Mandate Framework Document for the South African Coal Roadmap (SACRM)

This document provides a mandate for the establishment of a multi-stakeholder Steering Committee to develop a South African Coal Roadmap, which will detail and assess options and scenarios for the future development of the individual and collective components of the domestic coal industry and extract recommendations to maximise the economic opportunities of coal as a valuable energy and chemical resource, while ensuring a better quality of life for current and future generations. The Roadmap will be available for individual stakeholders to use at their discretion.

1. INTRODUCTION

This document outlines the plan to execute the South African Coal Roadmap (SACRM). The need for the SACRM is jointly acknowledged by Government, industry and related stakeholders and the objectives of such a study are briefly discussed. These entail the understanding of the current contribution of the individual and collective components of the coal industry in South Africa; the local and international drivers that will shape the industry in the future; and the identification of the options that can be deployed to maximise future benefits for South Africa. The high level objectives are supported by an action plan that links deliverables, timeframes and budgets. The SACRM will be executed in four phases and is expected to take approximately 26 months (from date of commencement) at an estimated cost of R5,500,000.00 (inclusive of VAT). This funding will be contributed by interested stakeholders and managed by the South African National Energy Research Institute (SANERI).

Broad stakeholder participation is essential for the objectives and deliverables of the SACRM to be met. The participation of as many stakeholders as possible who have a fundamental impact on the supply of coal into the South African markets (both domestic and international) needs to be sought. The energy-intensive consumers on the demand side, with the ability to effect coal usage changes on a large scale should also be considered for participation in the SACRM. These large scale users have the ability to induce a demand side shock that can disrupt the coal supply and/or value chain. Consequently, the criteria for the initial participation in the SACRM would be those stakeholders that collectively supply or control/manage the supply of coal to the South African domestic and international markets, the major intensive users of coal for industrial and commercial purposes such as generation of electricity or steam, major energy-intensive consumers, recognised associations and relevant government departments or state organs. The rationale here is that all other stakeholders beyond the major producers and consumers, such as academic, specialists, smaller scale users and producers and representatives of bodies, would also be consulted on an ad hoc basis during the development of the SACRM project.

Upon approval of the mandate, a Steering Committee will be formed comprising senior executive representatives from Government, industry and related stakeholders that have committed to a significant involvement, through participation and contribution, to the success of the South African Coal Roadmap. The purpose of the Steering Committee is to steer the technical and non-technical operations of the SACRM. The Steering Committee will be supported by the Fossil Fuel Foundation, who will be responsible for:

1. project management – the development of the detailed technical scoping for approval by the Steering Committee – as well as the practical deployment of the various work streams; and
2. the secretariat function.

2. BACKGROUND

In South Africa, in 2006, 79% of the total energy supplied to South Africa was attributable to coal (and 10% to crude oil). In the same year, coal production was 245 million tons, of which 46% was consumed in the local generation of electricity; 18% in the local production of synthetic fuels and chemicals; 28.6% was exported (primarily to Europe - 87%) and the remainder distributed across industrial, mining, metallurgical and domestic applications. At current production rates, based on estimated reserves, coal is expected to last around 140 years. This outlook can be radically altered by the decisions to build new coal-fired electricity and coal-to-liquid (CTL) plants and by the conversion of resources to reserves through more exploration. On the one hand, doubling coal production by 2025, would halve the life of the reserves; while on the other, reserves could be doubled if a mere 18% of the estimated 194 billion tons of coal resources could be converted to reserves.

In 2006 the spot market price of export coal averaged at $60/ton, making it the third largest mineral export in South Africa with subsequent generation of R21.6 billion in foreign exchange earnings. Reliability of supply and life cycle costs to the end user must remain competitive - the major cost elements being mining, beneficiation, inland transportation and port charges.

At the same time, coal provides the basis for approximately 90% of the electricity generated in South Africa. Significant attention must be given to ensuring that the power industry remains competitive while also meeting the relevant national and international environmental standards. There must be awareness of possible competition for resources between users, market deregulation, inflationary pressures and add-on costs associated with environmental and market-distorting mechanisms (cross subsidisation of renewables, and other).

Coal also mitigates South Africa's reliance on imported crude oil with coal-to-liquid processes supplying approximately 25% of South Africa's liquid fuel demand.

Resulting employment included nearly 58 000 people directly in coal mining alone (13% of the mining sector's workforce) as determined by the Chamber of Mines in 2007, and more if one includes those employed in coal-fired electricity generation and liquid fuel production and distribution. In the coal mining sector, gross turnover per person employed (R630,110) was over double that of the national average for the minerals sector. In terms of earnings, the average worker in the coal mining sector realised R82,795 per annum.

The future contribution of coal will be heavily affected by ongoing international discussions on the often conflicting issues of energy security and climate change. According to the International Energy Agency's Energy Technology Perspectives (2006), coal contributed around 24% of total (global) primary energy supply in 2003. Under their baseline scenario, coal production is set to triple by 2050 - increasing its share of primary energy to 34% - supported by strong growth in energy demand in developing countries in conjunction with high international oil prices. However, under the various alternative "accelerated technology scenarios" required to mitigate greenhouse gas emissions, coal demand in 2050 ranges from 18% less than in 2003 to only 32% higher, a considerable difference from the baseline scenario.

Countries that possess or rely on large indigenous fossil fuel resources to supply their energy needs and fuel their economic growth need to understand the key driving forces evident at the global and local level in order to optimise their position in a changing legislative, commercial and technological landscape. This is particularly true for the new democracy and emerging economy of South Africa, with its own unique set of circumstances.

3. OBJECTIVES

The objectives of the SACRM have been expressed as follows - to:

1) Provide independent and impartial expert analysis and comment on the various national and international drivers, including but not limited to climate change, that may impact on the supply and utilisation of coal over the coming 25 years;
2) Provide independent and impartial expert analysis and comment on available and future technology options for the supply and utilisation of coal over the short-term (5 years) and long-term (25 years);
3) Identify, consider and report on the various parameters/metrics for evaluating coal's position, relative to other competing resources and to identify relative strengths and weaknesses of these competing resources;
4) Focus on and identify technologies, coal and coal-derived products that meet current, new and emerging future market needs and demands;

5) Identify and report on global trends and information sources for coal supply and utilisation, as well as opportunities with renewable energy sources that have an impact on coal such as wind, solar and biomass;
6) Develop an understanding of the primary factors required for the successful development of various future coal related opportunities;
7) Provide guidance on technology acquisition and implementation for South Africa in key areas, including, inter alia, external partnerships, policies and structures, and centres of global excellence;
8) Provide guidance on issues of governance, research and development, private sector and infrastructural investments and opportunities for social investment.

4. SCOPE

A supply and demand analysis due to the significant "knock-on" effects of the various local and global drivers will be undertaken and the SACRM will address all elements of the coal supply chain and look at effects over the short- to long- term (5 – 25 years).

This analysis is an iterative process that takes input from, amongst others, the following focus areas:

1) Coal exploration (resources and reserves)
2) Coal extraction
3) Coal beneficiation
4) Coal bed methane
5) Coal transport
6) Coal transformation technologies: including coal combustion, coal liquefaction, coal gasification (including underground coal gasification)
7) Coal markets: including-
    a) Electricity generation,
    b) Heat-and-power,
    c) Transportation (liquid fuels),
    d) Metallurgical reductant (steel industry), and
    e) Petrochemical products (such as polyethylene, polyvinyl chloride, polypropylene, waxes and related products, ammonium nitrate-based fertilisers and explosives)

Notwithstanding traditional technical and cost metrics, information reported in the various focus areas will also have to detail:

1) Security of supply
2) Process efficiency

3) Employment, skills, migration, training and remuneration
4) Occupational health and safety
5) Air emissions, waste, land and water consumption
6) Adaptation and mitigation to climate change
7) Existing R&D initiatives and future R&D needs
8) Intellectual property rights
9) Capital investment/ financial climate
10) Associated, existing or proposed, local and international legislation, standards and agreements

5. DELIVERABLES/ OUTPUTS:

A Coal Roadmap for South Africa that can be used by all stakeholders to meet their strategic needs and it will further provide:

1) A report on the position of South Africa's coal products in the domestic and international markets relative to other competing resources;
2) A quantified assessment of local and global drivers (including climate change) as they will impact on projected coal supply and demand;
3) Recommendations on how to ensure coal security of supply including an appraisal of resources and reserves;
4) A list of primary constraints that need to be addressed for the successful development of various future coal-related opportunities (for example, information, water etc…);
5) Recommendations on infrastructural investments by both the private and public sector;
6) Possible technological trajectories, which optimise production taking into account, amongst other things, air quality standards, efficient coal extraction, production and utilisation practices within local and international norms and standards that govern the coal sector/industry;
7) Recommendations on the research and development needs;
8) Guidance on technology acquisition and implementation that, amongst others, takes into consideration adaptation and mitigation of climate change;
9) Recommendations on the appropriate occupational health, safety and environment development needs for the coal industry of South Africa; and
10) Recommendations to build capacity and develop and retain the necessary skills in the coal industry.

For a detailed implementation schedule, please see attached action plan in Annexure 1

6. STRUCTURE FOR IMPLEMENTATION

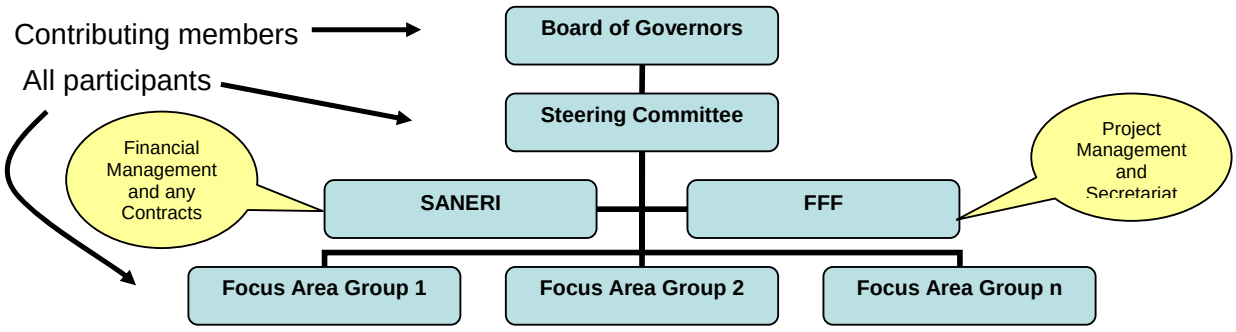
Formal participation in the development of a South African Coal Roadmap will be through signature to the Charter and its' annexes. This Charter outlines the right of funding organisations to nominate one representative to the Board of Governors, who shall meet quarterly, principally to approve participation, the workplan and budget submitted by the Steering Committee and to ensure that Contributions received are applied for the purpose for which they were provided.

A Steering Committee shall be constituted, comprising appointed senior executive representatives from Government, industry and related stakeholders that are committed to participation, contribution and the success of the Roadmap.

The Steering Committee will oversee and provide guidance on the development of SACRM project with the support of the South African National Energy Research Institute and Fossil Fuel Foundation. The Fossil Fuel Foundation will coordinate the practical deployment of the various work streams to be covered by the focus areas.

The Focus Area Working Groups will comprise experts from government, industry, research and non-governmental organisations, who will actively explore their own areas of endeavour and revert back with proposals, options and data pertinent to their segment of the coal value chain. This information is to be collated by the Project Management Team; in order to produce the South African Coal Roadmap, incorporating the deliverables described in section 5 above.

PROPOSED STRUCTURE FOR IMPLEMENTING THE SOUTH AFRICAN COAL ROADMAP



Focus areas will be chaired by nationally-recognised experts in their respective disciplines and are expected to cover: Coal exploration (resources and reserves); Coal extraction; Coal beneficiation; Coal bed methane; Coal transport; Coal transformation technologies (coal combustion, coal liquefaction, coal gasification); Coal markets (electricity generation, heat-and-power, liquid fuels, metallurgical reductant and petrochemical products) and **together with traditional technical and cost metrics will also address issues around**: Security of supply, Process efficiency, Employment, skills, migration, training and remuneration, Occupational health and safety, Air emissions, waste, land and water consumption, Adaptation and mitigation to climate change, Existing R&D initiatives and future R&D needs, Intellectual property rights, Capital investment/ financial climate, Associated, existing or proposed, local and international legislation, standards and agreements. **The work of the individual focus areas will be integrated and consolidated in a number of scenarios that have outcomes based on the economic principles of balancing supply and demand**

7 SACRM STEERING COMMITTEE

7.1 Mission

To develop and consolidate a joint vision for the South African Coal Roadmap and to facilitate its smooth and efficient execution, ensuring its strategic relevance within a global context and in a direction that is consistent with the national interest.

7.2 Terms of Reference

The SACRM Steering Committee is convened on the basis of commitments by the interested stakeholders and Government and on approval of the Board, in order to address the need for a review of the coal industry in South Africa with the view to ascertain the current status of the sector and to map potential future development plans for the sector.

In the light of this background, the Steering Committee's Terms of Reference are as follows:

1) To convene regular meetings, in accordance with the Charter;
2) To oversee and provide guidance on the development of SACRM project, which is specifically to investigate the entire coal value chain of South Africa and make recommendations to the optimal use coal;
3) To produce an overall work programme and budget and submit such to the Board for approval;
4) To manage technical and non-technical operations, by proposing efficient organisational structures, and implementing procedures in order to have effective integration of the outputs of various investigations and feasibility studies in the coal roadmap and for monitoring quality;
5) To recommend the appropriate core competencies required to lead the identified specialist focus areas;
6) To receive progress and final reports and submit these to the Board fro approval;
7) To approve contracts and issue payment subject to a Board approved budget and annual work programme;
8) To facilitate dialogue between the private sector, the public sector and the state owned enterprises in order to build a coherent view of the challenges and opportunities facing the South African coal industry;
9) To report regularly to all stakeholders with regard to the progress of the coal roadmap;
10) To advise the Project Management Team of cross-cutting issues, which could impact on or benefit from input by the work on the Coal Roadmap; and

11) To issue and/or approve any proposed public communications.

Detailed operational procedures for the Steering Committee are contained in the Charter hereto attached as Annexure 2.

ACTION PLAN (ANNEX 1)	TIMEFRAME	ESTIMATED COST
Phase I – Project Plan	4 months	R500 000
1. Obtain the necessary approvals within DME and others for participation in and financial contributions to SACRM (on the basis of this Mandate Document)		
2. Constitute the Board of Governors and the Steering Committee		
3. Confirm the appointment of SANERI and FFF for the financial and project management, including:		
a. Organising necessary funds and resources		
b. Communicating with key stakeholders and affected parties (including the establishment of a website and database of contacts)		
c. Identifying national and international organisations that can contribute		
d. Finalising key areas to be reviewed		
e. Convening working groups for each area and identifying working group leaders		
f. Compiling a detailed terms of reference and budget for Phase II		
Phase II – Define Status Quo	6 months	R1 500 000
1. Identifying global technology and industry roadmaps of relevance		
2. Scanning and mapping out the local and global drivers and existing technology initiatives (high level) per focus area and including cross-cutters		
3. Developing or commissioning more detailed information around the character (chemical, physical and geological) of the coal reserves/ resources as pertains to extraction, beneficiation, transformation and consumption		
4. Reviewing focus area deliverables, compiling detailed terms of reference and budget for Phase III		
Phase III – Establish Options	12 months	R2 300 000
1. Developing (commissioning where necessary) scenarios (including supply and demand analysis), targets and technology paths for each focus area		
Phase IV – Collate & Communicate	4 months	R1 200 000
1 Collating focus area information – indicating options, enablers, targets, timeframes and related socio-economic, political, environmental and technological consequences		
2. Completing the draft South African Coal Roadmap – communicate extensively for comment		
3. Finalising and publishing South African Coal Roadmap		