VIABILITY OF POWER GENERATION FROM COAL IN AFRICA - A POLITICAL PERSPECTIVE

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The discussion paper avoids technical aspects of coal-based power technology and focuses on contextual issues that directly relate to the technology.
WHY A POLITICAL PERSPECTIVE?

• The need for robust public due to singular view on coal-based power technology

• Energy conferences tend to steer away from political issues – creates gaps retards progress in resolving challenges that have political implications.

• Depoliticisation of politically-charged situations hardly provides sustainable solutions

• Coal, regarded as a “dirty” energy source – sensitive & controversial issue for countries with abundance of coal.

• The dilemma of equitable socio-economic development between developing and developed countries

• Content and nature of leadership that is evolving at global level with special reference to the outcomes of the COP sessions?
POWER GENERATION FROM COAL BY INDEPENDENT POWER PRODUCERS (IPPs) IN SOUTH AFRICA PLUS AFRICA

ENERGY IN SOUTH AFRICA

KEY STATISTICS

Aware of the constraints that energy poverty imposes on achieving sustainable development, South Africa has pursued a reform programme across the economy, including the energy sector. The energy sector reforms aim to promote a balanced, integrated system that will capitalise on the country’s indigenous resources, particularly coal.

Population: 54 million
GDP (in $US): 350.1 billion
GDP Growth: 1.5%
GDP per Capita (in $US): 6,482.8

“The importance of security of supply of coal cannot be overstated, and government has prioritised this need to ensure that there is sufficient supply for existing and future power stations.”

Department of Energy

KEY ENERGY FACTS

17th largest producer and consumer of electricity globally
69% of primary energy demand provided by coal in 2012

Total primary energy consumption in S. Africa, 2013

ENERGY POVERTY

South Africa aims to achieve universal access to electricity by 2025. Coal is to play a major part of this outcome due to its affordability and availability.

- 8 million people without access to electricity
- 85.5% of the population has access to electricity

ENERGY IN THE KEY ENERGY FACTS

Electricity

In 2012, electricity demand was 212 TWh and this is projected to rise to:

- 248 TWh in 2020
- 341 TWh in 2040

COAL IN THE ENERGY MIX

As recognised in IEA’s Africa Energy Outlook 2014, coal is the mainstay of the South African energy system, meeting around 70% of primary energy demand and accounting for more than 90% of domestic electricity output.

- 6th largest consumer globally
- 6th largest producer globally with 146.6 Mtce

- 94% coal share of total power generation in 2012

ENERGY POVERTY

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- 85.5% of the population has access to electricity

NDC

“The government has no intention of abandoning coal as an energy source, but is determined to find cleaner technologies that will reduce the adverse environmental impact associated with greenhouse gas emissions from coal generation.”

Department of Energy

South Africa is investing heavily in transforming its energy sector. At the heart of this part of the transition to a low-carbon energy sector is a complete transformation of the future energy mix, which is designed to replace an inefficient fleet of aging coal-fired power plants with clean and high efficiency technology going forward.

South Africa also has plans to invest half a billion dollars to capture 25 Mt of CO₂ from a coal-to-liquid plant.
POWER GENERATION FROM COAL BY
INDEPENDENT POWER PRODUCERS (IPPs) IN
SOUTH AFRICA PLUS AFRICA

• SA has recently driven a coal-based RFB of 1600MW – hopefully clean coal technology is integral to this effort in keeping with WCA’s Platform for Accelerating Coal Efficiency

• POWER GENERATION FROM COAL AS PART OF THE ENERGY MIX in SA and other African countries

• “Outside of South Africa there are IPP developments in numerous countries in the region, including Zambia, Namibia, Uganda, Nigeria, Kenya and Mozambique,” - Scott Brodsky, Partner at international law firm Macfarlanes.
WHY COAL POWER GENERATION WILL BE PART OF POWER GENERATION IN AFRICA FOR SOME TIME
POWER GENERATION PLUS OTHER APPLICATIONS

- OPPORTUNITIES ON COAL POWER GENERATION include CONVENTIONAL POWER STATIONS, DISCARD COAL and HYBRID systems as well as BY-PRODUCTS AND various APPLICATIONS OF COAL.

Different types of coal have different uses viz.:

- Steam coal - mainly used in power generation.
- Coking coal - mainly used in steel production.
- Other NB users = alumina refineries, paper manufacturers, chemical & pharmaceutical industries.
- Several chemical products produced from by-products of coal.
- Refined coal tar is used in the manufacture of chemicals
- Ammonia gas used to manufacture ammonia salts, nitric acid and agricultural fertilisers.
- 1000’s products have coal or coal by-products as components: soap, aspirins, solvents, dyes, plastics and fibres, such as rayon and nylon.
- Coal also an essential ingredient in production toothpastes of specialist products:
  - Activated carbon - used in filters for water and air purification plus kidney dialysis machines.
  - Carbon fibre - reinforcement material used in construction, mountain bikes and tennis rackets.
  - Silicon metal - used to produce silicones and silanes, which are in turn used to make lubricants, water repellents, resins, cosmetics, hair shampoos and toothpastes.
THE DANGERS OF TECHNOLOGY RIVALRY

• Technology rivalry is a thorn in the energy supply “flesh” which confuses greed with honest efforts towards clean coal technology.

• Debate usually marred by technology rivalry and in many instances camouflages real issues that are supposed to be debated.
CURRENT EFFORTS ON CLEANER COAL PROGRAMMES

• What R&D programmes are there on cleaner coal locally and globally?

• R&D efforts on cleaner coal a reality hardly given prominence and consideration – reference on UCG CCUS and nano technology

• Carbon capture, use and storage (CCUS) is an integrated suite of technologies that can capture up to 90% of the CO$_2$ emissions produced from the use of fossil fuels in electricity generation and industrial processes, preventing the CO$_2$ from entering the atmosphere. – World Coal Association
CURRENT EFFORTS ON CLEANER COAL PROGRAMMES

• What role is played by:

✓ Government

✓ The business community

✓ Organised civil society
CURRENT EFFORTS ON CLEANER COAL PROGRAMMES

• What progress has been made in such efforts?

• Carbon Capture, Use and Storage technology will be key to reducing global CO2 emissions, not only from coal, but also natural gas and industrial sources. – World Coal Association
CURRENT EFFORTS ON CLEANER COAL PROGRAMMES

KEY POINTS ON WCA PLATFORM FOR ACCELERATING COAL EFFICIENCY

• In the lead-up to COP21 in Paris there is no evidence to suggest that mitigation action arising from any climate treaty will come close to achieving emissions reductions necessary to limit atmospheric concentration of CO$_2$ to 450ppm.

• As developing and developed economies grow and urbanisation increases, demand is growing for affordable, reliable and secure forms of energy in order to combat energy poverty and ensure competitive economies.
CURRENT EFFORTS ON CLEANER COAL PROGRAMMES

KEY POINTS ON WCA PLATFORM FOR ACCELERATING COAL EFFICIENCY

• This has meant that coal remains the world's fastest growing fossil fuel. Its current contribution to global primary energy consumption (30.1%) is its highest since 1970. In Southeast Asia alone demand is expected to grow by 4.8% a year through to 2035 as the region turns to coal to fuel its growing energy needs.

• There appears to be no concerted international government action to integrate the global priorities of reducing energy poverty and supporting economic competitiveness through affordable energy with global ambitions on climate change.
CURRENT EFFORTS ON CLEANER COAL PROGRAMMES

KEY POINTS ON WCA PLATFORM FOR ACCELERATING COAL EFFICIENCY

• Moving the current average global efficiency rate of coal-fired power plants from 33% to 40% by deploying more advanced off-the-shelf technology could cut 2 gigatonnes of CO2 emissions now, while allowing affordable energy for economic development and poverty reduction.

• Deploying high efficiency, low emission (HELE) coal-fired power plants is a key first step along a pathway to near-zero emissions from coal with carbon capture, use and storage (CCUS).
CURRENT EFFORTS ON CLEANER COAL PROGRAMMES

KEY POINTS ON WCA PLATFORM FOR ACCELERATING COAL EFFICIENCY

• There should be coordinated global action to support developing and emerging economies already choosing to use coal to do so with the lowest possible emissions profile.

• To that end the WCA proposes a global Platform for Accelerating Coal Efficiency.
THE DILEMMA OF THE CARBON TAX

• Under basic economic theory, the pricing mechanism associated with a carbon tax will cause firms to internalise the environmental and social costs of emissions, and, as a result, firms will shift towards the use of low-carbon and more energy-efficient technologies in order to mitigate these costs.

• According to the Carbon Tax Policy Paper (2013), in the South African context, "a carbon tax is more appropriate than a cap-and-trade scheme (ETS) because of the oligopolistic nature of the energy sector", where an ETS would "need a sufficient number of entities participating in the scheme, as well as adequate trading volumes in order to generate an appropriate carbon price" (Carbon Tax Policy Paper, 2013).

• IS THIS THE ONLY VAILABLE SOLUTION?
THE CLIMATE CHANGE DILEMMA: Outcome of COP 21

The Paris Agreement and the accompanying COP decision:

1. Reaffirm the goal of limiting global temperature increase well below 2 degrees Celsius, while urging efforts to limit the increase to 1.5 degrees;

2. Establish binding commitments by all parties to make “nationally determined contributions” (NDCs), and to pursue domestic measures aimed at achieving them;

3. Commit all countries to report regularly on their emissions and “progress made in implementing and achieving” their NDCs, and to undergo international review;

4. Commit all countries to submit new NDCs every five years, with the clear expectation that they will “represent a progression” beyond previous ones;
THE CLIMATE CHANGE DILEMMA: Outcome of COP 21

The Paris Agreement and the accompanying COP decision:

• Reaffirm the binding obligations of developed countries under the UNFCCC to support the efforts of developing countries, while for the first time encouraging voluntary contributions by developing countries too;

• Extend the current goal of mobilizing $100 billion a year in support by 2020 through 2025, with a new, higher goal to be set for the period after 2025;

• Extend a mechanism to address “loss and damage” resulting from climate change, which explicitly will not “involve or provide a basis for any liability or compensation;”

• Require parties engaging in international emissions trading to avoid “double counting;” and

• Call for a new mechanism, similar to the Clean Development Mechanism under the Kyoto Protocol, enabling emission reductions in one country to be counted toward another country’s NDC.
THE CLIMATE CHANGE DILEMMA: Outcome of COP 21

• What is not said nor made public about the climate change dilemma - the disputed changes in climate change.

• The IEA has estimated that CCUS could deliver 14% of cumulative GHG emissions cuts through to 2050 and that climate change action will cost an additional US$4.7 trillion without CCUS"
PROS AND CONS OF POWER TECHNOLOGIES

• Is there any technology that has not been expensive at its initial and nascent stages? How is cost of power production calculated – at the power production including or excluding the value chain?

• In the context of projections and predictions into the future one of the interesting issues is the underplaying of serious attempts to have cleaner coal power generation.

• Is it realistic or a pipe dream that science, engineering and technology can provide solutions to “dirty” energy such as coal?

• The continuation or the contrary thereof in coal-based power generation is more political than economic given the imperative of developing the country with what the country has been endowed with.
CONCLUSION

• Visible acknowledgement of R&D on clean coal

• Is there no relation between journey to low-carbon economy and R&D programmes on clean coal?

• Efforts to invest on R&D - a fallacy or productive?

• Would the label of “dirty energy” extend to “dirty applications”? 
CONCLUSION

• The journey towards a low-carbon economy through NDP

• The duty and obligation and right to influence politics around coal-based power generation is not a preserve or an exclusive for political practitioners and therefore coal industry captains have to ensure their rightful place to participate in the debate but also be noble to subject themselves to criticism which must be fair nevertheless.

• Profit-driven motives without due regard to the environment considerations and development imperatives is not self-defeating but counter-productive.
CONCLUSION

• In other words inward-looking practices instead of taking the debate to the public is rather a limitation

• Whilst lobbying may one route what is fundamental is a genuine public discourse on the matter notwithstanding entrenched interests that always muddle the public debate.

• Provision of quality leadership in such a sensitive and mostly controversial topic is more essential than ever before! e.g. **Why not openly engage with denialists regularly?**

• Public discourse on coal must be for real and must be void of entrenched interests

• Rather than dismissing coal - cooperation on clean coal campaign efforts area a better option.
“In this century climate change has become a dominant political issue and central to the future of energy.”
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