Playing the Game with Integrity and Passion

Annual Report

Unlocking Energy

Annual Report Presentation to the Portfolio Committee on Public Enterprises
23 March 2010
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- Way Forward
Annual Report for Financial Period
Ending 31 March 2009

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- Mission
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- Value created
Introduction
Introduction

- Key changes in business model and product offering due to significant changes locally and internationally in economic and energy environments

- Main reasons for the change in strategy
  - global economic climate
  - funding restrictions
  - emergence of potential process heat clients
  - PBMR’s continuous and successful involvement in the United States Department of Energy’s Next Generation Nuclear Plant (NGNP) programme

- Restructuring and skills preservation
Mission
PBMR Mission Statement

- **Vision**
  - Bringing the benefits of pebble power to humankind.

- **Mission**
  - To provide environmentally friendly, accessible and market-driven nuclear energy systems.

- **Values**
  - Safety and quality without compromising on standards
  - Customer and stakeholder-centric
  - Respect for people
  - Relentless pursuit of excellence
  - Partnering to create sustainable success

- **Brand**
  - Your future energy solution today.
Time for Change
Time For Change

- PBMR could be South Africa’s Nuclear Design Authority!
- Role Clarity and Commercial Business Model
  - Government and other shareholders
  - Off-taker Consortium and Operator
Highlights
Highlights

- Excellence throughout PBMR
- Unqualified audit report – 31 March 2009
- Cost cutting/cash preservation
- Culture shaping process
- Nuclear licensing – Nuclear Design Authority
- Enterprise Architecture Project
- Suppliers Conference
- Charity initiatives
- Environmental Impact report submitted (Koeberg)
- Fuel delivery to US & Russia
- Progress on DPP200 Reactor Design
Highlights

- NGNP bidding
- Technology Innovation awards (world class technology programs)
- National Nuclear Regulator (NNR) issued a licence to the Fuel Development Laboratories to produce kernels with 9.6% enriched uranium
- Delivery of the core unloading device (CUD) to the Helium Test Facility at Pelindaba
  - The CUD is a truly home grown technology, engineered by South Africans for SA
- A record of 200 000 and 250 000 accident-free hours was achieved by both the Helium Test Facility and Fuel Development Laboratories respectively
Performance against Strategic Objectives
## Strategic Objectives

<table>
<thead>
<tr>
<th>Objective</th>
<th>Measured by</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select a near-term product configuration based on customer requirements</td>
<td>Supporting analysis, independent international review and assessment for product selection</td>
<td>PBMR Board approved the indirect Rankine cycle (PBMR-200 DPP) for electricity and process heat</td>
</tr>
</tbody>
</table>
| ▪ Develop an affordable business case and financial model to retain existing investors and attract new investors. | ▪ Approved 2009-Corporate Plan  
▪ Extensive stakeholder engagement to ensure repositioning | ▪ Approved Corporate Plan by the PBMR Board (May 2009)  
▪ Extensive internal and external consultation and collaboration to reposition PBMR |
## Strategic Objectives (cont.)

<table>
<thead>
<tr>
<th>Objective</th>
<th>Measured by</th>
<th>Status</th>
</tr>
</thead>
</table>
| Establish a sustainable, affordable funding model in support of the business of PBMR | ▪ Approved business plan  
▪ Approved funding model  
▪ Extensive stakeholder engagement  
▪ New draft shareholders’ agreement aligned to the new business plan and financial model | ▪ Board-approved business plan and funding model  
▪ Government supports the plan but the financial ability is challenging  
▪ Extensive consultation with stakeholders / investors  
▪ New draft shareholders' agreement with DPE |
### Strategic Objectives (cont.)

<table>
<thead>
<tr>
<th>Objective</th>
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</tr>
</thead>
</table>
| Partner/collaborate internationally to ensure the commercialisation of the pebble bed technology | ▪ Secure and strengthen PBMR’s participation in the United States Department of Energy’s Next Generation Nuclear Plant (NGNP) programme  
▪ Join the European Union's EUROPAIRS programme (end-user requirements for nuclear process heat applications with innovative nuclear reactors for sustainable energy supply) | ▪ The NGNP Alliance submitted a bid to the United States Department of Energy based on PBMR’s new product configuration  
▪ PBMR has joined EUROPAIRS as a member, which is a European initiative similar to the NGNP in the United States |
## Strategic Objectives (cont.)

<table>
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<th>Status</th>
</tr>
</thead>
</table>
| Develop a consortium of customers made up of high-end energy users in South Africa with the aim of evolving into a programme similar to the United States NGNP | § Formally establish a PBMR customer consortium group in South Africa  
§ Planned launch date is June 2010 | § Sasol and PetroSA have accepted PBMR’s invitation to join the PBMR Customer Support Group  
§ Further meetings are scheduled with companies in the Energy-Intensive Users Group  
§ Continue to establish / formalise the role of Eskom and Necsa in the consortium |
Technology Development
Technology Development

- 6 South African universities and Necsa participate in various research activities to further the technologies required to keep PBMR at the forefront of nuclear reactor development in future.

- Technology Development Programme includes, amongst others, R&D on the minimisation of nuclear waste, improved materials and fuel measurement techniques.
Technology Development (Cont.)

- PBMR - one of the largest and most efficient programmes by any company in South Africa

Statistics:
- Number of scientific papers published since 2006: 160
- Number of baccalaureus degrees since 2006: 2 (BEng)
- Number of honours degrees since 2006: 28 (BSc Hons)
- Number of master's degrees since 2006: 54 (MEng and MSc)
- Number of doctorates since 2006: 34 (PhD)
- Number of post-doctoral fellows: 3
Corporate Governance

PBMr’s Stakeholders

Department of Science and Technology
Department of Water and Environmental Affairs
Department of Trade and Industry
National Treasury
Department of Public Enterprises
Department of Energy
Department of Labour
Department of Foreign Affairs

Eskom Holdings Limited

Pebble Bed Modular Reactor (Pty) Ltd

Investors

South African government
Westinghouse Electric Company
Industrial Development Corporation of South Africa
Eskom Holdings Limited

Employees
Regulatory bodies
Customers and potential customers
Suppliers and partners
Labour
Future operators
Learning and research and development institutions
Community
Corporate Governance

- Oversight by DPE
- Accountable to Investors to preserve Shareholder Value
- Board of PBMR

Sub-committees of the Board include:

- Audit, Risk and Finance Committee
- Human Resources and Remuneration Committee
- Commercial Committee
- Technology Committee
- Project Delivery Committee

Members of Board committees are selected based on specific skills requirements of the respective committees to adequately fulfil their duties.

Management Committees include: Executive Committee (Exco), Procurement Committee, Employment Equity Committee, Workplace Forum Committee, Remuneration Committee, and Job Grading Committee.
Employment Equity
PBMR Skills Profile

- 851 Employees
- 596 (70%) Engineers, scientists and technologists in March 2009
Employment Equity
Employment Equity Appointments – 2008/09

- 2008/09 Appointments – 55% Black
Financial Information
Annual Incremental Spend to 31 December 2010 – R8.7 billion
Categories of Spend to 31 December 2009 – R8.7 billion

- Remuneration: 39%
- Corporate Costs: 12%
- DPP: 31%
- Fuel Plant: 13%
- Process Heat Development: 2%
- Technology Programmes: 1%
- Test Facilities: 2%
- FDL: 1%
## Budget vs. Actual – 2008/2009

<table>
<thead>
<tr>
<th>Expense Category</th>
<th>Original Budget R'000</th>
<th>Actual R'000</th>
<th>Variance R'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remuneration</td>
<td>573,216</td>
<td>603,598</td>
<td>(30,382)</td>
</tr>
<tr>
<td>Corporate Costs</td>
<td>237,984</td>
<td>159,116</td>
<td>78,868</td>
</tr>
<tr>
<td>Process Heat Plant Development</td>
<td>42,590</td>
<td>38,794</td>
<td>3,796</td>
</tr>
<tr>
<td>Technology Programmes</td>
<td>40,750</td>
<td>21,724</td>
<td>19,026</td>
</tr>
<tr>
<td>Fuel Development Laboratories</td>
<td>22,156</td>
<td>25,731</td>
<td>(3,575)</td>
</tr>
<tr>
<td>Test Facilities</td>
<td>30,127</td>
<td>21,514</td>
<td>8,613</td>
</tr>
<tr>
<td>Fuel Operations</td>
<td>44,077</td>
<td>30,066</td>
<td>14,011</td>
</tr>
<tr>
<td>DPP</td>
<td>1,058,900</td>
<td>714,026</td>
<td>344,874</td>
</tr>
<tr>
<td>Fuel Plant</td>
<td>301,903</td>
<td>233,356</td>
<td>68,547</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,351,703</strong></td>
<td><strong>1,847,925</strong></td>
<td><strong>503,778</strong></td>
</tr>
<tr>
<td>Contingency</td>
<td>235,166</td>
<td>235,166</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,586,869</strong></td>
<td><strong>1,847,925</strong></td>
<td><strong>738,944</strong></td>
</tr>
</tbody>
</table>

These figures are as incorporated in monthly Management Accounts and IFRS adjustments are not taken into account.
<table>
<thead>
<tr>
<th>Period</th>
<th>Total</th>
<th>SA Government</th>
<th>IDC</th>
<th>Eskom</th>
<th>WEC</th>
<th>Excelon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R'million</td>
<td>R'million</td>
<td>R'million</td>
<td>R'million</td>
<td>R'million</td>
<td>R'million</td>
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<tr>
<td>Up tp 31 August 2005</td>
<td>2,086</td>
<td>600</td>
<td>264</td>
<td>817</td>
<td>304</td>
<td>101</td>
</tr>
<tr>
<td>1 September 2005 to 31 March 2006</td>
<td>848</td>
<td>509</td>
<td>193</td>
<td></td>
<td>146</td>
<td></td>
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<tr>
<td>1 April 2006 to 31 March 2007</td>
<td>1,056</td>
<td>1,056</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 April 2007 to 31 March 2008</td>
<td>2,195</td>
<td>2,195</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 April 2008 to 31 March 2009</td>
<td>1,534</td>
<td>1,534</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>7,720</td>
<td>5,894</td>
<td>457</td>
<td>817</td>
<td>450</td>
<td>101</td>
</tr>
<tr>
<td>1 April 2009 to 31 March 2010</td>
<td>1,524</td>
<td>1,524</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9,244</td>
<td>7,419</td>
<td>457</td>
<td>817</td>
<td>450</td>
<td>101</td>
</tr>
</tbody>
</table>
US DOE - NGNP Programme
Phase 1 FY-10 US$40 Million

Fiscal year: 1 October - 30 September

Phase 1
- FY-10
  - Nuclear Heat Supply System, Steam Plant & BOP
    - Pre-Application Review
    - Develop ESP Apps for up to 4 sites
    - Develop COLA for Pebble design
- FY-11
- FY-12
- FY-13
- FY-14
- FY-15
- FY-16
- FY-17
- FY-18
- FY-19
- FY-20
- FY-21
- FY-22
- FY-23
- FY-24

Phase 2
- Conceptual Design
- Final Design
- Site Work
- Construction
- Startup Testing
- DCA for Pebble Technology
- NRC Review of DCAs
- NRC Issues COL with provisions
- NRC Concurrence with initial fuel load and initial operation with provisions
- Resolve Operating Provisions

Licensing and Regulatory
- Pre-Application Review
- Develop ESP Apps for up to 4 sites
  - Submit ESP APPs
- Develop COLA for Pebble design
  - Submit COLA for Commercial Plant
- State and EPA Permitting
  - Obtain Permits
- NRC Review of ESP and COLA
- Develop Final SAR
- Resolve ITAACs
Value Created
PBMR Value Created

- Advancement of Science and Technology
- Local Nuclear Industry Development
  - Localisation and Competitive Supplier Development Programme (CSDP)
  - Formation of Nuclear Industry Association of South Africa (NIASA)
- Social and Economic Transformation, Growth and Development
- International Value
  - Next Generation Nuclear Plant (NGNP)
  - EUROPAIRS
  - Canadian oil Sands
  - Gen IV forum
- Systems and Intellectual Property
- Hydrogen from an HTGR plant

Demo Plant Local & Foreign Content Targets (2009-2016)

Plant Costs estimated
PBMR Value Created

- **Test Facilities**
  - Helium Test Facility
  - Fuel Development Laboratories
  - High Temperature Test Unit
  - High Pressure Test Unit

Test Facilities form part of the Development Process
## Independent Socio-Economic Development and Impact

### MEGA PROJECT COMPARISON SUMMARY

<table>
<thead>
<tr>
<th></th>
<th>Richards Bay</th>
<th>Sasol</th>
<th>Motor industry</th>
<th>PBMR Project Est 2045</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Turnover</strong></td>
<td></td>
<td>R130 bn</td>
<td>R275 bn</td>
<td>R120 bn</td>
</tr>
<tr>
<td><strong>GDP</strong></td>
<td>R32 bn+</td>
<td>n/a</td>
<td>R160 bn</td>
<td>R105 bn</td>
</tr>
<tr>
<td><strong>B O Payments</strong></td>
<td></td>
<td>+R40 bn</td>
<td>-R(15-30) bn</td>
<td>+R8 bn</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td>150 000+</td>
<td>194 000</td>
<td>500 000</td>
<td>500 000</td>
</tr>
<tr>
<td><strong>Dependents</strong></td>
<td>600 000+</td>
<td>776 000</td>
<td>2 000 000</td>
<td>2 000 000</td>
</tr>
</tbody>
</table>

Source: Econometrix (2008)
UPDATE ON CURRENT EVENTS
Update of Current Events

- Adoption of Financial Policy in December 2009:
  - To curtail expenditure and commitment to meet available financial resources

- Participation in Phase 1 of US DOE’s NGNP

- With approval from Minister of Public Enterprises the Board of PBMR contemplate large scale retrenchments and are currently in consultation with employees in accordance with the Labour Relations Act

- Scale down or mothball test facilities, fuel laboratories and technology programmes at 6 SA Universities (would require an additional R72 million)
Budget for April 2010 to 31 March 2011
R’ million

Opening Cash 1 April 2010: 448
+ US DOE NGNP revenue 75
- Expenses (462)
Net cash available 61
- Residual closure cost (47)
= Cash Surplus 14
Principles

- Curtail expenses and commitments to meet cash resources as stated in 2009 Annual Report
  [Financial Policy adopted at the Board meeting on 4 December 2009]

- Use existing cash resources to fund the operating cost and closure cost from 1 December 2010 to March 2011
  [Base case for the financial period ending March 2011 attached]

- Continue to explore opportunities to save cash and create flexibility and optionality in the next 60 days
  [Propose to PBMR Board Sub Committee]
Objectives of the Company

- **Primary Objectives**
  - Protect IP of HTR technology for Government & existing Investors
  - Aim to retain core skills and know how
  - PBMR effectively operates as a stand alone legal entity
  - Contemplate a reduction of current staffing levels to 237
  - Ensure a capability to deliver on the US DOE’s NGNP FOA

- **Shareholding (finalise shareholders agreement)**
  - Secure funding from existing investors
  - Attract new investors
  - Clarify the relationship and role of Eskom going forward

- **Customer(s)**
  - Secure NGNP as anchor customer
  - Develop other customers e.g. EU - EUROPAIRS and Canadian Petroleum Technology Alliance of Canada
WAY FORWARD
Way Forward

- Leverage value created to date for SA’s economic benefit
- Organisational alignment and restructuring of the company
- Nuclear Design Authority (NDA) and nuclear licensing
- Enterprise Architecture
- DPP200 design in line with NGNP
- Cost cutting and cash preservation
- Product and customer alignment
- Long term - Fuel design & strategy
Thank you for your time

Contact details

- Pebble Bed Modular Reactor (Pty) Ltd
  - Telephone (012) 641 1000

- Website
  - www.pbmr.co.za