

**COMMENTS ON THE PEBBLE-BED MODULAR REACTOR
DEMONSTRATION POWER PLANT SOCIO-ECONOMIC IMPACT
ASSESSMENT AS PART OF THE IMPACT ASSESSMENT PHASE
OF THE EIA REPORT NOVEMBER 2007 (REVISED MAY 2009)**

**SUBMITTED BY THE PUBLIC SERVICE ACCOUNTABILITY MONITOR, A
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Introduction

The Public Service Accountability Monitor (PSAM) is a programme of the Centre for Social Accountability (CSA), an independent organisation situated at Rhodes University. The PSAM has been engaged in social accountability monitoring since 1999 and aims to improve public service delivery and the progressive realisation of constitutional rights by using various social accountability monitoring tools (which relate to resource allocation, strategic planning, performance monitoring, expenditure management, integrity and oversight processes). These tools have been developed in order to systematically monitor public resource management and will enable citizens to hold government officials accountable for the delivery of services and the performance of their duties.

The PSAM believes that the proposal to develop a Pebble Bed Modular Reactor Demonstration Power Plant (PBMR DPP) involves significant decisions regarding the use of substantial public resources, and such decisions must therefore meet various constitutional imperatives contained in the Constitution of South Africa which determine *inter alia* that in encouraging the public to participate in the formulation of policy, “transparency must be fostered by providing the public with timely, accessible and accurate information” and that organs of state must promote the “efficient, economic and effective use of resources”.¹

The PSAM further believes that the Socio-Economic Impact Assessment (SEIA)² of the PBMR DPP contains serious flaws, and it is our opinion that unless and until these flaws are addressed it will not be possible to approve the construction of the PBMR DPP without violating the Constitution of South Africa.

PSAM Comments on the SEIA

The PSAM submits that the SEIA is critically flawed in the following three ways:

- 1) It does not assess the socio-economic impact of the current size and design of the proposed PBMR DPP;
- 2) It provides no real-term timelines for the implementation of the PBMR DPP project;
- 3) It provides no valid opportunity cost to the implementation of the PBMR DPP project.

¹ Section 195 of the Final Constitution of the Republic of South Africa read in conjunction with the various fundamental rights recognized in Chapter 2 of the Constitution.

² Dippenaar, A. “Pebble-bed Modular Reactor Demonstration Power Plant. Socio-Economic Impact Assessment as Part of the Impact Assessment Phase of the EIA”. November 2007 (Revised May 2009).

Taken together, these flaws are, in our opinion, serious enough to invalidate the conclusions, results and recommendations of the SEIA. We will briefly outline our concerns regarding these three problematic aspects of the SEIA below.

We would also point out that other concerns with the SEIA, such as the costing of the PBMR DPP and its impact on poverty and inequality in South Africa, have not been considered in these comments. In our opinion, such further concerns are consequent upon the three central flaws which we outline below.

1. Size and Design of the PBMR DPP

The SEIA is based on a “current proposal for a 400MW demonstration unit”.³ However, in an article posted on the Pebble Bed Modular Reactor (Pty) Limited (PBMR) website on 30 July 2009, it is stated that the first PBMR is “now designated DPP200”.⁴ This suggests that the PBMR DPP is now of a 200MW design.

The SEIA is further based on a PBMR single-stage direct cycle design in which “hot helium is used to drive a closed cycle gas turbine-compressor and generator system”.⁵ However, it is clear that PBMR is currently redesigning the PBMR DPP. According to Campbell, “the first PBMR, now designated DPP200, will use a two-stage indirect cycle system in which superheated helium from the reactor core will turn water into superheated steam in heat exchangers and this steam will then drive turbines to generate power. Originally, the idea was to use a single-stage direct cycle in which the helium drove a gas turbine”.⁶ Campbell quotes PBMR CEO Jaco Kriek as stating that “we want to complete it [the design] by about two years from now, and then do the licensing of the design”.⁷

The PSAM submits that it is not possible or plausible to adequately assess the socio-economic impact of a PBMR DPP whose size and design is uncertain or unknown. Since both the size and design of the proposed PBMR DPP now differ from those on which the SEIA was based, it follows that the assessment of the socio-economic impact contained in the current SEIA must be revised.

³ Dippenaar, A. “Pebble-bed Modular Reactor Demonstration Power Plant. Socio-Economic Impact Assessment as Part of the Impact Assessment Phase of the EIA”. November 2007 (Revised May 2009), p. 5. On p. 7 of the same SEIA it is stated that “Eskom is seeking authorization for the construction, operation and decommissioning of a 400 MW (t) Pebble-Bed Modular Reactor Demonstration Power Plant”.

⁴ Campbell, K. “PBMR Concentrates on Core Competences and Diversifies Markets”. 30 July 2009: <http://www.pbmr.co.za/index.asp?Content=217&Article=115&Year=2009>.

⁵ Dippenaar, A. “Pebble-bed Modular Reactor Demonstration Power Plant. Socio-Economic Impact Assessment as Part of the Impact Assessment Phase of the EIA”. November 2007 (Revised May 2009), p. 5.

⁶ Campbell, K. “PBMR Concentrates on Core Competences and Diversifies Markets”. 30 July 2009: <http://www.pbmr.co.za/index.asp?Content=217&Article=115&Year=2009>.

⁷ Campbell, K. “PBMR Concentrates on Core Competences and Diversifies Markets”. 30 July 2009: <http://www.pbmr.co.za/index.asp?Content=217&Article=115&Year=2009>.

2. Real-Term Timelines

The SEIA states that “it is estimated that the construction phase could take up to six (6) years from the start of the construction until commissioning”.⁸ The operational phase is estimated at forty (40) years.⁹ No estimate of the time required for the decommissioning of the PBMR DPP is provided. This may well be because, as the SEIA notes, the Radioactive Waste Management Programme (RWMP) for the PBMR DPP “is still being compiled”.¹⁰ This latter is clearly a matter of concern.

Of greater concern, however, is that the SEIA provides no real-term timelines for the PBMR DPP at all. The absence of real-term timelines means that it is not possible to make any meaningful assessment of the socio-economic impact of the PBMR DPP.

In August 2000 PBMR announced that “assuming shareholder approval and Government consent, preliminary construction activities could commence by the second half of 2001. Completion of construction should occur about three years later, to be followed by one year of commissioning activities”.¹¹ In November 2004 PBMR announced that “the current schedule is to start construction in 2007 and for the demonstration plant to be completed by 2010. The first commercial PBMR modules will be available from 2013 should the demonstration prove successful”.¹² In August 2008 PBMR announced that “the current schedule is to start construction in 2010 and for the demonstration plant to be completed by 2014”.¹³ However, by July 2009, PBMR was estimating that “the first pebble bed reactor will be commissioned towards the end of 2018”.¹⁴

⁸ Dippenaar, A. “Pebble-bed Modular Reactor Demonstration Power Plant. Socio-Economic Impact Assessment as Part of the Impact Assessment Phase of the EIA”. November 2007 (Revised May 2009), p. 68.

⁹ See Dippenaar, A. “Pebble-bed Modular Reactor Demonstration Power Plant. Socio-Economic Impact Assessment as Part of the Impact Assessment Phase of the EIA”. November 2007 (Revised May 2009), p. 82.

¹⁰ Dippenaar, A. “Pebble-bed Modular Reactor Demonstration Power Plant. Socio-Economic Impact Assessment as Part of the Impact Assessment Phase of the EIA”. November 2007 (Revised May 2009), p. 104.

¹¹ Ferreira, T. “PECO Invests In Pebble Bed Project”. PBMR Communication Department. 1 August 2000. <http://www.pbmr.co.za/index.asp?Content=218&Article=43&Year=2000>

¹² Ferreira, T. “South African Government Approves Funding For The Development Of Pebble Bed Modular Reactor Technology”. PBMR (Pty) Ltd . 9 November 2004. <http://www.pbmr.co.za/index.asp?Content=218&Article=48&Year=2004>.

¹³ PBMR Corporate Communications. Pebble Bed Project Moves a Step Closer to Construction. 22 August 2008. <http://www.pbmr.co.za/index.asp?Content=218&Article=100&Year=2008>.

¹⁴ Ferreira, T. “South Africa Is Preparing for the World’s First Commercial PBMR”. PBMR. 30 July 2009. <http://www.pbmr.co.za/index.asp?Content=217&Article=113&Year=2009>. See also Campbell, K. “PBMR Concentrates on Core Competences and Diversifies Markets”. 30 July 2009: <http://www.pbmr.co.za/index.asp?Content=217&Article=115&Year=2009>.

The PSAM submits that in the absence of credible real-term timelines in the planning of the PBMR DPP project and consequently in the SEIA, it is impossible to make any meaningful assessment of the socio-economic impact of the PBMR DPP. Since the socio-economic environment is constantly changing, revisions to the real-term timelines of the PBMR DPP project must affect the assessment of its socio-economic impact.

3. Opportunity Cost

The Draft Environmental Impact Assessment Report for a 400 MW(t) Pebble Bed Modular Reactor Demonstration (EIA DPP) states that “technology alternatives were described and discussed in the RFESR (Revised Final Environmental Scoping Report), where it was concluded that technology alternatives would not be carried forward into the EIA. The discussion on technology alternatives was only a description and update of the alternatives described in the RFESR and was provided for information purposes only. No assessment on the technology alternatives is required”.¹⁵ In accordance with this decision, there is no assessment of the socio-economic impact of technological alternatives to the PBMR DPP in the SEIA.

The PSAM submits that this both contradicts the requirements of the social impact assessment process and precludes any consideration of technological opportunity costs.

The SEIA does not consider technological alternatives to the PBMR DPP. With regard to renewable energy sources of electricity generation, for example, it states that “at present they are not economic alternatives”.¹⁶ But neither is the PBMR at present economically viable, which is presumably why the EIA DPP notes that “information which is necessary to inform whether the PBMR is techno-economically feasible, such that it can be compared against other power generation technologies, cannot therefore be obtained through any means other than the construction and operation of a demonstration facility”.¹⁷

The SEIA also suggests that the opportunity costs of the no-go option “include the loss of employment and business opportunities”.¹⁸ A no-go decision does not represent an opportunity cost (or loss) in respect of employment or business

¹⁵ Arcus Gibb. Draft Environmental Impact Assessment Report for a 400 MW(t) Pebble Bed Modular Reactor Demonstration Power Plant. August 2008, p 8.

¹⁶ Dippenaar, A. “Pebble-bed Modular Reactor Demonstration Power Plant. Socio-Economic Impact Assessment as Part of the Impact Assessment Phase of the EIA”. November 2007 (Revised May 2009), p 11.

¹⁷ Arcus Gibb. Draft Environmental Impact Assessment Report for a 400 MW(t) Pebble Bed Modular Reactor Demonstration Power Plant. August 2008, p 7.

¹⁸ Dippenaar, A. “Pebble-bed Modular Reactor Demonstration Power Plant. Socio-Economic Impact Assessment as Part of the Impact Assessment Phase of the EIA”. November 2007 (Revised May 2009), p. 107.

opportunities. It simply means that employment and business opportunities would not be created by the PBMR DPP. The opportunity cost would be the employment and business opportunities foregone by favoring the PBMR DPP over an alternative investment of public resources.

Accountable governance requires the provision of justifications for the use of public resources, and this in turn requires consideration of opportunity costs. The PSAM submits that the SEIA is fundamentally flawed in this regard, since it provides no valid opportunity cost to the proposed PBMR DPP project.

Conclusion

The PSAM submits that the SEIA does not and cannot provide an adequate assessment of the socio-economic impact of the PBMR DPP since it is not informed by the current size and design of the proposed PBMR DPP, provides no real-term timelines for the implementation of the PBMR DPP project and provides no valid opportunity cost to the implementation of the PBMR DPP project.

The SEIA therefore cannot adequately inform a decision to approve the construction of the PBMR DPP without violating the Constitution of South Africa.