

CHAPTER 1: INTRODUCTION

Definitional issues

1.1 The Organisation for Economic Co-operation and Development defines research and development (R&D) as:

*Creative work undertaken on a systematic basis in order to increase the stock of knowledge – including knowledge of man, culture and society – and the use of this knowledge to devise new applications.*¹

1.2 This definition encompasses a range of activities. Research is usually categorised as being basic, strategic or applied:

- “basic” research is aimed at discovery, which may not have any particular objective in mind other than the advancement of knowledge;
- “strategic” research is directed at broad areas of research that are considered important and the results of which are widely applicable; and
- “applied” research has a shorter term focus and is directed at more specific problems.

1.3 In general terms, basic and strategic areas of research have high potential economic “spillovers” (that is, benefits over and above those available to the innovator; see page 2) and in Australia are primarily conducted in the public sector. Applied research, which is directed at commercial outcomes, is mostly the province of the private sector.²

1.4 The effect of public policy changes on the different types of R&D is examined in Chapter 3 of this report.

1 Quoted in Industry Commission, *Research and Development*, Report No 44, May 1995, p. 1.

2 DIST, submission no. 48, pp. 8-9. See also RMIT, submission no. 24.1, p. 1.

Box 1: Spillovers

The diffusion of knowledge throughout the economy is associated with “spillovers” or “externalities”. The relevant terms are:

- **Private returns:** *the returns appropriated by the firm undertaking the R&D. These include not only the profits resulting from the marketing of any products, but also receipts from selling R&D results (such as royalties).*
- **Social return:** *the flow of benefit accruing to society expressed as a proportion of the cost of the asset generating the benefit.*
- **Spillovers (or externalities):** *the difference between the private and the social rates of return; that is, the benefits from R&D accruing to entities other than the innovator without adequate recompense. This can happen because (a) the entity which generated the knowledge may be unable to prevent others from using it without itself incurring heavy costs, or (b) a given piece of new technological knowledge can be employed simultaneously by any number of firms at no extra cost of provision, and without the intrinsic usefulness of the knowledge being diminished for any one of them.*

Spillovers can thereby cause failures in the market forces that would otherwise encourage firms to innovate. This is one of the main reasons for government support of private sector R&D.³

R&D and economic growth

1.5 The Committee, although specifically examining the effects of public policy changes on R&D, emphasises that R&D is not an isolated activity. R&D is just one element in Australia’s system of *innovation*,⁴ along with other elements such as education, taxation and venture capital.⁵

1.6 As explained by the University of Western Sydney:

the critical process of innovation ... is the driver of economic growth in the ‘learning economies’ emerging in developed OECD countries and which will become the norm in the twenty first century. R&D is only one element

3 Industry Commission, *Research and Development*, pp. xi-xii, p. 64 & p. 170. See also Productivity Commission, *Telecommunications Equipment, Systems and Services*, May 1999, pp. 73-74 at <http://www.pc.gov.au/inquiry/tessi/finalrep/index.html> (as at 6 July 1999).

4 See House of Representatives Standing Committee on Industry, Science and Technology, *Innovation: A Concept to Market*, November 1995.

5 ASTEC, submission no. 42, p. 4.

because innovation should not be understood as a linear process, running from scientific ‘invention’ to a commercialised product (a better mouse trap). All recent research into the innovation process emphasises that it is an interactive process in which clients and suppliers are at least as important as particular pieces of R&D understood as scientific research. It is thus necessary to understand that while R&D is a central element to many innovation processes it is innovation, both technological and non-technological which is the driver of growth.⁶

1.7 The June 1997 report of the government’s review of business programs, titled *Going for Growth* (the Mortimer report) noted that innovation accounts for an estimated 50 percent of long-term economic growth in advanced industrial countries, with a high correlation between the wealth of nations (gross domestic product (GDP)/capita) and R&D intensity (R&D/GDP).⁷ Mortimer also quoted studies estimating the social return from R&D to be as high as 99 percent, with Australian studies placing the social return at between 50 and 100 percent.⁸

1.8 As the Industry (now Productivity) Commission stated in the report of its major 1995 inquiry into research and development:

The benefits which firms seek through R&D – lower costs, higher productivity, better products – if realised, also ultimately result in higher GDP. Recent developments in economic theory, known as ‘new growth theory’, have shown in a formal way how R&D can permanently raise a country’s rate of growth. This is seen by some as theory catching up with common sense. The theory recognises that new knowledge is rarely confined to any one firm or even industry and indeed can often be used repeatedly and simultaneously at little extra cost to users. This ‘spillover’ effect eases the constraint usually placed on growth by the scarcity of capital.⁹

6 UWS, submission no. 22, p. 1. See also Professor Jane Marceau, UWS, transcript of evidence, p. 109 and Professor Jane Marceau et al, *The High Road or the Low Road? Alternatives for Australia’s Future*, Australian Business Foundation, August 1997 (exhibit no. 10).

7 Mortimer Review of Business Programs, *Going for Growth: Business Programs for Investment, Innovation and Export*, June 1997, p. 99.

8 *ibid*, p. 106.

9 Industry Commission, *Research and Development*, p. 9. See also DISR, submission no. 48.1, pp. 11-12; Professor Jane Marceau et al, *The High Road or the Low Road?*; Professor Jane Marceau, “Industry Policy and the Nation State”, *Evatt Papers*, v. 5(1-4), 1998, pp. 81-84; Norihisa Sakurai, Evangelos Ioannidis and George Papaconstantinou, *The Impact of R&D and Technology Diffusion on Productivity Growth: Evidence for 10 OECD Countries in the 1970s and 1980s*, OECD STI Working Papers 1996/2, 1996 (exhibit no. 26); DISR, *A New Economic Paradigm?*

1.9 In the absence of satisfactory work having been done for Australia, the Commission undertook its own quantitative estimates on the rate of return on Australia's R&D effort. While the estimates were sensitive to various assumptions and were made difficult by a lack of data, they ranged from 25 to 90 percent, with one estimate as high as 150 percent.¹⁰

The rationale for government support of R&D

1.10 Australian governments of all persuasions have nominated R&D and innovation generally as key drivers in developing a high-skill, high-income future for the nation. According to the government's industry policy statement, *Investing for Growth*:

First rate science and technology will give Australia the competitive edge as it enters the 21st Century.

Science and technology underpin Australia's capacity for innovation – the development and commercialisation of new products, processes and services. In turn this determines our ability to generate sustainable economic growth and to create new jobs and improve living standards.

Science and technology build our knowledge base. They improve our quality of life, our health, the environment, social infrastructure and national security.

Australia has a strong record of scientific achievement and an international reputation for scientific excellence in many fields.¹¹

1.11 The extent to which government can help business to be “innovative” is limited. The development of management competencies and technical skills is essentially the responsibility of individual businesses.¹² However, governments directly support business R&D in recognition of the net public benefits and in order to correct inadequate incentives for private investment. Investment incentives may be inadequate because of factors such as:

- the inability of firms to capture for themselves the full benefits associated with their R&D (the “spillover” effect);

Innovation-based Evolutionary Systems, Discussions in Science and Innovation 4, 1998; and “How the New Economy Grows”, *The Australian Financial Review*, 26 June 1999.

10 Industry Commission, *Research and Development*, p. 9. See pp. 127-159 & Appendices QA & QB for more detail on the links between R&D, competitiveness and economic growth.

11 The Hon John Moore MP, *Investing for Growth: Competitive Science*, 19 March 1998.

12 Mortimer Review of Business Programs, p. 99.

- the large investments many research projects require, which may be beyond the scope of individual firms (“indivisibilities”); and
- the uncertainty of R&D outcomes and the consequent high commercial risk.¹³

1.12 The incentives for private investment decrease as the likelihood of commercial gain decreases. If the research would have social benefits, the case for government intervention strengthens to counter the shortfall in private investment. This is why the public sector has such a dominant role at the basic end of the research spectrum.¹⁴

1.13 Associated with this is the role of research institutions which are wholly or partly publicly-funded, to ensure that research is undertaken which has direct significance for specific national problems:

*... the government has a particular role as a sponsor of research associated with its own role as a policy-maker, provider of services such as defence, and custodian of community resources such as environmental amenity and public health. It is also generally better placed to fund research into Australia-specific needs and problems that cut across interest groups. In many of these areas, government sponsorship can also allow wider dissemination of research results of public benefit than would otherwise occur.*¹⁵

1.14 In 1995 the Industry Commission estimated that the Commonwealth and State governments, through incentives for business R&D and funding of public sector research agencies and universities, fund about 60 percent of all research undertaken in Australia.¹⁶

The Australian science and technology system

1.15 The Australian science and technology (S&T) system consists of a broad range of initiatives to enhance and apply the knowledge base of Australia through the actions of the public and private sectors. S&T policy arose in a haphazard fashion from the disparate agendas of organisations such as the universities, the Commonwealth Scientific and Industrial Research

13 For a more detailed discussion of rationales for government intervention to support R&D, see Industry Commission, *Research and Development*, pp. 161-180 & Appendix QA.

14 House of Representatives Standing Committee on Industry, Science and Technology, p. 83.

15 Industry Commission, *Research and Development*, p. 202.

16 *ibid*, p. 86.

Organisation (CSIRO) and other government-owned laboratories.¹⁷ The way in which such initiatives were traditionally undertaken and funded resulted in fragmentation, which was mirrored by “policy” divisions being scattered throughout government departments.

1.16 The mid-1960s saw the establishment of the first of a series of umbrella bodies to prioritise the allocation of funding by the Australian Government – the Australian Research Grants Council, which oversaw university-based research.¹⁸ The Australian Science, Technology and Engineering Council (ASTEC) was later established as the principal advisory body for research policy. Following several reviews, ASTEC’s role was folded into the Prime Minister’s Science, Engineering and Innovation Council (PMSEIC) in late 1997.

1.17 Science and technology initiatives of the 1980s and 1990s were broad-ranging, and included increased funding of research and strategies to promote linkages between industry, government and university research projects. The 1999-2000 *Science and Technology Budget Statement* states that Australian government support for major initiatives is in the order of \$3.9 billion.¹⁹ This amount excludes the “external earnings” (Chapter 3 refers) which the CSIRO and several other Commonwealth science organisations have been required to find since the mid-1980s for their activities.

1.18 Government promotion of R&D, one of the strands of the science and technology system, has become an integral part of industry policy in an effort to increase the low level of R&D undertaken by Australian industry (compared to other OECD countries). An understanding of the importance of innovation as a driver of economic growth saw the reconsideration of the previous laissez-faire attitude towards the research effort.

17 Prominent government-owned laboratories include the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Defence Science and Technology Organisation (DSTO), Australian Nuclear Science and Technology Organisation (ANSTO), Australian Institute of Marine Science (AIMS) and Australian Geological Survey Organisation (AGSO).

18 The Australian Research Grants Council was the predecessor of the Australian Research Council (Chapter 4 refers).

19 Highlights and Summary Notes pages. The quoted figure is in accrual terms.

Summary of federal government R&D support programs

1.19 R&D is primarily funded by the federal government through annual appropriations, competitive grants and tax incentives. Diagrammatic representations of funding support for R&D and the various channels of policy advice are in the S&T budget statement.²⁰

1.20 Programs to support R&D are delivered through the sectoral interests served principally by the Department of Industry, Science and Resources (DISR); Agriculture, Fisheries and Forestry Australia (AFFA); the Department of Education, Training and Youth Affairs (DETYA); the Department of Defence; the Department of Environment and Heritage; and the Department of Health and Aged Care. Exchange of information amongst departments, and co-ordination of their S&T programs, are facilitated by the inter-departmental Co-ordination Committee on Science and Technology (CCST).²¹

1.21 The programs have undergone major changes since the mid-1980s aimed at increasing their relevance to national priorities, improving the linkages among them and with industry, and improving the focus, quality and timeliness of the research effort. The incentives available to Australian researchers attempt to reflect this diversity of need. Details of support programs are in the S&T budget statement.²² Government financial incentives for R&D are discussed in Chapter 5 of this report.

1.22 State governments also fund R&D programs, notably in agriculture, health and the environment. Further details are available in the Industry Commission's report on R&D,²³ and in submissions to this inquiry from the Department of Primary Industries and Energy (DPIE, now AFFA) and the Western Australian and Queensland governments.²⁴

20 Senator the Hon Nick Minchin, *Science and Technology Budget Statement 1999–2000*, DISR, 1999, figures 1 and 2 in the Summary Notes pages at <http://www.disr.gov.au/sandt.pdf> (as at 6 July 1999).

21 See www.science.gov.au (as at 30 June 1999) for more detail on CCST and government science bodies.

22 Senator the Hon Nick Minchin, *Science and Technology Budget Statement 1999–2000*. See also DIST, submission no. 48, Appendix 2.

23 Industry Commission, *Research and Development*, pp. 90-93 & Appendix QE.

24 Western Australian Government, submission no. 8; Queensland Government, submission nos. 27 and 27.1; and DPIE, submission no. 46.

Public policy changes in the past decade

1.23 Few organisations in Australia have remained unaffected by economic reforms implemented over the past decade or so:

A consistent theme in those reforms, whether in international trade, domestic regulation or public sector management, has been an increased reliance on market based mechanisms and competition to promote efficiency and competitiveness.

In the public sector, increased attention has been given to the core role of government and how government services can be best delivered in an environment of resource constraint. This imperative has driven reforms ranging from privatisation, deregulation of public monopolies, competitive tendering and contracting to various management reforms, including devolution and accountability frameworks.²⁵

1.24 All levels of government in Australia have reassessed their role in the provision of goods and services. The common objective has been to encourage greater competition and provide services more efficiently. The benefits of this are widespread, in that they reach across industry sectors in the form of lower input prices for goods and services consumed in production. They should also reach consumers in the form of lower prices and more competitive product and service offerings.²⁶

1.25 Some jurisdictions have placed greater emphasis on commercialising Government Business Enterprises (GBEs) and increasing their exposure to competition, while others have gone further and privatised key public sector assets, including electricity utilities, airports and financial institutions.²⁷

25 *Commonwealth Competitive Neutrality Statement*, June 1996, p. 3. For further reading on microeconomic reform, see Industry Commission, *Microeconomic Reforms in Australia: A Compendium From the 1970s to 1997*, January 1998, at <http://bilbo.indcom.gov.au/research/other/micref97/> (as at 30 June 1999).

26 DIST, submission no. 48, p. 7.

27 Industry Commission, *Microeconomic Reforms in Australia*, pp. 4-5.

Box 2: Policy Reform – A Glossary of Terms

Some reform initiatives relevant to the inquiry are:

- ***Outsourcing (or contracting out) and competitive tendering and contracting (CTC):*** these initiatives involve tenders from external entities to provide goods and services for government. While CTC and outsourcing can often involve the same process, CTC allows the consideration of an in-house bid. The term “outsourcing” suggests that in-house bids have been ruled out. Outsourcing generally refers to the contracting out of entire services (such as information technology, building, maintenance or corporate services functions).²⁸
- ***Commercialisation:*** the introduction of commercial arrangements to government activities, including the application of user-pays principles. Commercialisation does not necessarily change the formal structure of the organisation.
- ***Competitive neutrality:*** requires that government business activities not enjoy net competitive advantages over the private sector simply by virtue of public sector ownership. Such advantages are particularly marked where government businesses are not subject to tax or regulatory requirements. Competitive neutrality is a central feature of the National Competition Policy agreements.
- ***Corporatisation:*** establishing a government business as a separate legal entity with more clearly specified objectives and a requirement to operate along private sector lines, including the payment of tax or tax-equivalent payments. The relevant government retains ownership of the business.
- ***Privatisation:*** can range from the sale to the private sector of government-owned infrastructure, such as land and buildings, to the full sale of publicly-owned and operated enterprises and utilities. Whilst privatisation cedes full financial and managerial control to the private operator, the government retains regulatory responsibilities.²⁹

28 Commonwealth Department of Finance and Public Administration at <http://www.ctc.gov.au/ctc/index.htm> (as at 10 February 1999).

29 The Institution of Engineers, Australia, *Engineering the Transition to Competitive Utilities: Innovation, Design Capability and Human Resource Requirements*, February 1996, p. 17 (exhibit no. 3).

National Competition Policy

1.26 Microeconomic reform in Australia was given a substantial boost with the signing of the National Competition Policy (NCP) agreements by the Commonwealth, State and Territory governments in 1995. As explained by the Productivity Commission:

*In essence, NCP requires infrastructure providers to address structural, access and competitive neutrality issues. Its focus is on removing legislative barriers to entry and other impediments to effective competition. Amongst other things, the reforms have involved the separation of regulatory and commercial functions, and of the natural monopoly and potentially competitive components of service provision. Most government infrastructure providers have also been commercialised or corporatised so that, where feasible, they can compete on an equal footing with each other and any private sector counterparts.*³⁰

1.27 The development of a National Competition Policy was first addressed by Heads of Government at a Special Premiers' Conference in 1991. In October 1992, the Prime Minister established the National Competition Policy Inquiry (the Hilmer Committee), which reported in March 1993 on a framework for reform of Australia's domestic markets.³¹

1.28 In February 1995 the Industry Commission estimated that the Hilmer recommendations and related reforms had the potential to create 30 000 new jobs and to increase real GDP by \$23 billion or 5.5 percent.³²

1.29 In April 1995, the Council of Australian Governments (COAG) endorsed a package of legislative and administrative arrangements to establish the NCP. The package contained four parts:

1. **The Competition Policy Reform Bill** (subsequently enacted) – this provided for:
 - the application of the conduct rules in the Commonwealth Trade Practices Act to both the “unincorporated” sector (which includes the professions) and State and local government business activities;

30 Productivity Commission, *Inquiry into the Impact of Competition Policy Reforms on Rural and Regional Australia*, Draft Report, May 1999, p. 98 at <http://www.pc.gov.au/inquiry/compol/draftrep/index.html> (as at 30 June 1999).

31 Independent Committee of Inquiry into National Competition Policy, *National Competition Policy*, August 1993.

32 DIST, submission no. 48, p. 7. The Industry Commission's figures are not uncontested; for example, see Professor John Quiggin at <http://econ.jcu.edu.au/jcq:jq.html>. Professor Quiggin has argued that the net benefit of the entire reform process (except tariff reform) amounts to no more than one percent of GDP.

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- a mechanism for businesses to negotiate access to services which are of national significance and which are necessary for their operations (“third party” access);
 - amendments to the Prices Surveillance Act to enable price surveillance of GBEs; and
 - establishment of the National Competition Council (NCC) and the Australian Competition and Consumer Commission (ACCC). The NCC monitors progress and plays an advisory role, while regulatory aspects of the package are mostly under the control of the ACCC.
2. **The Conduct Code Agreement** – this agreement set out the legislative means by which the application of the Trade Practices Act has been extended.
3. **The Competition Principles Agreement** – this agreement set out principles (and deadlines) for the development and implementation of policies on:
- the establishment of State-based third party access regimes;
 - prices oversight of State-based GBEs which have monopoly power;
 - the structural reform of public monopolies;
 - the imposition of competitive neutrality between government business activities and their private sector competitors; and
 - a systematic review of legislation to remove restrictions on competition, except where it can be demonstrated that the benefits of a restriction to the community as a whole outweigh the costs and that the objectives of the legislation can be achieved only by restricting competition.³³
4. **The National Competition Policy and Related Reforms Agreement** – this agreement set out the timetable for the implementation of the full suite of NCP reforms and related reforms in specific industries (notably, agreed COAG reforms in electricity, gas, water and road transport). The package also incorporated arrangements to distribute the benefits of reform – the so-called “competition payments” – based on jurisdictions successfully implementing the reform measures.³⁴
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33 For a list of factors which have been taken into account as public benefits, see Productivity Commission, *Inquiry into the Impact of Competition Policy Reforms on Rural and Regional Australia*, Draft Report, p. 89.

34 Queensland Treasury at <http://www.treasury.qld.gov.au/homencp.htm> (as at 10 February 1999).

1.30 As an example of the application of the reforms,³⁵ the States have been restructuring their electricity utilities since the early 1990s with NSW, Victoria, South Australia and the ACT participating in a trial national electricity market since May 1997.³⁶ Although the various States are at different stages of the process, the restructuring has generally seen monopoly utilities split into separate generating, transmission and distribution/retail supply companies.

1.31 The recent performance of public sector agencies suggests that competition reforms have delivered significant improvements. The NCC has stated that competition has already reduced electricity prices by about ten percent in Victoria and NSW,³⁷ with gas access tariffs predicted to fall by 60 percent by 2000. The NCC further claims that reforms in government enterprises have resulted in average price reductions of around 15 percent, and a doubling of total payment by trading enterprises to governments.³⁸

35 A detailed summary of microeconomic reform in individual sectors (such as electricity, gas, water, manufacturing, communications, health and agriculture) is available in Industry/Productivity Commission publications, including: *Microeconomic Reforms in Australia: A Compendium From the 1970s to 1997*, January 1998, at <http://bilbo.indcom.gov.au/research/other/micref97/> (as at 30 June 1999); *Performance of Government Trading Enterprises 1991-92 to 1996-97*, October 1998, at <http://www.indcom.gov.au/service/gte/perf9697/index.html> (as at 30 June 1999); and *Inquiry into the Impact of Competition Policy Reforms on Rural and Regional Australia*, Draft Report, Chapters 5 and 6.

36 The National Electricity Market (NEM) commenced operation in December 1998. The NEM provides for a common wholesale market serving interconnected jurisdictions, a single controller despatching generators in the interconnected jurisdictions, customer entitlements to purchase electricity either from the spot market or under contract with a supplier of their choice, and a market settlement function handling trading and the contractual requirements of wholesale customers and generators. The NEM currently encompasses some 60 entities in NSW, Victoria, South Australia and the ACT. Queensland and Tasmania are expected to participate when grid connections are completed. Productivity Commission, *Inquiry into the Impact of Competition Policy Reforms on Rural and Regional Australia*, Draft Report, p. 101.

37 See also *ibid*, pp. 103-105 and Mr David Eiszele, Chairman of ESAA, *Electricity Supply Magazine*, October 1998, p. 7. There have been suggestions that wholesale electricity prices may rise as the NEM comes into full operation, due to a tighter balance between supply and demand and the need for companies to begin recouping the cost of their power asset purchases. See Mike Roarty, *Electricity Industry Restructuring*, Parliamentary Library Research Paper no. 14 1997-98, May 1998 at <http://www.aph.gov.au/library/pubs/rp/1997-98/98rp14.htm> (as at 10 February 1999); "Savings Are Starting to Add Up For Consumers", *The Australian Financial Review*, 19 November 1998; and "Power Prices to Rise Further" and "Grid Move Sparks Price Warning", *The Australian*, 7 and 17 July 1998.

38 Quoted in "And the Biggest Task is Still Ahead", *The Australian Financial Review*, 8 July 1998.

Box 3: National Competition Policy

<i>Policy Element</i>	<i>Purpose</i>	<i>Example</i>
Extension of coverage of the Trade Practices Act	To limit the anti-competitive conduct of firms, regardless of ownership.	Coverage of Part IV of the Trade Practices Act is extended to the unincorporated sector (including the professions) and State Government business activities.
Third party access	To provide access, at “fair” prices to facilities that are essential for competition to a third party (ie someone other than the owner/supplier of the facility eg a potential new user or existing user).	Access to facilities for a third party, such as Optus for telecommunications. Optus would not have been able to compete with Telstra without access to the existing communications network.
Prices oversight	To prevent the misuse of monopoly powers by government businesses.	Introduction of arrangements, similar to the (former) Commonwealth Prices Surveillance Authority, for State and local government businesses which exercise monopoly powers.
Structural reform	To reform the structure of government businesses to facilitate competition.	Division of State electricity commissions into separate generation and transmission entities to allow potential for competition in generation.
Competitive neutrality	To remove the benefits (and costs) which accrue to businesses as a result of their ownership by government.	Requirement for government businesses to pay taxes (or tax equivalents), removal of regulations which provide special advantages (or disadvantages) for government businesses competing with the private sector.
Legislative review	To justify and/or reform government regulation which restricts competition.	Commonwealth: deregulation of domestic air travel and telecommunications arrangements; State: deregulation of various State statutory marketing arrangements and general review of business regulations.
Other reforms	To further reform key sectors of the economy which are already subject to COAG reforms.	Areas which have been identified especially are electricity, gas, water and transport.

Source: Queensland Treasury at <http://www.treasury.qld.gov.au/homencp.htm> (as at 9 February 1999).

1.32 The sectors affected by competition policy, and the outcomes for Australian R&D, are still evolving. For example, a consortium of three energy authorities has announced it will use power distribution networks to provide telecommunications in Brisbane, Sydney and Melbourne,³⁹ while ACCC Chairman Allan Fels has stated that multi-utility companies are “a logical step” in the competitive reforms being undertaken across the country.⁴⁰

1.33 The table at page 13 summarises the NCP reforms. The reforms are in the early stages of implementation and will continue well beyond the year 2000.

The inquiry

1.34 The application of competition policy to government authorities seeks increased efficiencies. In part, these increases in efficiency are achieved by focusing on activities that support an organisation’s “core business”. This raises important issues with respect to future R&D, as was noted by the (then) Chief Scientist, Professor John Stocker, in his June 1997 report *Priority Matters*:

...Commonwealth, State and Territory government reforms in competition policy, while focused primarily on business operations, have impacts (both positive and negative) on Australian science, technology, engineering and innovation. This can include unintended and unforeseen impacts. For example, many water authorities have been privatised or have become government business enterprises. Once operating in a business mode, these agencies tend to identify their core business and only undertake data collection activities in direct support of this core business. This has resulted in a concentration on short term, rather than longer term issues. In some instances, fragmentation of responsibilities as a result of privatisation has led to the situation where it is difficult to know exactly who is responsible for what in terms of water resources data

39 Australian Photonics CRC, transcript of evidence, p. 143; ASTEC, transcript of evidence, p. 214; “The Privatisation Push Continues”, *Business Review Weekly*, 8 June 1998, p. 82; and “Power Link to Rival Telstra” and “Communication the Main Game”, *The Australian Financial Review*, 26 May 1998 and 17 May 1999.

40 Quoted on the AAP news wire, “One Bill For All Utilities Under Merger Plans”, 3 June 1998. Synergies are already emerging in the national electricity market – in July 1998, the gas retailer AGL revealed it had secured two percent of the contestable electricity market in NSW and was intending to secure five percent by the year 2000, while in the same month the corporatised Queensland electricity supplier Energex took control of gas utility Allgas Energy. See “AGL Has Electricity Market in Sights”, *The Australian*, 17 July 1998; and “Qld Labor Gives Energex Green Light”, “Economies Will Lead to a Multi-utility Approach” and “Dual Fuel Deals Fire Up Energy Market”, *The Australian Financial Review*, 9 July 1998, 19 November 1998 and 17 May 1999.

collection and as a result, data collection for some purposes has decreased or 'fallen through the cracks'. A related issue of some importance is the ownership of water resources data collected by commercialised water agencies. A similar situation might be expected to develop in the telecommunications sector, given the planned deregulation and the upcoming partial sale of Telstra.

Although the above situation specifically relates to the collection of data in the context of water or environment research, the issues raised are illustrative and likely to be relevant to other situations. In addition to this problem, issues such as the impact of competition policy upon the willingness of scientists, technologists and engineers employed by corporatised or privatised authorities, to cooperate either among themselves, or with university or other public sector researchers, are of some concern, particularly given the body of evidence demonstrating the benefits of such cooperation.⁴¹

1.35 Professor Stocker suggested that ASTEC undertake a study of “both the advantages and disadvantages” to science, technology, engineering and innovation resulting from competition policy. In light of this Committee’s inquiry, ASTEC instead interviewed the managers of several organisations and presented the results as a submission to the inquiry.⁴²

1.36 Evidence to the Committee as to the precise effect of the policy changes on R&D was limited. This may be because the policy changes have been in place for a relatively short period – for example, ASTEC noted that the utilities it examined are in transition, with most in a “shakedown” phase in which all business inputs are being critically examined.⁴³ The policy changes themselves may have encouraged an atmosphere of commercial secrecy around R&D, making evidence less available to the Committee (as the Academy of Technological Sciences and Engineering suggested).⁴⁴

1.37 In addition, many participants in the inquiry regard competition policy as being of less consequence for R&D than such matters as university funding and the level of the R&D tax concession, and tailored their submissions accordingly.

41 Professor John Stocker, *Priority Matters*, June 1997, p. 46 at <http://www.disr.gov.au/science/cs/index.html> (as at 10 February 1999).

42 ASTEC, submission no. 42. ASTEC has now been abolished and its functions transferred to the Prime Minister’s Science, Engineering and Innovation Council (PMSEIC).

43 *ibid*, p. 1.

44 Academy of Technological Sciences and Engineering, submission no. 30, p. 1.

1.38 Despite a lack of evidence, the Committee has been able to identify some emerging issues of importance. These include:

- the need to identify public utilities' R&D activities – particularly “public good” R&D and data collection – before corporatisation or privatisation;
- the need to maintain public sector support for long-term research; and
- the need to provide mechanisms to encourage the “critical mass” for effective R&D.

1.39 The Committee, in identifying these issues, has no desire to “turn back the clock” on policy reforms which are delivering substantial benefits for all Australians. Instead, rectifying any unintended consequences for R&D will contribute to the work being done by many agencies to ensure the successful implementation of the reforms.⁴⁵

1.40 Some possible effects of the policy changes on the level and nature of Australian R&D are examined in the next two chapters of this report. Issues concerning R&D and the university sector are examined in Chapter 4. Incentives for investment in R&D are examined in Chapter 5. Additional issues raised in evidence, including the awareness of innovation amongst Australian management and financiers, are examined in Chapter 6.