2

Extension of scope

2.1 On 9 June 2010 the Government announced that the CSIRO[1] had been granted $47.3 million in funding through the Government's Education Investment Fund (EIF) for renewable energy solutions.[2] This money will be spent on infrastructure at the Murchison Regional Radio-astronomy Observatory (MRO) for the Australian SKA Pathfinder (ASKAP) project at Boolardy Station, WA and the Pawsey High Performance Computing Centre in Perth, WA.

2.2 On 21 June 2010 the CSIRO wrote to the Committee seeking approval to proceed with these infrastructure works as an 'extension of scope' to already approved projects rather than 'new works' and having to undertake a referral to the Committee pursuant to the *Public Works Committee Act 1969*.

2.3 The Committee has previously undertaken inquiries into the Pawsey High Performance Computing Centre (Pawsey Centre) and the Australian SKA Pathfinder (ASKAP) project. These proposed extended works were raised with the Committee during both of those inquiries.

2.4 In consideration of the request, the Committee received a written brief and held a public hearing with the CSIRO on 24 June 2010.[3] A list of witnesses appearing at the public hearing is at Appendix A and the brief outlining the scope of works is at Appendix B.

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1 The Commonwealth Scientific and Industrial Research Organisation is commonly referred to as the CSIRO.

2 Media Release, Senator the Hon Kim Carr, Minister for Innovation, Industry, Science and Research, Jointly with the Prime Minister and the Treasurer, *Sustainable Energy Boost for Super Telescope Bid*,9 June 2010.

3 The transcript is available on the Committee's website at <aph.gov.au/house/committee/pwc/briefingdocuments/index>.

2.5 The CSIRO also provided advice from the Australian Government Solicitor's office confirming that the works could be considered an extension of scope, rather than 'new works'. This advice is at Appendix C.

Works proposed for ASKAP

2.6 The Australian Square Kilometre Array Pathfinder Telescope (ASKAP) will provide a survey radio telescope intended for international research in cosmology, transient radio sources, pulsar astronomy and the structure and magnetic field of the galaxy at a cost of $111 million.[4]

2.7 The Committee considered the ASKAP project in hearings held on 1 October 2008 and tabled its report recommending the House of Representatives resolve that the works proceed on 1 December 2008.

2.8 Infrastructure to be delivered for the ASKAP project under this proposal, at a cost of $27 million, is:

> a high renewable penetration hybrid power generation system, and will enable an energy efficient MRO control building to be constructed, as well as sophisticated geoexchange cooling to be developed and deployed for cooling ASKAP antenna electronics and the data processing system in the MRO control building.[5]

2.9 In the original proposal presented to the Committee on the ASKAP project, the CSIRO noted that it was seeking more renewable energy solutions to reduce the cost and environmental impact of powering the ASKAP.[6] In discussions at the hearing held on 1 October 2008, the CSIRO stated:

> In the submission we have about 20 per cent as a solar photovoltaic power system, and we are investigating mechanisms to provide more of the power using other solar technologies. CSIRO is involved in energy technologies as well, and we are working with the Division of Energy Technology to further that.[7]

2.10 In its June 2010 written brief to the Committee the CSIRO states:

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4 For details see the Committee's Report 9/2008.

5 CSIRO, additional brief submitted 23 June 2010, p. 3 (See Appendix B).

6 Submission 1, Australian SKA Pathfinder Radio Telescope, p. 20-21

7 Dr D. De Boer, CSIRO, Transcript of Evidence, 1 October 2008, p. 4

> The funding provided by EIF enables the ASKAP project to realise its stated goals in three important areas…
>
> - The development of remote power generation infrastructure that utilises renewable technologies to reduce reliance on traditional energy sources by over 50%... together with an underground power distribution network to minimise radio-frequency interference to the sensitive ASKAP receiver systems …
> - The development and use of ground coupled cooling systems to cool the electronics in the ASKAP antennas and the data processing facility in the MRO control building. The EIF Sustainable Energy for SKA project provides funding for the project to deploy passive geoexchange cooling technology on the MRO…
> - The enhancement of the energy efficiency of the MRO control building though building techniques that reduce the power load whilst also preserving the radio-frequency interference integrity of the building.[8]

2.11 Australian Government Solicitor advice obtained by the CSIRO states:

> In our view, these activities can properly be regarded as part of the proposed work that was the subject of the motion agreed to [by the House of Representatives] on 3 December 2008. We say that, in particular, because it appears from the material that the funding will be used, in effect, to enhance or further develop aspects of the proposed work that was before the PWC, rather than to introduce new components into the proposed work.[9]

2.12 The Committee finds that the works proposed by the CSIRO for the ASKAP project as part of the EIF initiative to be an extension of scope to those works put to it in October 2008 and approved by the House in December 2008.

Works proposed for the Pawsey High Performance Computing Centre

2.13 The Pawsey High Performance Computing Centre for SKA Science will provide facilities for researchers in high-end computation and data-

8 CSIRO, additional brief submitted 23 June 2010, p. 8 (See Appendix B).

9 Australian Government Solicitor, advice obtained by CSIRO, p. 5 (See Appendix C).

intensive science to support the ASKAP project as well as other computing science at a cost of $66 million.[10]

2.14 The Committee considered the Pawsey Centre project in hearings held on 16 April 2010 and tabled its report on 21 June 2010 recommending the House of Representatives resolve that the works proceed. In its report, the Committee noted the possible use of geothermal technology in conjunction with this project.

2.15 Infrastructure to be delivered under this proposal, at a cost of $20 million, is:

> A drilling program to access the hot sedimentary aquifer under the Perth basin to power an absorption chiller to meet the significant cooling requirements of the Pawsey Centre super computer and the heating/cooling requirements of the adjacent Australian Resources Research Centre (ARRC). The infrastructure will establish the Pawsey Centre as Australia's largest direct-heat geothermal demonstration site.[11]

2.16 In its original submission to the Committee on the Pawsey Centre project, the CSIRO noted the cost of cooling the data centre and its desire to utilise geothermal technology. At the Committee's hearing on 16 April 2010 in Perth, the CSIRO told the Committee:

> **CHAIR**—I dare say you are going to use a lot of energy to keep those data centres cool.
>
> **Dr Zelinsky**—Just to add to that, we do have another application in with the EIF for a geothermal cooling application to actually reduce the energy footprint. We have a colleague here, Steve Harvey, who spoke to you this morning, and he is available to give a bit of background to that if the committee should require it.
>
> **CHAIR**—That would be useful.
>
> **Dr Harvey**—CSIRO has an active interest in geothermal energy research and development. We have recently established a centre here in Perth together with our colleagues at Curtin University and the University of Western Australia. The particular focus of that centre is looking at tapping into the hot sedimentary aquifers that in the Perth Basin and tapping into the heat that is associated with those aquifers. We have done quite a lot of work looking at the viability of using the hot water with off-the-shelf chiller

10 For details see the Committee's Report 2/2010.

11 CSIRO, additional brief submitted 23 June 2010, p. 3 (See Appendix B).

> technology to cool the data centre as part of this proposal. At the moment, as Dr Zelinsky said, we have got a proposal in for funding support and a very large part of that is drilling wells into the Perth Basin to access that hot water.
>
> **Dr Bryce**—About half the cost of running the facility after its commissioning is to cool the system—hence the real enthusiasm for finding a means of doing that that is much less expensive than using electricity from the grid.[12]

2.17 In its June 2010 written brief to the Committee, the CSIRO states the this project will 'access the heat resource within the hot sedimentary aquifers within the Perth Basin to run off-the-shelf absorption chillers' through a drilling program comprising:

> … three, 3km deep wells be drilled in the ARRC site:
>
> - an exploration well to provide critical data (water temperature, flow rates and water chemistry) to inform the engineering design specifications for the production system; and
> - a production "doublet" – geothermal extraction and re-injection wells.[13]

2.18 While this project is new technology and its success can only be determined once the exploration well is drilled, the CSIRO is confident on data currently available to it that it will be successful. Use of this technology rather than electricity off the grid is estimated to result in an annual saving in the order of $2 million.[14]

2.19 Australian Government Solicitor advice obtained by the CSIRO states:

> … it appears from the CSIRO's submission to the PWC … from evidence given to the PWC at its hearing on 16 April 2010 … and from the PWC's report itself … that the possible utilisation of geothermal energy for the purposes of the Pawsey Centre building was part of the proposed work.
>
> …
>
> In summary, it appears to us that the EIF funded works would increase the cost of the proposed work the subject of the motion of the House, but would not change it into a different work.[15]

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12 CSIRO, Transcript of Evidence, 16 April 2010, p. 11-12.

13 CSIRO, additional brief submitted 23 June 2010, p. 3 (See Appendix B).

14 Dr S. Harvey, CSIRO, Transcript of Evidence, 24 June 2010, p. 4, 5.

15 Australian Government Solicitor, advice obtained by CSIRO, p. 5 (See Appendix C).

2.20 The Committee finds that the works proposed by the CSIRO for the Pawsey Centre as part of the EIF initiative to be an extension of scope to those works put to it in April 2010 and approved by the House in June 2010.

Committee findings

2.21 The Committee takes seriously its responsibility to ensure that all proposed infrastructure works put to it are necessary, with an appropriate scope and cost. This is a significant investment and it should not be undertaken without proper scrutiny.

2.22 However, in reviewing the evidence put to it in October 2008 and April 2010 as part of the Pawsey Centre and ASKAP project inquires alongside the proposal put to it in June 2010 by the CSIRO and advice from the Australian Government Solicitor's office, the Committee is satisfied that these works are an extension of scope, rather than 'new works'.

2.23 Therefore, the Committee finds that works should proceed without the need for a referral to it under the *Public Works Committee Act 1969*.

Senator the Hon Judith Troeth
Deputy Chair
12 July 2010