

Australian Innovation Policy and Public-Private Alliances:
"Where we were and where we are going".
Case Study*

Dr Terry Cutler
Australia
Santiago, April 2008

*Background for ECLAC's project "Private-Public Alliances for Export Development" (2008) in collaboration with the Iberoamerican General Secretariat and Corfo, Chile

Caveat emptor!

What shapes my perspectives and observations on this subject ?

¶ Career has straddled corporate and public sector roles

- *have sat on both sides of the fence!*

¶ Work extensively internationally, especially in Asia

- *so interested in differences **across** national innovation systems - no “one size fits all model”*

¶ Background in technology, but also worked extensively in creative industries and their role in innovation

- *so believe that a national innovation strategy is more than just a science and technology policy*

¶ Currently chairing Australian Government major review of innovation policy for Australia

- *so obviously don't believe we can ever stand still*



The pitfalls around country case studies

□ For one's own country:

tendency to overstate the country's weaknesses and challenges,
and to understate strengths and embedded advantages

and

to over-emphasise the short-run at the expense of the long run.

There is also as much to be learned from policy failures (or mixed results)
as from obviously success outcomes

“How can innovation change a country?”

What is innovation? What are the questions we need to ask?

Innovation within the Australian context

The journey : a brief history of innovation in Australia

What we do well, and not so well

Current issues facing Australia

Government responses - the current Review

Opportunity to apply some of the principles and learnings from working with CEPAL

What is Innovation?

Innovation = creating value through doing something in a novel way

= *ex post*,

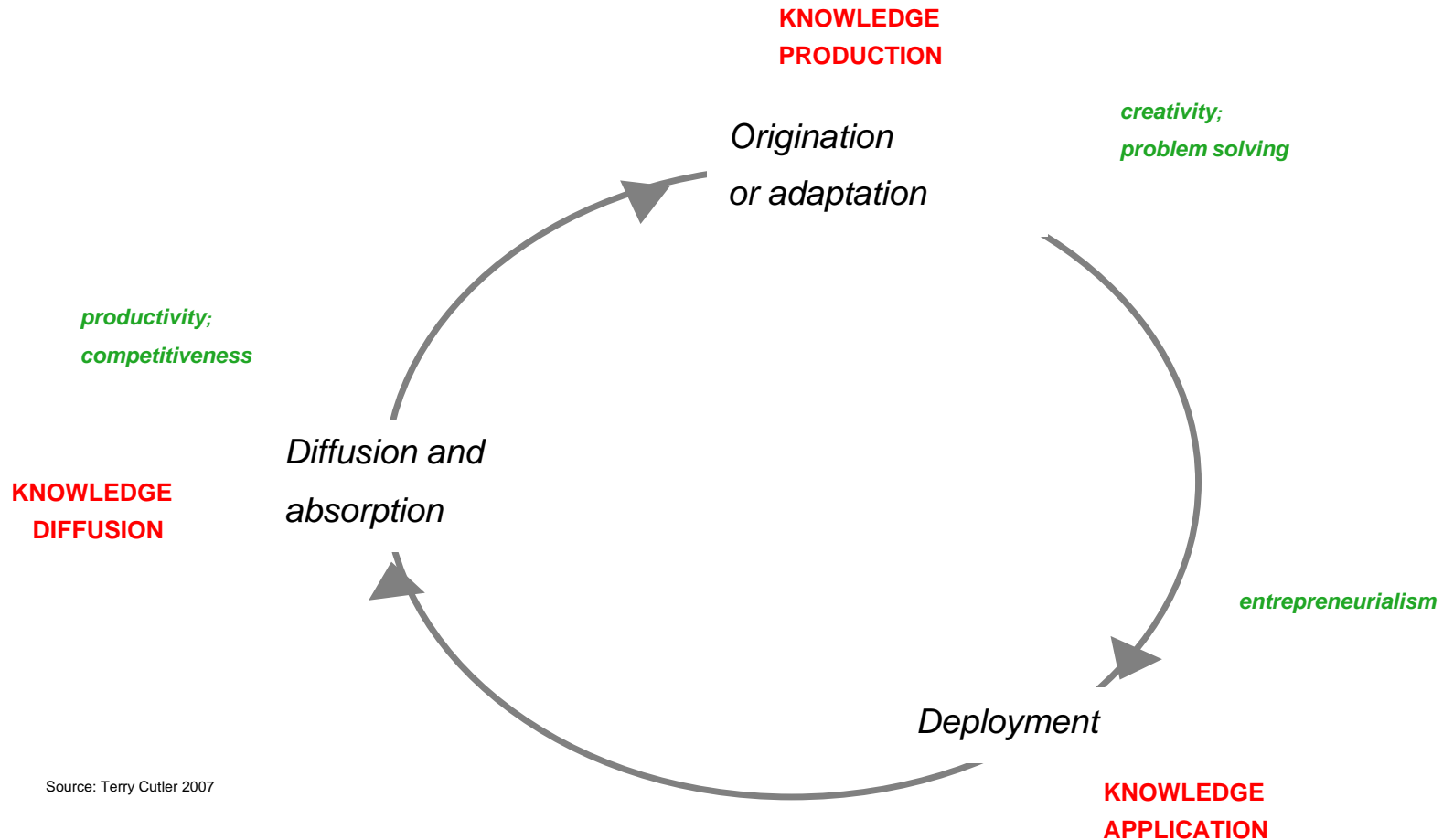
so we need *ex ante* understandings of the dynamics of socio-economic change

Innovating = creative problem solving

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

There has been a lack of coherent theories of innovation to underpin development policies

Innovation is an evolutionary system for socio-economic change and development.



Source: Terry Cutler 2007

There are thus three facets to innovation - each needs balanced attention within a national innovation system

Creativity

-the generation of ideas and inventions
Requires fresh thinking and inventiveness

Support for higher education and research environments.

Entrepreneurship/ Commercialisation

-linking good ideas to the right market opportunities

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

Requires entrepreneurs and risk taking

*Public - private linkages for sourcing relevant IP
- needs two way awareness of opportunities and needs*

Industry should lead, but governments should 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”

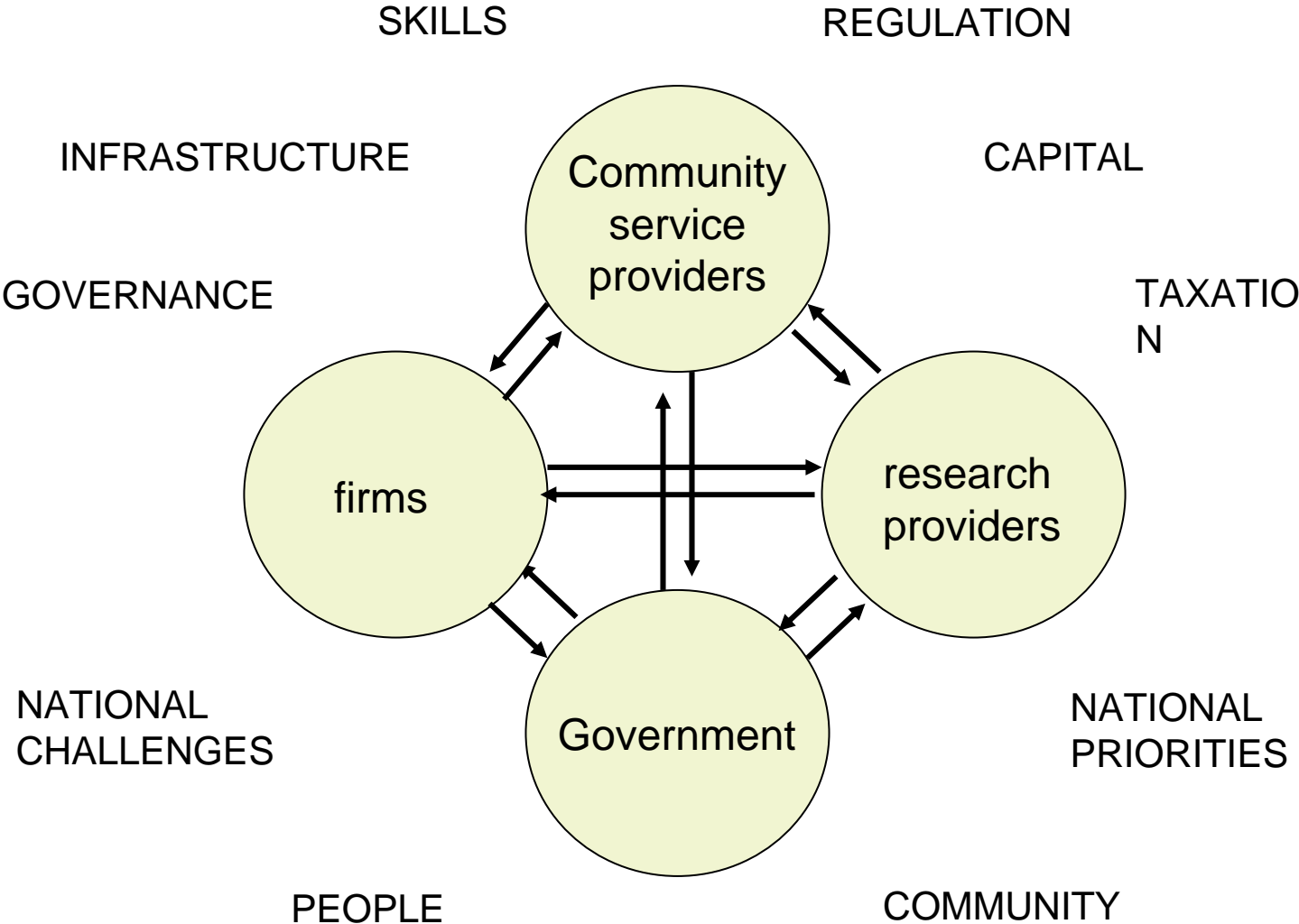
Diffusion and adaptation

-rolling out high potential innovations across industry or the community
Capturing national benefit

Government can assist with awareness and extension programmes - especially for SMEs;

Export facilitation

Innovation occurs within a complex ecosystem of actors, and relationships



Innovation system = the stocks and flows around innovation

- The elements of innovation involve both ‘stock’ and ‘flows’: stocks of knowledge and capability, and the 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*

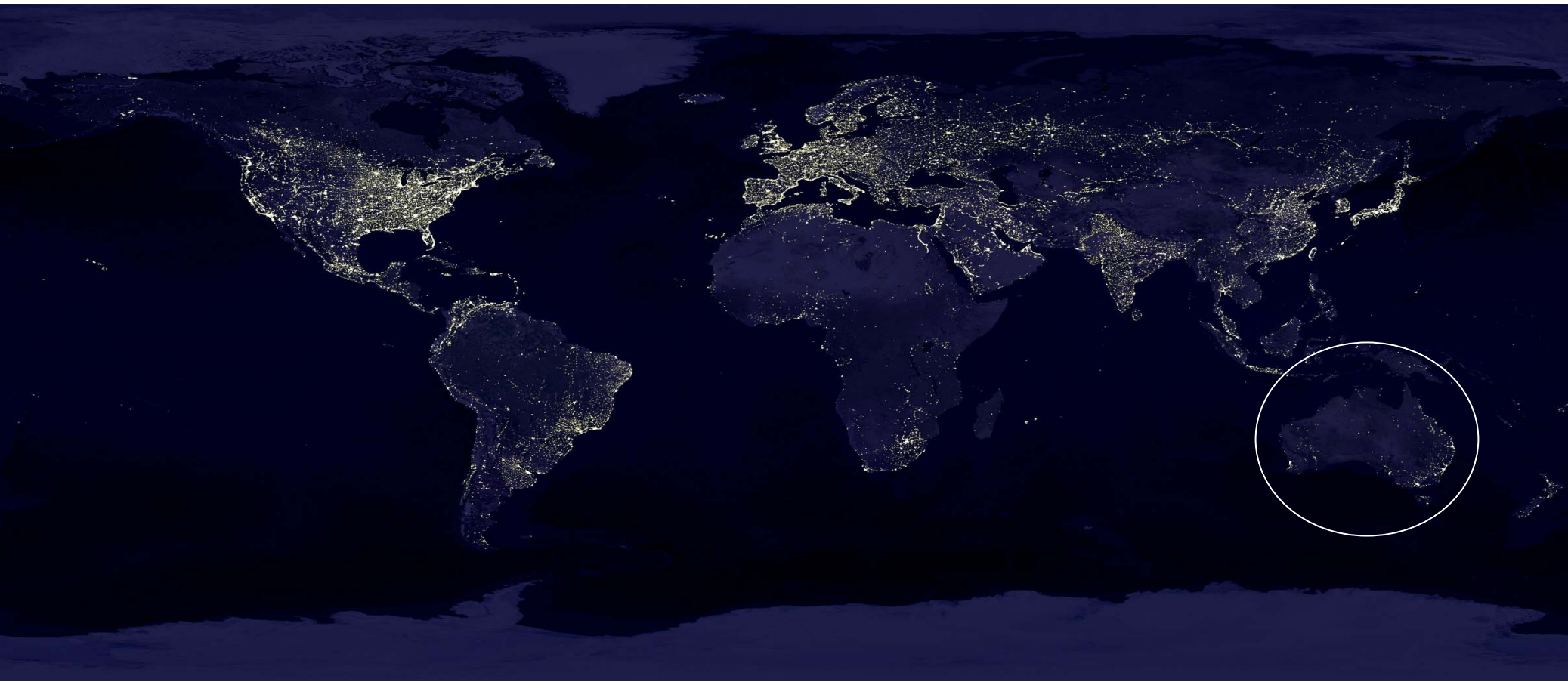
- identification of opportunities
- creating capabilities
- managing risk and uncertainty
- building and maintaining infrastructures
- mobilising resources

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. Capability 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 versus specialisation.**
- 7. Imbalances within and across the innovation system (eg. forgoing leverage)**

Putting Australia into context - the innovation challenge of a small economy



- ¶ 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

AUSTRALIA'S ECONOMIC PERFORMANCE - SCORECARD

Strong GDP growth

Low unemployment, with skill shortages

But ... all fuelled by commodities boom.

National savings through pension fund scheme

**Strong productivity growth since mid-1980s
(impact of micro-economic reform agenda)***

**The sustained productivity gains in the agricultural sector have been more long-run*

**Challenged agricultural sector -
10 year drought, fuelling longer term
climate change fears**

**High household debt,
and housing affordability challenge**

highly skewed exporting base

Inflationary pressures

**Low trade intensity across economy as whole
(despite having doubled over past three decades-
a function of the scale of the services sector?)**

Analysts often forget that technological innovation is especially important for resource based economies

“Most of Australia’s massive deposits of minerals were of no use until new technology liberated them. In the last two centuries Australia has depended as much on the rise of new technology as on its own soil, grasslands, minerals and other resources”

Geoffrey Blainey, *A Shorter History of Australia*, p.24

EVOLUTION OF AUSTRALIA'S ECONOMIC DEVELOPMENT



19th century

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

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

1920-1940

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

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).

1960-1980

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

1980-2000

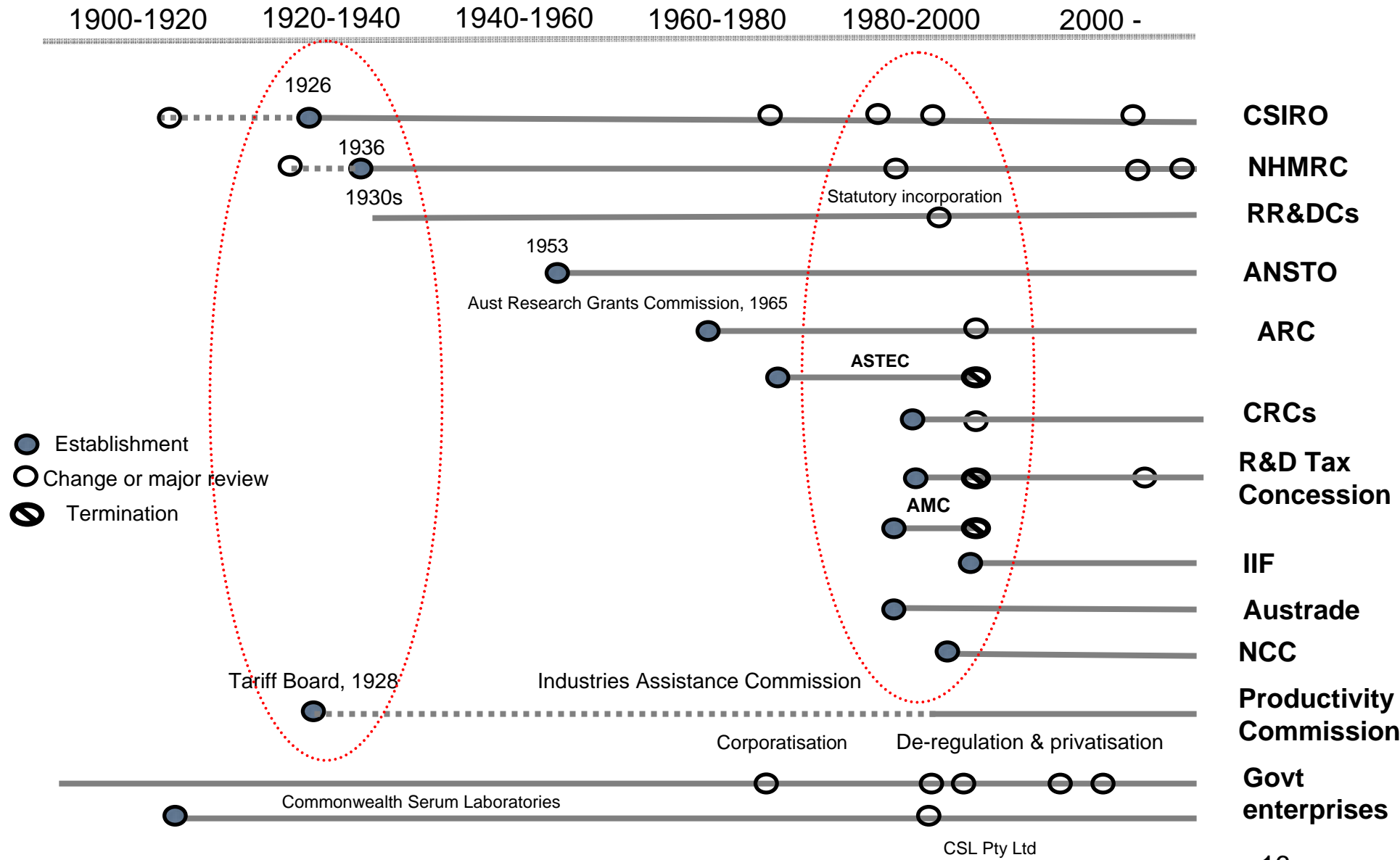
Internationalisation of economy (with reduction of tariffs and floating of currency); programmes for structural adjustment and micro-economic reform; privatisation of government enterprises. Focus on new ICT and biotech technologies. Strong productivity growth.

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

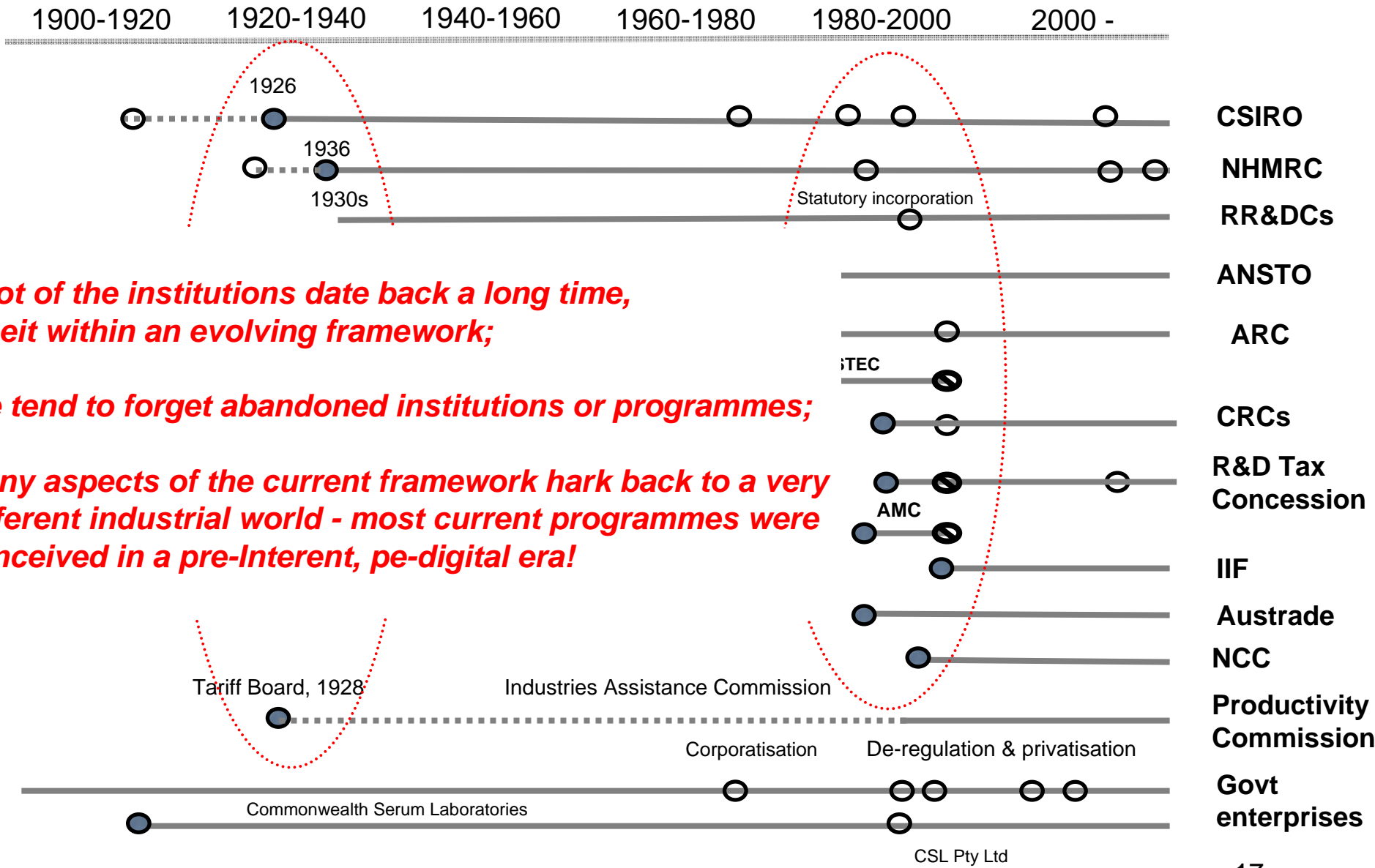
THE INSTITUTIONAL EVOLUTION OF AUSTRALIAN DEVELOPMENT AGENCIES

Not comprehensive



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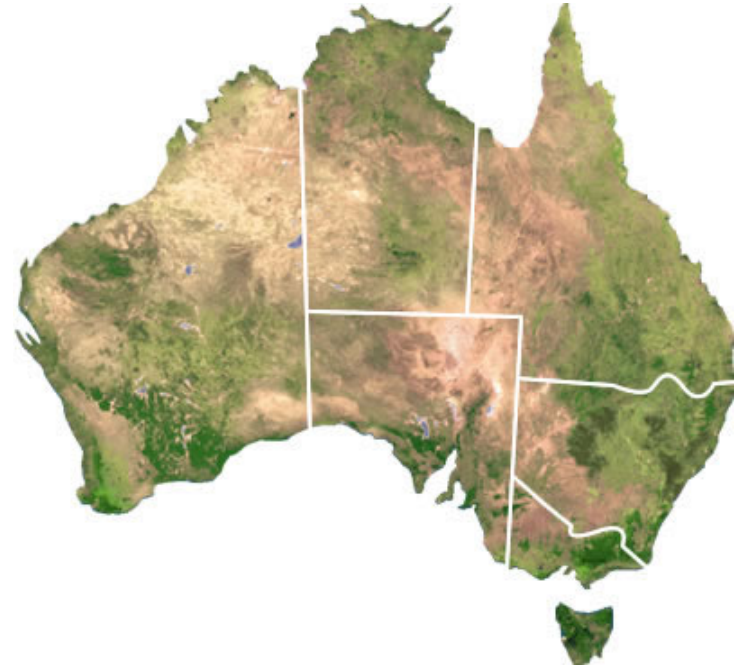
A lot of the institutions date back a long time, albeit within an evolving framework;

We tend to forget abandoned institutions or programmes;

Many aspects of the current framework hark back to a very different industrial world - most current programmes were conceived in a pre-Internet, pre-digital era!

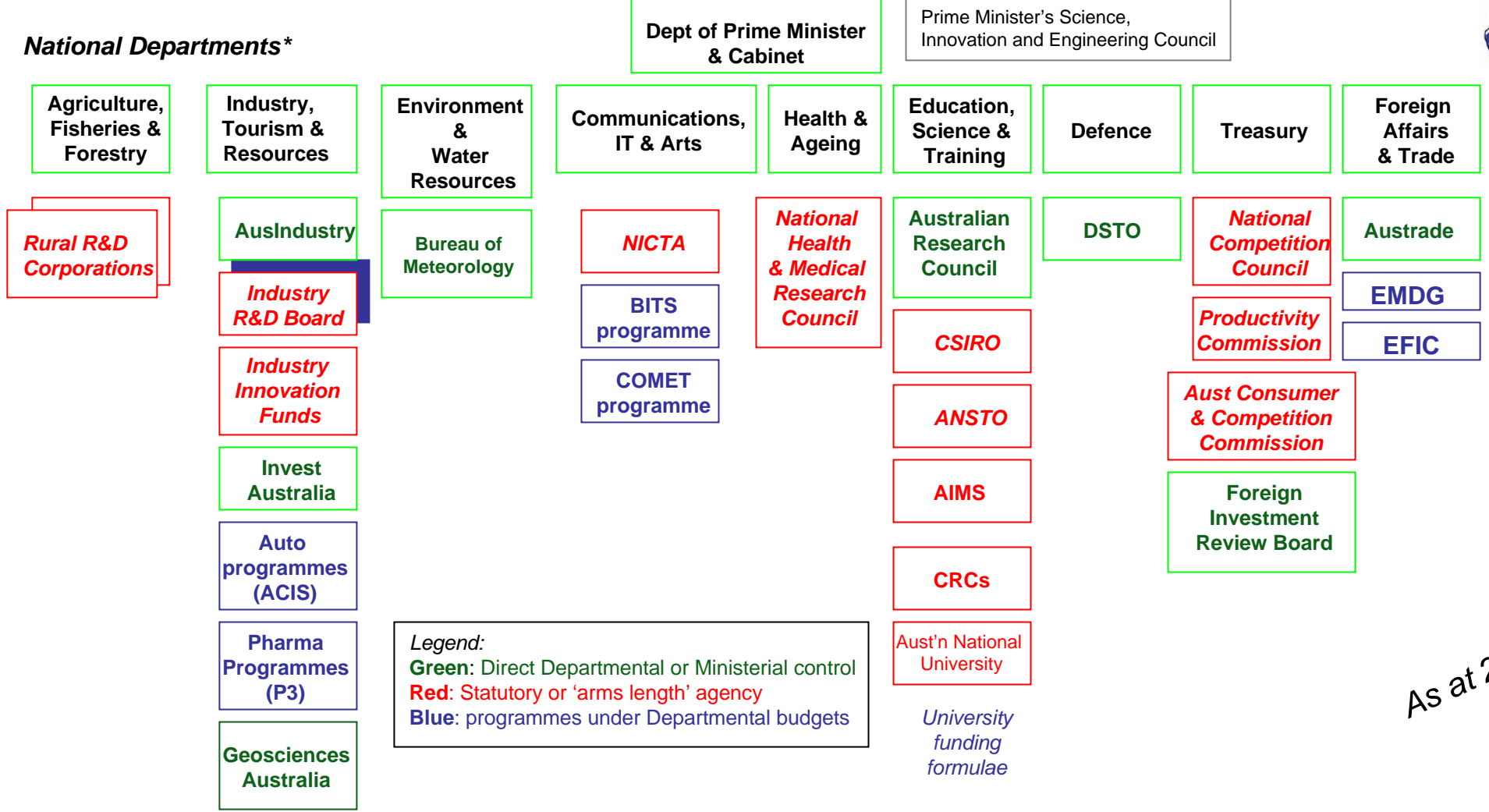
Australia: currently a federated, decentralised model of innovation (cycles of centralisation and fragmentation)

- ¶ 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).





National Departments*



As at 2007

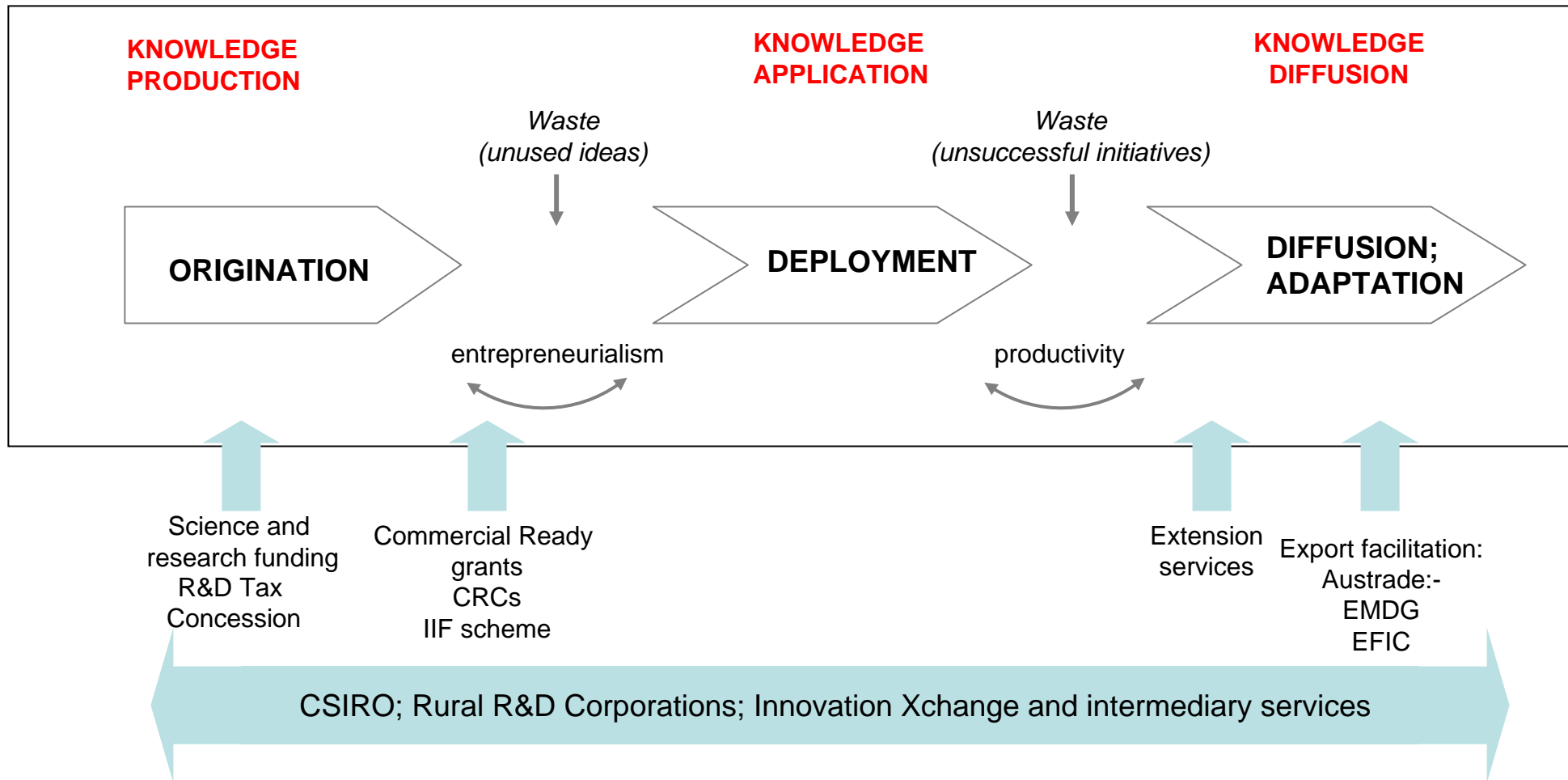
State Administrations



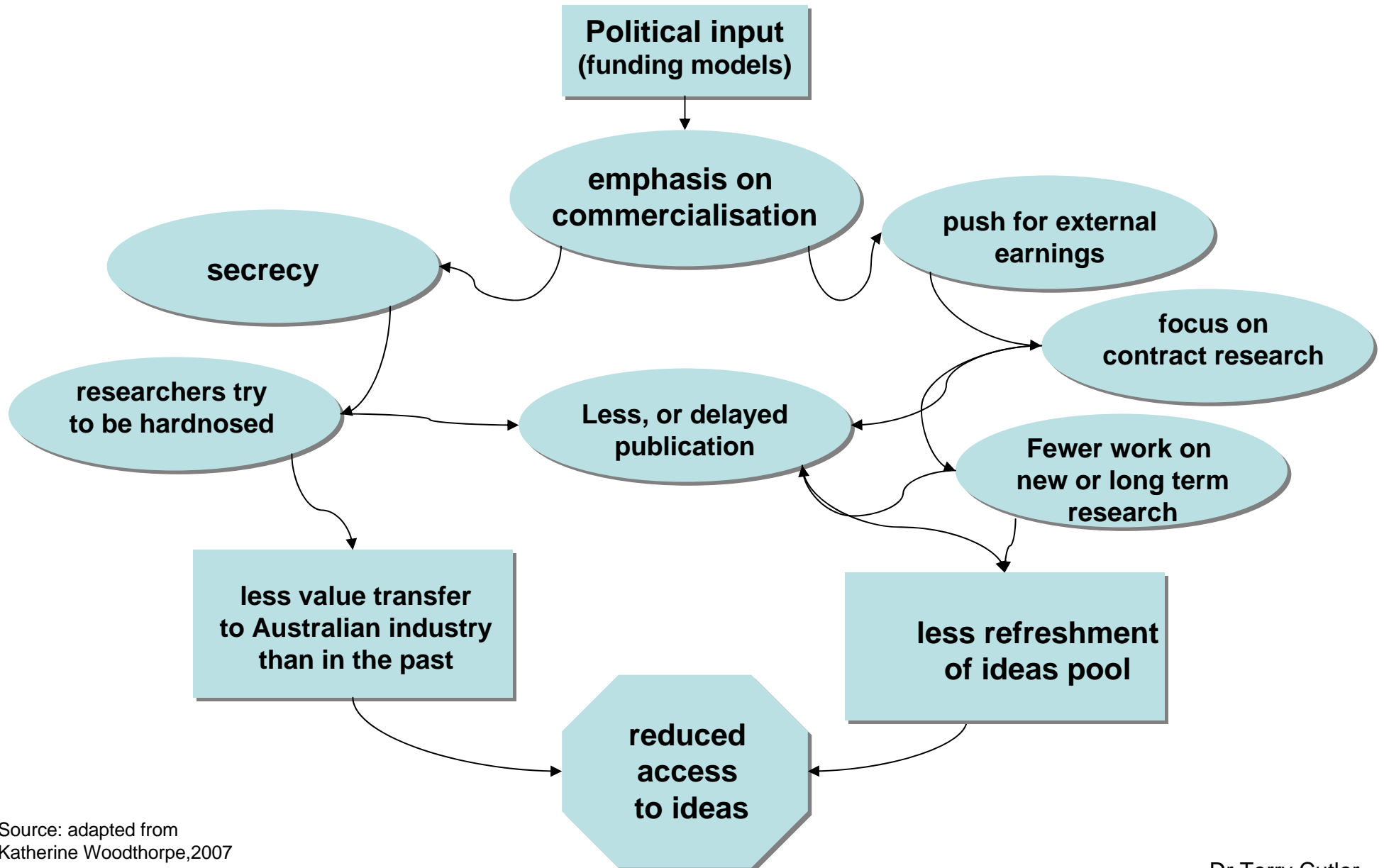
* This does not purport to be a comprehensive mapping

Mapping country policies and programmes against the innovation system

Some Australian agencies have mandates that span the whole innovation system; other focus on specific aspects. The general challenge is to pursue balanced attention to the whole system and its interdependencies. Standalone, 'silo-like' interventions risk upstream or downstream distortions.



The recent policy focus on commercialisation of Australian university and public sector research illustrates the need to think about unintended consequences



Source: adapted from Katherine Woodthorpe, 2007



The limits to cross-sectoral partnerships

Need to balance sectional against national interests

Need to pay special attention to transparency

Need to avoid exposure to moral hazard of capture, and difficulty of disengagement or re-negotiation of terms of engagement (Important to focus attention on 'pre-nuptial' agreements. Australian lessons from R&D Syndication and Innovation Investment Funds)

Scope to bias paths to market - eg. preference to global markets versus attention to local diffusion (eg CSIRO partnering with foreign MNCs)

Path dependence - bias to existing industries and players (especially where there is a relationship history between the private sector and government)

Tensions and conflicting interests over "build or buy" decisions by public sector agencies (eg CSIRO, and Defence Science and Technology Organisation)

Private sector will have limited interest in building national capabilities for future responsiveness

A global assessment of Australia's innovation system

The parts of the system which appear to work **best** are where:

1 **There has been a long history of industry 'self organisation'**

(such as mining, primary production and, more recently, computer games)

- industries where Australia is fully integrated within global supply chains
- industry overwhelmingly focused on export markets
- industry arrangements span the whole value chain (from R&D to marketing)
- these industries drive diversification in support industries and attract technology innovation (eg mining and agriculture).

2. **There is reciprocity and mutuality in partnerships around outcomes ('skin in the game')**

- co-investment and risk-sharing

3. **There are strong, semi-autonomous institutions with scale**, within which the competing pressures for sustained capability building and of responsiveness to new challenges can be assessed and balanced.

- CSIRO, Rural R&D Corporations, Bureau of Meteorology

4. **A distributed, federated model of innovation focuses attention on diverse and complementary roles rather than contests for hegemony.**

5. **National structural challenges fuel innovative solutions.** (Logistics, environment, systems integration and project management; distributed collaboration)

A global assessment of Australia's innovation system(2)

The parts of the system which appear to work *least well* and which represent major challenges are:

- 1. Where “Innovation” is unhappily or inappropriately coupled with structural adjustment and palliative interventions.**
 - can create conflicting messages, lack of transparency
 - eg. aspects of automotive, pharmaceuticals and textiles
- 2. Where industry sectors are not self-organising, or where there is no natural market organiser**
 - manufacturing, emerging markets: *issue around the role of government in such areas*
- 3. Where sectors are dominated by strong local oligopolies, which are not greatly trade exposed**
 - many parts of Australia's *services sector* (retail, banking, telecommunications) whilst other areas have been highly successful (asset management, financial services, logistics, education etc)
- 4. When market interventions are disconnected from upstream or downstream activities (and accompanying feedback mechanisms).** This is the challenge with schemes like the R&D tax concession, EMDG, S&T commercialisation
- 5. The lack of authoritative and continuing agencies with a responsibility for strategic direction setting and consensus building around national priorities and interests.**

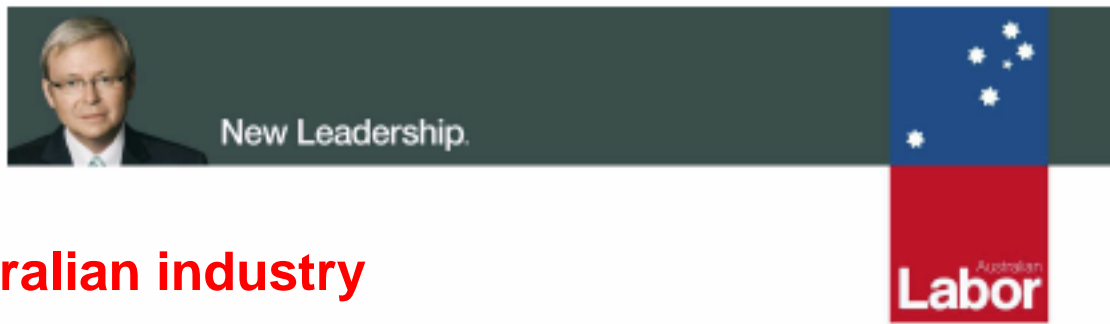
Some challenges and issues arising from the Australian experience:

- Strategic adaptation to a changing innovation environment
- Specific innovation challenges for smaller country economies
- Internationalising the national innovation system
- The difficulties of collaboration and the limits to 'partnerships'
- The role of formal versus informal networks
- The role of SMEs within innovation systems
- Maintaining complementary support strategies, especially around skills
- 'market driven' versus 'technology driven' company formation
- The utilisation and dissemination of public sector research
- The challenge of evidence-based policy and evaluation
- Linking capabilities to desired national outcomes
- Maintaining robust frameworks for governance

Australia's innovation challenge into the future

Global drivers for review and reassessment include:

- the shift from in-house R&D to open innovation markets
- and what does this imply for access to skills, and what might represent incentives for firms
- the rise of globally networked operations and 'cyber-infrastructure', and the implications for internationalisation and collaborative effort
- user-generated & demand-driven innovation
- the growing role of service industries in the economy, and in productivity
- the shifting and unsettling dynamics of global competition (e.g. Russia, India & China)
- the increasing urgency around emerging challenges (e.g. climate change, energy, ageing)



An innovation future for Australian industry

Australia's new government has laid out a **ten point** framework for its innovation policy which addresses many of the identified challenges going ahead:

1. Build a culture of innovation and new ideas by strengthening investment in creativity and knowledge generation.
2. Focus incentives for business R&D to promote global competitiveness, delivering the best outcomes for exports and economic growth.
3. Accelerate the take up of new technology, so Australian firms can access the best ideas from around Australia and the rest of the world.
4. Make Australia's innovation system truly international, by supporting partnerships, collaboration and foreign investment in Australian R&D.
5. Use government procurement to support innovative Australian firms.

The ten point framework for Australian innovation policy:

6. ... develop multiple pathways for industry to access the knowledge and expertise in universities and research agencies.
7. Strengthen the skill base for innovation, including in maths, science and engineering, and professional training for firms to manage innovation.
8. Develop and implement a set of national innovation priorities
9. Strengthen the governance of the national innovation system to support higher expectations of government agencies and industry.
10. Review the bewildering array of government innovation and industry assistance programs to reduce duplication and improve effectiveness.



MEDIA RELEASE

SENATOR KIM CARR

Minister for Innovation, Industry, Science and Research

Tuesday, 22 January 2008

08/000

GOVERNMENT ANNOUNCES REVIEW OF NATIONAL INNOVATION SYSTEM

The Minister for Innovation, Industry, Science and Research, Senator Kim Carr, today announced a wide ranging review of Australia's national innovation system to

Review is addressing the triple helix of innovation policy:

- (i) industry challenges, and market-oriented 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.

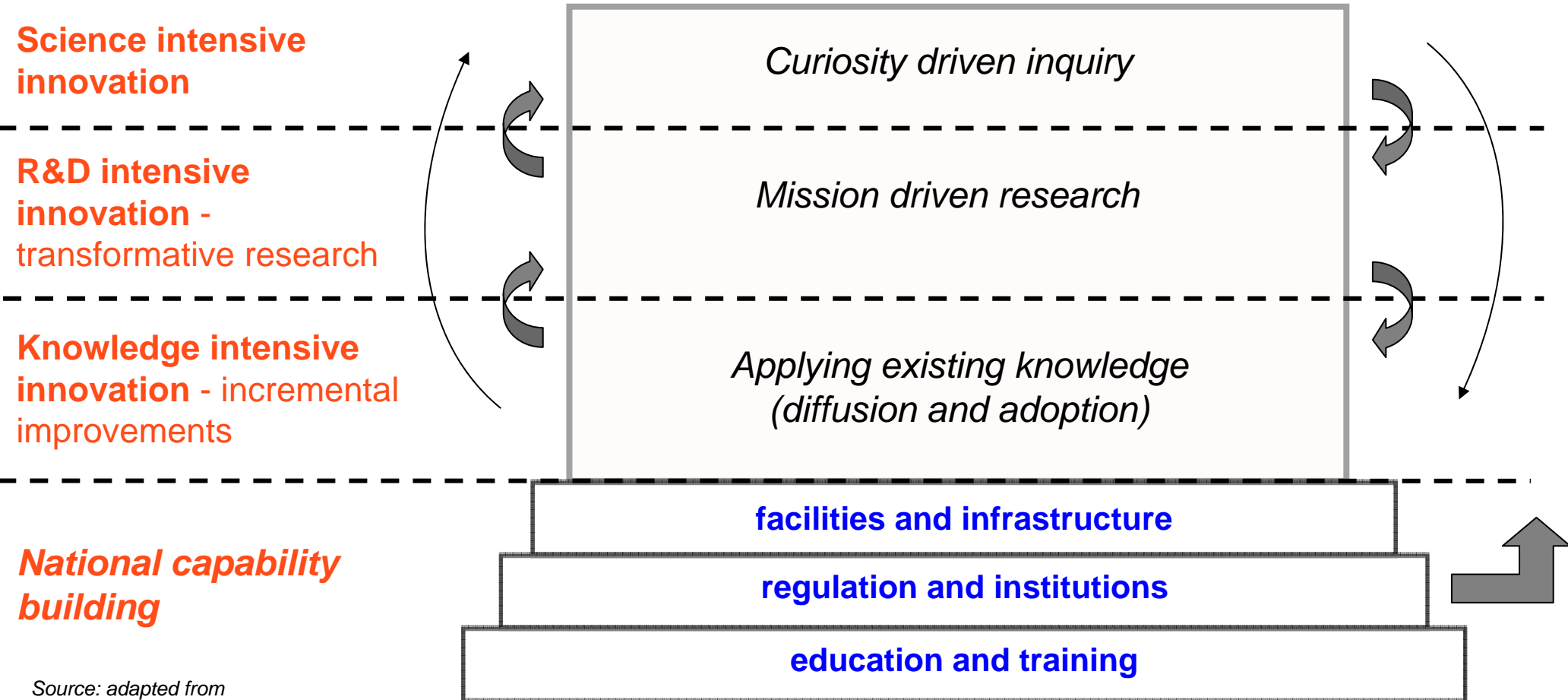
Proposing national priorities for innovation: *we can't be good at everything*

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
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

Developing the different roles within a national innovation system

Managing an innovation portfolio that encompasses the spectrum of activity from breakthrough science through to incremental innovation, all underpinned by crucial national facilities and capability building



Source: adapted from Stokes 1997 and CSIRO

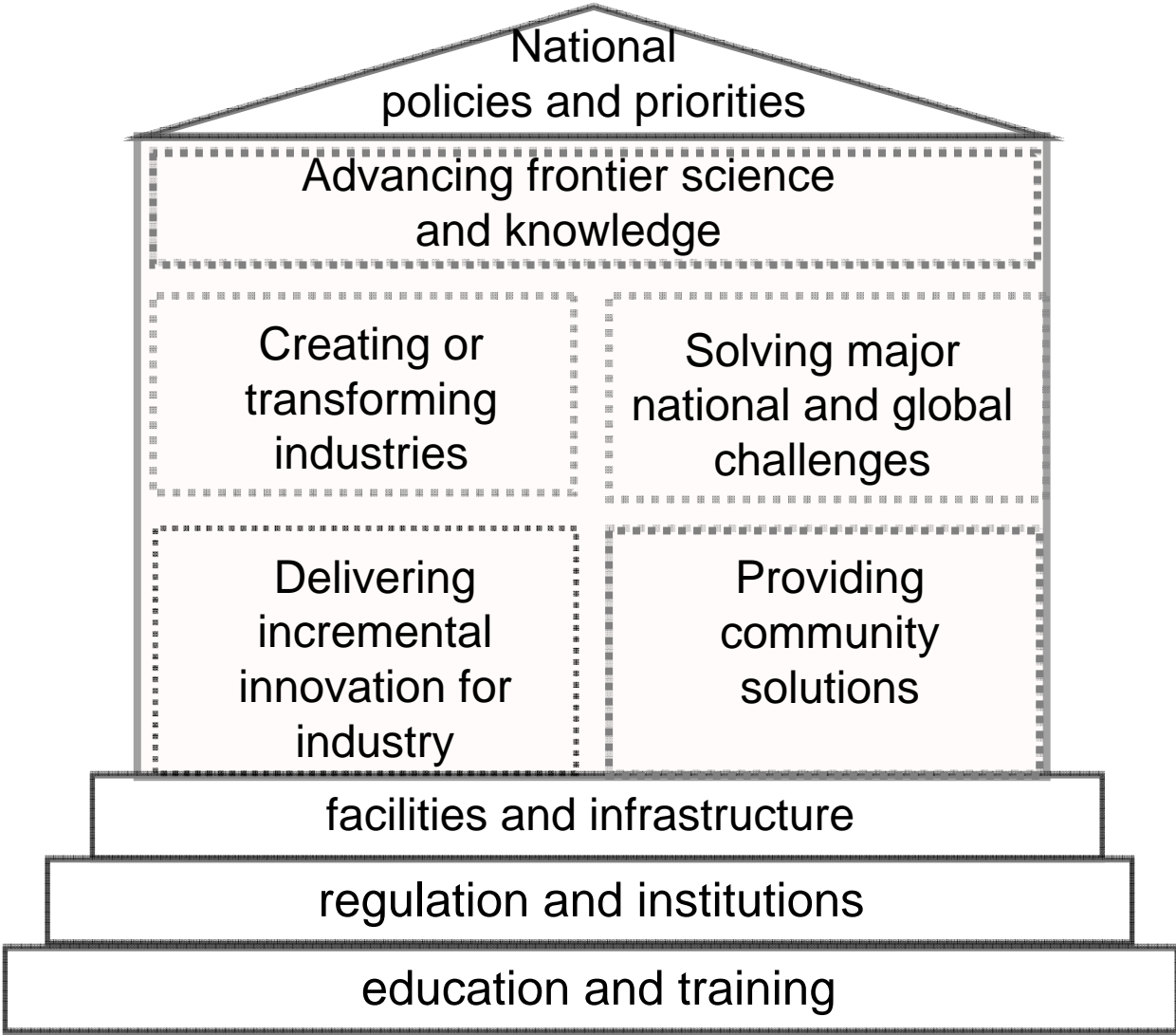
Promoting a clear framework for national investment and decision making (and for aligning the objectives and incentives of partners)

Science intensive innovation

R&D intensive innovation

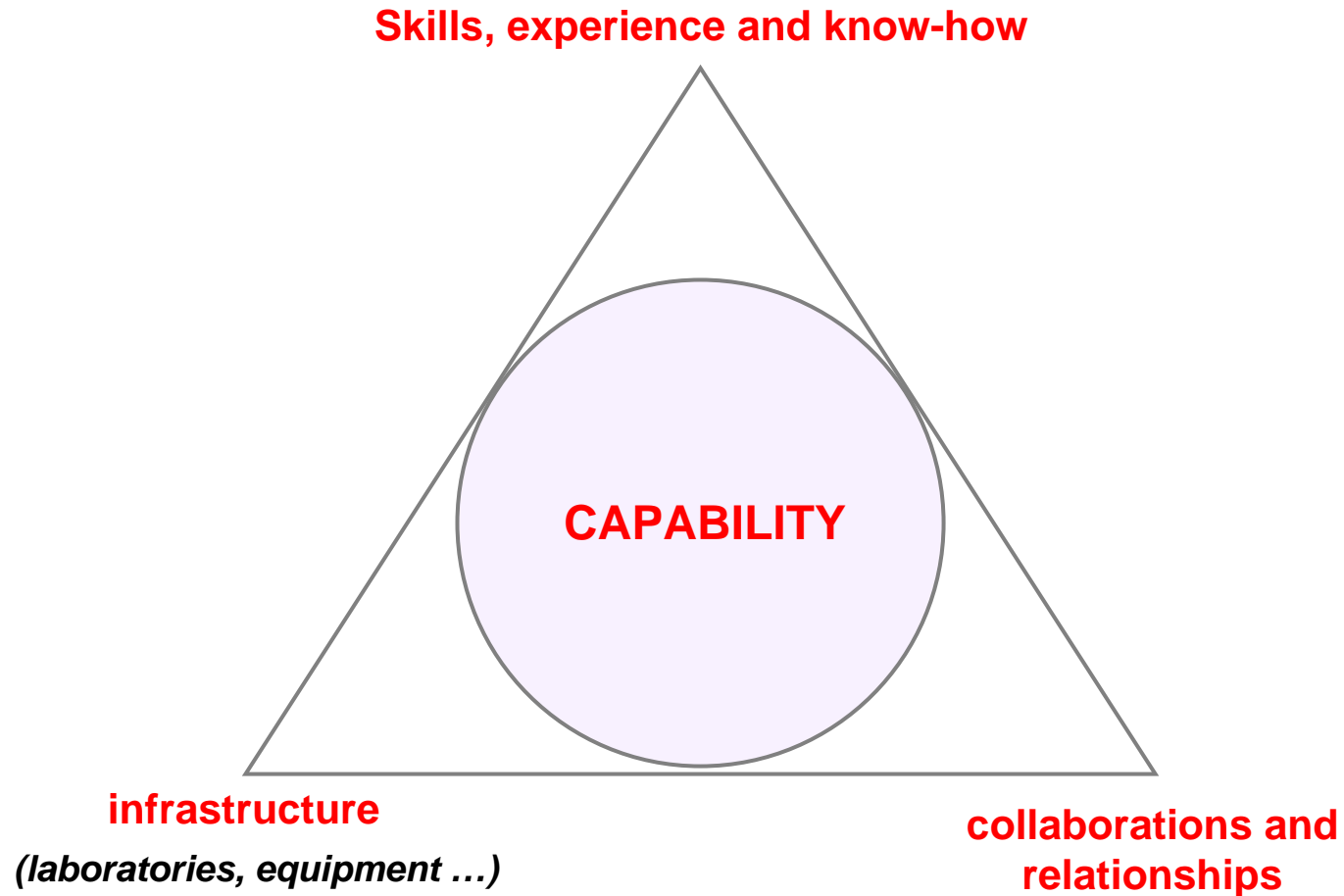
Knowledge intensive innovation

Capability building



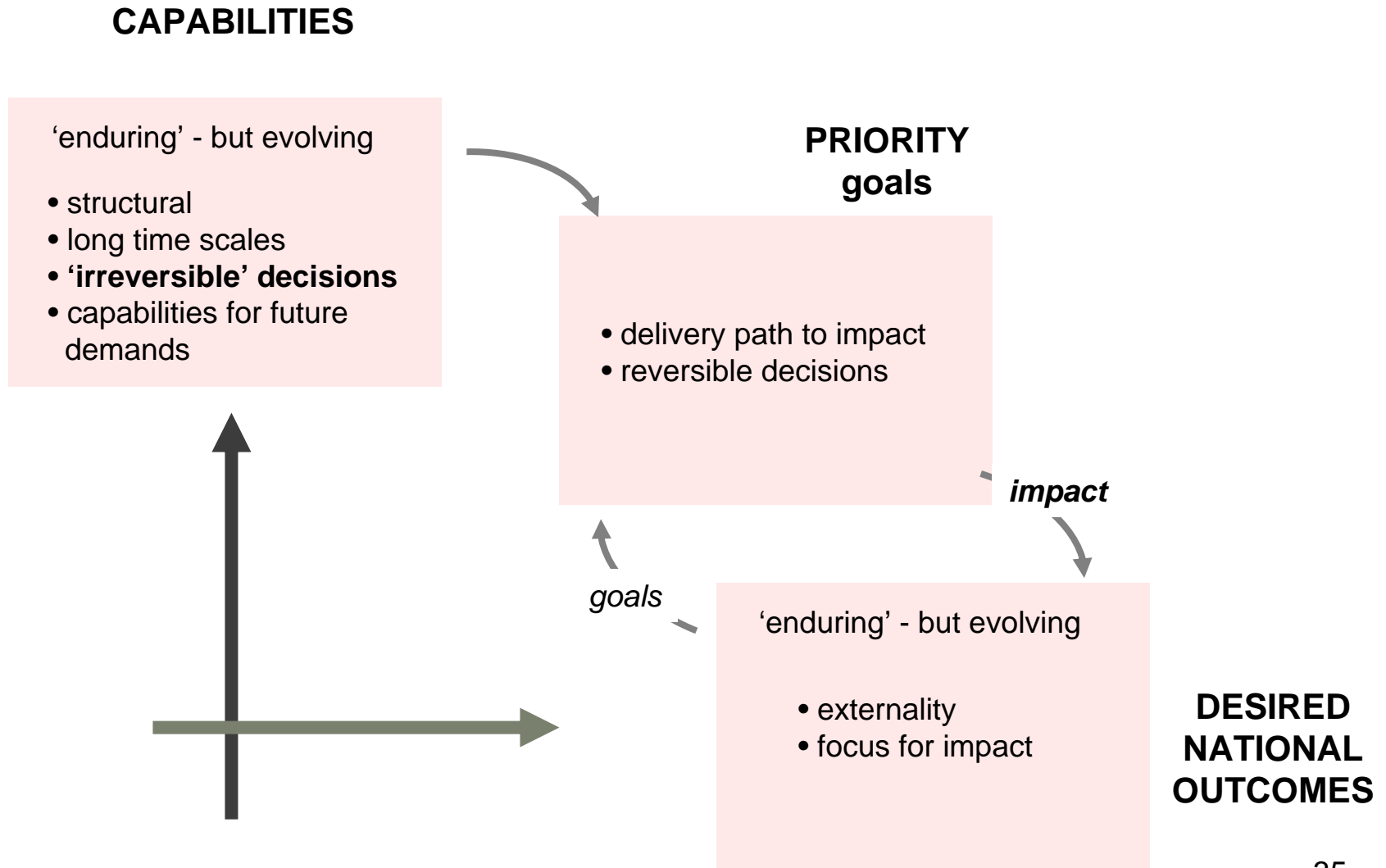
Investing in missions and capabilities to address national priorities.

Capability is



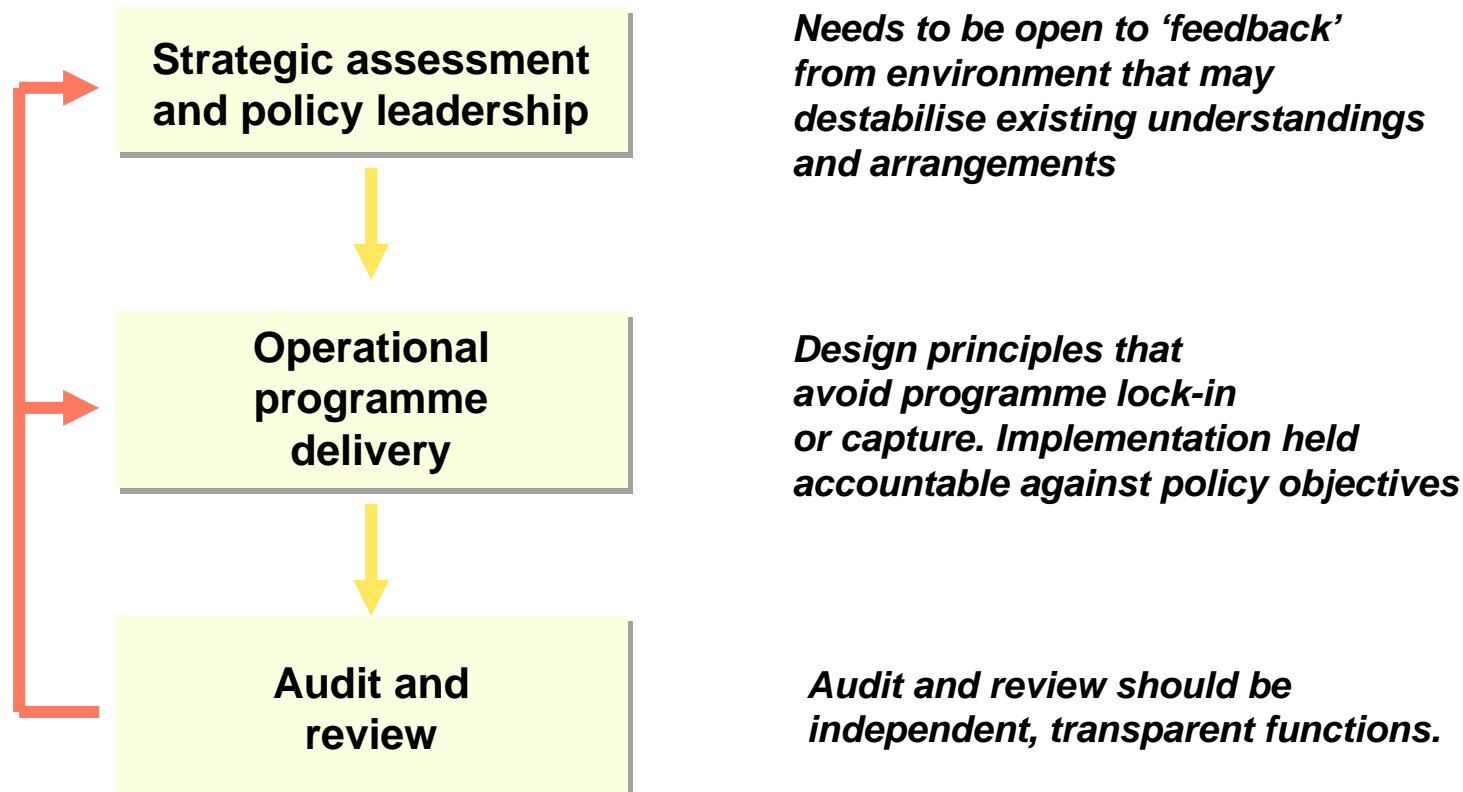
Investing in missions and capabilities to address national priorities ...

Matrix management - matching capabilities to priority goals



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



Australia's innovation challenge

Australia needs an innovating capacity that:

- addresses national priorities and challenges;
- addresses science AND the rest of the innovation system
- is open-ended; and
- is able to evolve and respond to changes



LET'S TALK ABOUT INNOVATION

THERE NEEDS TO BE A MAJOR OVERHAUL OF THE INNOVATION SYSTEMS IN AUSTRALIA. THE CURRENT SYSTEMS REWARD RENT SEEKING AND DISCOURAGE GOOD IDEAS

INNOVATION AND STUFF ?

ABSOLUTELY

THEY SURE DO!

TELL ME ABOUT IT

I HEAR YA!

WE WANT EVERYONE INVOLVED IN THE CONVERSATION ABOUT HOW AUSTRALIA IS GOING TO GET INNOVATION MOVING AND GET GOOD IDEAS FLOWING TO THE RIGHT PLACES

I WANT TO BE A PART OF THAT CONVERSATION

OH YEAH

ME TOO

WE NEED TO MAKE SOME FUNDAMENTAL CHANGES TO THE WAY RESEARCH GRANTS AND FUNDING ARE ASSESSED AND DISTRIBUTED

I BEG YOUR PARDON?

DO YOU MEAN CHANGE LIKE "THINGS ARE DIFFERENT" CHANGE?

IT DIDN'T SAY ANYTHING ABOUT CHANGE IN THE BROCHURE

OF COURSE SOMETHING NEEDS TO CHANGE - ALL THESE PEOPLE GET MORE MONEY THAN WE DO

HANG ON A MINUTE, HOW MUCH DO YOU GET?

NO WE DON'T

MY LEG HURTS

THIS ISN'T VERY INNOVATIVE