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GLOBAL ENERGY SECURITY

South African Energy Policy & G8 Petersburg Declaration on Global Energy Security

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1 Introduction

This paper examines commonalities in South African energy policy and the G8 St Petersburg Declaration on Global Energy Security policy¹ (Petersburg Declaration) and assesses what interests South Africa might have in contributing to implementation of the G8 policy and how this might be achieved.

South Africa faces many of the same energy sector challenges as expressed in the Petersburg Declaration, although, South Africa faces additional challenges that developing countries face.

Prior to 1994 the state had invested heavily in the energy sector. Often these investments had been un-economic and that the sector had operated in conditions of secrecy imposed by legislation and levels of accountability and transparency were problematic. The major South African energy markets were non-competitive and/or controlled by large monopolistic energy enterprises and/or heavily regulated non-competitive regimes. It is to be expected that reforms of the sector which would per force take on large influential and powerful actors in the South African economy, would face significant challenges.

South African energy policy experienced a fundamental shift after the 1994 election. This shift found expression in a comprehensive and inclusive energy policy development process culminating in publication of the White Paper on the Energy Policy of the Republic of South Africa dated December 1998 (SAWPE). Although it is nearly ten years old, the SAWPE still forms the basis for South African energy policy.

South Africa is still effectively in the initial stages of giving effect to much of the policy in SAWPE. A raft of legislation has been promulgated to give effect to this policy and consequent energy sector transformation. Establishment of Independent Regulation is in its infancy. Restructuring and reform processes are still underway. Intended re-structuring and introduction of competition in the electricity sector has not yet been achieved and re-regulation of the petroleum/liquid fuels sector has not occurred. There have been some severe unintended consequences of the process to implement re-structuring and introduction of competition in the electricity sector and the de-regulation of the liquid fuels sector.

2 Correspondence between South African energy policy and the Petersburg Declaration

As expressed in its own energy policy documents, in particular the comprehensive South African Energy Policy White Paper of 1998 (SAWPE), South African policy is largely in agreement with the Petersburg Declaration and the June 2007 G8 Summit Declaration on Climate Change and Energy Efficiency in the main approach of how to address these challenges: i.e. through transparent, efficient and competitive markets, enhancing energy efficiency, diversifying energy supplies, through paying special attention to the energy needs of those without access to adequate energy, promotion and support of environmentally sound development and usage of energy, and through effective engagement with all stakeholders in development and implementation of policy. South African expressions of energy policy agree in approach and broad principles, and also, for each of the items in the Petersburg Declaration a corresponding and compatible item can be found in the SAWPE. Key policy statements illustrate the broad agreement between SAWPE and the Petersburg Declaration. The compatibility is not limited to issues raised but also to the solutions chosen to address the issues.

3 Significance of the five key elements of the Petersburg Declaration for South African energy policies

Open, transparent, efficient and competitive markets

Policies stated in SAWPE are in many cases a fundamental departure from policy existing before SAWPE and require fundamental restructuring and reform of the major South African energy sub-sectors, from highly regulated non-competitive markets and non-transparent government intervention and regulation towards competitive markets and independent transparent regulation.

South African internal markets for electricity and petroleum/liquid fuels and piped gas are still essentially non competitive. In electricity generation, while Eskom does not have exclusive generation rights, it has for historical reasons a practical monopoly on bulk electricity and in electricity distribution customers do not have a choice of supplier. The petroleum/liquid fuels sector is tightly regulated ranging from quota control of product imports through to price control of main products at retail level. Some coal markets are

¹ As expressed in the G8 St Petersburg Declaration on Global Energy Security of 16 July 2006

competitive but most domestic coal production is via long-term non-transparent contracts.

A central tenet in the South African Energy Policy White Paper of 1998 is that: “*Government will encourage competition within energy markets.*” Since publication of SAWPEn South Africa has put a lot of effort into activities around attempting to establish competition in the bulk electricity market, re-structuring the electricity distribution industry and de-regulating the Petroleum/liquid fuels sector. There have been problems which are ongoing, and given the long history of monopoly in the electricity sector and the tight, secret regulation of the petroleum² sector it can be expected that the market liberalization and de-regulation processes will face significant challenges and obstacles.

Transparent, equitable, stable and effective legal and regulatory frameworks

Transparent, equitable, stable and effective legal and regulatory frameworks are a central tenet of the SAWPEn. A raft of legislation has been promulgated to implement the SAWPEn and South Africa is now in the first phase of implementing crucial aspects of the legislation involved in establishing the institutional capacity necessary for independent regulation.

Independent energy sector regulation is in an embryonic stage. The National Electricity Regulator (NERSA) was established in November 2006. South Africa is in the throes of implementing an entirely new regulatory regime. Prior to establishing NERSA, practically all regulatory experience and capacity in the energy sector had been in electricity regulation. Now, the new regulatory regime is based on fundamentally different principles and procedures and new capacity is being built to implement it.

Enhanced dialogue on relevant stakeholders' perspectives

Following a long history of policy often being made in relative secrecy, the approach followed in developing the SAWPEn recognized and put into practice effective and transparent engagement of all stakeholders. In addition, the SAWPEn explicitly recognizes the need for the South African energy sector to be operated and developed within co-operative and integrated regio-

nal and international systems. Indeed, the SAWPEn was developed with the participation of key players in the international arena, and during and after development of this key policy document there have been significant and successful ongoing efforts to build, contribute to, and work within a number of international bodies and institutions, with South Africa often playing a key role.

Locally, too, ongoing policy development and implementation have sought to further extend stakeholder involvement. Relevant examples include the processes around compilation of National Integrated Resource Plans³; production of the first ever national Integrated Energy Plan⁴; the National Climate Change Response Strategy⁵ and the National Energy Efficiency Strategy⁶. The processes around production of these plans and strategies have been comprehensively inclusive in terms of engaging stakeholders. Another example is the recent joint activities between the National Energy Efficiency Agency and key stakeholders⁷.

In addition to these pro-active processes involved with implementation of policy, when implementation runs into problems, government has engaged stakeholders, openly where appropriate, in assessing the problems and seeking solutions, for example the Report of the Moerane Investigating Team to the South African Minister of Minerals and Energy on the December 2005 Fuel Shortages⁸ and the Fuel Supply Strategic Task Team.

Diversification of energy supply and demand, energy sources, geographical and sectoral markets, transportation routes and means of transport

SAWPEn explicitly supports diversification of energy supply sources in one of its 5 fundamen-

² During the apartheid years' United Nations crude oil sanctions legislation made it a criminal offence to communicate basic information about this industry.

³ NIRP-1-3, Integrated Energy Plan for the Republic of South Africa Department of Minerals and Energy. 19 March 2003.

⁴ Integrated Energy Plan for the Republic of South Africa Department of Minerals and Energy. 19 March 2003.

⁵ A National Climate Change Response Strategy for South Africa. South African Department Of Environmental Affairs And Tourism. September 2004.

⁶ Energy Efficiency Strategy of the Republic of South Africa South African Department of Minerals and Energy. March 2005.

⁷ Note that this is a small selection of a multitude of stakeholder processes.

⁸ Report of the Moerane Investigating Team to the South African Minister of Minerals and Energy on the December 2005 Fuel Shortages. July 2006.

tal policy objectives namely: “*Securing supply through diversity*”.

However, reform of existing systems always presents challenges. Also, especially in terms of diversification of primary energy sources, the history of coal in development of the South African energy system and the realities of local coal costs, including spatial layouts of major South African markets play an important role in selecting coal as a least-cost supply option.

Issues related to distance of South African markets from other large international markets and local availability of abundant very low cost coal are mentioned in the section below on areas that are problematic. South Africa has recently successfully introduced piped gas from Mozambique into the local market although known reserves limit the potential from this source to a contribution of 4% of primary energy supply. The electricity generation expansion programme is considering conventional nuclear and CCGT fired by imported LNG for base-load stations although no commitments have been made. These options are more costly than coal, if calculations are limited to standard economic considerations in the current economic environment and so these choices rely on government intervention to implement diversification policy.

Environmentally sound development and use of energy

The establishment of energy systems and heavy industry to exploit South Africa's large coal resources in an era when pollution and environment degradation were not as prominent on the policy agenda as today, and the prevalence of large areas of poverty in South Africa, with the inevitable environment degradation, much of this energy related, are legacies that have sensitized current policy that has been developed using more democratic processes where the voices of the many that bear the brunt of pollution, environmental degradation and energy poverty are better represented than before.

As a result, energy-environmental linkages enjoy prominence in South African policy. The physical and economic realities of the legacy systems, energy poverty, local asymmetry in energy consumption and access and environment degradation are a large challenge and central to formulation and implementation of South African energy policy, and are also linked to long-term security of supply considerations.

4 G8 Petersburg Declaration action plan - seven core aims

1. Reducing energy poverty

The first statement of Energy Sector Policy Objectives in the South African Energy Policy White Paper of 1998 (SAWPE_n) is: “*Government will promote access to affordable energy services for disadvantaged households, small businesses, small farms and community services.*”

The prominence and position of this statement accords with government economic and social policy in general, which recognizes poverty as a highest priority issue.

South Africa has a Gini coefficient of 58, amongst the highest in the world and 26% unemployment according to the narrow definition of the unemployed or 44% if discouraged work seekers are included. A large and significant proportion of the population lives in conditions of poverty, one of which is inadequate access to affordable, safe energy.

The asymmetry of access to and consumption of energy is mirrored in what has been called the South African “dual economy”: within the boundaries of one country there is a relatively small proportion of citizens enjoying a “first” economy which exhibits developed world characteristics and is linked into the global economy while a large proportion of citizens inhabit a poverty stricken “second” economy with few links to the first economy or the global economy. Domestic asymmetry in energy consumption is perceived as an element of economic inequity in general. Thus in a democratic policy process in South Africa it is possibly less problematic to build support for processes to address asymmetry in consumption than in countries without a dual economy.

This could impact G8 policies around energy consumption asymmetries in two diametrically opposed directions: on the one hand it could assist with building support for policies that address the asymmetry in terms of leveling it, while on the other, if world resource constraints limit the degree to which the asymmetry can be decreased while maintaining current levels of consumption amongst high-consuming countries, this could work against the support for such policies.

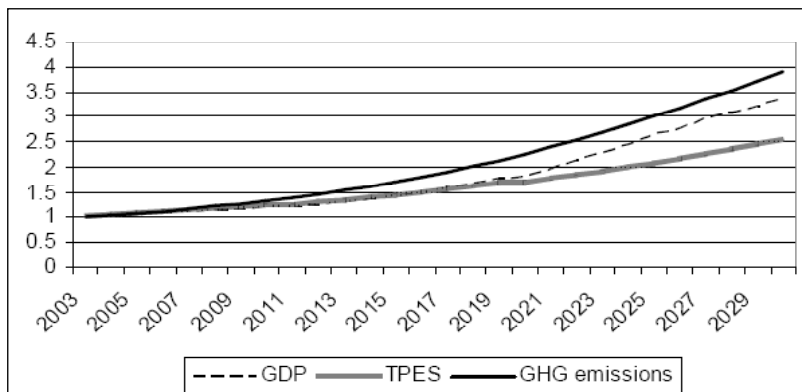
Thus, there is no potential conflict with the Petersburg Declaration as a whole but South African efforts to reduce poverty would depend on the balance struck between the various components of the Declaration. Measures to decrease energy intensities, carbon intensities and emissions need to be designed and implemented bearing in mind the overall effects on all components of the South African economy: South Africa has stated that it supports such measures but that they need to be properly integrated into economic growth and re-distribution and social development. In some cases, such as a number of household energy efficiency measures, emission reduction and poverty reduction goals can be achieved simultaneously. However, in others, such as carbon taxes on established large scale mineral beneficiation industries, the effect could sometime be limited to a negative impact on the local economy and knock effects leading to an increase in poverty.

Also, the current costs and impacts of reform and de-regulation measures, which are expected to be warranted by the medium-to-long term benefits of open competitive markets, include negative impacts on poverty reduction programmes in the short term. Poverty reduction within a framework of sustainable development is South Africa's stated policy. South Africa understands that trade-offs are required between short term costs and medium to long term benefits. However, these need to be made within the realities of democratic political processes and the urgent need in South Africa to address widespread and often acute poverty. Thus, contributions from G8 regarding assistance with short term costs and immediate reductions in poverty - while the longer term benefits of open and competitive markets are being secured through re-structuring, reform and de-regulation - are an important consideration.

2. Addressing climate change and sustainable development.

South Africa is highly vulnerable to the effects of climate change. Large parts of South Africa are arid and water-supply systems are already stressed and in many cases already at their natural supply limits. Decreases and/or disruptions in patterns of rainfall will result in water shortages, desertification, destruction in ecosystems, large-scale negative impacts on human-health owing

amongst other effects to significant extensions to areas carrying disease vectors for malaria and Bilharzias and economic disruption and damage.



Base Case for Emissions.⁹

International measures taken to mitigate climate change such as CO₂ taxes or trade measures affecting energy-intensive industries could effect the South African economy for example by making certain South African-based industries non-profitable and hence damaging the domestic economy. This might be problematic in terms of South African contributions to international efforts to reduce GHG emissions. South Africa has ratified the United Nations Framework Convention on Climate Change (UNFCCC)¹⁰ and: "believes that an acceptance of common but differentiated responsibilities, as outlined in the convention, is the best and probably only way towards the sustainable management of the global commons".¹¹ The most appropriate implementation strategies in this framework would be Clean Development Mechanisms (CDM), technology transfer and donor funding.

⁹ Clean Energy and Development for South Africa: Results. Alison Hughes, Mary Haw. Energy Research Centre, University of Cape Town. 28 February 2007 Report 3 of 3. The energy and CO₂ tax (USD\$ 20 / tonne) scenarios have similar results on GHG emissions: each leads to 20% reduction in GHG from base case: i.e. there is still a large 180% increase but less than the 230% increase for the base case. In the CO₂ tax case much of the reduction is owing to the choice of nuclear for electricity generation. Carbon capture and Storage (CCS) is not considered for CO₂ emission reduction.

¹⁰ In addition, the Department of Environmental Affairs and Tourism has developed a comprehensive national climate change response strategy.

¹¹ South African Minister for Environmental Affairs and Tourism statement quoted in South Africa Initial National Communication under the United Nations Framework Convention on Climate Change. South Africa. 2003

This is accorded a high priority in South African policy firstly, because climate change will have¹² large serious (devastating) negative effects on South Africa so both mitigation and adaptation are important and secondly, because South Africa is a developing country and sustainable development has to be central. It is also a high priority because mitigation measures will have potentially large costs for the South African economy and thus have to be implemented appropriately to avoid severe economic damage.

Potential Conflict with Petersburg Declaration

South African energy policy is supportive of mitigation measures. Existing patterns of energy production and use in South Africa are associated with high levels of GHG emissions largely owing to two factors. Firstly South Africa's energy sector is based on fossil fuels and to date there has been negligible implementation of measures to use technologies to reduce GHG emissions associated with these fuels, such as carbon capture. Secondly, the production, transformation and use of these fuels is often very inefficient. In most cases where fossil fuels are used in South Africa, if (dis)-incentives are not applied, ongoing use of fossil fuels is the most economic solution: i.e. most electricity demand is, and will be for decades to come, be most economically generated using locally produced coal and switching to other sources will carry huge economic cost, and thus, unless done in an appropriate manner, could be in conflict with important South African interests: important industry sectors could be made non-profitable and increases in prices of goods and services could lead to severe economic damage.

Climate change mitigation through substitution of fossil fuels or through decreasing emissions through other measures (sequestration...) is not incompatible with South African energy policy in principle: South African energy policy recognizes the need and supports the principle. However, it will need to be implemented taking existing energy resource, production, transformation and usage patterns into account.

Conditions / incentives for SA entering international regime consistent with G8 policy

In 1997 South Africa ratified the UNFCCC and the Petersburg Declaration confirms commitment to the UNFCCC and thus South Africa is already subscribed to and participates fully in an appropriate international regime.

¹² Indications are that this process is already underway.

Implementation has already been thoroughly investigated and much work is underway¹³. The following selected points from the *National Climate Change Response Strategy* report illustrate some of planning and principles contained in the strategy: "An effective programme for climate change response will require that South Africa has access to public sector funding and funding from government related institutions, such as the Development Bank of South Africa. Further, as a developing country, South Africa can access assistance from developed country partners to meet its obligations under the convention and, further, participate in the global mitigation of climate change. This requires a framework to access and manage the climate change financial resources on offer as donor funding..."

Through the implementation of this national climate change response programme, South Africa will avail itself of the potential advantages that could stem from international action on climate change, whilst at the same time minimising its vulnerability to such events. To achieve this end, priority will be given to the following key interventions, although others appear in the key actions list in this document:

- a) Rapidly develop the DNA function within the Department of Minerals and Energy to facilitate the forwarding of CDM project proposals to the Executive Board for approval without undue delay.
- b) Perform a technology needs analysis for South Africa that builds on and integrates existing knowledge, through the Department of Science and Technology.
- c) Access appropriate funds, as feasible, for implementation of the climate change programme, in particular for adaptation purposes."

3. Increasing transparency, predictability and stability of global energy markets

This is accorded higher than average priority as far as *stability* and *predictability* are concerned because of the effects of crude-oil price volatility on the local economy and potential negative effects on the economy of disruptions in supply of crude-oil from international markets.

¹³ A National Climate Change Response Strategy for South Africa. South African Department Of Environmental Affairs And Tourism. September 2004.

4. Improving the investment climate in the energy sector

Enormous investment requirements along the entire energy chain

Prior to 1994 energy policy-making and implementation were non-democratic and often driven by the strategic concerns of a regime under siege. In this environment there was large over-investment leading to huge over-capacity in the electricity generation system and mothballing of both electricity generation and petroleum product manufacturing plant, much of this the result of state-led over-investment.

The new post 1994 economic regime has been fundamentally different from an investment perspective. Just how different can be gauged from the fact that the major energy supply sub-sectors have moved from positions of large extra capacity and mothballed plant to a situation that now can be accurately described as under-capacity and highly-over-stressed supply systems and periodic and increasingly frequent severe system failures.

That the policy environment over the past ten years or so has not and is not leading to required investment levels is not under question: the results of the under-investment are plain to see. What is useful to assess, in terms of potential South African cooperation and contribution to implementation G8 energy policy, is how can the obvious high level of agreement in policies and commonalities in interests between South Africa and the G8 lead to promoting and encouraging the required investments. The investment requirements and commonalities in policy and interest could offer significant potential to source and guide investments to achieve joint policy goals.

Electricity sector

It is a stated policy in the SAWPE that competition be established in the bulk electricity sector through re-structuring processes that have been underway for some time and that were intended to attract investment in power generation and the establishment of Independent Power Producers (IPPS). Government states that 30% of new generation capacity should be IPP.

The main feature of reform and re-structuring in the electricity sector to date is that bold plans to re-structure to achieve competition and establish independent regulation have met with significant and effective resistance. Re-structuring has largely failed and the de-facto powers of the National Energy Regulator of South Africa (NERSA)

are weak and only in the beginning stages of being established.

Prospective IPPs have shown very little interest. At the same time Eskom has held back from constructing new capacity while room was given for IPPs to enter the market. Ultimately, no new base-load capacity was licensed and by 2007 a serious supply shortfall has arisen.

On the positive side the serious shortfall in capacity and the stated intention of government to make room for IPPs in 30% of the market combined with the stated intention to achieve competition in the market provides an opportunity, in terms of stated policy agreement and commonalities of interests between South Africa and G8, for cooperation between South Africa and G8 in this area.

Petroleum / liquid fuels sector

The 1994 South African government inherited responsibility for a highly regulated petroleum / liquid fuels sector where all aspects were controlled through often non-transparent agreements and non-transparent regulation ranging from quota control of product imports through to price control of main products.

The new government decided to make fundamental changes in these arrangements and, in the words of the South African Energy Policy White Paper of 1998:

“The government believes that competitive market forces should determine prices. Retail price regulation, import control and Government support for the Service Station Rationalisation Plan will be simultaneously removed. Government is committed to promoting a climate that would be conducive to reasonable profits and sustained investment in the liquid fuels industry.”

A phased process of de-regulation was mapped out in the South African Energy Policy White Paper of 1998. However, like the electricity sector, liberalization of the petroleum sector has met severe challenges: uncertainties during the process of attempted implementation of the fundamentally new direction in policy have prevented necessary investment and development and have led to a severely stressed supply system. The current state of play is summed up below firstly in the words of a government commission and secondly in a press statement by an oil major operating in South Africa.

According to the Moerane Investigating Team to the Minister of Minerals and Energy on the December 2005 Fuel Shortages:

"... these events exposed underlying structural and regulatory weaknesses in the sector. If the weaknesses referred to in this Report are not addressed with urgency, petroleum product supply shortages will become a feature of the future economic environment.... The Investigating Team finds it difficult to accept that historical and current expenditures have been adequate, given the high incidence of production interruptions which have been reported. It is probable that a shortage of skills, both engineering and technical, has contributed to these problems... From a review of the submissions it is apparent that there are a number of regulatory issues that need to be resolved."

According to a BP Release¹⁴ :

"Putting it plainly, our refineries are operating at full capacity; our road and rail transport systems for carrying fuel are stretched to the limit; our pipelines are too expensive and too few and our roads are crumbling under the weight of increased loads. the truth is that we are now at a point at which any unplanned break in the supply chain (i.e. refinery breakdowns, pipeline interruption, shortage of rail tank-cars) will create shortages. "

"By 2008, the supply chain will be "significantly constrained". Without investment in manufacturing capacity within Southern African the amount of imports will need to "escalate dramatically". The existing infrastructure is "unable to support the requirements for increased imports in the short term and will need to be upgraded."

While on paper there has been stable policy agreed on by all in an inclusive process, in practice the implementation of policy has led to a level of policy and regulatory uncertainty that has led to under-investment in the sector with the consequence that the liquid fuels supply system, in all links of the chain, is overstressed and failing under pressure. Like the electricity system, rectification of the problems will take years, once this begins.

And like the electricity sector the capacity crisis provides an opportunity, in terms of stated policy agreement and commonalities of interests between South Africa and G8, for cooperation between South Africa and G8 in this area.

Establishment of independent regulation

Government is committed to implementation of independent regulation, and there is clear evi-

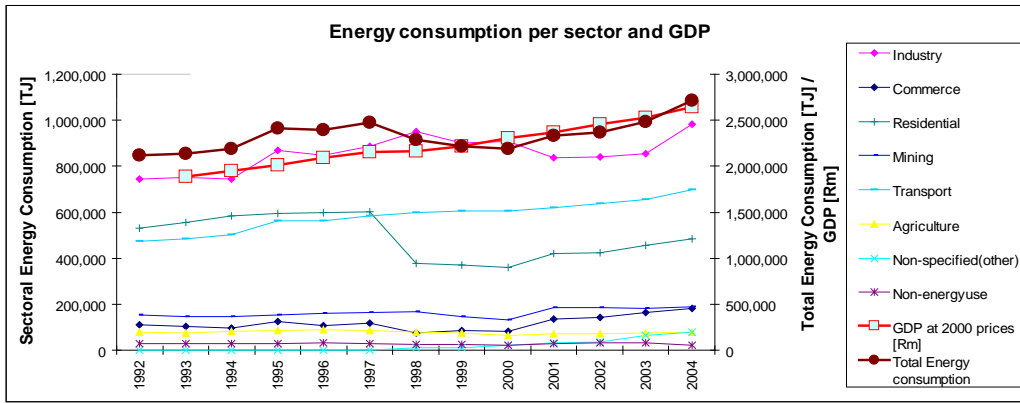
dence of this both in the energy sector and other sectors, but the principles and practice are new in South Africa. The lack of capacity and alignment in goals between G8 and South Africa offer potential for collaboration.

Currently, a significant proportion of inland fuel (the largest market) is transported by road tanker from coastal refineries, reportedly at a loss, by oil companies. The state-owned pipeline company, Petronet, recently had its application for a tariff increase declined by NERSA and so rejoined that it would not be able to go ahead with building a new multi-product pipeline from coastal refineries inland. This is not necessarily an indication of policy and regulatory failure but more an indication of the kinds of challenges faced in re-arrangements of relationships required in an environment where independent regulation is being established. Beforehand, state-owned enterprises such as Petronet would merely have obtained approval for tariffs in non-transparent internal government processes, and in fact Petronet did this for years and ran at huge profit margins that were used to subsidise sister companies in the state-owned Transnet group. During the current phase of establishment of independent regulation, NERSA has ruled that according to current regulations it is only authorized to grant certain tariff increases, which don't take future investments in additional capacity into account. In any case, to resolve the issue, on NERSA's side, moves have been made to develop a methodology to assess tariffs which includes new investment requirements. On Petronet's side, the company has moved to a cooperative position where Transnet CEO stated that: "an Executive-Level unit is being established to conduct relationships with the new economic regulators". This has taken months and has shown what is necessary in the transition towards independent regulation.

5. Enhancing energy efficiency and energy saving

This is another important goal because huge efficiency improvements are possible and economically feasible along the entire energy supply chains across all energy sub-sectors. Inevitable increases in South Africa's very low energy prices will make a larger range of efficiency improvements and savings economically viable. Some of these measures will help to lessen the negative economic impacts of other mitigation measures and need to be evaluated, as is being done in the Integrated Energy Planning and Integrated

¹⁴ "Who will invest in our fuel infrastructure and why should they?", 14 May 2007



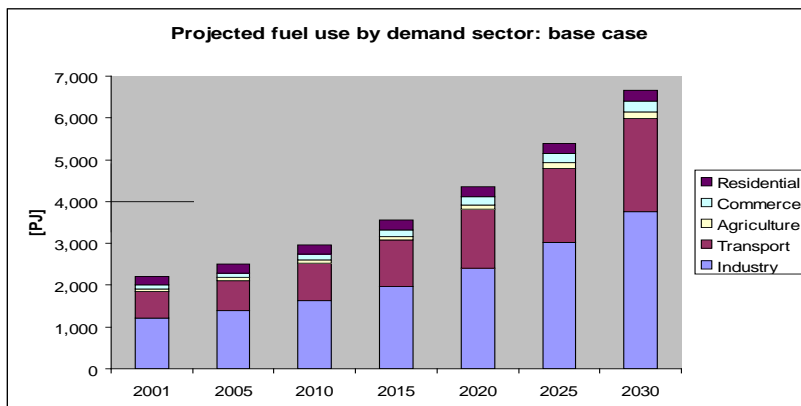
energy saving and efficiency measures. Primary energy supply is modeled to rise from year 2000 to 2020 from about 4,100 PJ to 6,700 PJ under a base case (63%) and 5,900 PJ (44%) under an optimized energy savings and efficiency regime.

Resource Planning processes that have been mentioned.

South Africa has recently started with official policy-linked activities contained in the Energy Charter such as¹⁵: “development of long-term energy demand and supply scenarios to guide decision-making;” in the Integrated Energy Plan¹⁶ of 2003 and follow-up research report: Clean Energy and Development for South Africa¹⁷.

Energy supply

In the current economic regime (e.g. no mandatory carbon taxes, existing CDM conditions, expected international crude-oil and gas prices...) coal will retain its cost advantage in South Africa and the underlying economics of patterns of energy production will not change significantly up until 2030. With CO2 taxes of R150/tonne, it would make economic sense to shift a small amount electricity generation to CCGT and nuclear. The National Integrated Resource Plan (NIRP2), official government plan for electricity generation and Eskom announcements are at significant variance with no nuclear electricity generation in NIRP2 and a significant nuclear component in the Eskom plan. Nevertheless even with introduction of some nuclear and CCGT primary usage patterns will remain similar to now with the large reliance on coal remaining.



Supply / demand balance

Energy demand

Models of expected energy demand in the official Integrated Energy Plan and the latest follow-up modeling show that if South Africa continues with current energy usage practices final demand could be expected to increase by 200% from about 2,200 PJ to 6,700 PJ which could be cut to 5,700 with successful implementation of

Thus, in summary, South Africa has problems in common with those stated in the G8, namely that energy demand is “estimated to rise by more than 50% by the year 2030, approximately 80% of which would still be met by fossil fuels, which are limited resources”.

6. Diversifying energy mix

“Securing supply through diversity” is one of the five fundamental policy objectives stated in the SAWPEN but economic considerations make switches in current South African energy production and usage patterns problematic. Historically, low energy prices have resulted in low efficiencies in much of South African energy production and use, and choices of energy carrier are most often driven by economic rationality and within South Africa the pervasiveness of and depen-

¹⁵ Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects (Annex 3 to the Final Act of The European Energy Charter Conference)

¹⁶ Integrated Energy Plan for the Republic of South Africa Department of Minerals and Energy 19 March 2003

¹⁷ Clean Energy and Development for South Africa: Results. Alison Hughes, Mary Haw. Energy Research Centre, University of Cape Town. 28 February 2007 Report 3 of 3

dence on very low-cost coal remains economically rational.¹⁸ Thus, implementation of the diversity policy carries significant economic and financial costs.

Coal and electricity

95% of South African electricity and 23% of liquid fuels are produced from locally mined coal from reserves of 55,000 Mt, which would last more than 200 years at current coal production rates, including exports of some 71 Mt p.a. The finite nature of coal reserves does not present an acute problem to South Africa in terms of physical supply, even with projected growth in electricity demand and industrial coal demand.

Table 1 South African Primary Energy Supply [Energy content] - 2005

	Local Production	Imports	Share in Total
%			
Coal	100	0	68%
Crude Oil	10	90	19%
Renewables	100	0	8%
Nuclear	100	0	2%
Gas	80	20 ¹⁹	3%
Hydro	1	99	0.1%

Increasing dependence on energy imports: crude oil, petroleum products and natural gas

South Africa only supplies 10% of crude oil from domestic production from a rapidly depleting small resource and relies on crude and product imports for about 70% of liquid fuels demand, which demand is growing rapidly. South Africa could produce, physically, all its liquid fuels demand from local coal which would decrease the life of the coal reserve to 150 years at current

¹⁸ South Africa has total energy consumption of some 2,780¹⁸ PJ and energy intensity of some 15 MJ/US\$, amongst the highest in the world. Coal accounts for about 95% of electricity production and 23% of petroleum liquid production resulting in an exceptionally carbon intensive economy of 0.8 tonnes per GDP \$1995 based on exploitation of large local coal reserves: the world's seventh largest recoverable coal reserves (55,000 Mt), approximately 5% of the world total, South Africa is the world's sixth largest coal producer, producing 243 Mt of coal in 2005 and the world's third largest net coal exporter at 71 Mt.

¹⁹ In July 2004 imports of natural gas from Mozambique were initiated: author's estimate.

demand rates and in fact a further coal-to-liquids plant has been mooted. However, the supply of all South African liquid fuels demand from coal-to-liquids is probably not viable, not least because of the very high carbon intensity and low energy efficiency of such a scheme.

South Africa has small natural gas reserves, some of which are being exploited to manufacture about 5% of South African liquid fuels using GTL but which will be depleted within a few years. A regional natural gas resource in Mozambique has recently come into production and supplies less than 3% of South African primary energy supply which amount could increase to a maximum 4% for about 25 years given known reserves.

Thus, in summary, South Africa faces similar problems as stated in the Petersburg Declaration related to global finiteness of crude-oil and natural gas, if somewhat mitigated by large scale local coal-to-liquids production.

Depending on developments in international measures to cut GHG emissions, diversifying the energy mix will most likely become much more important to South Africa than it is at present. It is a component of the South African energy policy but is stated very much in terms of being one of the measures to improve security of supply. If international measures to cut GHG emissions change the economics whereby coal is such a low-cost option compared to other sources, then the diversification will become a key for the South African energy economy which is so heavily dependant on very-low-cost coal.

Present day comparative costs of energy source options make alternatives to coal non competitive for much of the South African energy supply: which is how the existing pattern of energy consumption has arisen - where coal supplies more than 70% of primary demand and directly supplies more than 50%, and indirectly more than 80%, of industrial energy demand, and also accounts for 95% of electricity production.

For more than ten years South Africa has stated that it aims to diversify but with little result. This is problematic. South Africa has similar problems to other countries²⁰: *"transition to new kinds of fuel is a long-term process and is not always economically expedient"*.

²⁰ As expressed by Deputy Minister's of Industry and Energy of the Russian Federation A.G. Reus at his the Presentation on CERAWEEK, Oil Summit, Houston. USA 2007

7. Ensuring physical security of critical energy infrastructure

This is not at the top of the energy policy priority list in South Africa but is addressed in other government policies involving security.

5 South African policy interests and respective mechanisms of international dialogue and arbitration

Following on the 2006 Petersburg Declaration, the 2007 G8 Summit Declaration on Climate Change Energy Efficiency “*invites South Africa – and other O5 states – to adopt the G8 Global Energy Security Principles.*”

It has been argued throughout this paper that South African energy policy is largely in accord with the G8 Global Energy Security Principles, as stated in the Petersburg Declaration and as expanded upon in the Plan of Action.

Further, South Africa has ratified the UNFCCC and has actively complied with its commitments thereunder. Thus, subject to the acknowledgement that this is done under the principle of acceptance of “*common but differentiated responsibilities*” as understood in the context of the UNFCCC, it is reasonable to expect that South Africa would be able to adopt a similar relationship under the principles of the Petersburg Declaration.

As far as international arbitration under the WTO model is concerned, it must be noted that South Africa was a founding member of the GATT, has been a WTO member since 1995 and takes an active and often leading role in WTO processes.

Thus, South Africa is familiar with, subscribes to and supports WTO type dispute settlement.

South Africa patently accepts the WTO system as a member. However, there could be improvements specifically for developing countries: for example nothing in the current terms of reference for panels requires them to examine the development implications of their decisions: although they are authorized to and there is a history of their including such considerations. Including such a requirement for panelists to examine development implications of decisions would explicitly place consideration of development goals within the process and facilitate effective resolution of some of the incompatibilities between, for example developed and developing countries’ issues around mitigation. Equally, it would make sense for this kind of requirement to be part of South African participation in mechanisms to implement the principles in the Petersburg Declaration, also under a “*common but differentiated responsibilities*” principle, which acknowledges both the common interests of developed and developing countries and their special needs.

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