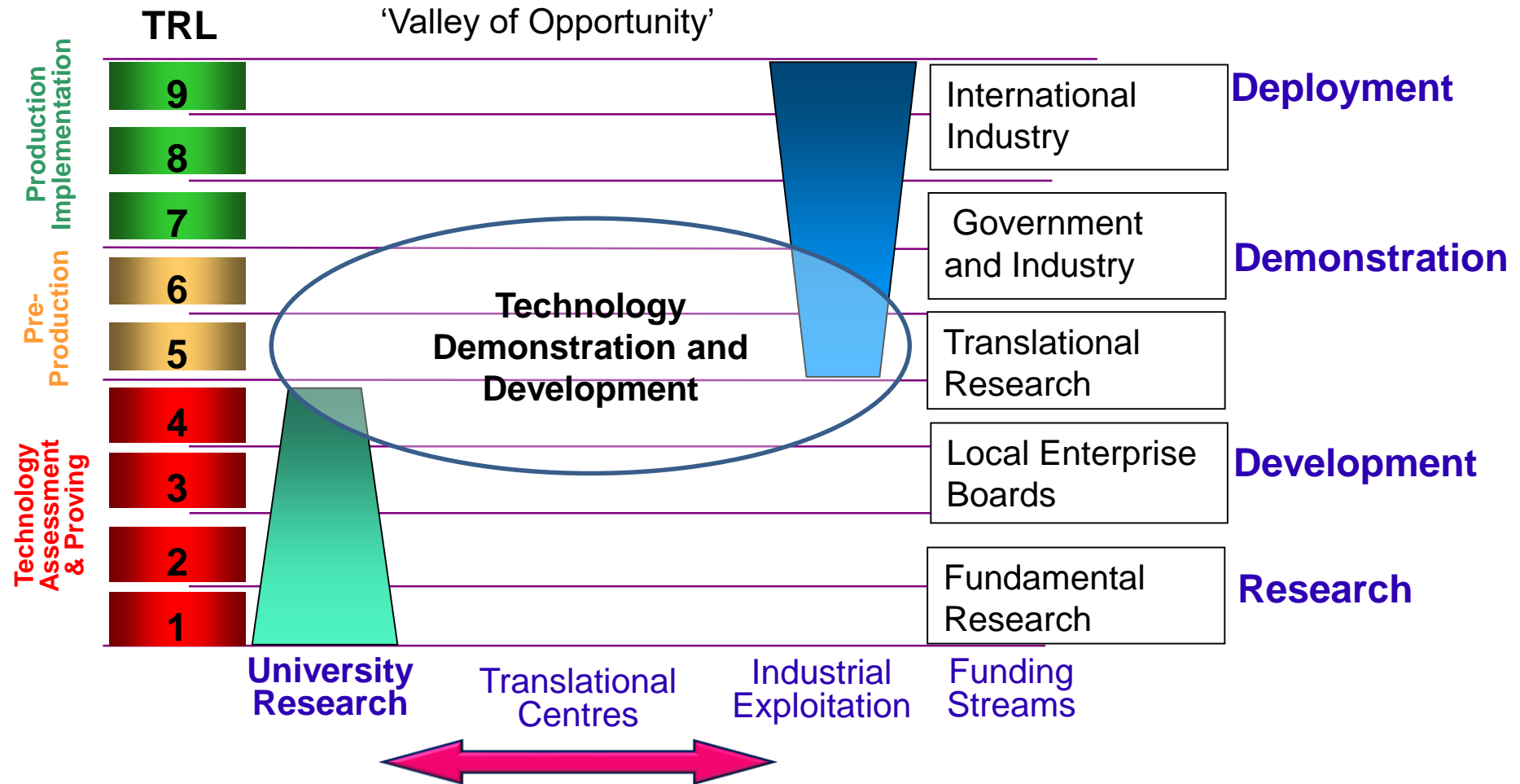
The ANRC mission is to help members achieve:

- Higher system availability
- Assured life extension
- Reduced through life costs
- Optimal maintenance and equipment replacement programmes
- Efficient, cost effective radioactive waste management and decommissioning

# ANRC: How We Do It

- Understand need
  - Common objectives
  - Joint road mapping
- Generate the right environment for innovation
- Form the right team through collaboration relationships with:
  - Industry
  - Academic partners (national and international)
  - Governments
  - Institutional partners
- Focus on delivery for industry as a collaborative team

# Innovation at Pace and Scale



Working with industry to understand market failure

Working with industry and public sector to support industry at pace and scale



UNIVERSITY of STRATHCLYDE  
ADVANCED NUCLEAR  
RESEARCH CENTRE

## Framework of Strategic Drivers

### Mega Trends



Asset  
Management



Low Carbon  
Future



Positive Nuclear  
Reputation



Value for  
Money



Robust Energy  
Policy



### Sector Challenges



Plant  
Efficiency



Life  
Extension



Decommissioning  
Management



New  
Builds



Intelligent Risk  
Management



### ANRC Strategic Programmes



Industrial  
Informatics



Life Time Management  
& Inspection Solutions



Decision  
Support



Radwaste & Decom  
Technology



Innovative  
Technologies



### ANRC Centres of Excellence



Advanced Data  
Processing and Analysis



Electronic and Electrical  
Engineering (inc. CUE)



Civil & Environment  
Engineering



Physics



Management  
Science



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# Underpinning Research

- Innovation in the treatment of radioactive wastes
- Biotechnology for concrete treatment and repair
- Laser particle acceleration
  - Compact particle and x-ray beam generation
  - Advanced radiographic diagnostics
  - Isotope production
- Advanced ultrasonic / optical detectors
- Robotics and autonomous systems
- Smart materials (e.g. fluorescent ceramic coatings for temperature measurement, fibre-optic based embedded sensors, magnetic gap filler material)
- AI, machine learning and data analytics
- Advanced image and video processing

# SCAPA: Scottish Centre for the Applications of Plasma-based Accelerators

Focussed on the development and exploitation of laser-driven accelerators and radiation sources.

~£11M strategic investment by Strathclyde, SUPA, EPSRC and STFC-CI.



- **3 shielded areas** containing up to 7 accelerator beam lines.
- High-intensity femtosecond laser systems:
  - a) 350 TW at 5 Hz
  - b) 40 TW at 10 Hz
  - c) sub-TW at kHz
- High-energy **ion** and **electron** bunches
- Secondary **X-ray/g-ray** and **neutron** pulses

# University of **Strathclyde** **Glasgow**

