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The Governance of Clean Energy Development: a Case Study of Botswana and its Stakeholders

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Tony Colman

Abstract

Botswana sits within interlocking circles of international, regional and national governance. It has not moved to a clean energy transition but faces complex energy decisions. This paper identifies the key decision makers and the views of Botswanan actors in the context of potential future energy shortages. Their view is that electricity availability for all should be the key goal for Botswana and that, as a non-Annex 1 country, utilisation of indigenous coal resources and building new coal fired power stations will be necessary. They see the hypocrisy of Annex 1 countries asking a country like Botswana to depend on low performance Renewable Energy Technologies, while not moving themselves to dependence on clean energy. The article provides an adjunct to the arguments for a new approach to the UNFCC negotiations as suggested by the Hartwell report (Prins et al. 2010) with the 'responsible use of coal' as part of a low carbon growth trajectory

Key words: Botswana, Renewable Energy, Coal, Governance.

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Abbreviations and acronyms

AfDB	African Development Bank
BIDPA	Botswana Institute of Development Policy Analysis
BMC	Botswana Meteorological Service
BNCCC	Botswana National Committee on Climate Change
BOCONGO	Botswana Council of Non-Governmental Organisations
BPC	Botswana Power Corporation
CCS	Carbon Capture and Storage
CDM	Clean Development Mechanism
CEF	Central Energy Fund of South Africa
CET	Clean Energy Technology
COP	Conference of the Parties
CSO	Civil Society Organisation
CSP	Concentrated Solar Power
CSRSE	University of Botswana Centre for the Study of Renewable and Sustainable Energy
CTL	Coal to Liquid operations
DANIDA	Danish International Development Agency
DBSA	Development Bank of South Africa
DNA	Designated National Authority
EBSST	Electricity Basic Services Support Tariff
EDF	European Development Fund
ESIA	Environmental and Social Impact Assessment
ESKOM	Electricity Supply Commission of South Africa
ESOU	Energy Sector Operational Units
FIT	Feed-In Tariff
G77	Grouping of Developing countries
GEF	Global Environment Facility
GHG	Greenhouse gas
GOB	Government of Botswana
GTDC	Generation/Transmission/Distribution Companies
IDC	Industrial Development Corporation
IEA	International Energy Agency
IFI	International Financial Institution
IPCC	UN Intergovernmental Panel on Climate Change
MEWT	Botswana Ministry of Environment, Wildlife & Tourism
MMEWR	Botswana Ministry of Minerals, Energy and Water Resources
MTI	Botswana Ministry of Trade and Industry
NA	Botswana National Assembly
NAMA	Nationally Appropriate Mitigation Actions
NCCC	South African National Climate Change Committee
NERSA	National Electricity Regulator of South Africa
ODA	Overseas Development Assistance
RE	Renewable Energy
REFIT	Renewable Energy Feed in Tariff
RET	Renewable Energy Technology
SA	South Africa
SACU	South Africa Customs Union
SADC	Southern African Development Community
SAPP	Southern Africa Power Pool
SAPSN	Southern African Peoples Solidarity Network
TNA	Technology Needs Assessment
UB	University of Botswana
UNCED	United Nations Conference on Environment and Development
UNCSD	United Nations Commission on Sustainable development
UNFCCC	United Nations Framework Convention on Climate Change
UNWSSD	United Nations World Summit on Sustainable Development
WB	World Bank

Introduction

> *Botswana's carbon emissions per capita are higher than that of Africa, and even Latin America; Botswana emits 2.44 tonnes of carbon dioxide per capita, which is much higher than the emissions of the rest of Africa which stands at 0.91 tonnes per capita. Latin America emits 2.14 tonnes per capita*
> David Lesolle, Botswana Chief Meteorologist (Mmegi, 14 July 2008)

Botswana is a lower middle income African country, currently having to choose the basis of its future electricity production owing to the inability of Eskom, the South African parastatal electricity supplier, to continue to supply 75 % of Botswana's needs, with a cut off in 2013. Botswana needs to establish security of supply and faces the choice of the continuation of the coal-fired production of energy of the past, which has given Botswana very high CO_2 emissions per capita, or embrace a clean energy transition. It is this choice, which this paper explores and in doing so examines the barriers and opportunities for clean energy development in Botswana from a governance perspective.

Botswana is the size of France but supports a population of only 2 million people, and has experienced very fast economic expansion over the last 40 years, based on the use of income from diamond production (Mule 2001). As a landlocked country under the Treaty of Almaty (2003), Botswana is seen as having special dispensation to use fossil fuels to ensure development and it has very large coal reserves. Access to grid-based energy was limited to 15% of the population in 1999 but the target is for 90% access by 2018 (Republic of Botswana 2000). There are clear statements on renewable energy and a national photo-voltaic (PV) rural electrification programme (Similane 2005). Fast growing biomass dominates the renewable sector, particularly in rural areas, whilst solar energy only constitutes 0.3% of energy production (Fagbenle 2001). Challenges to the development of clean energy generation abound, and include technical, social, economic, educational and training.

Botswana has an excellent education and health service, available to all citizens. It has paved roads to major destinations and good secondary roads. It has had 40 years of independence, but has not yet committed itself to a universal right of access to energy, similar to that committed to by the African National Congress (ANC) party in South Africa (SA). Are the frameworks for a clean energy regime change elsewhere in the world relevant to Botswana? Does a 'developmental' state, where the state has successfully guided macro-economic policy, such as Botswana, have different governance frameworks from 'developing' states (Leftwich 1995)? Do fossil fuel rich developing countries, such as Botswana with coal, or Nigeria with oil and gas supplies, need different climate change financial support regimes to leave the fossil fuels in the ground? Is Botswana's decision making process on energy choices relevant to the decisions being made now on energy policy for newly discovered oil producers such as Ghana and Uganda?

The widespread provision of clean energy to all in Botswana, whether on or off grid, has so far not taken place, despite the widespread perception that it is the one state in the Southern Africa Development Community (SADC) region where state intervention has brought about a 'developmental orientation' (Leftwich 1995). But does Botswana have the 'concentrated sufficient power, autonomy and capacity at the centre to shape pursue and encourage the achievement of explicit developmental objectives' (ibid) to support the concept of clean energy, and if so to remove the barriers and exploit the opportunities?

Botswana at independence in 1966 had very little formal, non-biomass energy provision and was one of the poorest states in Africa, with almost no state provision in infrastructure, health care or education. Thus, Botswana was a blank canvas upon which the framework for clean energy could then be painted. Given the success of Botswana in largely achieving the Millennium Development Goals (MDGs) (UNDP 2009), why was the provision of energy left behind? Is it in part a response to the lack of a MDG to achieve an energy standard (clean or otherwise) for all its citizens? Or is it a product of pressure from the industrial base and urban political elite to maintain the existing energy framework?

The drive to privatise the electricity industry in developing countries (Jamasb 2006, Zhang et al 2008) has not succeeded in Botswana. This means that in Botswana, unlike in most developed countries, the State is in the driving seat for any energy transition.

The forecasted fall in global electricity consumption of 3.5% in 2009-11 (International Energy Agency 2009) and of over 10% in Botswana due to global economic recession gives a breathing space for a transition. At the Copenhagen Conference of Parties in November 2009 the commitment is to a $100bn climate fund per year by 2020 could lead to such a transition.

Overall the framework is not that of simply the 'Ensuring State', which concentrates on the role of national governments (Giddens 2009). In the case of Botswana, as a small, middle income, neo-liberal Southern African state, any clean energy transition relies upon changes possible from the network hierarchies and partnerships with which Botswana is involved (Bäckstrand 2007). This study explores this network of actors.

The paper is based on a review of the literature and 34 interviews focussing on clean energy transitions in Botswana and the roles of International and Southern African actors and decision makers and key stakeholder groups and individuals within Botswana.

The political economy of clean energy regimes internationally and the impact of their failures on Botswana: Global governance

The 2002 UN World Summit on Sustainable Development (UNWSSD) saw the battle to include targets for clean energy (10%) in the final statement and thus in the Millennium Development Goals (MDG) but this battle was lost due the opposition of SA, then host, leading for the G77 and thus for Botswana (UNCSSD 2002). In the review of Botswana's progress in achieving the MDGs (Republic of Botswana 2004), access to energy, let alone clean energy, was not among the targets reported on in review of MDG 7 on the Environment.

The United Nations Intergovernmental Panel on Climate Change (IPCC) Conference of the Parties (COP) meeting in Copenhagen in December 2009 failed to negotiate a successor to the Kyoto protocol of 1997. The transfer of resources to developing countries for GHGE reductions, including clean energy, appears to still to be under the processes of the Clean Development Mechanism (CDM). However, this is seen to be dominated by a politically driven executive board which is partial in its regional decisions (Flues 2008), and Botswana has not been able to move forward with its own CDM projects.

The Botswana Designated National Authority (DNA) based in the Ministry of the Environment, Wildlife and Tourism (MEWT) is the Botswana interlocutor with the IPCC

and reviews the process on CDM in Botswana (Magang 2001). Its specialist, David Lesolle (2008), points out that

> *most African DNAs had imagined that the CDM world would take the form of a governmental process…. very formal and easy to follow: what actually emerged was a CDM that was very difficult to follow, with lots of players all vying for the different products delivered by CDM, certified emission reductions (CERs) (….) and, a number of funding windows. African countries further had not registered the emission reducing activities that African enterprises had already undertaken, and therefore, as these projects were not registered with DNAs, there was no baseline developed. So, African countries, including Botswana, lost out on the opportunities that CDM was supposed to bring.*

The Nairobi Framework of 2006 (COP 12), negotiated in part by Botswana, attempted to rectify the situation, but it is still the situation that of a total of 47 African parties to the Kyoto protocol, just 37 have DNAs and only 16 of these have projects, but there are currently no CDM approved projects in Botswana. On the 14th April 2008, the global community celebrated the 1000th CDM project but the African DNAs are sitting idle (Lesolle 2008).

At the WSSD in 2002, the Chinese Government supported the leadership of the host country SA in rejecting targets for renewable energy. Since that time, China has powered its growth through massive expansion of coal-fired and other fossil fuelled power stations, alongside significant deployment of renewable energy technologies. The China-Africa Partnership Forum, which commenced in 2002 and continues on a biannual basis, has formed a key mechanism for influencing Africa in standing up to its traditional partners in the West. Botswana's participation in the Beijing Chinese-Africa forum of 2008, led by President Festus Mogae resulted in the establishment of major links for both the power and industrial strategies of the two countries. The success of China, in avoiding the worst aspects of a global recession and continuing its expansion through 2009/10, has provided both an alternative exemplar for African development and G77 leadership in the UNFCCC negotiations. As this paper points out later, Chinese loans to Botswana appear to be an important financing mechanism available for the new coal fired power stations.

'The other inconvenient truth' (Wheeler and Ummel 2007) is that even if all Annex 1 countries moved to zero GHG emissions overnight, the existing expansion in developing countries would move to a climate change 'tipping point' of 2 degrees by 2025. There is an 'imperative' that all new energy must be clean energy even for Botswana (Wheeler 2008). 'All countries must make the clean energy transition together' (Ibid). All the international actors have, to date, failed to understand that all countries need to commit to climate change mitigation and the eradication of poverty (Winkler et al 2006). Any clean energy transition is subject to that condition.

However, to date Botswana has largely stayed out of playing an active part in international negotiations; it has not led on clean energy. Is the SADC where Botswana has dealt with the issues of clean energy?

SADC and Regional governance mechanisms for a clean energy transition

The fourteen, continent-based SADC countries contain 200 million people and about one third of the population of Sub Saharan African (SSA) countries seriously affected by conflict and high levels of poverty. South Africa's GDP of US $150 billion is three times that of the other thirteen SADC member countries put together (DFID 2002). Member states' contributions from 2003 are based on a GDP related formula, which has enhanced the economic position of South Africa and from that, its political hegemony, in particular over landlocked countries with contiguous borders such as Botswana.

Botswana led the struggle against Apartheid as the 'front line state', surrounded from all sides except the north by South African forces. Thus, after the end of Apartheid, the headquarters of SADC was agreed to be in Gaborone. Economically, South Africa dominated SADC and there was concern at the dominance of the neo-liberal paradigm in a post-apartheid South Africa. It was felt it should be countered by an African organisation of States and markets that would enable States to intervene to guide market forces so as to constructively transform the region and use its energy as prerequisites for a balanced and mutually beneficial development (Tsie 1996). SADC is seen as the key driver for the regional governance of energy policies (McGowan 2009).

The legal structure of SADC does not compel members to enact the necessary legislation at a national level to enable SADC to implement interstate projects (Tsie 1996). The loose nature of the treaty means that the implementation of SADC decisions may not be guaranteed as the SADC countries have retained their sovereignty and decision-making functions under the treaty. Therefore there is little obligation on their part to enact supporting and/or implementing measures at the national level. Decision-making is by consensus, which effectively means that within SADC, national governments have reserved their position. The focus, therefore, has largely been on regional cooperation rather than a limitation of national sovereignty (ibid). Unlike the European Union (EU) Emission Trading System (ETS), the SADC Council of Ministers did not propose any form of a SADC ETS at the Ministerial Task Force on Energy when they met in February 2009.

However the Southern African Climate Change Summit of March 2009 did receive a South African proposal to set a Carbon Market price for an ETS and encourage the generation of CDM credits. The Summit envisaged a levelling off of GHG between 2020 and 2025, followed by a decline. However, there appears to be a disconnect between this policy and the Eskom plans for three new coal fired power stations in South Africa (Reddy 2009). There are very real inconsistencies between these two SA positions.

The issues of energy are dealt with under the SADC Energy Protocol, which came into force in 1998. It seeks to improve economic efficiency through the utilisation of least cost energy suppliers across the region (SADC Energy Sector Thematic Group 2008). There is no requirement for either a minimum level of renewable energy or any definition of clean energy. There is also no commitment to provide universal access to energy, clean or otherwise, except in SA. There have been no sustainable incentive or subsidy schemes to encourage large scale grid connected renewable energy-based electricity systems. Renewable Energy Technologies (RET) would have to compete for a share, based on energy costs, which do not include any externalities (EC 1999). In March 2009, the South African Government announced its intention to bring in Feed in Tariffs (FIT) for RETs, and this may spread as a policy across SADC.

There are no regionally acceptable standards for hardware systems and components, which restricts interregional trade in RETs. Regulation is left to national Ministries that control the national parastatal power supplier. The one exception is South Africa where, despite a monopoly power provider in Eskom, there is a National Energy Regulator (NER) which has laid down a clean energy programme with a FIT, which can be openly debated by that country's strong civil society (Zipplies 2008).

In 2008, the SADC Parliamentary Forum concluded that regional governments had not only neglected power generating plants but had also ignored electricity generation and supply. The Southern African Peoples Solidarity Network (SAPSN) met in August 2008 in Gauteng to lobby the governments of SADC that were meeting concurrently. However SAPSN has no formal SADC role as consultative stakeholder.

The electricity sector of SADC is dominated by parastatal monopolistic utilities. In the past, they have provided little information and encouraged misconceptions about the potential for RETs, particularly PV for rural electrification**,** and this has had a dampening effect on market development (European Commission 1999). Eskom of South Africa is wholly state-owned and produces 98% of the electricity used in South Africa of which 85% is from fossil fuels and 5% nuclear. It has been the main provider of energy to the Southern Africa Power Pool (SAPP) and thus Botswana. But to finance investment in clean and unclean energy it will have to increase tariffs by 80%, if finance is not provided by loans or by equity injections from the government. An additional three nuclear power stations are to open by 2018 (Guardian Weekly 31 July2009). In addition, there is the Central Energy Fund (CEF) that was set up in 2003 as a South African owned parastatal to work on oil, gas and other energy sources for South Africa primarily but also perceiving itself as having a SADC role in RET. The Industrial Development Corporation (IDC) and Development Bank of South Africa (DBSA), both South African parastatals, have a mandate covering the SADC region. In 2009, the IDC of South Africa received a US $50 million loan from China Construction Bank (CCB).

The SAPP is organised on behalf of SADC power parastatals by the SAPP Coordination Centre in Harare, Zimbabwe (Figure 1, SAPP 2009). A saving of $100 million (1999) has been estimated should there be optimal distribution across the 12 mainland countries by minimizing costs from increasing the use of the existing hydropower facilities in the Democratic Republic of Congo (DRC), Zambia and Mozambique and reducing fuel costs primarily in South Africa (Bowen et al. 1999), allowing an immediate clean energy transition. However, the SAPP analysis of potential sources of power across SADC (Sparrow & Masters 1996) did not envisage renewable energies beyond hydropower, ignoring the potential for a major concentrated solar power (CSP) station in Botswana (Ketlogetswe 2007) that could use the SAPP interconnectors to supply clean power. SAPP enables Botswana to currently import 70% of its energy needs, and would allow exports from Botswana to SADC and particularly to South Africa.

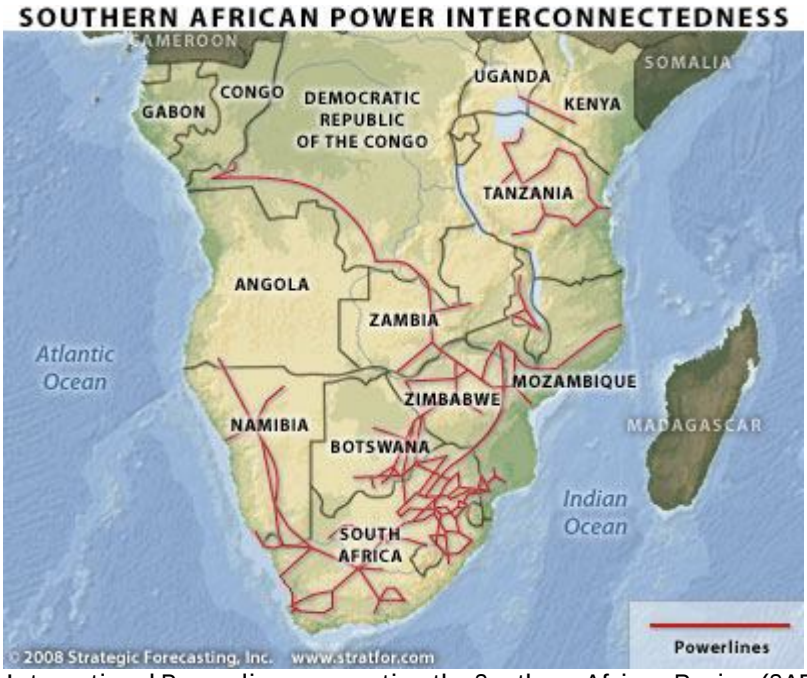

Figure 1. International Power lines connecting the Southern African Region (SADC 2008)

All the SADC countries have chronic need for outside finance to develop their power needs. The World Bank (WB) does not have a SADC policy or office, preferring to work

with individual governments. Funding for grid based power stations was envisaged to be led by International Finance Institutions (IFIs) following privatisation (International Finance Corporation 2000). To date, few African countries have moved on this and private power is still a nascent idea in the region (Zhang et al 2008). Private equity clean energy funds are starting up including Evolution One Fund (with a SA R 100M contribution from the African Development Bank and Inspired Evolution (SA R 400 million) primarily concentrating on South Africa (figures as of July 2009)

Donors to SADC have been hesitant to support a regional strategy (Tjonneland 2006, 2008). However, an EU-funded investigation into renewable energy in SADC (European Commission 1999) was extremely positive on the potential for full-scale implementation of the South African off-grid rural electrification programme by 2001, positioning SADC as 'one of the top photovoltaic markets of the globe' (ibid). However, no SADC country acted on the recommendations. The worldwide Renewable Energy and Energy Efficiency Partnership (REEEP) was set up primarily by the UK Government after UN WSSD and is based in Vienna alongside UNIDO. REEEP-SA (mainly funded by Finland) is based in Sandton, South Africa, and seeks to coordinate SADC country RET planning and implementation, but is dominated by its South African host and delivers only small-scale RETs (Sekabe 2009). It produces a biannual report on each SADC country, the most recent on Botswana in 2009 (REEP 2009).

The regional space of SADC beyond the convenience of SAPP has not helped influence a clean energy transition in Botswana. Rather, the easy availability of coal-fired electricity from Eskom SA has, until the withdrawal of this from 2006, muted the appetite for change.

Botswana governance mechanisms for a clean energy transition

There is a significant body of literature proposing that Botswana has succeeded as a developmental state because of 'good' institutions and good policy decisions (Solowame 2001; Taylor and Mbabazi 2005; Kiiza 2007). There is a further proposal that its success is due to the combination of developmentalist ideology and institutionalized developmental nationalism (Kiiza 2007). However as a result of its success as a lower Middle Income Country, Botswana is given very little Overseas Development Assistance (ODA) for clean energy transitions and is dependent on multilateral funding through the Global Environment Facility (GEF). This work is carried out by UN Development Programme (UNDP) working largely in the rural areas on wood/biomass energy resources and the introduction of RET to deliver cleaner energy to the majority of off-grid Batswana consumers (UNDP 2009).

It is perceived by civil society representatives that Botswana has an energy policy prioritising the mining industry; this has led to a growth miracle but not yet modern economic growth (Hillborn 2008). Debswana, a joint venture between the Botswana Government and De Beers PLC, which employs less than 4% of the adult Batswanan workforce, has delivered export earnings and government tax income to Botswana. Informed sources note that there have no moves by the Mining Industry to encourage clean energy either in their own small power stations in their mines or from the Botswana National Grid. Could there be a small group of Batswana actors, influenced by outside stakeholders who are holding back a clean energy transition in Botswana?

The political system is that of a parliamentary democracy. Legislative powers belong to the National Assembly working with the President. In addition, there is a House of Chiefs consisting of 15 members to advise on matters affecting custom and tradition. Botswana is regarded by many as a model of African democracy and the rule of law

(Kaunda 2008). Information on government policy is disseminated to communities during open hearings or 'Kgotla' meetings where the public may comment (Masire 2006).

Good and Taylor (2007) suggests that Botswana's much celebrated democracy is actually characterised by an immensely powerful President, unelected by the people and who does not need to consult anyone in making decisions. The president appoints everyone of any importance. The president does engage in Kgotla meetings with the people on a regular basis. President Ian Khama is Paramount Chief of the Bamangwato (Good and Taylor 2008). The picture is further painted of "an emasculated parliament" (Mogalakwe 2008) dominated by the executive (Good and Taylor 2007). However, the very lively hard fought elections of October 2009 led to a full democratic presidential mandate for Ian Khama. The subsequent defections from the winning party in the National Assembly have led in 2010 to a vocal opposition.

Botswana is lauded (along with Mauritius) as the only country having the capacity and effectiveness to run its economic and political affairs (Mule 2001). Botswana is rated as one of the best governed countries in Africa by the World Bank and the Ibrahim Foundation (Fosu et al 2006). However, according to Good and Taylor (2008), the civil service has tended to dictate policymaking, with civil servants becoming politicians and President, as with former President Mogae. The decisions on energy policy are split between two ministries: namely the Ministry of Minerals, Energy and Water (MMEWR) and the Ministry of the Environment, Wildlife and Tourism (MEWT)_and within it the Department of Meteorological Services. MMEWR are responsible for national energy policy. The then Permanent secretary Kago Moshashane committed MMEWR to the expansion of solar energy in areas "where it is difficult or too expensive to extend the national grid". He said Botswana has ''limited energy resources, but is blessed with abundant sunshine for most of the year'' (Mmegi 29 August 2007). But in 2009, energy security came to the fore, and at the signing of the Chinese financing deal for Morupule coal-fired expansion, he said 'this country and its economy needs power now as a matter of urgency' (Mmegi 16 June 2009). The Ministry, until 2009, set tariffs and policies on clean energy for the monopoly power provider, Botswana Power Corporation (BPC). Under 1% of Botswana's power comes from RETs (REEEP 2009). Interdependent Power Producers (IPP) have been encouraged since 2008 and are regulated in all their activities by the Ministry, including the obtaining of environmental approvals (REEEP 2009). The new independent energy regulator has not yet reported on its policies.

The Initial National Communication to UNFCCC produced by MEWT was very positive about the potential for Botswana to have a clean energy transition with low increases in GHGE and in a country with over half of the population dependent on biomass, that there was no net loss of biomass (Magang 2001). But MEWT has no energy proposal powers, despite leading on negotiations at the COP meetings (REEEP 2009).

Initiating power lies with the office of the President. Current and past Presidents are revered. President Masire (1988-98) architect of Vision 2016 (Masire 2006; Republic of Botswana 1996) advocated sustainable economic growth and development. However, despite being written in the year of the Kyoto protocol, Vision 2016 does not envision a clean energy transition for Botswana. The most recent past President is Festus Mogae 1998-2008, appointed one of only five UN Climate Change Envoys in 2009. It remains to be seen the extent to which he will be willing to use his position to remove the barriers within Botswana to establish the path to clean energy.

Botswana culture emphasises the roles of the Tribal chiefs, and their need to consult on "all important matters before a general assembly (Kgotla) of the men" (Schapera 1971:

24). Traditional Kgotlas agreement continues to be important for any clean energy transition to ensure that traditional forms of leadership are engaged in the debate.

In Botswana CSO representatives stated that civil society is weak. The Botswana Council of Non-Governmental Organisations (BOCONGO), the umbrella organisation for the NGOs, depends on donor funding, but over the years, many donor agencies have been pulling out as they regard Botswana as a middle-income country. This 'has resulted in some local NGOs closing due to lack of funding' (Mmegi 20 June 2008). It has been said that Botswana has a moribund civil society (Good and Taylor 2008; Good 2009) and where NGOs do exist, 'they are neo-governmental organizations, merely extensions of the state' (Good 2009). None of the environmental civil society organisation (CSOs) are campaigning for a clean energy transition.

A significant proportion of urban households have, according to BPC, been connected to the grid with a jump from 10% of the population to potentially 65% by 2009 (Botswana Power Corporation 2009). However, there is still a problem in the cost of connection to the grid, which has meant that only 40% (not 65%) of the population is in fact connected with 25% not able to afford the cost and still dependant in urban areas on biomass (Ibid). Thus in many urban areas, biomass collection for fuel remains an integral part of life and in rural areas the norm. Dependence on biomass, which in 2001 was seen to be in large surplus (Republic of Botswana 2001), could now be inappropriate given current levels of rural consumption (Paradzayi and Annegarn 2008), and the fact that certain 'desired species of biomass have been over harvested' (Howells et al. 2009).

The large scale purchasers of power have been the mining companies but they have not moved themselves to the production of clean energy. Debswana produces its own coal fired power needs at Palapye and sells its excess to BPC. The Mines' employees receive no help for the installation of RET. Tourism has produced little investment in clean power which is not seen as a significant factor in sustainable tourism. Farmers bring pressure to bear to extend on-grid BPC services, but none to develop clean energy solutions such as those used in the horticulture industry elsewhere in SADC / Common Market for Eastern and Southern Africa (COMESA). There have been no moves to reduce cattle emissions but there are proposals for a CER-based energy project around abattoir slurry (Zhou 2008).

Building regulations in Botswana have not encouraged clean energy technologies in either government or private contracts (Kiravu et al 2006). New Shopping centres have not incorporated the latest technology, primarily through inertia. New building regulations, using international best practice research funded by DANIDA in 2007, could emerge by 2011. Solar water heaters (Ketlogetswe and Mothudi 2009) are being installed by the Botswana Housing Department in the construction of new houses (Sekabe 2009).

From a burst of academic studies on clean energy between 2000 and 2002 has come the setting up by the University of Botswana of a Centre for the Study of Renewable and Sustainable Energy (CSRSE) (Kiravu 2008), consistent with a national agenda on renewable energy for continued economic development. The CSRSE seeks to inform and influence energy policy makers and energy providers and stakeholders on sustainability of renewable energy technologies in Botswana (Mmegi 6 March 2008). Two Batswana academics, Dr Opha Pauline Dube and Dr Peter Zhou, received International Nobel Prize certificates in 2007 in recognition of their work with the IPCC.

Despite a lively local press, informants suggest that there appears to be little discussion of a Botswana clean energy policy in the media. It is suggested that there is a 'void in environmental journalism', as 'most of the readership is still struggling with issues of governance, civil issues, food security and development', and that 'the environment is relegated almost to the last priority level' (Lesolle 2008). Most levels of Media are state owned and there is controversy over the implications of the Media Practitioners Act (2008), which has potentially punitive measures for the breaching of an imposed media code of conduct. Thus there is concern from media representatives that a critique of current energy policy could be seen as unacceptable. The only non-English and non-indigenous language newspaper opening in 2009 is in Chinese reflecting the importance of Chinese investment and workforce to Botswana. In summary, the influences on decision making on clean energy are from the government and the elite elders. CSOs and the media are weak.

The government owned power operator, the Botswana Power Company (BPC), generates, transmits and distributes electricity in Botswana for the domestic, commercial and industrial use, with the mining industry the largest customer. BPC currently supplies 28% of the country's electricity needs through the existing 132MW coal-fired Morupule power station, which opened in 1998 and has a 600MW expansion planned for 2012 (African Development Bank 2008). Construction contracts were signed with a Chinese firm in November 2008. Carbon Capture and Storage (CCS) of CO_2 emissions has been discussed by government and private sector actors but not insisted upon (Stenbeck 2009). However the geological structures in Botswana' show promise' (World Bank 2009: 22) The remainder of Botswana's needs for electricity are imported from outside Botswana from the SAPP (Republic of Botswana 2008b). There are no minimum targets for the percentage of power to come from clean energy (Republic of Botswana a 2008).Until the Electricity Act 2008, IPP could not sell to BPC, and thus have access to the SAPP and potential sales both in and outside Botswana. This restriction again held up any non-BPC CDM projects and there were no BPC ones. BPC remains the monopoly transmitter and distributer of electricity. The main IPP actors are the Coal Investment Corporation (CIC) (with strong regional supporters), a subsidiary of Canadian Tau Capital, developers of the new US $3 billion Mmamabula 1200MW coal-fired station (Multilateral Investment Guarantee Agency 2008; World Bank 2007) contracted with Shanghai Electric to open in 2013 (Business Day 24 Mar 2009). A further subsidiary of Tau Capital, Saber Energy is proposing to develop coal-bed methane power (Mmegi 26 March 2009). Mawana Minerals based in Botswana, is partnering Aviva Corporation of Australia in developing the Mmamantswe coal-fired 2000MW power station. Further coal-bed methane development is going ahead with a local company Kalahari Energy partnering Tuten (Turkey) and Exxaro (South Africa) following success in a BPC tender for a 250 MW IPP station (Business Monitor 30 Mar 2009).

In the clean energy field in Botswana, there are rumoured to be up to 20 CDM orientated proposals (Stenbeck 2009). Power Tower Ltd, a 205MW solar driven wind turbine with a 950 metre high tower based on German technology, has had initial DNA approval since 2002(Ketlogetswe et al. 2007) Botswana International Financial Services Centre has hosted the Western Corridor (WESTCOR), the company set up by the regional power utilities to carry out detailed financial and administrative support services to the DRC Grand Inga power project. WESTCOR was terminated in March 2010 following the withdrawal of DRC interest in the project. However DRC informants state the position is under review. There are no plans for a Renewable Energy Feed-in Tariff (REFIT) to enable private RE sale to the BPC Grid, but government officials expressed interest in the concept. Potential funders of clean power are Russian venture capital funds, supporting the production of concentrated solar power (CSP) from Power Tower Ltd

but to use this RE power for the proposed Botswana-Namibia (NAMBOT) coal exporting railway. In July 2009, the Japanese Government agreed funding, in principle, with the Government of Botswana for a BPC 200MW concentrated solar power station and there are talks to firm up this commitment and widen it in the future. The potential for nuclear power comes from Letlhane useable uranium deposits of over 100,000 tonnes (Energy Business Review 26 Aug 2009). Wind is not a potential clean energy resource because of low wind speeds over Botswana.

Why is funding for coal fired stations possible in Botswana? The BPC Morupule extension of up to 600MW was subject to World Bank loan approval. This was obtained in February 2010 after considerable lobbying by the Botswana Government (World Bank 2009, 23). The WB loan for new SA Eskom coal-fired stations in the Spring 2010 meeting, went through despite the US, UK, Netherlands, Norway and Italian Governments among others abstaining on the vote (Creamer 2010, McCabe 2010: 7). The US Treasury issued a statement explaining their abstention, citing 'concerns about the climate impact of the project and its incompatibility with the World Bank's commitment to be a leader in climate change mitigation and adaptation' (McCabe 2010). It is assumed G77 members of the World Bank, including China, voted in favour. The position of the US relating to World Bank involvement in the new $100bn climate fund is now contested (Friedman 2010).

However, World Bank funding with full support of all members has not been ruled out for Botswana and there appears to a dual strategy by the World Bank in Botswana to support both a coal fired expansion and a 'low carbon trajectory' incorporating finance for renewables (World Bank 2009: 24). The Chinese Government are key funders of both Moropule and Mmamabula power stations(Peoples Republic of China 2009). In the latter case IFC funding is also being sought (ibid). Both stations are being built by Chinese companies, namely China National Electric Equipment Corporation and Shanghai Electric. In December 2009, the Government announced a short term strategy for an imported gas fired power station to bridge the 2011-13 gap.

There are 3 key documents which are important to understanding the discourse on a clean energy transition in Botswana.

i. **Botswana Vision 2016** (from 1997). This came from discussions between the retiring President Masire, and the incoming President Mogae. It emerged from a series of traditional 'Kgotla' or dialogues between traditional leaders, civil servants and politicians and then a series of country-wide meetings. The document talks of the need for the 'economic growth and development to be sustainable' and 'renewable resources (being) used at a rate that is in balance with their regeneration capacity'. It goes on to state that 'natural resources and assets of the country will be equitably distributed between its people, (...) and between present and future generations'. (Republic of Botswana 2004). Access to electricity as such is not included. No mention was made of the threat of climate change to Vision 2016, and it has not been mentioned in the three year Development Plans that have followed, to the latest for 2008-11.

ii. **Botswana's Initial Communication to the UNFCCC** (Republic of Botswana, 2001)**:** Botswana signed the Climate Change Convention in 1992 and ratified in 1994. In 1999, a DANIDA financed analysis was completed by Peter Zhou of the University of Botswana of a climate change strategy for Botswana and this formed the basis for the 2001 document (Zhou 1999).The Botswana National Committee on Climate Change (BNCCC) was chaired in 2001 by the head of the Department of Meteorological Services and the deputy chair from the Department of Mines, with membership

drawn from academics, civil society and civil servants (Magang 2001) The Communication's strong support for a clean energy future for Botswana was enthusiastically supported, while noting the constraints of 'technological, financial and human resource limitations' (Gwebu 2002). No representatives of the market/private sector were allowed access then but have been at subsequent meetings. The follow up document (Phage 2004) was a Technology Needs Assessment (TNA) carried out with the help of UNDP that identified and assessed environmentally sound technologies that could reduce the impact of GHG with national development objectives. These proposals do not appear to have been taken up. The BNCCC continues to sit on an ad hoc basis particularly in agreeing the country position ahead of each COP, with a membership still largely drawn from Government.

iii. **Botswana's Energy Plan 2006+:** Each year the MMEWR produces an Energy Plan largely based on forecasts on availability from Eskom and the SAPP. In 2006, Eskom gave notice for cutbacks of up to 100% by 2010 at the latest. Total Botswana demand is forecast to be 700MW by 2012 (SAPP 2005). As current capacity is 130 MW, there is a planned expansion to fill the gap by increased coal fired production of electricity, not to 700MW but nearly 3000 MW, much more than the needs of Botswana. However with a shortfall in Eskom generation for South Africa needs, an export rationale was seen through utilising Botswana coal reserves and the SAPP connections into the South African Grid. Each power station has to fulfil an Environment and Social Impact Assessment (ESIA) to the local community.

In the case of the Mmamantswe coal power plant, it is reported that the residents of the district said the advantages outweigh the disadvantages (BOPA 2009). The residents said the establishment of the power plant would open doors for them to escape from the bonds of poverty and were looking forward to the project as some of them could be employed and infrastructure might come their way. It was said that 'some of the power would be exported to South Africa' (BOPA 2009). The objectives of the ESIA were defined as supporting the goals of environmental protection and sustainable development, providing for the involvement of the public and predicting environmental, social and economic and cultural impacts of the proposed development (BOPA 2009). It is noticeable that the GHG Project Selection Mechanism (Phage 2004) does not appear to have been given the same treatment as the ESIA planning mechanism, and thus there has been no discussion of the Climate Change Impact on the coal plant expansion.

There is no Select Committee of the National Assembly to deal with clean energy and there has been no questioning of Ministers of either MEWT or MMEWR on these issues. A presentation of the draft energy plan was made to Botswana National Assembly (NA) in early July 2009. The energy affairs ministry has proposed, in addition to the expansion of the coal-fired electricity, a major expansion of biofuel production with a plant producing 50 million litres of bio diesel by 2016, utilising jatropha planted in the drylands (first proposed by Phage 2004). However in the Kgotla meetings across Botswana, concerns were aroused that this would compete with food crops, if grown in arable areas (BOPA 2009).

To summarise, electricity demand in Botswana is forecast to rise to 700MW by 2012 with current production at 130MW (SAPP 2009). The views of those interviewed in Botswana was for energy security, moving beyond its current 30% home grown electricity production, but primarily based on the 400 billion tonnes of coal reserves using an asset of Botswana in the national interest. The alternative of RET was seen as second best. Thus the expansion of Coal fired power stations the Moropule coal fired

station from 130 MW to 630 MW, Mmamabula coal-fired station (CCC Energy Company) with a capacity of 2000MW and Mmamantswe coal-fired power station initially 1000MW but able to double that level were broadly supported.

However, if these plans go ahead, Botswana will become one of the highest emitters of CO_2 per capita of any country in the world (Wheeler 2008). The alternative development of a clean energy security policy within Botswana, such as 7000 MW solar thermal power station (Hill 2007) located in the Kalahari Desert, has not been supported to date by World Bank or other funders (Wheeler 2008). The unofficial target for renewables in the power production mix is 30% by 2020, seen as being potentially achievable through the funding and technology promised from Japan for a 200MG CSP station. But official support for this approach appears weak. Despite the discovery of Uranium deposits, there are no proposals for civil nuclear power and none for dependence on out of country large hydropower from the DRC Inga 3 (due to go from 700MW to 1700 MW by 2012 with BHP-Billiton finance). Under 1% of Botswana's power coming from small scale rural PV RET, funded by UNDP and GEF, with BPC/private sector small and medium enterprise support.

Batswanan actors' views[1]

- **There is an energy crisis**: BPC, the monopoly provider of electricity in Botswana, took out full-page newspaper advertisements in June 2009 to explain the current crisis and to outline the actions they intend to take. There was criticism expressed that it had taken three years for the admittance of the crisis. The first Botswana Energy Efficiency Championship Award Ceremony (July 2009) was prefaced by a long public statement on the crisis from the Permanent Secretary, MMER. The 20% drop in GDP in Botswana in 2009 has eased the crisis in reducing public demand from both the private and has sectors. However at present the main effort being made from the energy suppliers and ministries relate to reducing energy demand further through energy efficiency. No mention of RET or clean energy expansion was made as a way to deal with the crisis.

- **There had to be a plan:** The Government had a draft plan in 2008, not discussed with the parliament, private sector or civil society (Republic of Botswana 2008a). The plan was for large coal fired power stations. The concept of a FIT in this emergency for citizens or small IPP to independently finance the missing power was completely new to both civil servants and to civil society. A stop gap imported gas fired power station was mooted (February 2010) to come online in 2012.

- **There should be energy self-sufficiency and security within Botswana:** There was a very high level of pride in this concept. However, there was concern that other than use of the coal reserves, other alternative bases had not been examined. The potential for nuclear power stations, producing clean energy elicited reactions that the Botswana people 'are not in the business of making bombs' but respondents did feel it was important to ensure that the use of the uranium reserves of Botswana, was not simply to export them, without some form of beneficiation or value added. The use of concentrated solar power (CSP) was understood but seen as having the drawback of "covering over the Kalahari" as well as there being lack of local expertise in the technology.

[1] The following section draws on 34 semi-structured interviews June and July 2009, with follow-up interviews in February 2010.

- **There should be a role for IPP:** There needs to be a new mindset of "facilitation by government" to enable this to take place. There was opposition to an attempt by the Government to take over private sector initiatives which was seen as nationalisation.

- **External energy sources are second best, even if cleaner:** Botswana should never again depend on external supplies of electricity. The increase in large hydropower from Cahora Bossa Dam in Mozambique from 80 MW to 140 MW availability (agreed July 2009) was accepted as a stop-gap only. The potential for the Grand Inga (DRC) large hydropower for Botswana electricity was regarded with suspicion, borne out by the decision of the DRC to withdraw from WESTCOR in 2010. Botswana depends on South African refineries for all their petroleum and diesel products and it was remembered that in the change-over to unleaded petrol, Botswana had gone without any motor fuels for over a week leading to the strangulation of the economy. Thus bio fuels with their use of near agricultural quality land were supported by civil servants (but queried by civil society and academics) as a first step to removing further fuel dependency on South Africa. Civil servants felt a 5% bio fuel in gasoline mix could be introduced within a short time.

- **Financing of options was the key constraint:** After 40 years of good financial governance and budget surpluses, Botswana ran a 12% plus budget deficit and suffered a 20% reduction in GDP in 2009. It has borrowed US$3.5 billion to shore up its finances (World Bank 2009). As a result, any energy plan is subject to external financing constraints and this has particularly driven the idea of supporting coal-fired stations, believing that they are easier to finance. There was real concern from all interviewees that the World Bank was loath to support Botswana in this. The recently disclosed Country Partnership Strategy shows that, within the Bank, Botswana had support for its strategy (World Bank 2009). The agreement in early 2010 by the WB was regarded as doing the right thing for an African country. The availability of finance from China, Russia and to a lesser extent from Australia was welcomed and seen as the way forward for IPP.

  Civil servants and local industrialists welcomed the offer of finance in late 2009 from the Japanese government for a 200MW CSP station. High-level panel meetings with Scandinavian and WB support that took place in July and November 2009 on renewable energy (Stenbeck 2009, WB 2009) opened a new scenario of potential support for CDM projects bringing Botswana into line with South Africa in tapping CDM/CER money.

- **SADC is not the key:** SAPP enables trading across countries and is the linchpin of the interest that IPP interviewees in Botswana have in supplying South Africa and potentially other SADC countries. But there has been little availability of finance or expertise for Botswana from SADC, beyond pooling of ideas. The big new projects are becoming fatally delayed. As with Botswana, clean energy and climate change responsibilities are held by the environment committee of SADC, and not the energy committee of SADC and this divided approach was seen as constraining SADC moves on a clean energy transition.

- **Issues over clean or dirty energy are not pre-eminent:** Vision 2016 was seen by all as the key to achieving true middle income status for Botswana in health, education and economic development. The issue of which type of energy should

drive forward change was of secondary consideration. The progress from 1997 to 2009 envisaged in the various National Development Plans has never taken account of concepts of clean or dirty energy or even the unavailability of energy.

- **There had been little or no discussion of climate change and global warming and its impact on the climate of Botswana:** Despite the 2001 first submission, and the second submission in August 2009, the impact of the forecasts coming from the UNFCCC, as far as Botswana is concerned, has been low. There has been almost no discussion in the media or in the schools. Civil society, unlike in South Africa, has been largely silent. The academic community has produced excellent work in providing details of the potential impact on Botswana but they are frustrated at the lack of action. However, many interviewees argued that Botswana should not take account of climate change as a non-Annex 1 country and should be allowed to have business as usual. Thus the discussions about barriers to clean energy are believed to be misleading. The real opportunity is to stay with unclean energy. Within the stakeholders in Botswana, there has been very little appreciation of the need to have a clean energy transition. Ultimately, if coal-fired stations are still going ahead in Europe without CCS, why should Botswana be criticised for doing the same? The position of the DNA for the UNFCCC in the MEWT at the Department of the Meteorology is further seen as distancing the discussion of climate change and clean energy from the mainstream, which exist around the Office of the President, the Ministry of Finance and Planning and the MMEW. Strong views emerged, that the DNA should be moved either to the Office of the President or should have its own Ministry.

- **No appreciation of the need for equivalency of on and off grid provision of energy:** Only 31% of the people of Botswana have access to grid energy (World Bank 2009: 9). The BPC (2009) believes the figure is 65% in the areas they supply. Even on this much more optimistic figure, 35% of the population spread across Botswana have to depend on either biomass or very basic RET. The latter powers a light bulb or TV but not an iron, kettle, computer or washing machine. Only if these uses could be available from RET would it be a substitute for on-grid provision (Meyer et al 2010).

- **Thus there is pressure for an on-grid provision for all people in Botswana**, even beyond the target of 90%, through the extension of the 100 village electrification project. There is a feeling that the state wishes to either leave the poor without modern powered conveniences or worse that it has no interest in providing them with the standard of living that the middle income countries would expect for all their citizens. Those interviewed believed there needed to be a major drive to ensure that the level of energy provision, provided off and on grid has an equivalency and that Botswana has access to money which is available from the forthcoming Mexico UNFCCC negotiations to build a major local renewable energy industry in Botswana, serving SADC.

- **No policy on free limited access for all to electricity:** despite the commitments of Vision 2016, and the many election manifestos, there has been any similar commitment to that of the ANC in South Africa since 2002. Of the 65% able to access grid electricity in BPC supplied areas, 20% cannot afford the connection fees. Free or heavily subsidised connection would lead to a big decrease in unsustainable harvesting of biomass in Batswana towns. However

some interviewees stated that Botswana was a very poor country and could not afford such a policy.

- **A policy for the share of renewable energies in the energy mix:** The Botswana Energy Plan could be the breakthrough to clean energy. When pressed, senior civil servants in response to questioning espoused a 30% target for renewable energy in the total energy mix. The discussions with the World bank over the 'responsible use of coal' also contain the Botswana commitment to a low carbon trajectory (World Bank 2009)

- **The Kgotla consensus mechanisms:** These are available as part of the heritage of Botswana but have so far not been used to discuss these issues. The firm leadership of the President was looked up to, and it was emphasised by one interviewee that 'Botswana is a conservative state, which moves slowly on these issues'. Neither the National Assembly nor any other non state actors have got involved in discussing these issues. The role of the former President Festus Mogae as a UN Climate Envoy was little known.

Conclusion

Botswana appears to be choosing to move from being a country with very low GHG to potentially one of the highest per capita GHG emitters in the world, based on a major expansion of carbon based energy. This transition would utilise South Africa's lack of energy capacity for supply beyond its borders, the very large coal reserves in Botswana and its position, leading up to the UNFCCC Cancun negotiations, as a country unconstrained in its CO_2 emissions. Geopolitically, the UNFCCC has little to offer Botswana beyond moral exhortation. Neither carbon markets nor effective CDM procedures have started to date. The Mexico Climate Conference needs to confront these inadequacies in global institutional regulatory and policy frameworks to help countries such as Botswana. The Hartwell Paper (Prins et al. 2010) discussions give a space for a discourse that goes beyond the simple condemnation of use of indigenous fossil fuels by an electricity poor country like Botswana. Is there an overriding human right to access electricity (Tully 2006)? The nuanced approach of the World Bank in Botswana (World Bank 2009) needs to be critiqued in its actions on the ground from its new (2010) office in Botswana.

The regional body SADC suffers from a lack of pooled sovereignty such as would be needed for Botswana to envisage dependence for energy and particularly clean energy from the Northern SADC countries. The lack of support for SADC institutions and SAPP infrastructure from aid agencies provides as a further constraint.

Botswana is almost unique as a non Annex 1 country, in that it has not yet exploited its large fossil fuel (in this case coal and coal bed methane) reserves. It sees no advantage in not exploiting them when the Annex 1 countries are doing the same (Carrel 2009). Are there not similar barriers to clean energy transitions in the African fossil fuel rich countries such as Nigeria, Angola, Uganda, Ghana, in the absence of an Ecuadorian template of funding to keep the fossil fuels in the ground? Botswana is looking to China (as is much of Africa) to see the way forward post 2012 for G77 countries on clean energy. Chinese funding in Botswana has been largely channelled into coal-fired power stations (Peoples Republic of China 2009). Chinese energy decisions are both a barrier and an opportunity as it moves into the technological lead on RET in its own country.

Currently espousal of off grid RET is seen as an example of Annex 1 country hypocrisy in refusing to allow the Botswana rural poor electricity standards they themselves would

require. There appears to be no link perceived, either internationally or in Botswana, that real rural RET energy development programmes can deliver on poverty reduction strategies and the achievement of the MDGs. Is Botswana leading the way for Africa in attempting to give on-grid accessibility to all, even in remote villages, in its plan for 90% connectivity by 2020 (World Bank 2009)? Is it not a more inclusive approach than the excuses most African nations give to their citizens with off-grid RET? There is 97% energy access in Brazil and China (World Bank 2009). Should Botswana set a lower standard? There is the possibility of a full clean energy transitions for Botswana, through on-grid combination of decentralised REFIT and centralised CSP (Matheison 2009). But until this becomes possible through climate funds and carbon taxes, is the alternative strategy of going for grid supplying coal fired power stations now, a better way for dealing with poverty based GHG emissions from biomass burning (Prins et al 2010)? The Botswana interviewees would, in part, agree. But if this happens, Botswana could go down in history as taking a wrong turn, investing in 30-year embedded generation costs in new coal-fired stations, and potentially the highest per capita CO_2 emissions in the world.

The governance mechanisms in Botswana provided by the Kgotla consensual approach, involving all Batswanan actors, could provide the platform for discussion of an energy regime change after the end of the current Vision 2016, laying the foundations of a long term low carbon trajectory for Botswana.

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