

# **Shaping Australia's future through innovation**

**PMSEIC – 23 April**

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**Chair, Review of National Innovation System**

## **Desirable outcomes from Review include:**

- 2020 + perspective
- greater awareness of scope of innovation agenda
- clarification of roles within the system
- principles to guide action
- framework to support prioritisation of effort
- proposals for greater strategic capability in system
- governance for better execution and delivery
- addressing gaps in system and imbalances

## ***Australia needs an innovating capacity that:***

**Delivers prosperity and helps us compete in the world; and is able to evolve and respond to changes over time (the goal posts keep shifting).**

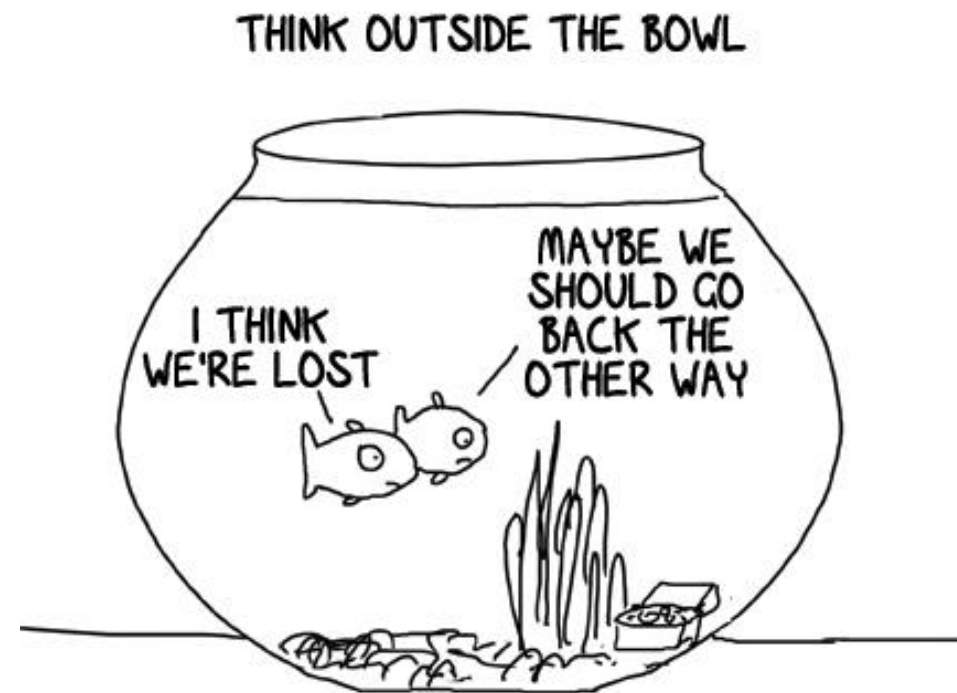
**The world of innovation has two very different models:**

***(i) Crisis and shock driven***

*(‘The gathering storm’ (US); ‘the last to leave turn out the lights’, Ireland ; ‘what’s life after the Soviet Union?’, Finland....*

***(ii) A culture of pursuing opportunity***

*(‘It’s a race to the top’, UK;  
‘We can be as good as the best’, China, Chile, India ...)*



## What is Innovation?

*“... in danger of becoming an aerosol term - sprayed around everywhere”, Glyn Davis, Panel member*

***Innovation*** = creating value through doing something in a novel way

= *ex post*,

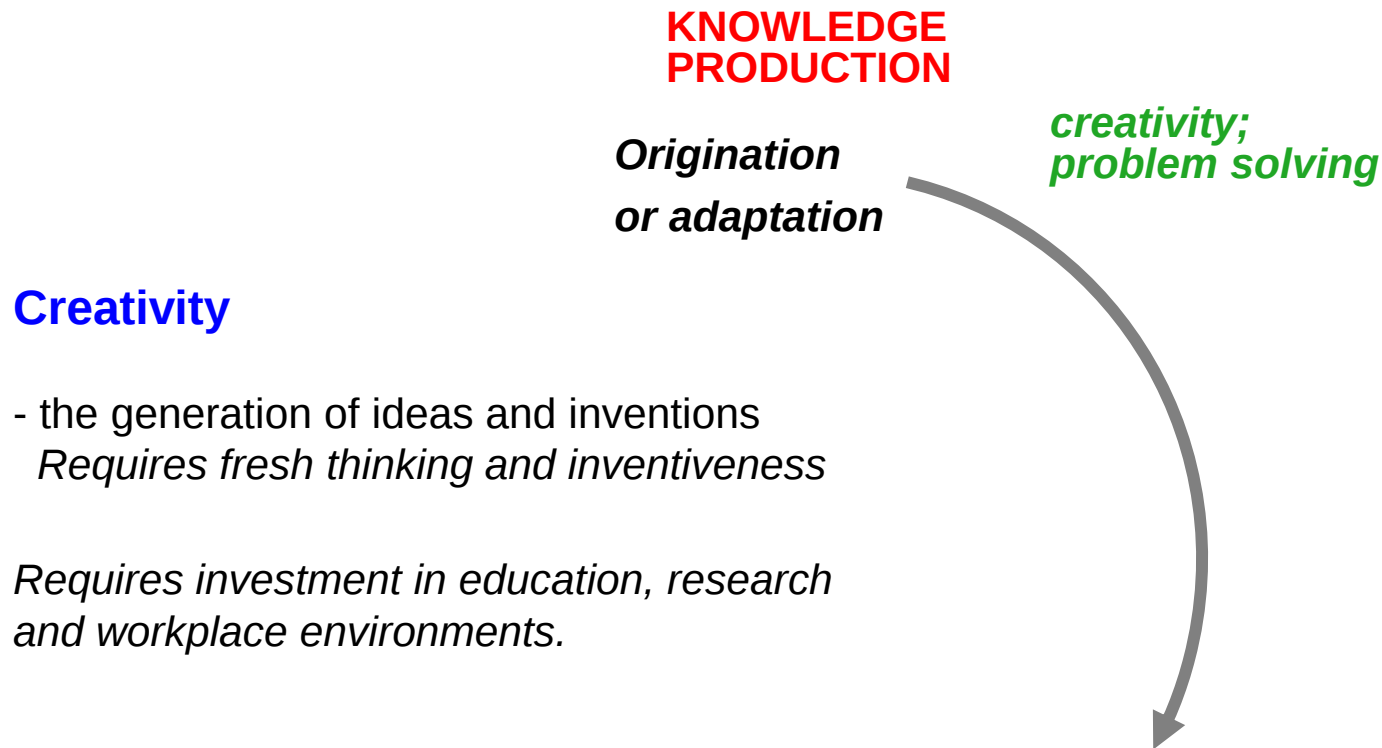
so we need *ex ante* understandings of the dynamics of socio-economic change  
in order to influence and shape the processes of value creation



***Innovating*** = creative problem solving

***Being innovative*** = creative problem-solving in order to create value

## The first phase of the innovation process:



***Using \$ to produce knowledge***

## The second phase of the innovation process:

### Entrepreneurship and commercialisation

- linking good ideas to the right market and other opportunities

*(Good ideas or patents without customers or users are worth nothing)*

*Requires entrepreneurs and risk taking*

*Needs two way awareness of opportunities and needs*

*Industry should lead (generally), but governments can help reduce barriers to success*

*Firm-to-firm and firm-to-research provider linkages become increasingly important in an era of open innovation and “markets for innovation”*

KNOWLEDGE  
PRODUCTION

*Origination  
or adaptation*

*creativity;  
problem solving*

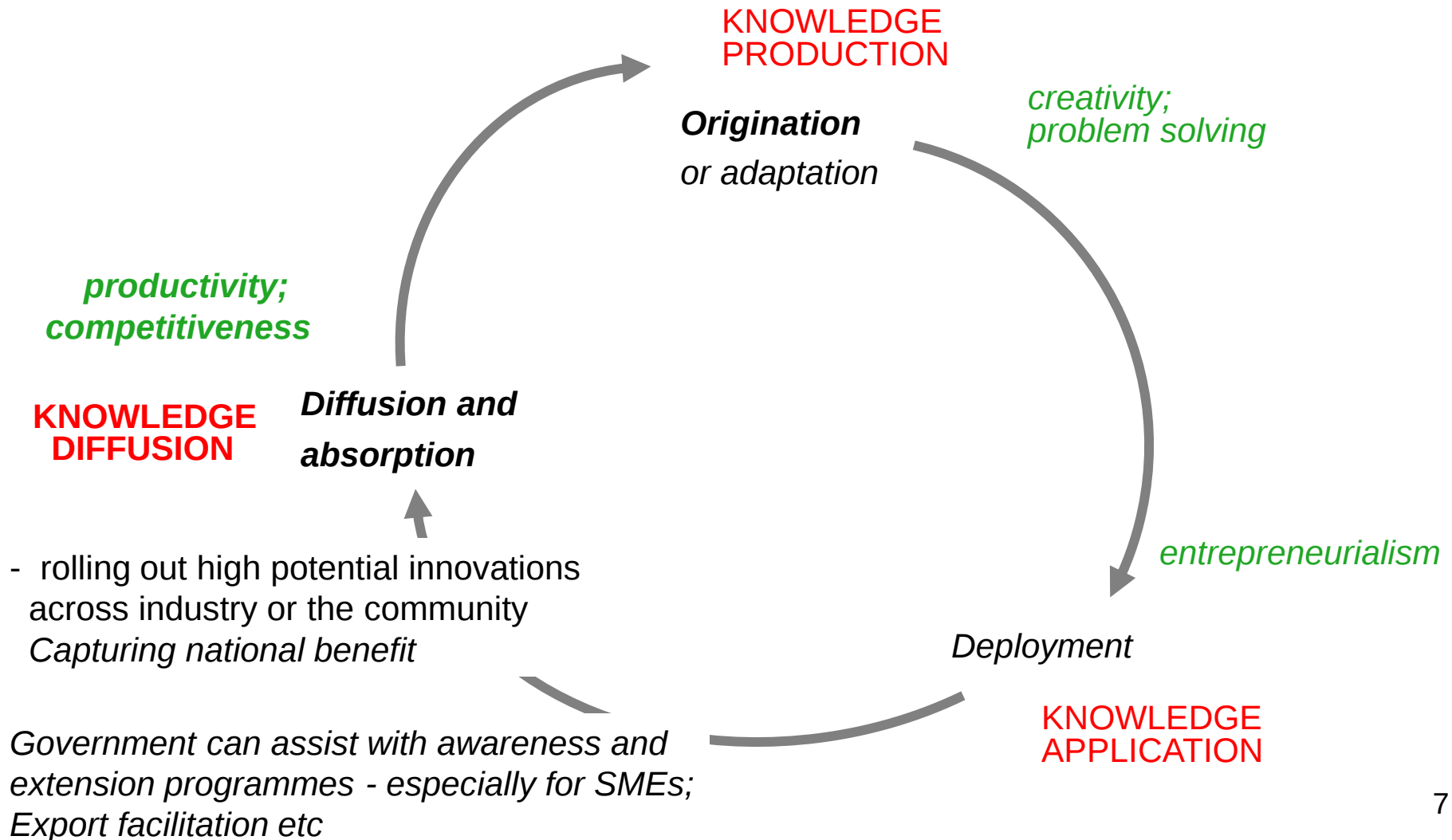
*entrepreneurialism*

**Deployment**

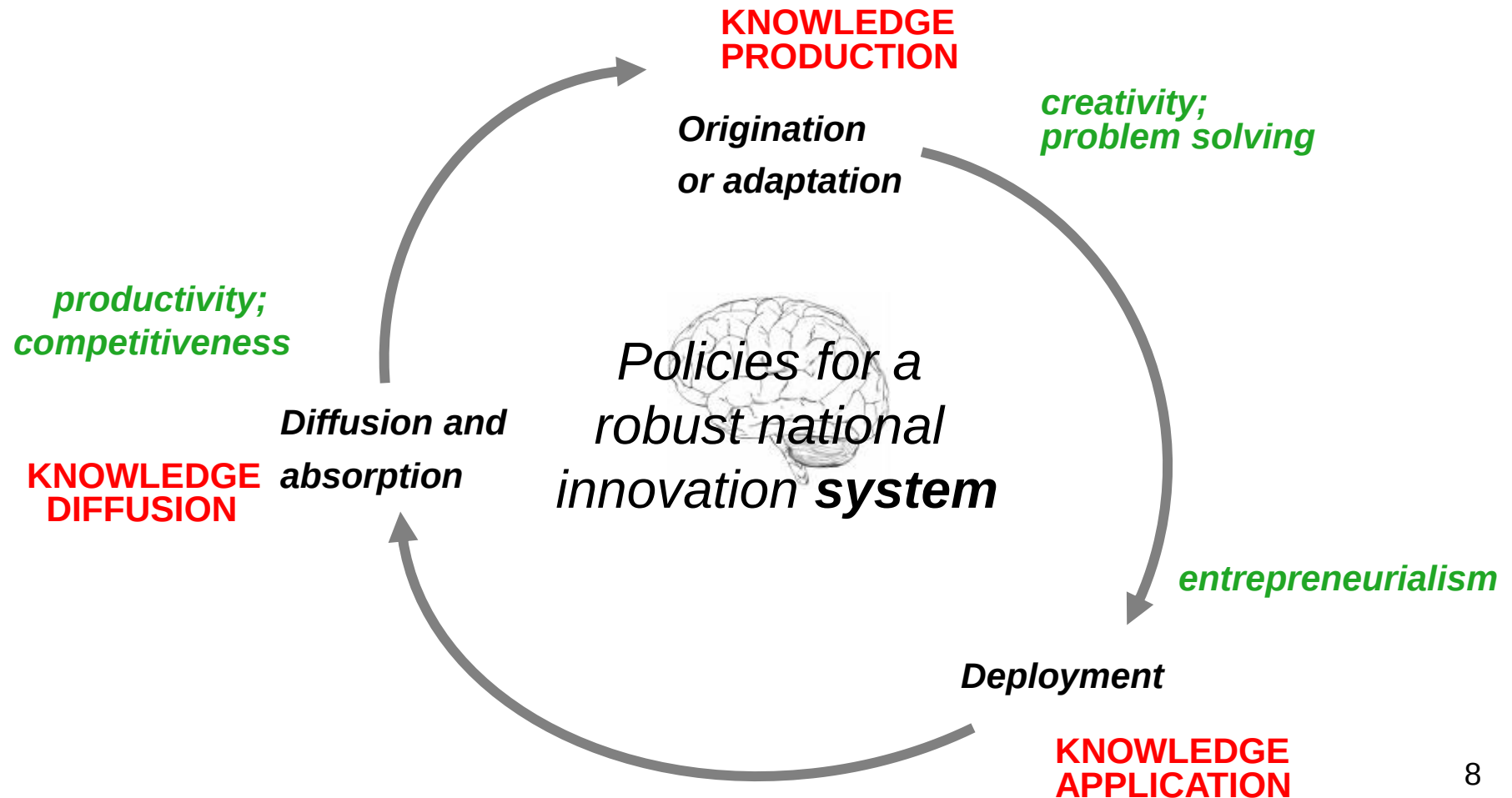
KNOWLEDGE  
APPLICATION

**“Using knowledge to produce \$ or value”**

## The third phase of the innovation process:



Innovation is a virtuous, open cycle of socio-economic change and industrial evolution: *it is about an economy and society on the move*



## The triple helix of innovation:

(i) market-based innovation to increase productivity and improve competitiveness;

(ii) innovations and changes in public policies and service delivery around the production of public goods;

*and*

(iii) innovations and changes to address societal and environmental aspirations and challenges, and the mobilisation of private and public sector capabilities around these challenges.

**INDUSTRY**

**GOVERNMENT**

**COMMUNITY**



## Innovation system = the stocks and flows around innovation

- The elements of innovation involve both ‘stock’ and ‘flows’: **stocks** of knowledge and capability, and the **information flows** of the innovation capital around these.
- We need to invest in the capabilities required around each element of the innovation system, as well as investing in the linkages and flows between them.
- Resources applied to innovation should be regarded as ***investment in the future***, not as expenditure.

## Five key functions within an innovation *system* are

- identification of opportunities and choices
- creating capabilities
- managing risk and uncertainty
- building and maintaining supporting infrastructures
- mobilising resources

## **Systemic challenges within an innovation system** *(areas for potential system failure, over and above market failure)*

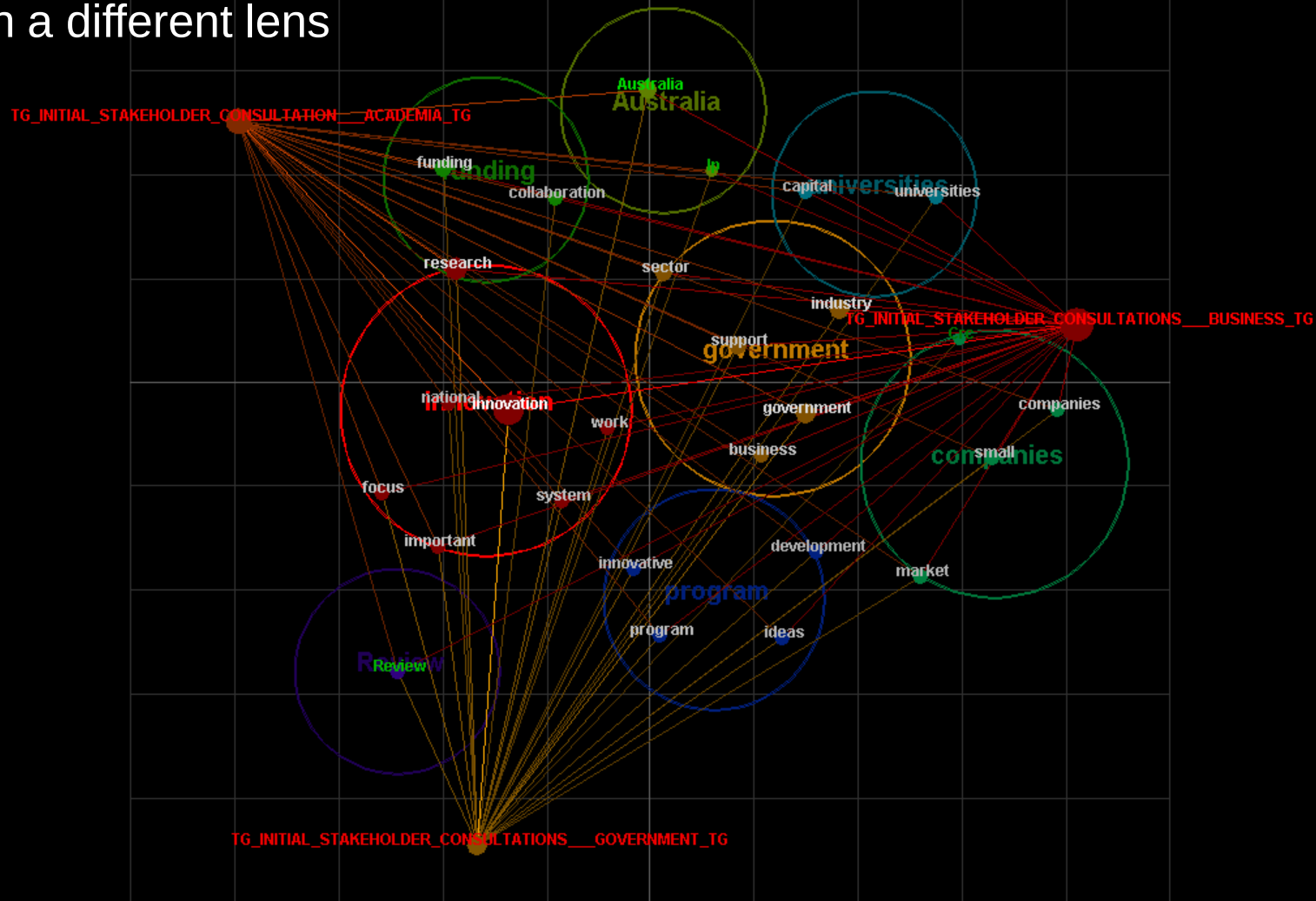
1. **Inadequate infrastructure provision**
2. **Inadequate institutional development and evolution.**
3. **Lack of skills, and learning problems (eg absorptive capacity).**
4. **Structural adjustment issues and transitional problems in economic change (eg technology lock-in).**
5. **Networking and collaboration problems (loose *versus* tight).**
6. **Heterogeneity and diversification versus specialisation.**
7. **Imbalances within and across the innovation system (ie. *forgoing leverage - in Australia, are the parts better than the whole?*)**

# REVIEW OF THE NATIONAL INNOVATION SYSTEM

[innovation.gov.au/innovationreview](http://innovation.gov.au/innovationreview)

Iterations = 1000

Analysis of our initial consultations shows agenda of different stakeholder groups are highly disconnected and divergent - each sees innovation through a different lens

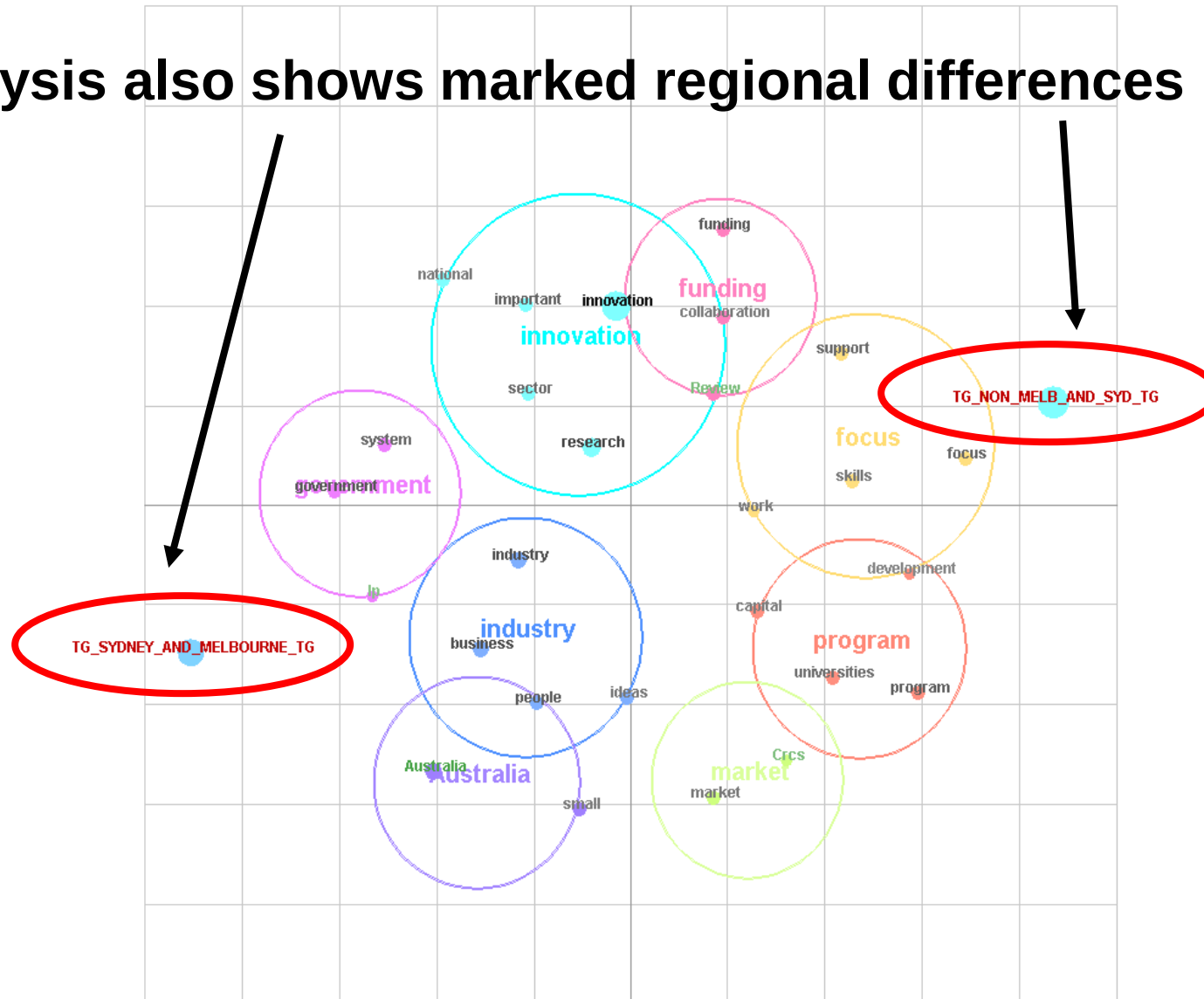


# REVIEW OF THE NATIONAL INNOVATION SYSTEM

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Iterations = 1000

## Analysis also shows marked regional differences



## Australia: currently a federated, decentralised model of innovation (cycles of centralisation and fragmentation over time)

- ¶ Both Federal and State governments play key roles in Australia's innovation system;
- ¶ At each level, activities are spread widely across different Ministries
- ¶ This means that a lot of co-ordination occurs at the inter-agency level, rather than from a top-down policy framework
- ¶ The mapping of innovation-related activities and functions on the following page can be variously interpreted as:
  - un-cordinated, de-centralised and fragmented, or
  - as representing a microcosm of the global challenge of managing complex systems.
- ¶ Australia's structural characteristics - small and sparse - put a premium on collaboration and partnerships (which equips Australia well for learning about "open innovation" within a global economy).



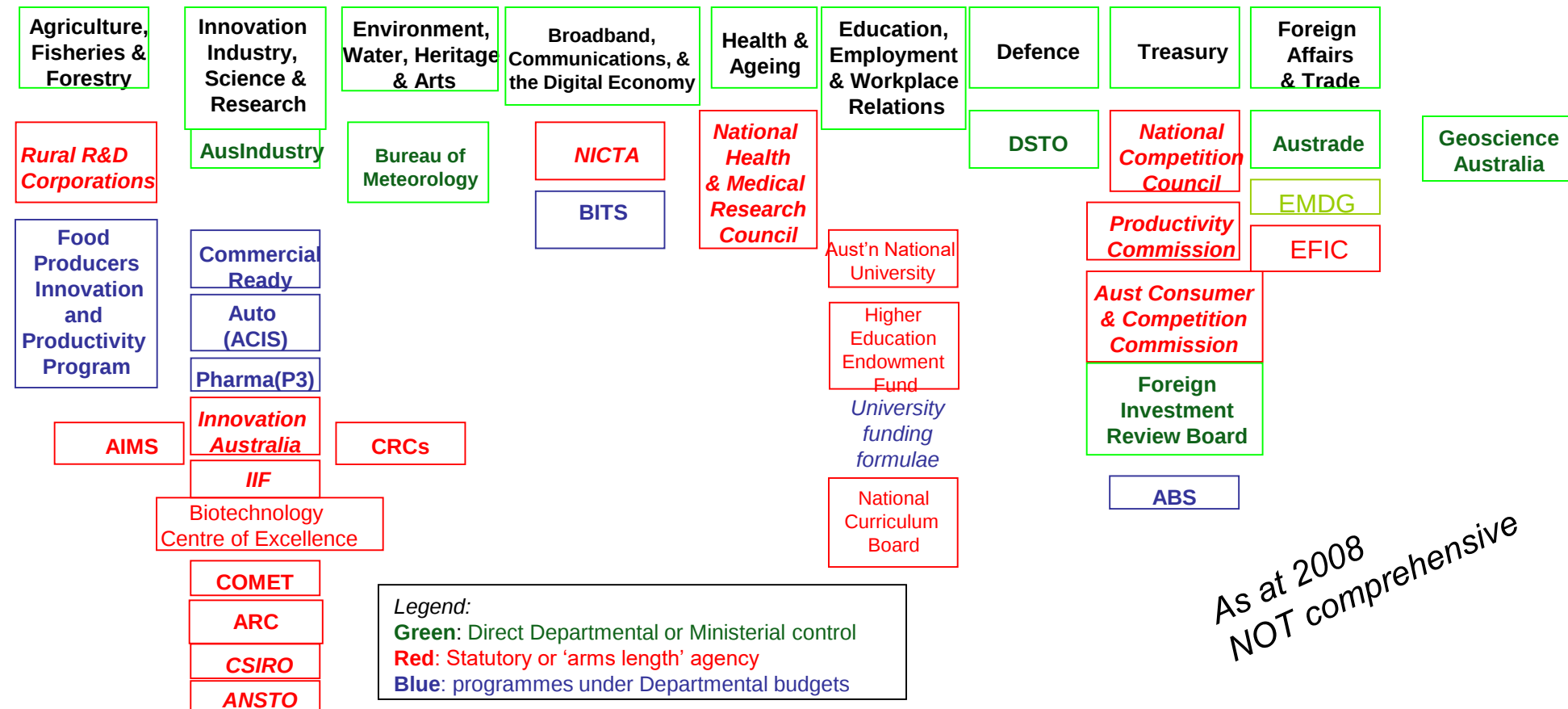
# REVIEW OF THE NATIONAL INNOVATION SYSTEM

innovation.gov.au/innovationreview

## National Departments\*

Dept of Prime Minister & Cabinet

Prime Minister's Science, Engineering and Innovation Council



Council of Australian Governments: *Federal and State co-ordination*

## State Administrations

Departments of Primary Industry    Departments of Innovation, Industry & State Development    Departments of the Environment    For eg: CIO, "Multimedia Victoria", Film Victoria    Health Services Hospitals    Education Universities    Emergency services    Treasuries    Trade promotion; Investment attraction

As at 2008  
NOT comprehensive

\* This does not purport to be a comprehensive mapping

## Innovation is a classic ‘whole of government’ issue...

### Specialised bodies of thinking and practice

#### Economy

- Employment
- Monetary settings
- Fiscal settings
- Savings
- Tax
- Commerce

#### Social infrastructure

- Education
- Health
- Housing
- Transport
- Communications
- Energy
- Demography

#### International relations

- Defence
- Foreign Affairs
- Trade
- Aid

#### Environment

- Water
- Air
- Climate
- Urban planning
- Biodiversity

#### Laws

- Constitution
- Justice
- Family law
- Commercial law
- Criminal law
- Human & legal rights

#### Identity and belief

- Religion and morality
- Culture- sports, arts & entertainment
- Indigenous peoples
- Multiculturalism
- Nationalism

### Innovation as a cross-domain issue and challenge

#### Investment

- focus
- incentives

#### Education & research

#### Cities

- “creative cities”
- industry clusters

#### Geography

- tyranny of (low) density
- distributional politics of federalism

#### Infrastructure

#### Demography

- population and immigration
- aging

#### Security

#### International treaties and agreements

#### Trade and export

#### Legal codes

- intellectual property
- competition law
- workplace law

#### Planning codes; standards etc

#### Culture

- the arts and creative industries

#### Values & norms

- risk taking
- elite performance
- egalitarianism
- pluralism

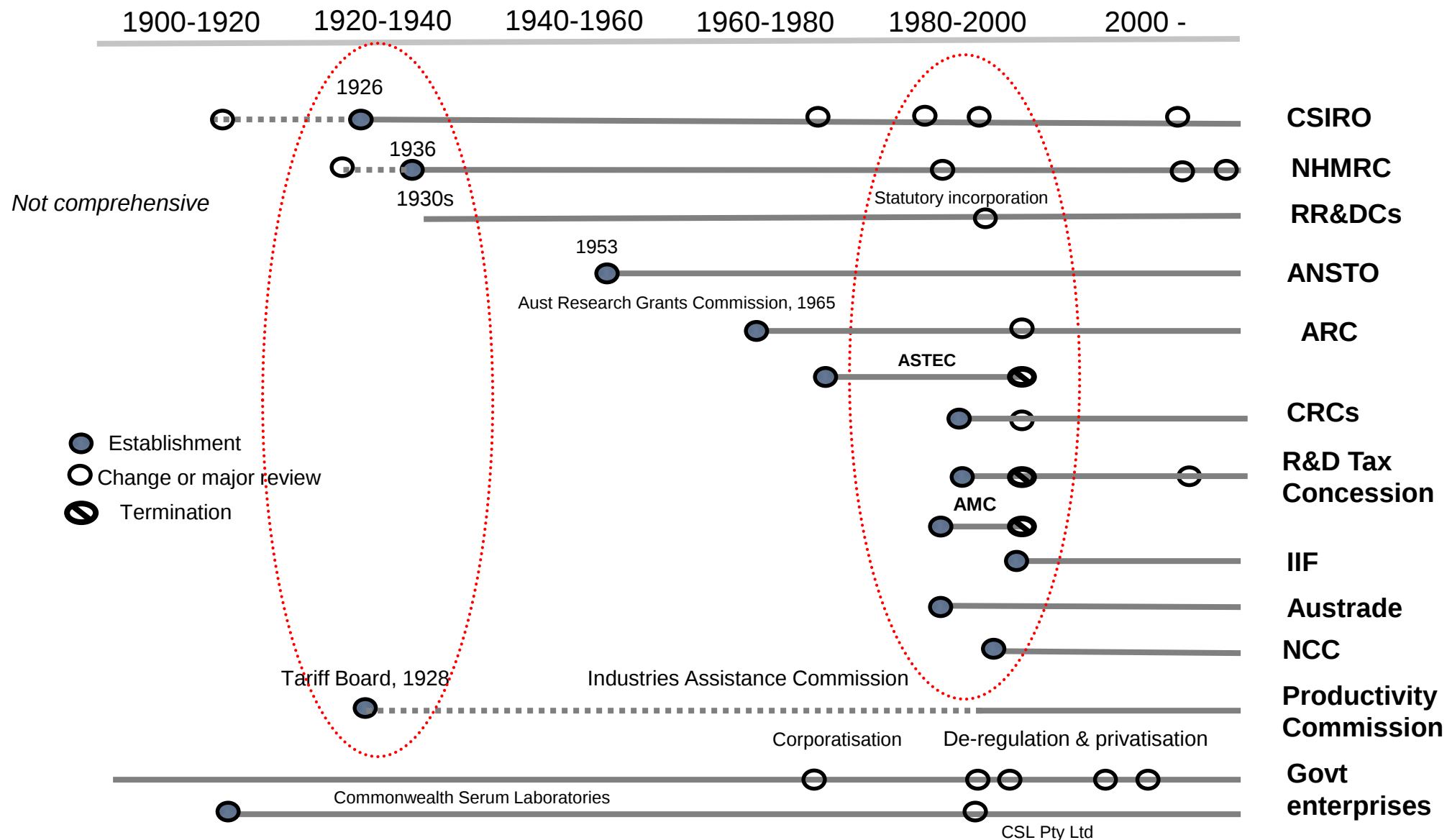
#### Rules

- regulation of biotech and research

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## THE INSTITUTIONAL EVOLUTION OF AUSTRALIAN DEVELOPMENT AGENCIES



## EVOLUTION OF AUSTRALIA'S ECONOMIC DEVELOPMENT - path dependencies and changing national priorities

19th  
century

Superior economic performance to US - off back of mining (gold) and wool

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1900-1920

1901 - Institution building around new Commonwealth of Australia; key role for government enterprises;  
1914-1918 war - Disruption to civil imports; lack of local defence materials

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1920-1940

Push for greater local industrial self sufficiency, defence industry and public health capabilities

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1940-1960

Sunset of Imperial influence: shift from UK to US alliance. Post war reconstruction, industrialisation: "nation building" projects - including discussion of nuclear futures (off uranium resources).

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1960-1980

Manufacturing stagnates behind protectionist barriers; beginning of second mining boom (iron; coal; uranium)

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1980-2000

Internationalisation of economy (with reduction of tariffs and floating of currency); programmes for structural adjustment and micro-economic reform; privatisation of government enterprises. Focus on new ICT and biotech technologies. Strong productivity growth.

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2000 -

New challenges from global warming, energy futures, terrorism and preventable diseases focus new national priorities; emergence of competition from BRIC economies; China now key trading partner

## The forward-looking challenges and issues being raised include:

- For business - re-gearing for a changed and changing industry environment (eg, globalisation, impact of “Web 2.0” and innovation in services). Innovation for business is about commercialisation.
- For the research sector - clarifying core roles; full funding, eResearch ... The core business of universities is about building knowledge and human capital.
- For government - what different roles; whole of government cohesion; governance; innovation in public services; innovation dividends through government procurement (smart user)
- Internationalisation of the innovation system (integration within the global innovation ecosystem) - issues for government, business and industry, and academia
- Funding models and resource allocations (stocks and flows)
- Prioritisation of effort and available resources - innovation priorities

**In addition to consideration of submissions and the input from our three Working Groups, we are initiating special roundtables in the following areas:**

1. Funding models
2. Government procurement (government as a demanding and innovative customer)
3. Information policy and intellectual property approaches
4. On the job skills development and training, and management education
5. Innovation metrics and target setting
6. National facilities and collections
7. Innovation in the public sector
8. Rural innovation
9. Tropical research and industries

## Putting Australia into context - the innovation challenges of an advanced but small economy (the 2%:98% challenge)



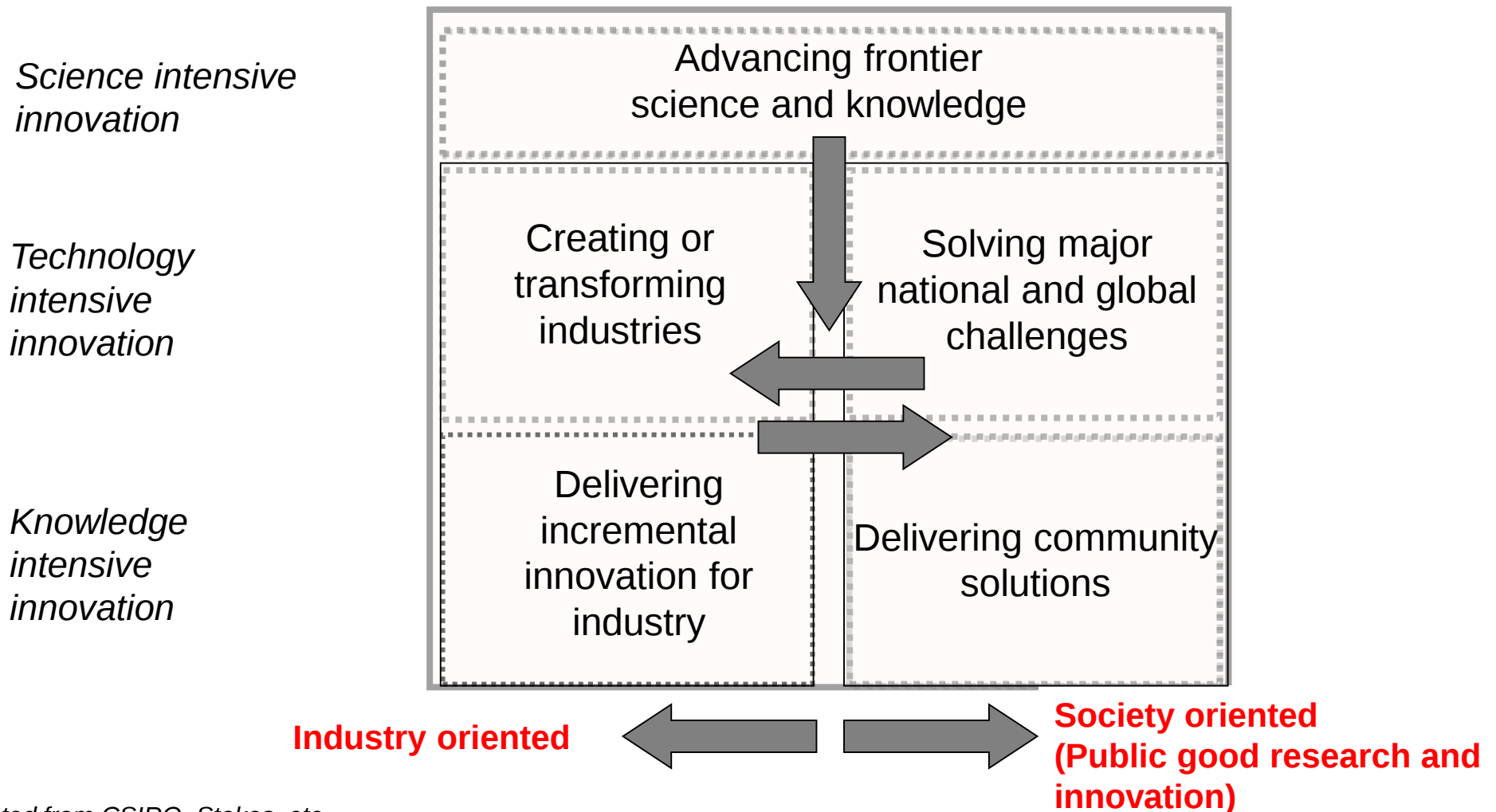
- ¶ The tyranny of distance
- ¶ The tyranny of low density (sparsity)
- ¶ The impact of trade gravity
- ¶ The opportunities from natural endowments  
(seas, space, land, resources, biodiversity, isolation)
- ¶ The challenges of federated, distributed systems

## Considering national priorities for innovation: *we can't be good at everything*

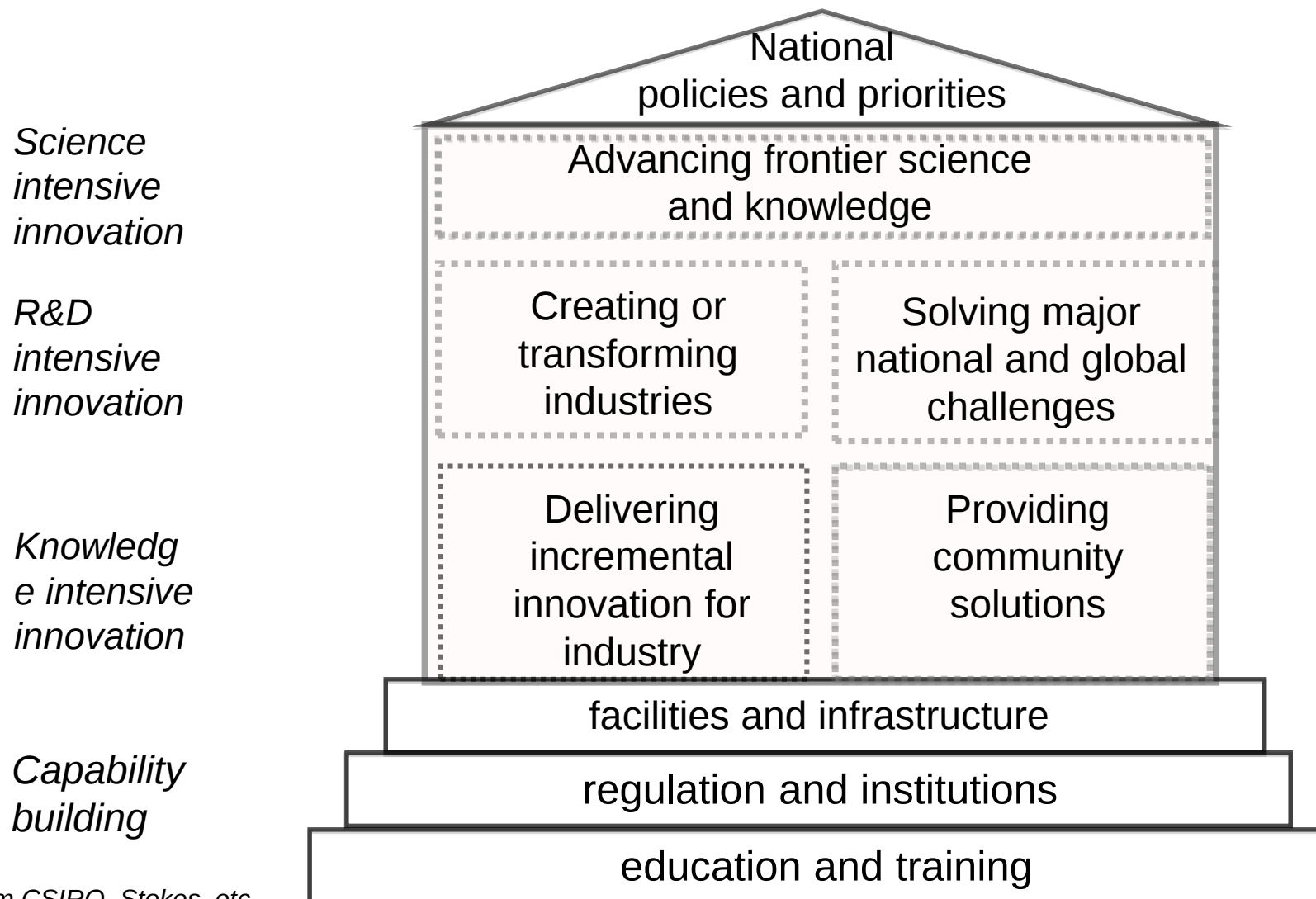
### *Some starting points ....*

1. *Start* from leveraging Australia's natural endowments or built strengths
2. Look to areas where there might be a distinctively Australian advantage in developing solutions to globally relevant challenges or markets
3. Identify opportunities through innovation to transform and reinvent existing industries and service delivery for competitiveness
4. Address the small country challenge in internationalising innovation
5. Maximising impact and national benefit from the supporting investments in national capabilities, facilities and innovation infrastructure

## Examining five discrete roles within a national innovation system:



***Addressing the challenge of managing an innovation portfolio - Promoting a clear framework for national investment and decision making (and for aligning the objectives and incentives of parties)***



## Investing in missions and capabilities to address national priorities ... *Matrix management* - matching the right capabilities against priority activities

### CAPABILITIES

'enduring' - but evolving

- structural
- long time scales
- **'irreversible' decisions**
- capabilities for future demands

### PRIORITY actions

- delivery path to impact
- reversible decisions

*impact*

*goals*

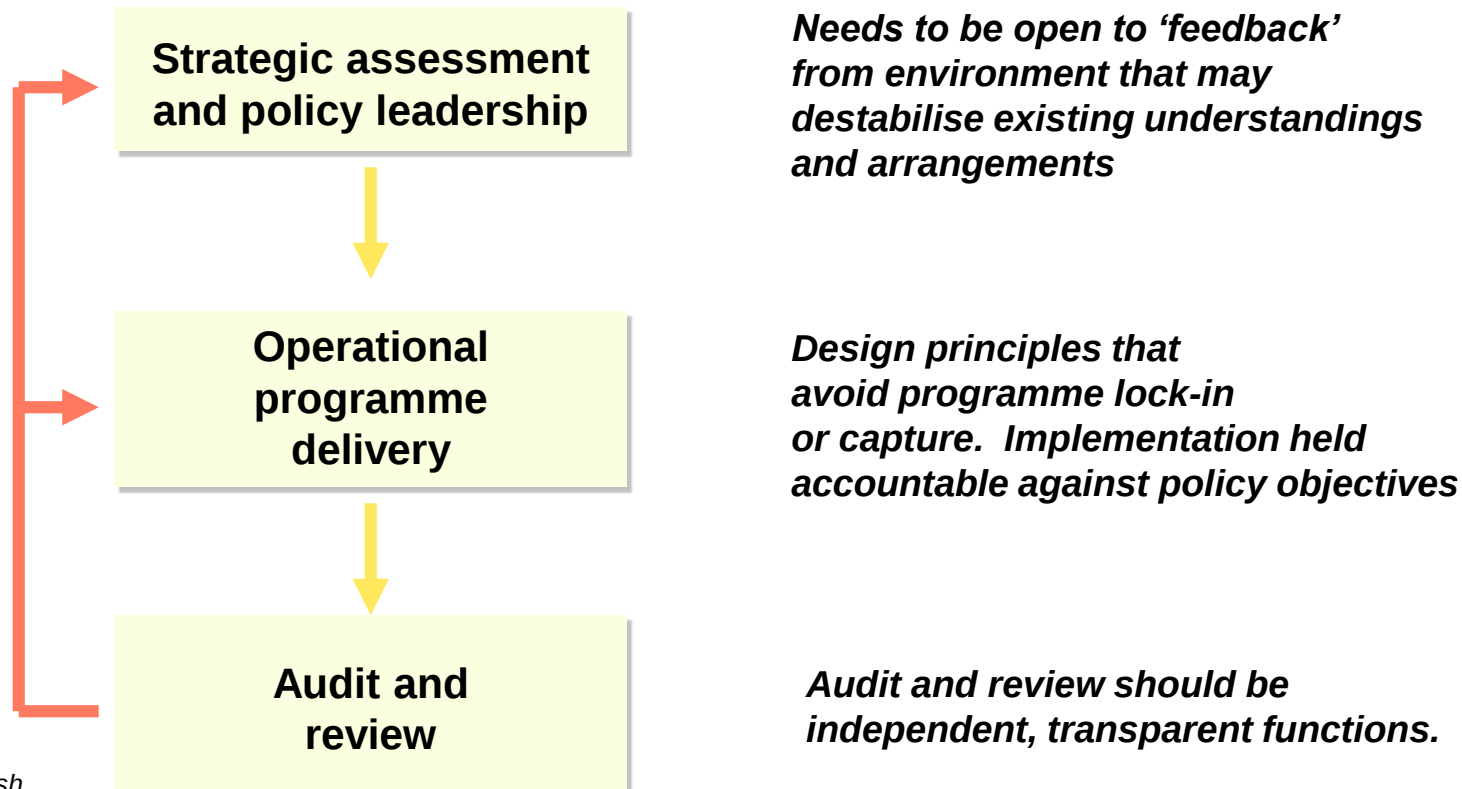
'enduring' - but evolving

- externality
- focus for impact

**DESIRED  
NATIONAL  
OUTCOMES**

## **Governance of the innovation system: *Strengthening strategic leadership for a never-ending journey***

Structuring how government exercises its roles and promoting sound governance for its innovation policy framework is promoted by distinguishing three distinct functions:



## Bringing an international perspective to bear on the Review

- International advisers
- International consultations

### Review of international approaches is showing that:

- our approach is consistent with thinking in leading jurisdictions
- most countries are converging around a common policy agenda -
  - what differentiates countries is their execution strategies
- leading countries have a strategic central coordinating body to promote consensus around national priorities and “innovation portfolio” resourcing.

## We are not in the business of reinventing the wheel...

