



# Australia's industrial development agenda: Australian science, technology and innovation policy

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# A brief history of the world (of S,T & I)

- Whitlam (1972-75): Beginning of Institutional arrangements
- Hawke (1983-1991): Period of the introduction of majority of S&T related programs
- Keating (1991-1996): “Working nation” – AusIndustry, Funding for major R&D Facilities, Pooled Development Funds
- Howard (1996-2007): No new programs but additional funding of Labor programs. Cuts to higher education and greater political intervention in selection of R&D funding. Science moved into Education
- Rudd (2007-2010): Many, many reviews and considerable increases in funding
- Gillard (2010-2013): Cuts in funding but “Industrial Transformation Hubs” at end
- Abbott (2013-2015): A disaster across the board, except for medical science
- Turnbull (2015- present): Defined his Prime Ministership on Innovation but little action

# Serious S&T Policy begins with Hawke government being elected in 1983

## The issues:

- R&D focused mostly on pure research – BERD by OECD standard amongst the lowest;
- Links between industry and research providers non existent
- No venture capital market – very high levels of foreign ownership
- Economy highly dependent on primary industries: agriculture & mining
- No institutional arrangements for science, technology and innovation (1<sup>st</sup> appeared in 1972 but 1st Science Minister was Barry Jones in 1983)

# How these problems were addressed

- R&D tax concession which has varied between 100% and 175%
- Venture capital schemes: MICs program, ASX Seconds Board, State Government Investment Instrumentalities, Capital Gains Tax concessions, Early Stage Venture Capital Limited Partnerships, Venture Capital Limited Partnerships
- Foreign company investment in Australian value added industries – Offsets
- Industry connections to R&D providers: ARC Linkage Grants, CRC programs, ARC Centres of Excellence (later); Industrial Transformation Hubs;
- Many industry commercialisation and R&D schemes – State and Federal

# Where do we now stand after more than 3 decades of government action

- 19<sup>th</sup> on 2016 Global Innovation Index (Cornell University, INSEAD, World Intellectual Property Organisation), down from 17<sup>th</sup> (2015) of 128 Countries, remembering Australia is a G20 nation & there are 35 OECD nations
- Total expenditure on R&D in 2013 (last OECD comparable figure) was 2.1% of GDP - OECD average was 2.37%
- BERD is actually declining in Australia e.g. from 1.23% in 2011/12 to 1.19% in 2013/14

# What we are good at

- Infrastructure – 6<sup>th</sup> (ICT use, ICT participation, public services)
- Human capital and research – 9<sup>th</sup> (School life expectancy, tertiary enrolment, tertiary mobility, QS University ranking, PISA scales)
- Market sophistication – 10<sup>th</sup> (Ease of getting credit, domestic credit to private sector % GDP, Stocks traded % of GDP)
- Institutions – 10<sup>th</sup> (Regulatory quality, rule of law, ease of starting a business, political stability and safety)

# The real problem areas identified by the 2016 innovation index (compare with where we started in 1983) – ranked against 128 countries

- Knowledge diffusion – 100<sup>th</sup> (FDI Outflow % GDP 107<sup>th</sup>, ICT services exports 90<sup>th</sup>, High-tech exports less re-exports % total trade 53<sup>rd</sup>)
- Knowledge absorption – 49<sup>th</sup> (ICT services inputs % total trade 66<sup>th</sup>, FDI net inflow % GDP 56<sup>th</sup>, Research talent % in business enterprises 47<sup>th</sup>)
- Innovation linkages – 37<sup>th</sup> (GERD financed abroad 83<sup>rd</sup>, State of cluster development 39<sup>th</sup>)
- Intangible assets – 37<sup>th</sup> (Industrial design by origin/bn \$ GDP 48<sup>th</sup>, ICTs & business model creation 40<sup>th</sup>)

## Further problem areas 2 ... (continued)

- Education (not Tertiary (8<sup>th</sup>) – 37<sup>th</sup> (Expenditure/secondary pupil % GDP 73<sup>rd</sup>, Expenditure on Education % GDP 54<sup>th</sup>)
- Creative goods and services – 37<sup>th</sup> (National feature films/mm pop 61<sup>st</sup>, Creative goods exports % total trade 53<sup>rd</sup>, Cultural & creative services exports % total trade 31<sup>st</sup>)
- Knowledge creation – 28<sup>th</sup> (Patents by origin % of GDP 51<sup>st</sup>, Utility models by origin % GDP 26<sup>th</sup>)
- Investment – 26<sup>th</sup> (Ease of protecting minority investors 62<sup>nd</sup>).
- Economic sustainability – 33<sup>rd</sup> (GDP/unit of energy use 68<sup>th</sup>).



# The nature of jobs & national character

- Art, poetry, popular culture (music), advertising, sport portrait Australian work usually in construction, mining, agriculture – plundering resources
- Witness the “hard cold thirst needs a big cold (VB) beer” – riding a horse, fixing a train, digging a hole, wheeling a barrow, shifting a house, or feeding a cane fire
- Barne’s *Working Class Man* is the young factory worker, the weary driver, the steel worker, the cane worker,
- The important imagery is that Australian work is about building, digging, or growing things from nature; not from creativity and the application of knowledge

# Political strategies on jobs and growth

- Tony Abbott on Tony's Tradies (2015) - "They are the backbone of any society. They are certainly the backbone of any strong economy..."
- Oakes (2016) – "When Joyce talked about jobs and growth it was in the context of specific infrastructure projects. The construction of dams. Building a second airport in Sydney...Trendy stuff about innovation, even defence projects, hardly got a look in ..."
- Tehan (2017) – "We gotta (sic) think of the carpenters, the plumbers, the farmhands who won't get a degree and they are paying taxes (for students to go to university)"

# CRONY CAPITALISM – SUBSIDIES TO INDUSTRY

(Productivity Commission, 2015, \$m)

	Gross Tariff Output	Budget Outlays	Tax Concessions	Net assistance
Primary Industries	\$208.9	\$746.9	\$450.8	\$1322.4
Mining	\$1.2	\$263.8	\$288.3	\$299.1
Manufacturing	\$7,617.3	\$1,091.7	\$392.7	\$7,040.2
Services	\$0	\$1,754.3	\$1,677.1	\$1,693.6
Unallocated	\$0	\$399.1	\$271.0	\$670.2
<b>Total</b>	<b>\$7,827.3</b>	<b>\$4255.7</b>	<b>\$3,079.9</b>	<b>\$7,638.3</b>

# Not included in Productivity Commission data

- Concessional debt and equity finance
- State and territory government support to industry
- Access and pricing of resources (mining, forestry, fishing and water), if on favourable terms

## NOT CONSIDERED TO BE SUBSIDIES

- Employment incentives to business
- Remote housing concessions in mining regions
- Differential rates in relation to excises, GST and FBT (e.g. fuel excise)
- Transport infrastructure

# Leadership and the ability to drive change

- Hawke and Keating: Period in which Australia experienced sustained economic structural change – most important achievement was ability to win support of business, labour, voters and achieve reasonably equitable outcomes. Strong leadership able to articulate vision and prosecute a case
- Howard and Costello: GST and Gunn control were the big achievements. Benefitted from very strong budget supported by mining income
- Rudd and Gillard: Rudd budgets provided big support for science and technology. Message got lost in GFC and leadership issues. GFC was achievement was underrated as was Gillard's ability to hold Parliament together for a full term
- Abbott: Disfunctional. Support for medical science but everything else in R&D and innovation suffered. No vision, no commitment. A disaster zone.
- Turnbull: Started with a very strong commitment – the first for a conservative leader but the aftermath has been a cynical return to developmental politics. Last budget showed signs that things might change.

# Where are we going .....

- The resource, extractive base economy is dying, despite signs of a recent small recent revival (witness mining job advertising in WA)
- Coal fired powered stations are not being build unless government is going to build them – Business is a long way ahead of government on energy policy e.g. carbon trading, renewable energy, future power stations
- The jobs are currently in Health care and social assistance, Construction, Retail, Professional scientific and technical services, Education and Training, Accommodation and Food, Manufacturing – not the resource sector
- However, still no sign of emerging high value added manufacturing services sectors, knowledge based industries (other than education), nor creative goods and services ....
- The S&T policy debate is around about where Keating left off with “Working Nation” in 1996.