CHAPTER 3

ALLOCATION OF AUSTRALIAN RADIOFREQUENCY ELECTROMAGNETIC ENERGY PROGRAM FUNDS

Introduction

3.1 This chapter focuses on the $4.5 million Radiofrequency Electromagnetic Energy Program the stated aim of which is to address community concerns about exposure to electromagnetic radiation occurring in the radiofrequency range of the spectrum. This Program is managed by two government agencies: the Committee on Electromagnetic Energy Public Health Issues (CEMEPHI) and the National Health and Medical Research Council (NHMRC). Both of these agencies come under the Department of Health and Aged Care. The Committee examined the funding allocation as well as criticisms of the program raised during its inquiry.

Committee on Electromagnetic Energy Public Health Issues (CEMEPHI)

3.2 On 23 October 1995, the Government established an interdepartmental Committee on Electromagnetic Energy Public Health Issues (CEMEPHI). This Committee is responsible for advising the Government on public health issues related to the use of the radiofrequency spectrum for communications including:

- the current status and suitability of technical standards relating to electromagnetic energy in the radiofrequency spectrum and public health (but not to cut across the standards development process);
- how standards are being implemented by the industry;
- whether compliance programs are adequate, and, if they are found to be lacking, developing appropriate reporting processes to ensure compliance is being maintained (relying as much as possible on self regulation strategies but utilising legislative means if necessary);
- the extent of human services programs put in place to assist those experiencing interference problems with health equipment from electromagnetic energy;
- the status of overseas and Australian research into the health/electromagnetic energy issue and the scope for further research to be undertaken in Australia; and
- the implementation of a community information program to ensure all relevant information on the health/electromagnetic energy issue is freely available.[1]

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1 Committee on Electromagnetic Energy Public Health Issues (CEMEPHI), Submission 127, p 4.

Radiofrequency Electromagnetic Energy Program

3.3 On 15 October 1996, the Australian Government announced the program which would fund electromagnetic radiation research into health issues associated with mobile phones, mobile phone towers and other communications devices and equipment; contribute to a World Health Organization (WHO) project that coordinates the international research effort, and reviews the scientific literature; and provide public information. A total of $4.5 million was drawn from a one per cent levy on radiocommunications licences in 1996-97, set aside for use over a five year period.

3.4 Of the $4.5 million, $3.15 million was initially allocated for research, with the remainder identified for public information and the WHO collaboration. The research component was later increased to $3.4 million.

3.5 With the establishment of the Radiofrequency Electromagnetic Energy (RF EME) Program, the CEMEPHI became responsible for the overall implementation of that Program. In addition, it became specifically responsible for the public information component and Australia's involvement in the WHO collaboration.

3.6 On 1 July 1998, the support function for the CEMEPHI was transferred from the then Department of Communications and the Arts, and its administrative costs drawn from the $4.5 million. The CEMEPHI is currently convened by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) which falls under the aegis of the Department of Health and Aged Care. Current membership of the CEMEPHI is:

Table 3.1

CEMEPHI Membership[2]

Dr John Loy (Chair)	ARPANSA
Dr Kevin Buckett	Department of Health and Aged Care (Public Health Division)
Professor Don Cameron	NHMRC
Mr David Clarkson	NHMRC
Mr Wayne Cornelius	ARPANSA
Ms Liz Cotton	NHMRC
Mr Tad Jarzynski	DCITA
Mr Ken Karipidis	ARPANSA Secretariat

2 ARPANSA, Committee on Electromagnetic Energy Public Health Issues (CEMEPHI), response to written questions on notice.

Mr Ian McAlister	Australian Communications Authority
Ms Leonie Tarnawski	Australian Communications Authority

National Health and Medical Research Council (NHMRC)

3.7 The research component of the Radiofrequency Electromagnetic Energy (RF EME) Program is managed by the National Health and Medical Research Council (NHMRC). The NHMRC is a national body which makes authoritative recommendations to Commonwealth, state and territory governments. It is regularly referred to for advice on prevailing public health, medical research and ethical issues, as well as providing practical advice to the community.

3.8 The NHMRC's role in the RF EME Program is to develop a research framework, determine priorities, call for funding proposals, make recommendations and ensure that the research is of a high quality and in the public interest. It requires that the research findings are submitted for publication in peer-reviewed scientific literature. The NHMRC does not manage the research it funds. This is the responsibility of the grant recipients and their institution.[3]

3.9 The NHMRC established a Radiofrequency Electromagnetic Energy Expert Committee (the Expert Committee) for the purpose of administering the research funding for the RF EME Program. The Expert Committee was formed pursuant to a Memorandum of Understanding (MOU) between the CEMEPHI and the NHMRC. This MOU specified the roles and responsibilities of the NHMRC and the CEMEPHI in relation to the research, and provided a framework for the EME research.

Where the Funds Have Been Allocated

3.10 Funding for the whole program has been made available at the rate of $1 million per year starting on 1 January 1997. Of the $1 million, $700,000 goes to the NHMRC for the research program and the remaining $300,000 covers the involvement in the WHO International EMF Project ($US50,000 per year) and also the public information program ($131,000 spent by June 2000).

3.11 The MOU between the CEMEPHI and the NHMRC provides that funds, which are not required for other parts of the Program, may be transferred to the research component. This occurred when the support function for the CEMEPHI was transferred from the Department of Communications and the Arts to ARPANSA and an additional $250,000, not required in the other parts of the Program, was allocated to the research component.

3 National Health and Medical Research Council (NHMRC), Submission 69, p 10.

Australian Research Component

First round of funding

3.12 On 25 October 1997, the NHMRC advertised in the national press for expressions of interest for research proposals to be received by 5 December 1997. Twenty-two expressions of interest were received covering a range of fields. The Expert Committee participated in a round table debate on the strengths and weaknesses of each proposal and arrived at an agreed rating for scientific merit. Seven highly rated proposals were short-listed and invited to submit full proposals.

3.13 The NHMRC arranged for peer review, including possible conflict of interest issues, of the full proposals. This involved both Australian and international grant assessors. All full applications each went to four assessors. Mr David Clarkson, Director, Research Development Section, Centre for Research Management, NHMRC described the assessment criteria:

> When examining this proposal versus that proposal, there is a list of criteria that we give to assessors and that the committee use – for example, the quality of the science: is it good science, is it good methodology, has it got ample sample size, are there enough subjects involved, are there enough mice involved? There is also the track record of the scientists: have they done work in this area before or is it something they have never done before, and have they got enough people on their team to do the specialised examination of the issues within the project – for example, have they got an epidemiologist, if that is required; have they got somebody who knows something about the dosimetry, which is fairly complex for a lot of the scientists because it is an area they are unfamiliar with; have they got somebody who is a medical statistician? Those sorts of things depend on the issue that they are looking at.
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> So those are the issues: relevance, scientific importance, track record and, important in this particular area, is it strategically important, is it answering those questions? In the last call for proposals, we put on the bottom 'other areas that may be relevant'. There is a judgment made by the panel about relevance as we ask the assessors to make a judgment call on that one too.[4]

3.14 Four projects, two of which were pilot studies, were selected for funding in the first round, totalling approximately $1.4 million. Funds were quarantined to convert two of the pilot studies to full studies if results from the pilots indicated that this would be required.

3.15 Three of the research projects were announced in July 1998, following endorsement by the Minister for Health and Aged Care. The pilot studies were:

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4 *Official Committee Hansard*, Canberra, 8 September 2000, p 50.

- a case-control study of brain and other tumours in adults, conducted by Professor Armstrong, administered by the NSW Cancer Council. This 16 month pilot study received $90,000; and
- the effect of radiofrequency exposure on intrachromosomal recombination in mutation and cancer, conducted by Dr Sykes and administered by Flinders University of South Australia. This pilot study received $75,000.

3.16 The third project was an 18 month study on human volunteers testing the effect of 900 MHz radiofrequency radiation on human neuropsychological responses conducted by Dr Stough and administered by the Swinburne Institute of Technology, Victoria. This project received $50,000.

3.17 The fourth project was announced in September 1998. This project was to test the effects of GSM-like fields on tumour incidence in *Eμ-pim-1* mutant mice[5]. It was to be conducted by Professor Vernon-Roberts, administered by the University of Adelaide and received $1.122 million. This was a replication or confirmation study of research, funded by the Federal Government and Telstra and conducted in 1993-95 by the Royal Adelaide Hospital.

3.18 A report on the Professor Armstrong pilot study was reviewed by the Expert Committee and a decision made to fund a full, stand alone, four year study. The grant, totalling $1.2 million, was announced in December 2000.

3.19 Dr Sykes reported at the end of 1999. The findings from the pilot study did not support the hypothesis of the project and the Expert Committee decided there was no justification to provide further funds for a full study to test the same hypothesis with the same methodology.

3.20 The NHMRC informed the Senate Committee that Dr Stough's project is now complete and the final report is awaiting publication.[6]

3.21 Further details of these projects can be found in Chapter 2.

Second round of funding

3.22 In February 2000, the Expert Committee called for a second round of expressions of interest for radiofrequency electromagnetic energy research. It was able to do this when funds set aside for Dr Sykes' full study were not required. In addition, a decision had been made to reallocate funds earlier quarantined for an additional component to Professor Vernon-Roberts' study, which it was thought would be better spent elsewhere.[7] There were also monies transferred from other parts

5 A strain of genetically modified mice engineered to be susceptible to a particular type of cancer.

6 *Proof Committee Hansard*, Canberra, 2 March 2001, p 397.

7 The original application for this project proposed a large additional component, which had been kept under consideration for some time. This was for a similar study to that currently under way, using another mouse variant (*p53* mice). The NHMRC advised that the Expert Committee believed there was

of the Radiofrequency Electromagnetic Energy Program in line with the MOU between the NHMRC and the CEMEPHI (refer to paragraph 3.9 above). The second round of funding came to $530,000.

3.23 The second round endeavoured to address research areas that have been identified by the World Health Organization as still requiring attention. Research in the areas of neuropsychological and neurophysiological abnormalities was particularly encouraged by the NHMRC.

3.24 The NHMRC sought expressions of interest in April 2000. Eleven proposals were submitted (although some proposals incorporated more than one project) with one of the eleven proposals being ineligible for funding through the Radiofrequency Electromagnetic Energy Program because it would have been based and managed overseas.

3.25 The process for deciding which projects to fund was similar to that for the initial funding round. The Expert Committee met on 20 June 2000 to shortlist the expressions of interest, subsequently inviting full applications from six proposals. Five full applications (one applicant chose not to submit a full application) were received, peer reviewed, and considered by the Expert Committee.

3.26 The Expert Committee recommended two grants for funding which were announced by the Minister on 1 March 2001. The projects, totalling $522,575, were:

- human physiological responses to exposure to mobile phone type radiation. This study will be conducted by Dr Andrew Wood at Swinburne University of Technology. Funds allocated are $213,570 over three years; and
- effects of radiofrequency electromagnetic radiation from long term mobile phone use on vision and hearing. Associate Professor Paul Mitchell at Westmead Hospital will conduct this study. Funds allocated are $309,005 over two years.

Criticism of the research program

3.27 The Senate Committee received submissions which were critical of the research program. The criticism focussed on the amount of funds provided for the program; the length of time taken to get research results; the selection of projects for funding; and scientists whose findings have indicated in the past that there may be health and psychological effects from electromagnetic radiation have had their funding discontinued or made unavailable for the necessary experimental replication, or they have not been awarded grants at all.

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no justification for the second variant of mouse until the first study had been completed. So if there was something that came out of the *pim-1* study that indicated that another variant mouse study was required, then the Expert Committee would consider it at that time instead of holding the money virtually in embargo for another two years. NHMRC, Submission 69, p 8 and *Proof Committee Hansard*, Canberra, 2 March 2001, p 396.

Amount of funds

3.28 Witnesses argued that, in the light of the revenues earned by the Government from the telecommunications industry, and the large number of people exposed by the use of mobile phones in particular, a much larger sum should be provided for research into the health effects of electromagnetic radiation. The Electromagnetic Radiation Alliance of Australia (EMRAA) commented:

> This amount of funding for research into the health effects of EMR is paltry, given that the telecommunications industry generates millions of dollars annually for the government and many millions more from the sale of spectrum.[8]

3.29 According to Mr Stewart Fist, a journalist:

> The most generous characterisation that any reasonable person could put on the present government's $4.2 [sic] million funding for EMF research and public information about cellphone dangers, is that it is tokenism at its worst.[9]

3.30 The NHMRC provided to the Committee comparative information on grants which it distributes in other areas. In 2000, it distributed approximately $118 million in grants, of which approximately $42 million were new grants. It argued that the $700,000 per annum research component of the Radiofrequency Electromagnetic Energy Program was consistent with amounts awarded in the following areas:

- aetiology and neurobiology of depressive and bipolar disorders ($621,549);
- vascular biology in thrombosis ($813,386); and
- biological function of genes in the pathophysiology of Downs syndrome ($621,549).

3.31 A media release from the Minister for Communications and the Arts claimed that whilst there are public concerns about possible health effects of electromagnetic radiation, other health issues such as damage to skin through exposure to the sun, the development of breast cancer or death or injury because of road accidents are of greater concern.[10]

3.32 Dr John Moulder, a Professor of Radiation Oncology in Wisconsin, told the Committee that it becomes a political and social decision whether to divert resources from one area of inquiry into another:

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8 Electromagnetic Radiation Alliance of Australia (EMRAA), Submission 80, p 4.

9 Mr Stewart Fist, Submission 30, Appendix C, p 1.

10 National Health and Medical Research Council (NHMRC), Submission 69, Attachment 1, p 27.

> Sometimes, as soon as you start looking, you find something hazardous, but once some work has been done and it does not show any strong evidence of a hazard, then it is a political decision how much more time and money should be spent on this issue as opposed to all the other things out there that are possible or known hazards. I think that is a social or a political decision.[11]

3.33 The NHMRC received a smaller number of applications in response to the second round of funding and said:

> One can look at the number of applications we received for the second round. Eleven is not a lot, given the amount of interest in the area, so maybe we need to stimulate it in different ways …[12]

3.34 The NHMRC acknowledged that, with an increase in money, more research could be funded, but had reservations about the small number of researchers in this particular area in Australia. In addition, the one-off nature of the funding is seen as a problem by the Expert Committee and this aspect of the funding does not encourage researchers to specialise and become expert in the area.[13] According to Mr David Clarkson from the NHMRC:

> … good people are working in other areas and are not being pulled across to this area because of its limited career path …[14]

3.35 The Australian Mobile Telecommunications Association (AMTA) informed the Committee that if there were not enough funds to cover projects identified by the NHMRC as appropriate, it would look at funding them:

> I should draw your attention to the fact that in our submission we said that, were the NHMRC to identify research programs that were appropriate for funding and there was insufficient funding, the industry would be prepared to look at providing funding for those projects. But they would be projects identified by the NHMRC.[15]

3.36 There is consensus among stakeholders in this area, that more research needs to be conducted into the effects of electromagnetic radiation and the Committee recommends that the Government maintain a research program on an ongoing basis. This is necessary not only for the research findings that will be the result of such a program, but also to develop the expertise in this area in Australia and enlarge the pool from which researchers can be drawn.

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11 *Proof Committee Hansard*, Canberra, 2 March 2001, pp 322-323.

12 *Official Committee Hansard*, Canberra, 8 September 2000, p 48.

13 *Proof Committee Hansard*, Canberra, 2 March 2001, p 403.

14 *Proof Committee Hansard*, Canberra, 2 March 2001, p 403.

15 *Official Committee Hansard*, Canberra, 8 September 2000, p 36.

3.37 Professor Philip Jennings, Professor of Physics at Murdoch University (in a personal submission) made the point that:

> … health research related to the effects of EMR is well behind the level needed to ensure that public health is not adversely affected by technological progress. This is partly a result of underfunding and partly due to the emphasis on ionising radiation in the past. We have very little experience of long term exposure of large numbers of people to the sorts of EMR doses we are now experiencing.[16]

3.38 The amount of funding was criticised as inadequate for independent Australian scientists to seriously explore the possibility of health problems caused by electromagnetic radiation, and the Committee Chair therefore considers that the level of funding should be significantly higher and adequate to deliver a structured program of research which is independent and of high quality and relevance.

3.39 Much of the controversy in the area arises from attempts to discredit studies because of their design or methodology or the fact they have not been replicated.

3.40 The CSIRO suggested that a figure of $60 million, based on a $10 levy on each mobile phone user, would be a generous amount of research funding:

> If Australia wants to do this sort of research then it needs to be adequately funded. Therefore, a levy seems one way to do that; there are others, I am sure. I think there are six million subscribers, so $10 is quite a lot. It adds up to $60 million. That is about the budget for my division, which is 400 people.[17]

3.41 Other submissions also advocated a levy on mobile phone users which would be used to fund research. Mr Les Dalton, a retired CSIRO Principal Research Scientist, advocated that there be:

> … a levy on users of mobile phones to provide the research funding. That would channel funds from the industry far better than direct handouts by carriers themselves; it is then at arms-length between the research and the funding source. A very small levy would provide a far greater research fund than anything the government has so far been prepared to offer.[18]

3.42 Mr Don Maisch, an electromagnetic energy activist, also suggested that there be a levy on the phone user:

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16 Professor Philip Jennings, Submission 122, p 1.

17 *Official Committee Hansard*, Sydney, 16 November 2000, p 230.

18 *Official Committee Hansard*, Melbourne, 22 September 2000, p 173.

> Considering the amount of profits that are being made by the industry, I think a small tax on mobile phone users, going back into research, is not really very much of a thing to ask.[19]

3.43 The Electromagnetic Radiation Alliance of Australia suggested that '[i]n order to avoid the difficulties of obtaining genuine results from credible science, there is a great need for independent research and independently administered funding'.[20] It recommended that:

- two funds be established, one to finance studies on the effects of telecommunications technology on health and the other to finance studies on the effects of powerline fields on health;
- funding for these be derived from all telecommunications companies and all power utilities;
- each mobile phone user be required to contribute $10 per annum to research the effects of mobile phone use; and
- money from these funds be allocated to research by independent panels comprising public health professionals and members of the community.[21]

3.44 Mr Fist provided the Committee with a proposal for an independent Commonwealth Institute of Radio/Environmental Health which could be incorporated within the CSIRO. He argued that this was necessary because:

> Currently the research being conducted into cellphone health problems around the world is scattered and the researchers often work in isolation, only meeting at conferences. Australian funding is piece-meal – the money is being scattered to a few institutions and researchers with little long-term strategy. [22]

3.45 Mr Fist suggested that this Institute should be funded on a user-pays basis, by a levy on all cellphones in Australia or on all mobile phone bills:

> People are spending on average $1,200 a year on these things. For God's sake, they should be able to spend another $5 or $10 a year on whether they are safe. You fund by a levy, and therefore it is not on the budget and not subject to budget cuts. You keep it independent within the CSIRO where people will trust it, where the money does not get sloughed off into other CSIRO research.[23]

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19 *Official Committee Hansard*, Melbourne, 22 September 2000, p 96.

20 Electromagnetic Radiation Alliance of Australia, Submission 80, p 8.

21 Electromagnetic Radiation Alliance of Australia, Submission 80, pp 8 and 9.

22 Mr Stewart Fist, Submission 30, Appendix A, p 2.

23 *Official Committee Hansard*, Sydney, 16 November 2000, p 202.

3.46 The Consumers Telecommunications Network suggested that research could be funded from the sale of Telstra but was not opposed to the idea of a consumer levy. Ms Corbin said in relation to a levy:

> I think $10 is probably a bit much. However, I do think consumers would be happy to have some form of levy. … The public wants to know whether mobiles have a detrimental effect. The most common question I get asked when people find out what I do for a living is, 'Do you know if mobile phones actually affect you?' There is a huge hunger out there to have that question answered. I think people would be happy to contribute to research and also to proper labelling.[24]

3.47 The Committee Chair considers that a levy would circumvent the problem alluded to earlier, where, to increase research in the electromagnetic radiation area, resources would need to be diverted away from other areas.

3.48 Submissions suggested that research funds should be raised from a levy on mobile phone users rather than on the carriers, in order that the research so conducted is at arms-length from the industry, to avoid implications of bias.

3.49 The Committee Chair is not persuaded that the means of raising funds is a determinant of independence. Rather the process for deciding which research receives funding must be at arms length and seen to be so.

3.50 Mr Les Dalton provided another reason for restricting the levy to mobile phone research rather than for other radiofrequency emitting equipment. He suggested that mobile phone users are a special case because they are so numerous and are subjected to intense levels of radiation.[25]

3.51 The Committee Chair considers that revenue raised from the mobile phone sector should primarily be used for such research but that it should be a matter for the body which administers the research program to determine whether research into radiofrequency emissions from other sources has relevance.

3.52 The Committee Chair considers that revenue for research from the sector should be linked to the numbers of users of mobile phones but holds the view that industry and Government should develop the fairest and most administratively effective system of collection.

3.53 One way of determining the amount of additional funding required in Australia for this research would be to draw on the total value of the expressions of interest which were lodged with the NHMRC:

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24 *Official Committee Hansard*, Sydney, 16 November 2000, p 219.

25 *Official Committee Hansard*, Melbourne, 22 September 2000, p 179.

Table 3.2

Value of applications for RF EME research

	Expressions of interest received	Full proposals received
First round of funding	$9,357,557	$4,334,443
Second round of funding	$3,103,985	$1,069,626

3.54 However, the Committee Chair considers this approach to be limited because an ongoing program of funding for research would likely produce a more substantial number of proposals.

3.55 The Committee Chair supports the concept of the CSIRO being the premium research body for this work but as the CSIRO pointed out, even though it has a watching brief on telecommunications radiation issues it does not have a budget to conduct research. Dr Haddad explained:

> … the Division of Telecommunications and Industrial Physics … has a lot of dealings with telecommunications carriers, but primarily in a very much more commercial role than the sort of area that Dr Barnett has been talking about. CSIRO has a choice these days. It is required to maintain its external income level at a reasonably high level for a research organisation and, as such, it has to choose the areas in which it works quite carefully. Appropriation funding has been flat; in fact, in real dollar terms, it has decreased significantly over the last few years. That makes it harder and harder to maintain a variety of areas of what I would call more fundamental research, if you like, which underpins all this sort of short-term tactical work that you can do to earn money. So we are forced to make choices. In this particular area, yes, it is of great public interest, but it harks back to the fact that I do not believe that, unless a significant amount of money is available, we will be doing anything more than tinkering around the edges. So my attitude would be: if you want it done, do it properly, or, essentially, keep a watching brief and stay out of it.[26]

Recommendation 3.1

The Committee Chair recommends that the equivalent of $5 for each mobile phone in use be collected annually for this purpose (approximately $40 million) and that the rate be reviewed after a period of five years.

26 *Official Committee Hansard*, Sydney, 16 November 2000, pp 227-228.

Recommendation 3.2

The Committee Chair recommends that funding for maintaining the NHMRC-administered research program be provided at $4 million per annum of the $40 million and that the balance be used by the CSIRO to establish a structured program of research and set up a specialised research unit for this purpose.

Length of time taken to produce research results

3.56 Submissions expressed frustration with the time taken to produce research results:

> The Council is concerned that almost four years have elapsed since the Federal Government provided the $4.5 million fund for EMR research with only preliminary research having been undertaken so far.[27]

3.57 The CSIRO pointed out, however, that the issue of effects of radiofrequency radiation is not going to be solved quickly or easily:

> I think the committee should be aware that this is not the sort of research work that you will get done by next month. This is a long, rigorous and arduous piece of work to establish cause and effect in this particular situation. You need epidemiological studies. You need all sorts of things that will take a significant length of time. You cannot have it finished by Christmas.[28]

3.58 The NHMRC and the CEMEPHI argued that their processes aimed to ensure that electromagnetic energy research, funded through the NHMRC, was of the highest standard, was independent, and addressed the most important scientific questions in relation to any health effects of exposure to radiofrequency electromagnetic energy.

3.59 Dr Barnett of the CSIRO, however, suggested that the NHMRC often takes a long time to distribute research funds:

> Once the Department of Communications obtained those funds from cabinet, they were essentially passed on to NHMRC because it was felt at the time – at least within government circles – that that was the expeditious way to do things. In fact, it did take rather a long time to get around to actually providing any funding for research. That is not atypical of NHMRC – the time frames are usually long.[29]

3.60 The NHMRC outlined for the Committee the steps taken which led to the allocation of funds and the conduct of the research. The draft Australian Research Agenda, developed by the CEMEPHI, was forwarded in August 1997 to the NHMRC

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27 Holroyd City Council, Submission 44, p 1.

28 *Official Committee Hansard*, Sydney, 16 November 2000, p 224.

29 *Official Committee Hansard*, Sydney, 16 November 2000, p 225.

as a basis for developing its research priorities. The Strategic Research Development Committee (one of the four principal NHMRC committees) and the CEMEPHI signed a Memorandum of Understanding (MOU) on 22 September 1997 to set out their respective roles and responsibilities. The MOU between the CEMEPHI and the NHMRC specified that the NHMRC should establish a Radiofrequency Electromagnetic Energy Expert Committee under its Strategic Research Development Committee. The Expert Committee was convened and research questions were refined in October 1997. The call for expressions of interest took place also in October 1997. Expressions of interest were received in December 1997, shortlisted applicants were invited to submit full proposals in February 1998 and full applications were sent for peer review in March 1998. Assessor reports were forwarded to applicants for their comments in May 1998 and the Expert Committee considered the peer reviews and rebuttals. It made its recommendations to the Minister in May 1998 who announced the successful grant recipients in July 1998.[30]

Influence of the telecommunications industry on the research

3.61 Some submissions suggested that the RF EME Research Program wasted funds on projects designed to spread industry-based propaganda:

> Much of the money from the 5-year research/public education program has been wasted on projects designed to spread industry-based propaganda and to cover up the existing research that shows a possible connection between electromagnetic radiation and health problems.[31]

3.62 It was contended that the telecommunications industry will try to influence research into electromagnetic emissions to show that there are no ill effects from its technology:

> If you are a researcher doing research that is being funded by industry, if you are coming up with results that are not what the company wants to hear, you will not get further funding. But if you give results that look good you tend to get further funding. So there is very much a bias to slant your research towards the person who is providing the funding.[32]

3.63 Some submissions have claimed that industry cover-ups and interference in the publication of research results, and selection bias in the choice of studies to be funded, are reasons for the failure to replicate many studies that have shown a relationship between EMR and biological and health effects. Mr Fist pointed out:

> On the question of replication, if a scientist does a study and produces a certain result, then replication needs to be done by someone else. … Independent universities are not going to fund the replication because their

30 *Proof Committee Hansard*, Canberra, 2 March 2001, pp 399-400.

31 Mr Ray Winter, Submission 13.

32 *Official Committee Hansard*, Melbourne, 22 September 2000, p 101 [Maisch].

> interest is in advancing into new areas. The only people who have the money to fund replication when adverse effects are found are the cellphone companies and the government. The government does not fund it around the world and the cellphone companies have no interest in funding replication of adverse effects, at least not in public release, so you get pseudo replications.[33]

3.64 The Committee also notes the following observation:

> Scientists do not want to go out and do an exact replication. This is an enormous waste of time. What science is built on is that, if you do something and you claim a result, what is the implication? If I do it in a cervical cancer cell, does it imply that it will work in a breast cancer cell? So I can confirm a concept not by going and doing it in cervical cancer but I can do it in a breast cancer cell.[34]

3.65 Mr Dalton expressed concern about the lack of independence of scientific studies when research is carried out under a direct contract between the corporation and the research team. Mr Dalton claimed that under these arrangements 'the release to the public of the information about the research findings can, and at times has been, restricted or manipulated'.[35] Other submissions also stressed the need for research to be overseen by an independent committee and conducted independently of industry.

3.66 Mr Dalton referred to the 1997 Adelaide mouse study, the results of which, he claimed, had been delayed by a telecommunications company under a confidentiality clause in the research contract.[36] Mr Dalton advised that this study had indicated that the 'rate of tumour incidence in the mice increased over time, showing that the development of tumours is related to a measurable dose of radiation'.[37]

3.67 Mr Fist drew parallels between the operations of tobacco companies and telecommunications companies whereby, he alleged, both industries manipulate the research, discredit findings and researchers who produce unfavourable results, and employ various public relations techniques for managing the debate and influencing government policy. Mr Fist commented that:

> … especially in the United States but also in parts of Europe, particularly in Germany, there has been the development over the last years of a subset of the public relations industry which has specifically targeted science and scientists, which has systematically corrupted the presentation of evidence, which attempts to control a couple of scientific disciplines – mainly

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33 *Official Committee Hansard*, Sydney, 16 November 2000, p 198.

34 *Official Committee Hansard*, Melbourne, 22 September 2000, p 151 [Litovitz].

35 Mr Les Dalton, Submission 40, p 2.

36 Mr Les Dalton, Submission 40, p 2.

37 Mr Les Dalton, Submission 40, p 4.

> epidemiology and toxicology – and which very much controls what is now being called 'risk assessment'.[38]
>
> … the science in this country [Australia] is particularly good. The countries that stand out around the world are Australia, England and Sweden. The most corrupt science countries are America by far, Germany and some of the Scandinavian countries like Finland, which in the cellphone area depend totally on the cellphone industry for funding all sorts of research. In the States the government withdrew totally from funding research. The EPA and the FDA were both doing a lot of research. In fact, at one stage the EPA classed cellphones as a potential carcinogen. They got stopped from doing that and they got their research rights taken away from them. So since about 1994-95 until now research has been totally in the hands of the cellphone industry.[39]

3.68 Dr Michael Repacholi from the World Health Organization, however, claimed that the telecommunications industry has learnt not to repeat the experience of the tobacco industry when it funded research to support its product:

> … I think industry has got the message that they are the cause of the problem to start off with – it is their technology, their industry – and they are putting substantial amounts of money into this, there is no doubt. …
>
> We know about the tobacco industry but I think industry has learnt from that and they do not want to go through that again. That is my understanding. But we certainly have had industry saying early in the program, 'We have funded lots of projects but the people do not believe the results'. I say, 'What do you expect? If you were there dealing directly with the scientists then people will relate back to the previous experiences of other industry funding'. We recommended that that has to be a firewall. There has to be an independent panel that deals with the funding agency and the scientists …[40]

3.69 The Mobile Manufacturers Forum told the Committee:

> … we are striving to be open and responsive to consumer concerns about questions that have been raised about health issues. There is a very large scientific database in existence which is continually being reviewed, and the conclusions are consistent in confirming no health risk from mobile phone use. However, many of these reviews are calling for further research. We are taking the research call very seriously. … We have established principles within our research sponsorship to assure transparency.[41]

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38 *Official Committee Hansard*, Sydney, 16 November 2000, p 188.

39 *Official Committee Hansard*, Sydney, 16 November 2000, p 192.

40 *Official Committee Hansard,* Canberra, 31 August 2000, p 25.

41 *Proof Committee Hansard*, Canberra, 2 March 2001, p 361.

3.70 Although Dr Repacholi claimed industry was providing substantial amounts for research, the Australian Mobile Telecommunications Association (AMTA) advised the Committee its members are generally not undertaking research.[42] Furthermore, the Committee Chair fails to see how the industry's 'established principles' can 'assure transparency' and prefers Dr Repacholi's recommendations that research should be dealt with through an independent panel.

3.71 In convening the Expert Committee which administered the research funding, the NHMRC informed the Senate Committee, that it was particularly cognisant of the need to maintain very high standards to avoid conflicts of interest. The NHMRC said that measures to protect against conflict of interest were standard practice, but given the particular sensitivity of the electromagnetic radiation issue, the NHMRC refined its procedures for the EME process. These were consequently more stringent than those in place for other areas of the NHMRC at that time.[43]

3.72 Members of the Expert Committee were appointed on the basis of their recognised expertise in areas of science relevant to the EME research program. Committee expertise includes the fields of epidemiology, cancer biology, radiation physics, physical dosimetry and engineering, nuclear medicine, mathematical modelling, and neurology. Two representatives from the Strategic Research Development Committee who had not been involved in the EME area were nominated to independently co-chair the Expert Committee. A member with a background in, and knowledge of, consumer issues was also appointed.

3.73 Membership of the Expert Committee, and members' fields of expertise follow:

Table 3.3

NHMRC Electromagnetic Energy Expert Committee[44]

Prof Don Cameron (co-Chair)	Endocrinology - SRDC nominee
Prof Judith Black (co-Chair)	Respiratory/Thoracic - SRDC nominee
Dr Chris Bain	Epidemiology
Prof Tony Basten	Cancer Biology (resigned February 2000)
Prof Annette Dobson	Epidemiology/Biostatistics

42 *Official Committee Hansard*, Canberra, 8 September 2000, p. 35.

43 National Health and Medical Research Council (NHMRC), Submission 69, p 6.

44 National Health and Medical Research Council (NHMRC), Submission 69, p 5; and overhead presentation at Committee Hearing, Canberra, 2 March 2001.

Prof Kay Ellem	Cancer Cell Biology (resigned June 2000)
Dr Alan Harris	Cancer Biology
Prof Michael Halmagyi	Neurology (commenced June 2000)
Dr Ken Joyner	Radiation physics, physical dosimetry and engineering (expert observer)
Ms Michelle Kosky	Consumer issues - NHMRC nominee (resigned 2000)
Dr Fred Khafagi	Nuclear Medicine
Dr Colin Roy	Radiation Physics, physical dosimetry (observer from CEMEPHI)
Prof Colin Thompson	Mathematical modelling

3.74 The NHMRC believes that it has developed procedures to ensure that bias is not present in the selection of projects for funding:

> The NHMRC was invited to manage the research in recognition of its independence, the rigour of its peer review processes and the overall quality of the research it supports. The EME Expert Committee has no preconceived ideas in relation to possible health effects of mobile phones and related telecommunications equipment, wishing only to know the facts relating to this issue.[45]

3.75 Mr David Clarkson, Director, Research Development Section, NHMRC, was questioned by the Committee about whether any allegations had been raised at either the Expert Committee level or the more senior board level about actual bias or perceptions of bias in the allocation of funds. He informed the Committee that no allegation of bias has been raised formally at either level.[46]

3.76 The CSIRO commented that one member of the Expert Committee was a previous chairman of the New South Wales Cancer Council which received funding for one of the four projects approved by the Minister, and that this could be perceived as a conflict of interest.[47]

3.77 The NHMRC response to this comment was to inform the Committee that Professor Armstrong resigned from the Expert Committee before the call for the first round of funding. The NHMRC emphasised that it is a requirement that all potential appointees declare any personal or financial interest they have in the area of research under consideration. If appointees declare a conflict of interest, the Expert Committee

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45 National Health and Medical Research Council (NHMRC), Submission 69, p 5.

46 *Official Committee Hansard*, Canberra, 8 September 2000, p 51.

47 *Official Committee Hansard*, Sydney, 16 November 2000, p 227.

will consider how it can be most appropriately managed. All members of the Expert Committee are requested to declare any potential conflict on a regular basis.[48]

3.78 Some submissions to the inquiry pointed out that Dr Ken Joyner is a member of the Expert Committee even though he presently works for Motorola and previously worked for Telstra. Dr Joyner and the NHMRC defended this potential conflict of interest on the basis that he does not have voting rights on the Committee but acts as an expert adviser. According to Mr Clarkson from the NHMRC:

> We were obviously, as a secretariat, very concerned about a potential conflict of interest because it is a very emotive issue. We always are very conscious of conflict of interest anyway because we have only a small number of researchers in certain areas and so it is an issue that always occurs. All members have to specify any interest they may have in Telstra shares or whatever. In Dr Ken Joyner's case it was his membership of an organisation associated with industry. That has to be spelt out and if there is a conflict of interest that prohibits them being involved in the discussion, they are excluded from the discussion. If a decision is made that it is not peripheral but is pertinent to the issue being discussed at the time, they may be permitted to be part of the background discussion but excluded from voting. For example, in the case of Dr Joyner, he is not permitted to vote on the actual allocation of grant applications.[49]

3.79 The Committee Chair notes that any member taking part in the research funding process has the capacity to influence the Expert Committee and is of the view that greater efforts should be made by the NHMRC to ensure that the Expert Committee is and is perceived to be, at arms length from industry.

3.80 The Committee did not find evidence of industry bias within the NHMRC but the Committee Chair was nonetheless attracted to Mr Fist's suggestion that the CSIRO should be charged with setting up a 'premier research institute' whereby:

> … you have a way of concentrating on a single problem with all of these various scientists – the dosimetrics people, the molecular biologists, the normal biologists, epidemiologists and all of those people – in one institute where they can cross-fertilise, where they can collect and collate information. You would have a chance of doing something substantial. Until you do that, you really cannot set standards. All you can say is that we need to take precautions.[50]

3.81 Dr Haddad of the CSIRO advised that:

> We at CSIRO, particularly within Telecommunications and Industrial Physics, continue to maintain a watching brief on the scientific literature

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48 *Proof Committee Hansard*, Canberra, 2 March 2001, p 401.

49 *Official Committee Hansard,* Canberra, 8 September 2000, pp 51.

50 *Official Committee Hansard*, Sydney, 16 November 2000, p 202.

> pertaining to radiofrequency bioeffects, but we do not have the resources available at the current time to undertake active scientific research in this area so it is a watching brief only.[51]

3.82 Dr Barnett explained that:

> We have certainly been involved for many years, in fact since 1993 when the Department of Communications approached CSIRO to evaluate the status of research on biological effects of radio frequency radiation. We have been involved in analysing what was available, and I spend a lot of time visiting laboratories, speaking to scientists who were actively involved in research from 1993. That resulted in a report and monograph that was written, a fairly comprehensive monograph, published in 1994. So from that perspective we have certainly done a lot of literature research. As far as hands-on experimental research directly related to RF biological effects is concerned, we have not done any.[52]

3.83 Allegations were raised about the funding of the Vernon-Roberts study which is a replication of a Repacholi *et al*, 1997 transgenic mouse study which found a more than two-fold increase in lymphomas in Eμ-*Pim1* transgenic mice exposed to pulsed 900 MHz electromagnetic fields which simulated the digital mobile phone system.[53] According to Mr Fist:

> Not only has it taken years for this government to issue grants of any kind through the NHMRC, the decision has been made for the major grant to be given to the Adelaide Hospital for a replication study of its own work. Thus the group who did the original work, are being called upon to confirm that work. This is equivalent to having the police force investigating itself.[54]

3.84 According to the NHMRC however, this is not correct. The administering body for the Repacholi *et al*, 1997 Telstra study was the Adelaide Hospital. The administering body for the current study is the University of Adelaide and the project is being undertaken at the Institute of Medical and Veterinary Science, in Adelaide.

3.85 The NHMRC acknowledged that there was some overlap within the research groups at a junior and associated clinician level but said that, given the limited number of people in Australia with relevant expertise, it is to be expected that some overlap would occur.[55]

3.86 When it was put by the Committee to Mr Fist that only two people would be on the team from the previous study he said:

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51 *Official Committee Hansard*, Sydney, 16 November 2000, p 221.

52 *Official Committee Hansard*, Sydney, 16 November 2000, p 223.

53 Mr Stewart Fist, Submission 30, Appendix C.

54 Mr Stewart Fist, Submission 30, Appendix C, p 1.

55 Committee correspondence, letter from Robert Wells, CEO, NHMRC, dated 14 August 2000.

> That still largely defeats it. It is a bit like justice needing to be seen to be done. When studies are replicated, that study will be open to attack whatever happens. If it comes out the same as before, everyone is going to say they were covering their tracks. If it comes out totally different, they are going to be saying they are trying to get Telstra funds again. You really needed to shift that study away. The reason it was done in the same place is that Australia really has only one decent animal house capable of doing this work. You need very expensive exposure systems. … we need to develop a major facility for the study of long-term insidious effects. I do not hold that cellphones are a potential immediate threat to anyone; I think cellphone handsets against the side of the head have the potential to produce very large-scale increases in some specific diseases, mainly connected with immune systems, in the long term. That is what I think the evidence shows.[56]

3.87 Although peer-reviewed, the original study has been largely discounted by industry because it had not been replicated and its methodology criticised. The Vernon-Roberts study is a 'confirmation' rather than a 'replication' because the methodology has been changed and considerably improved, according to the NHMRC.[57] For instance, the mice are confined within metal tubes for the period of exposure instead of being free to move around. There is also an Italian study being done, which, to a large degree, mirrors the Vernon-Roberts study:

> The importance of the second study being done by the Italians is that, if they come out with findings that are similar using the same methodology, you can have a greater degree of confidence in the results than in one study alone. That is just a scientific method.[58]

3.88 Dr Stan Barnett from the CSIRO, commented that there were many parties with an interest in this study being replicated, because of the significance of its findings and that the cost was quite modest for a whole-of-life rodent study:

> I guess it would have come as no surprise to anybody who has been involved in this area that the Repacholi mouse study would be repeated in some form. Clearly that was a very important finding, and there is lots of pressure – scientific, political and others – to ensure that that work is continued in some way. So I do not think it is surprising that that Adelaide study was funded. One of the difficulties with doing that sort of research is that it is certainly expensive. I think the funding of about $1.1 million that went to the Adelaide study was quite modest for a whole-of-life rodent study.[59]

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56 *Official Committee Hansard*, Sydney, 16 November 2000, p 193.

57 *Official Committee Hansard,* Canberra, 8 September 2000, pp 48-49; *Official Committee Hansard, Canberra*, 31 August 2000, pp 10-11; and *Proof Committee Hansard*, Canberra, 2 March 2001, p 317.

58 *Official Committee Hansard*, Canberra, 8 September 2000, p 49 [Clarkson].

59 *Official Committee Hansard*, Sydney, 16 November 2000, p 223.

Scientists who have found effects were not awarded grants

3.89 Reports have appeared in the media suggesting that the NHMRC was failing to support some of the most promising lines of inquiry in its attempts to discover any link between radiofrequency radiation and health effects.[60] Dr Sykes' pilot study, for which funds were not provided for a full study, was cited as one example. The NHMRC explained to the Committee that Dr Sykes' pilot study was not converted to a full study because results had failed to support its hypothesis. Dr Sykes had acknowledged that this was the case but argued that the effects found in the pilot were nonetheless significant and warranted further study.

3.90 Dr Barnett advised the Committee that the CSIRO was one of the organisations which had not been successful in its applications for funds:

> We did apply to the NHMRC and we had two projects short-listed out of the six that were short-listed. Unfortunately, odds seem to be against us. Four of the six that were short-listed were funded and we were not. I do have ongoing research allied to this area in developing specifically radiation sensitive biosensors. That work is carried on outside of Australia. It is undertaken and sponsored through the United States Air Force. They apparently are more interested in our research than Australia is.[61]

3.91 In detailing the study proposals, Dr Barnett said:

> Essentially we had two types of projects that we submitted as expressions of interest, and both of those were short-listed. They involved looking at the potential effects of radiofrequency radiation on DNA and cancer production in two different systems. One was an animal system, where we were looking at repeating, I believe, a very important research finding which has been largely ignored, which was finally published in 1992 by Chou and others. That work was actually undertaken at the Brooks Air Force Base in San Antonio. That study looked at simply exposing rats to 2450 megahertz of radiation throughout their lives.
>
> When the data was analysed for tumour development in the exposed versus controlled animals, it turned out that, depending on how you chose to analyse the data, you got either a negative or a positive result. The study has been largely referred to as providing a negative result. It was only negative if you separated out each type of cancer and then looked at the difference in numbers for each type of cancer. Clearly, because they only used a couple of hundred animals, when it was broken down into all the different types of cancer, the numbers that were being compared were extremely small, so the statistical power would be pretty poor. When they compared the incidence of primary malignancies between the two groups there was a fourfold increase in the exposed group.

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60 *Sydney Morning Herald*, 18 December 2000, p 10.

61 *Official Committee Hansard*, Sydney, 16 November 2000, p 223.

We felt that was a pretty important study. Because that study had been largely ignored, and because my colleagues at Brooks Air Force Base agreed to work with me, we thought that it would be an interesting one to try to duplicate, with some improvements on the exposure conditions but essentially using the same laboratory set-up and looking at other indicators of chromosomal damage such as the micronucleus assay, which has now just this year become an important issue because there have been some publications of positive effects in that area.

The other study was looking at using what we know as a radiation sensitive cell line, which has been specifically developed, again with that organisation. One of the biggest failings of all cellular studies is that, largely, they either use highly transformed cell lines which are very sensitive to almost anything, or they use cell lines which are general laboratory, fairly robust, cells like lymphocytes. Nobody bothers to try to synchronise the cells. It is well known in radiation biology that cells respond to radiation at specific periods in the cell division cycle. Our proposal was to use a fairly complex system which would allow us to use what we know as a radiation sensitive cell line and to synchronise it so that we only exposed it in G1, where we know - because of 30 years of background work – this particular cell is highly sensitive to radiation. It is deficient in DNA repair enzymes, and we know that, if you are going to produce any kind of impairment of DNA repair which would be manifest as single strand breaks as per the Henry Lai study, this would be an opportunity to use the most sensitive available end point that we know of to test that scenario.

The result of the expressions of interest were that the committee in its wisdom thought that the two studies that we were proposing were so similar – we found that hard to believe, but they seemed to think that they were similar – that we should combine them into one study and submit that. We chose to ignore that direction, because they clearly are not similar, and decided against doing the whole-of-life animal study. Also, suspecting – or, in fact, knowing – that someone else had submitted to do a repeat of the Repacholi study, we thought that, because of the amount of money involved, there was no way the NHMRC were going to fund two whole-of-life rodent studies. So we put in our submission on the basis of the radiation sensitive cell line that we have and the outcome was that we were not funded. I have, incidentally, continued to do that work to develop that radiation sensitive line further. Again, under sponsorship of the US Air Force, I spent some time over there last year. But we have not yet obtained funding to use it as an end point for RF radiation. We have used it for ionising radiation.[62]

One of the concerns that was expressed, certainly to me [by NHMRC], was that the committee did not want to see any research done outside of Australia because this was supposed to be an Australian research program. More importantly, they did not want any funding to go outside of Australia.

62 *Official Committee Hansard*, Sydney, 16 November 2000, pp 225-226.

> My proposal made it absolutely clear that none of the funding was being used outside. I had established a collaborative research program with, again, partners in the US Air Force. They were prepared to do their side of the program at no cost to us or the NHMRC program. That was made pretty clear in my submission, but it was used as one of the reasons given – there were a couple of reasons given – as to why they chose not to fund that particular project.[63]

3.92 The NHMRC informed the Committee that it was asked to coordinate the research component of the EME program in recognition of the rigour of its peer review processes and overall quality of its research effort. Selection of all grants is made through a competitive process and recommendations for funding are made on scientific merit and ability of projects to meet the objectives of the EME program.[64]

3.93 The NHMRC argued that if a researcher is unable to get funds under the Radiofrequency Electromagnetic Energy Program, there are other sources of funds available. An annual grant round in December is open to any researcher to put in a proposal in any field.

3.94 On the other hand, the RF EME Research Program falls into the category of research which is required to meet a specific need:

> … what we call strategic research. These are areas identified as underdone or needing additional support and encouragement, and a small amount of money is allocated to that research. In those areas, the research questions are more specifically defined, with an orientation to getting results as quickly as possible.[65]

3.95 Dr Barnett of the CSIRO, however criticised the lack of a 'sensible structured program of research':

> Research has been sporadic. The results have been controversial and contradictory. It is not really surprising. Unless you have a properly structured and directed system of research, you will not overcome the initial problem of the undirected sporadic bits of research that are carried on, sometimes not particularly well. Clearly if you pay peanuts you get monkeys, as the old saying goes. If you do not provide adequate or proper resources, you are being extremely optimistic in expecting a decent outcome.[66]

3.96 In answer to the Committee's question as to whether CSIRO would be well placed to head up an RF radiation research effort, Dr Haddad said:

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63 *Official Committee Hansard*, Sydney, 16 November 2000, p 225.

64 *Proof Committee Hansard*, Canberra, 2 March 2001, p 400.

65 *Official Committee Hansard*, Canberra, 8 September 2000, p. 48.

66 *Official Committee Hansard*, Sydney, 16 November 2000, pp 223-224.

> We would certainly be interested in looking at coordinating such an effort, provided we could be assured that we could get somewhere within a finite time.[67]

3.97 Dr Peter French raised the issue of difficulty he and Professor David McKenzie have had in accessing funds for their joint research:

> We have been struggling to raise funds. … I believe that the funding difficulties are attributable to a number of problems and that is mainly to do with the fact that it is a cross-disciplinary field: it does not fit neatly into the NHMRC or the [Australian Research Council] – it crosses both. It is an area of investigation which five years ago was certainly quite obscure. It has now become of much greater interest.[68]

3.98 Professor McKenzie added:

> I think this field is one of the most difficult things to get support for that I have experienced in my scientific career. I have had no success in being funded for this work. Although we have tried jointly and separately for many years, we have not succeeded in securing adequate support for our work. …
>
> I think that it is partly the interdisciplinary nature of it, the controversial nature of it. It tends to raise eyebrows when you are working in interdisciplinary areas without supposedly adequate qualifications in all fields. But, together, I would contend that Peter [French] and I have more than adequate qualifications. In fact, we now have a significant track record together, so I think we should be considered expert in the field; nevertheless, it proves and remains difficult.[69]

3.99 Dr French and Professor McKenzie expanded on the usefulness of the disciplines of cell biology and physics coming together in EMR research:

> **Dr French**: It is essential in this area. I know not very much about electromagnetic physics, and I know a lot about cell biology. David is in a reverse position. For this area, which requires a complex understanding of both issues, given the reductionist way science goes, it is very hard to get that expertise in one group or one institution. Certainly, it has been of great help assisting in devising exposure systems that can seek to answer the sorts of questions that David has raised and to characterise the exposure systems that we have used in the past.
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> **Prof. McKenzie**: While I am not expert in cell biology and Peter is not expert in electromagnetic fields, we are fortunate in being able to understand

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67 *Official Committee Hansard*, Sydney, 16 November 2000, p 224.

68 *Proof Committee Hansard*, Sydney, 16 November 2000, p 266.

69 *Proof Committee Hansard*, Sydney, 16 November 2000, p 266.

> each other's language. We interface very well and come up with new science because of this ability to understand each other's language.[70]

3.100 It is not the role of the Senate Committee to advocate which projects should or should not have been awarded grants, however it would appear that a greater pool of available research funding would help overcome many of the criticisms which arise when research proposals do not receive funding.

3.101 The Committee has not found evidence that the NHMRC has been deficient or biased in its allocation of the research funds.

World Health Organization Electromagnetic Field Project

3.102 The World Health Organization (WHO) is coordinating an international response to the various electromagnetic fields issues through its International Electromagnetic Fields (EMF) Project. This project, established in 1996, involves over 45 countries and eight international organisations. It provides a research coordination role with an emphasis on determining research needs. The second part of the Australian Radiofrequency Electromagnetic Energy Program is an annual contribution of $US50,000 to the WHO project.

3.103 The budget of the World Health Organization International EMF Project is $US600,000 per year. Contributions to the project are voluntary. The costs in Australian dollar terms, of Australia's contribution to the project are shown below:

Table 3.4

WHO Contribution[71]

Time Period	**Cost ($A)**
1996/97	$64,000
1997/98	$78,000
1998/99	$76,000
1999/00	$87,000
Total	**$305,000**

3.104 The WHO is currently coordinating approximately $100 million worth of research world wide.[72] It will assess the health and environmental effects of exposure to static and time varying electric and magnetic fields in the frequency range 0 - 300 gigahertz (GHz), with a view to the development of international guidelines on exposure limits.

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70 *Official Committee Hansard*, Sydney, 16 November 2000, pp 265-266.

71 Electromagnetic Energy Public Health Issues Committee (CEMEPHI), Submission 127, p 16.

72 *Official Committee Hansard,* Canberra, 31 August 2000, p 2.

3.105 When Dr Michael Repacholi appeared before the Senate Committee on 31 August 2000, the WHO EMF project had completed its initial literature reviews and was in the research period which he anticipated would last about three years.[73] Dr Repacholi emphasised that it takes time to do the research. The project is due to end in 2005 when the results from all the research projects will be analysed and a final report will be published.

3.106 Three of the initial four studies funded by the NHMRC form part of the international agenda for research: Professor Vernon-Roberts' study is one of two replications of the Repacholi *et al*, 1997 mouse study - another replication study is being done in Italy; Dr Stough's project addresses components of the neurophysiological area, identified by the World Health Organization as requiring research; and Dr Armstrong's study forms part of a large scale International Agency for Research on Cancer (IARC) mobile telephone epidemiological study which is expected to cover nine countries in Europe plus five others.[74]

3.107 The NHMRC call for the second round of research funding was designed to address outstanding issues identified in the WHO Research Agenda.

3.108 The Committee was advised that if Australia is to maintain research into the effects of electromagnetic radiation, any results showing effects from radiofrequency radiation would likely require replication and verification in other independent laboratories. It is therefore important to maintain links with overseas institutions and to continue and extend active participation in the WHO program, which will enable the results of many studies to be pooled and analysed.

Public Information Program

3.109 The third component of the Radiofrequency Electromagnetic Energy Program is the Public Information Program. This component has involved determining the information that is required by the public, obtaining the details and presenting it in a clear and concise manner.

3.110 The funds expended on this component of the RF EME Program appear below:

73 *Official Committee Hansard,* Canberra, 31 August 2000, p 2.

74 National Health and Medical Research Council (NHMRC), Submission 69, p 23.

Table 3.5

Information program costs[75]

Time Period	Cost ($A)
1996/97	$24,000
1997/98	$81,000*[76]
1998/99	$12,000
1999/00	$14,000
Total	**$131,000**

3.111 Criticism of the lack of information available on the potential risks associated with electromagnetic radiation was expressed by witnesses and submissions to the inquiry.

3.112 Some submissions referred to the contradictory information being presented to the public from the government and industry on the one hand claiming that there is no substantiated evidence that mobile phone base stations or using mobile phones will cause adverse health effects, and the print and electronic media on the other, which report studies that show biological effects and epidemiology which suggest the potential for adverse health effects from radiofrequency radiation.

3.113 Mr Stan Stanfield advocated that there be regular reports to the public regarding mobile telephones and telecommunications towers. In addition, he felt that there is insufficient information on research findings being made available to the public:

> Why isn't the public being told more about these connections, and what is being done about this specific research matter? … does using a hands-free kit create a greater risk than not using one?[77]

3.114 Similar concerns were raised in relation to television towers. Mrs Leanne Noakes stated:

> Inconclusive as results may have been so far, the public should be given the opportunity to make an informed decision for themselves and their families' own well being. The government has an obligation to inform the public fully of any possible health risk. People are being told that the television towers are perfectly safe at the distances they have been placed to residents

75 Committee on Electromagnetic Energy Public Health Issues (CEMEPHI), Submission 127, p 16.

76 Includes $73,000 for the Measurement Program (part 1).

77 Mr Stan Stanfield, Submission 36, p. 1.

> and schools etc. This is not a truthful answer and does not give people the opportunity to make their own informed decision. The truth is society does not know if they are safe and current research in fact indicates there may well be adverse effects on people living in close proximity to the various telecommunication facilities … The public have a right to know and a right to make our own informed decision on the safety and welfare of our families. To do this, information must become freely available to the public without any bias or concealment.[78]

3.115 The Committee sees a great need for a public information program to accurately inform the community of radiofrequency issues. It can be a highly technical area with concepts which are difficult to understand for the professional in the area, never mind the layperson. Even here, however, the Government's program has been criticised:

> There is a need for much greater public awareness about the issue of EMR. However, it is important that this information be independent. As the telecommunications industry and the government benefit substantially from the proliferation of telecommunications technology, they are neither independent nor reliable sources of information. They must not be promoted as such.[79]

3.116 Some submissions criticised the Public Information component of the Government's program, particularly since the fact sheets were published ahead of any of the research program being put into effect. Some argued that the Government was misusing the $4.5 million fund by spending $12,483.75 to brief local and state governments in February 1997, as a part of the wider briefing on network rollout activities. According to the Electromagnetic Radiation Alliance of Australia:

> A good proportion of the $4.5m research fund was squandered on an expensive and ill-directed public relations exercise. …
>
> However, public information campaigns must not be funded from the meagre $4.5 [million] research allocation.[80]

3.117 These comments may show that the Public Information Program has not been a success in informing the public. ARPANSA offered the view that it is difficult to address the concerns of people who are particularly worried about possible health effects of EMR, other than by one-on-one direct interaction over a period of time. ARPANSA says that it, and other agencies, are devoting resources to talking directly to people with particular concerns. The Committee was unable to verify the effectiveness of this one-on-one communication.

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78 Mrs Leanne Noakes, Submission 144, p 3.

79 Electromagnetic Radiation Alliance of Australia (EMRAA), Submission 80, p 36.

80 Electromagnetic Radiation Alliance of Australia (EMRAA), Submission 80, p 4.

3.118 The CEMEPHI advised that it consulted with consumer focus groups, public health associations and the general public. It reported that the Australian public's awareness and concern about the possibility of adverse health effects from long-term exposure to radiofrequency emissions from telecommunications had been stimulated and heightened by the increasing visibility of base stations and hand-held mobile phones. The problem was said to be exacerbated by the perceived absence of balanced public information on the question. Mobile phone base station towers provided a frequent visual reminder of a possible health risk and carried an element of environmental pollution with aesthetic, property value and health implications.[81]

3.119 ARPANSA informed the Committee that current information regarding EMR has been disseminated to the public through the following channels:

- fact sheets and other information on the ARPANSA website;
- distribution of hardcopy versions of the fact sheets;
- responding to telephone inquiries;
- consulting in public meetings;
- participating in seminars and conferences; and
- the ACA in collaboration with ARPANSA has recently developed a poster outlining the facts concerning base stations and EMR.

Fact sheets

3.120 In February 1997, in response to public concerns, the CEMEPHI released a set of fact sheets which provided detail on the Government's Radiofrequency Electromagnetic Energy Program, potential health effects of electromagnetic energy emissions and other related issues.

3.121 The fact sheets are:

- Government action on electromagnetic energy public health issues;
- Electromagnetic energy and its effects;
- About mobile phones;
- About mobile phone networks;
- Potential interference of mobile phones with pacemakers, hearing aids and other devices;
- What about telecommunications towers, and are there any health effects?;

81 Electromagnetic Energy Public Health Issues Committee (CEMEPHI), Submission 127, p 14.

> The weight of national and international scientific opinion is that there is no substantiated evidence that RF emissions associated with living near a broadcast or mobile phone tower poses a health risk.
>
> To date, the only health effect that has been proven to exist as a result of exposure to RF EME relates to heating of part or all of the body. This is known as the thermal effect, and the Australian exposure standard AS/NZS2772.1(Int):1998, which sets public and occupational limits of exposure to radiofrequency radiation, is designed to avoid adverse heating effects where people are exposed to RF EME.[82]

and

- The standards making process and AS/NZS2772.1(Int):1998 (under revision).

3.122 These fact sheets are available from the CEMEPHI website and are sent out on request. In addition, the fact sheets are distributed at public meetings, seminars and conferences. The website also provides a link to ARPANSA's report on the measurement of levels of radiofrequency radiation from GSM mobile phone base stations.

Base station radiofrequency measurement program

3.123 At the state and territory briefings in 1997, local councils were invited to nominate two mobile telephone base station sites in major population centres in each state and territory that were of concern to local communities. ARPANSA was asked to carry out a survey of the radiofrequency electromagnetic energy emissions (RF EME) in the vicinity of these base stations. The Public Information Program funded this site measurement program.

3.124 Measurements were performed at 14 different locations throughout Australia. Although the primary focus of the ARPANSA study was to measure the radiofrequency emission levels from GSM (Global System for Mobile Communication) base stations, fixed site environmental measurements from other radiofrequency sources were also recorded, including the analogue mobile phone system (AMPS), VHF TV, UHF TV, AM radio, FM radio and paging.

3.125 The results of the survey showed that the radiofrequency emissions from GSM base stations were several orders of magnitude below the maximum permitted limit in the Australian Standard. Measurements showed that exposure levels are generally less than one per cent of the exposure limits recommended by the Standard.[83]

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82 Committee on Electromagnetic Energy Public Health Issues, Fact sheet, *What about telecommunications towers, and are there any health effects?*, May 1998.

83 A worst case radiofrequency electromagnetic energy power flux density* prediction, based on the measurements from GSM base stations, was 0.178 microwatts** per square centimetre (0.178 $\mu W/cm^2$). This

3.126 Dr Michael Repacholi made the point that despite the fact that emissions from mobile phone base stations are 1,000 or 10,000 times below the levels recommended in standards, they get singled out:

> I know there is pressure by people, but the pressure is really because the base stations are ugly-looking things. They are in people's living environments – probably by schools – and people do not want anything happening to their children, which is absolutely right, so they pick on a technology. They do not worry about the paging transmitters, because the paging transmitters are much smaller, but they emit much higher levels than base stations.[84]

The future

3.127 A major on-going activity for the CEMEPHI is to provide the public with information that reflects current scientific opinion and the most recent research. The CEMEPHI has indicated that specific future activities to be engaged in include:

- assessing ongoing research;
- assessing the UK Independent Expert Group on Mobile Phones Report (the Stewart Report);
- drafting new and revising current fact sheets;
- establishing a searchable database of quality research publications;
- improving the webpage to facilitate public access; and
- investigating and/or developing a multimedia information package.[85]

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level is at least 1,000 times below the 200 μW/cm^2 exposure limit in the Standard. Also, the average radiofrequency exposure level from GSM base stations is considerably less at 0.0016 μW/cm^2 which is at least 100,000 times below the 200 μW/cm^2 limit of power flux density permitted by the Standard.

Measurements of the fixed site environmental radiofrequency electromagnetic energy power flux density levels indicate that, relative to the maximum exposure limit permitted in the standard, after adjusting the exposure limit with respect to the frequency of the signal, the highest environmental radiofrequency exposure was FM radio (0.0259 μW/cm^2), which is about 7,000 times below the 200 μW/cm^2 limit of power flux density.

[Line P, Cornelius W, Bangay M, and Grollo M, *Levels of Radiofrequency Radiation from GSM Mobile Telephone Base Stations*, Australian Radiation Protection and Nuclear Safety Agency, Technical Report 129, p 1, January 2000.]

* Radiofrequency (RF) power flux density is the rate of flow of RF energy per unit surface area expressed in watts per square metre (W/m^2).

** A microwatt (μW) is a unit of power equivalent to one millionth of a watt (W). (1 μW = 1/10^6 W)

84 *Official Committee Hansard,* Canberra, 31 August 2000, p 14.

85 Electromagnetic Energy Public Health Issues Committee (CEMEPHI), Submission 127, p 16.

3.128 The Senate Committee supports these activities but considers that there is scope for improvement in the CEMEPHI's website in the information available to the general public. The CEMEPHI's website, which at present only includes the fact sheets listed above, should be regularly updated to reflect ongoing developments in EME research and standard setting and there should be advice to the public as to where people can go if they consider that they suffer from electromagnetic emissions related effects. It would also be useful if the CEMEPHI advice to Government was tabled in the Parliament.

3.129 Many submissions to the inquiry compared the seemingly unrelated Bovine Spongiform Encephalopathy (BSE) crisis in Europe, asbestos and the tobacco industry to the electromagnetic radiation debate. Whatever the health effects from electromagnetic radiation, the Government needs to recognise that public trust in governments and industry to say what is safe and what is not, has been seriously undermined by assurances and fact sheets which do not generally reflect the level of uncertainty about the safety of cellphones identified in so many scientific studies.

3.130 In this respect, the Government has a responsibility to provide independent, honest, competent advice to the general public about radiofrequency issues. The Australian Government could spend millions of dollars on an information program, but if that information is not believed by the general public, the funds are wasted.

3.131 Mr Les Dalton suggested that a key to minimising exposure from radiofrequency emissions to individuals and the community is an informed public. He advocates that there be a national 'prudent user campaign', not unlike the Quit campaign directed towards smokers.[86]

3.132 The funding for the Radiofrequency Electromagnetic Energy Program runs out at the end of the 2000-01 period. Research worldwide into health effects of radiofrequency radiation is ongoing and the major literature reviews of the World Health Organization from the International EMF Project will not be completed until 2005. The Committee considers that there is an ongoing role for the CEMEPHI to monitor developments in this area and to more widely provide information to the public.

86 *Official Committee Hansard*, Melbourne, 22 September 2000, p 173.