



Energy law and environmental protection in South Africa

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Abstract

South Africa's energy legislation is fragmented. Specific issues are regulated by different acts, which may confuse developers. One of the major criticisms against South African energy legislation is that it does not address the cycle of sourcing, exploitation, generation or production, transportation, distribution and consumption. These issues are either not dealt with or are to be found in different pieces of legislation. Legislation is focused on governmental control and the functions of the regulators. The pre-1994 dispensation was more focused on exploitation rather than taking into account people and the environment. In recent energy legislation, however, more emphasis is placed on health, safety and environmental matters. In this paper South African legislation dealing with energy and environment is discussed in order to make recommendations for change.

1 Introduction

Energy law in South Africa is in a state of flux. In the pre-1994 dispensation, energy was seen as a commodity to be exploited. Although environmental considerations were taken into account in/to a limited extent, the legislation itself did not provide for energy efficiency or refer to the protection of the environment.

Energy law and environmental law relating to energy are fragmented. They do not, for example, address the cycle of sourcing, exploitation, generation or production, transportation, distribution and consumption. The topics are either not dealt with or to be found in different pieces of legislation (Du Plessis [1]).

Since 1994, with the introduction of a constitutional dispensation in South Africa, the new government has placed more emphasis on protection of the environment. Section 24 of the Constitution of the Republic of South Africa states that everyone has a right to an environment that is not detrimental to their health or well-being and an obligation is placed on the state to ensure protection of the environment through reasonable legislation and other measures. The state has to secure ecologically sustainable development on the one hand, while promoting justifiable economic and social development on the other. This obligation is taken seriously by the South African government and various policies and pieces of legislation have since 1994 been introduced to ensure a new energy and environmental dispensation in South Africa.

2 Types of energy used in South Africa

South Africa is a developing country and as a result different energy sources are exploited, used and produced, such as coal, nuclear energy, liquid fuels, gas, electricity and biomass (Energy policy [2]). South Africa's main energy source is coal from which electricity is generated. The generation of electricity is the cheapest in the world. One of the reasons is that the environmental cost of coal mining and energy generation is not reflected in the real cost of these commodities. South Africa has one nuclear power station, namely Koeberg. New nuclear technology is however developed, namely pebble-bed modular reactors to produce energy - the technology is promoted as being safe and cost-effective (Du Plessis [1]). Liquid fuels are produced from coal and natural gas, which are produced locally; some liquid fuels are refined from imported crude oil (Burger [3]). In the rural areas fuel wood, obtained from natural woodlands is used for cooking and heating. In some isolated instances biogas is recovered from solid waste, land fill sites and sewerage works. In some areas the woodlands are under severe pressure. Dung is also used in some areas to provide fuel and in other areas to generate biogas. Wind, solar and hydro energy sources have not been exploited to their full potential. Sunshine averages 2500 hours per year in most areas of South Africa and the radiation levels range between 4.5 and 6.5 kWh/m². Solar energy is seen as one of the possible solutions to energy problems in South Africa, but has been used in a limited sense only (Energy policy [2]).

Historically legal arrangements addressed energy supply issues, while arrangements to manage energy demand (households, industry, commerce, mining, transport and agriculture) have been ignored. In the case of households there is an increased demand for resources due to rapid migration and urbanisation. Industry and mining depend for example on 40% of all energy generated while only 40% of households, schools and clinics have access to electricity. Where electricity has been provided to low income households, it as in some instances disconnected, as the users could not pay for the electricity. This led government to realise that it is vital to utilise all possible energy sources for sustainable economic development (Energy policy [2]). It is also foreseen that energy security for low-income households can reduce poverty, increase

livelihoods and improve people's living standards. This will be done by setting a minimum standard for basic household energy services (Energy policy [2]).

The challenge for government is therefore to carefully co-ordinate social sectors and energy sub-sectors. Government must also facilitate optimal energy consumption and production to meet social needs. This requires consumer choice and the operation of market forces. Government must also address existing environmental problems associated with energy exploitation, generation or production, transportation, distribution and consumption.

3 Environmental problems

The pre-1994 government's policies included macro-economic and sectoral policies pertaining to settlement, discrimination with regard to access to natural resources and differential subsidisation. Energy and water were subsidised which helped industry, mining and commercial farmers to produce their goods at subsidised prices. Environmental costs were not taken into account (Głazewski [4]). On a global scale South Africa's contribution to greenhouse gases is relatively small, but on a per capita basis it exceeds global averages. One of the reasons is the reliance on coal as the primary source of energy and oil. Mining and industry also contribute to greenhouse gases with the emission of sulphur dioxide, nitric oxide and methane (Department of Environmental Affairs and Tourism [5]). Coal is used by 950 000 households daily, which results in indoor pollution problems that pose a serious health risk. In some instances people's exposure to fuel wood exceeds the World Health Organisation's lowest-observed level effect (Crothers [6]).

In the past few years pressures on the environment resulted in the loss of biodiversity, acidification, impacts on air and water quality and depletion of non-renewable resources (Department of Environmental Affairs and Tourism [5]).

Since 1994, there has been a policy shift towards sustainable development - nearly all environmental related legislation includes sustainable development as a principle for example National Environmental Management Act 107 of 1998, the National Water Act 36 of 1998, the Minerals and Petroleum Resources Development Act 28 of 2002 and the Gas Act 48 of 2001.

Energy law, however, is still in a state of flux. A number of bills have been published to change the pre-1994 position. Until such legislation is passed, pre-1994 legislation still applies. Energy legislation must, however, be read with environmental legislation. The regulatory framework dealing with energy can best be discussed with reference to the energy sources.

4 Nuclear energy

In the pre-1994 dispensation, all matters related to nuclear energy were shrouded in secrecy. The Nuclear Energy Act 46 of 1999 and the National Nuclear Regulator Act 47 of 1999 provide for a more transparent process for obtaining licences and authorisations. A public participation process may also be introduced by the regulator. Government is preparing a national radioactive

waste management policy that is to be discussed with stakeholders (Anon [7]; Government Notice [8]).

The use of nuclear energy has been a point of dispute between industry and the general public. Although few, if any, nuclear accidents have been reported in South Africa, any proposal involving nuclear energy has been met with disapproval. The reason for the debate is the potential danger of nuclear facilities. Due to the secrecy of the past it is difficult to establish what the extent of pollution as a result of the production of nuclear energy is. The nuclear industry is, however, strictly regulated and they have to comply with all environmental legislation (Du Plessis [1]).

5 Electricity

Electricity is mainly generated and supplied by Eskom, an institution government by a stakeholder council. Some local authorities also generate electricity (Glazewski [4]). The legislation regulating electricity has no measures pertaining to the environment. An environmental impact assessment has, however, to be done in the case of the construction or upgrading of electric power installations and power lines (Government Notice [9]). Eskom also have to comply with the Atmospheric Pollution Prevention Act 45 of 1965. There are no air quality standards in this Act and the scale and nature of emissions are negotiated between the company and the chief atmospheric pollution control officer. The Department of Environmental Affairs and Tourism is in the process of drafting a Clean Air Act, which will be more stringent than its predecessor and will provide for air quality standards (see also 12 *infra*).

Ash waste dumps created as a result of electricity generation by coal are excluded from the definition of waste in the Environment Conservation Act 73 of 1989 and is not regarded as mine tailings in terms of the Minerals Act 51 of 1991. These waste dumps are however regulated by the National Water Act 36 of 1998 and are classified as a water use. Eskom is, however, committed towards environmental conservation as set out in the company's policy and is voluntarily working towards ISO 14001 certification and in the process ash waste dumps are rehabilitated although the company is not legally obliged to do so (Du Plessis [1]).

6 Gas

The exploitation of gas has until recently only been an experiment in South Africa as natural gas occurs in the ocean. South Africa is planning to import gas from its neighbouring countries Mozambique and possibly also Namibia. The petroleum company, Sasol, produces gas from coal and supply gas in the Gauteng region. The gas is transferred by pipeline (Du Plessis [1]). Various pieces of legislation have been introduced to regulate the gas industry. The objectives of the Gas Act 48 of 2001 is *inter alia* to promote the efficient, effective and sustainable and orderly development and operation of gas transmission, storage, distribution and trading facilities. When an applicant applies for a licence to transmit, store, distribute or trade in gas, they must

amongst other prove that they have plans and the ability to comply with all applicable health, safety and environmental legislation and subordinate legislation. Only small-scale operators are exempted from the legislation.

Before a facility can be erected for the transmission or production of gas an environmental impact assessment must be approved (Government Notice [9]), during which process public participation plays an important role. Many projects received a setback because of public outrage at the prospect of a gas line in their area (Du Plessis [1]).

7 Petroleum and liquid fuels

In the 1970s legislation controlling petroleum products was promulgated as a result of the economic boycott against South Africa. The main concern of government was to ensure secrecy about the importation, exportation and transportation of petroleum products and to introduce saving measures (Du Plessis [1]). The Petroleum Products Act 120 of 1977 does not deal with environmental aspects at all. With regard to environmental matters the Act is "indirectly relevant ... as the Minister can manipulate the demand and supply of lead-free petrol and thereby control the type of contaminants that enter into the atmosphere" (Glazewski [4]).

New legislation is drafted, namely the Petroleum Products Amendment Bill and the Petroleum Pipelines Bill. In both bills emphasis is placed on compliance to environmental, health and safety measures. In some instances an environmental impact assessment needs to be done for the construction of new facilities and the upgrade of existing facilities.

The legislation dealing with petrol and liquid fuels is fragmented and does not address the cycle of sourcing, exploitation, generation or production, transportation, distribution and consumption.

Hydrocarbon refining processes are a schedule 2 process in terms of the Atmospheric Pollution Prevention Act 45 of 1965. Permission is needed from the chief atmospheric pollution control officer to operate these processes. As has been stated above, permission is granted in the absence of both generic and regional air quality standards. The high level of emissions and VOCs in the vicinity the area of refineries led to protest by the public. This opposition led to negotiations between the state, petroleum companies and civil society to set acceptable atmospheric quality standards against which refinery performance will be measured. The focus is on the reduction of sulphur and VOCs (Du Plessis [1]). During 2002 new sulphur dioxide guidelines were issued and the level of emissions were substantially reduced.

8 Coal

Coal is one of the main energy resources of South Africa (Burger [3]). The mining of coal is regulated by the Minerals Act 50 of 1991 and will in future be regulated by the Minerals and Petroleum Resources Development Act 28 of 2002. These acts only deal with exploitation and do not regulate the transportation, distribution and consumption of coal as such. These matters are

regulated by other legislation. Mining is one of the activities that has a serious impact on the environment, ranging from impacts on soil, water, human health, the built environment, to air, plants and animal life (Mineral policy [10]). The first priority of mining is to maximise the extraction of a mineral - their first priority is not environmental protection. One of the big concerns of coal mining is spontaneous combustion of abandoned underground works and discard dumps, while methane emissions are increasingly perceived to be a significant issue. The emissions from these stockpiles are not always monitored and the rate of combustion is unpredictable (Du Plessis [1]).

9 Renewable and organic energy

Renewable and organic energy are important sources of energy in South Africa. Ten percent of the primary energy supply in South Africa is renewable or organic. The organic sources include biomass harvested from natural woodlands as fuelwood or waste from commercial forestry and the sugar industries. As is stated by the Department of Minerals and Energy: 'Fuel wood and charcoals supply 67 per cent of the total net energy consumed in the domestic sector, whilst the figure is close to 12 per cent in the industrial and commercial sectors' (Department of Minerals and Energy [11]). The use of organic energy as such is not regulated, but the sources of such energy (e.g. plants) are regulated.

It is recognised in the National Forests Act 84 of 1998 that the economic, social and environmental benefits of forests have unfairly been distributed in the past. The Act states that forests should be protected on the one hand but on the other hand the fair distribution of their economic, social and environmental benefits should be distributed (section 3(3)). Sustainable forest management and use must benefit the environment and contribute to economic development. Certain activities can be licensed, namely the felling of timber, the cutting, disturbance, damage or destruction of forest produce (section 23).

As has been stated, low-income groups rely on biomass for energy. In some instances the National Parks Board and local communities have come to an agreement that communities may gather firewood in these parks under the supervision of a park ranger. These agreements are voluntarily and no legal provision exists for them. There are no legal measures dealing with the collection of dung, except in the case of the Gas Act of 2002 that excludes small biogas projects in rural communities from the Act.

Renewable energy includes energy created by water, wind and the sun. Hydroelectric energy is regulated by the National Water Act of 1998 while wind and solar energy are not regulated. Solar energy, as has been stated, is not fully exploited. A wind energy project is only recently established in Darling in the Western Cape.

10 Energy law and environmental law

In the past government controlled the energy sector. The environment was to a lesser extent taken into account, as the main purpose of government was to develop and use South African resources to become independent from the use of

energy sources obtained from outside South Africa. Since the relaxation of sanctions and the inclusion of an environmental right in the Constitution and the opening up of the borders, South Africa's industries realised that in order to import and export they will not only have to comply with national standards but also with international standards. Several of the energy industries have embarked on a process to voluntarily obtain ISO14001 certification. In the absence of South African standards, these companies strive to comply with international or American standards (Du Plessis [1]).

The National Environmental Management Act 107 of 1998 and the Environment Conservation Act 73 of 1989 can be regarded as South Africa's environmental framework legislation. The Environment Conservation Act was partially repealed by the National Environmental Management Act. The environmental impact assessment regulations (Government Notice [9]) were issued in terms of the Environment Conservation Act. Nearly all energy related industries are listed as activities for which an environmental impact assessment needs to be done in the case of construction of new facilities and the upgrading of existing facilities. Nuclear facilities, electricity generation facilities, gas and petroleum pipelines and manufacturing are also listed activities in terms of the construction and upgrading thereof. The clearing of forests will for example fall under the item dealing with change of land use. Mining is not a listed activity, but mines have to draw up an environmental management programme in terms of the Minerals Act 50 of 1991. In future mines will also in the case of an application for a mining right, have to do an environmental impact assessment. The same department that approves the mining right approves both the environmental impact assessment and the environmental management programme. In the new draft environmental impact regulations mining is a listed activity. This may lead to unresolved conflicting interests. The Department of Minerals and Energy is not prepared to allow the Department of Environmental Affairs and Tourism to approve matters dealing with mining. In terms of the National Environmental Management Act and the Constitution, however, government departments are obliged to introduce a system of co-operative governance which may solve some of the problems.

The National Environmental Management Act provides for principles of sustainable development to which all organs of government should adhere to (section 2). These principles apply indirectly to individuals and private industries as these principles form the basis of decision-making by government. These principles include inter alia the polluter pays principle, the precautionary principle and environmental justice. Section 28 of the Act deals with the principle of the duty of care and the remediation of environmental damage. It allows the Department of Environmental Affairs and Tourism for example to order an industry to do an environmental impact assessment when it is clear that there is pollution or that an action may cause severe pollution. The Department uses these measures to control pollution that is not provided for in other legislation. It also provides them with a tool to force industries whose activities do not fall under the environmental impact regulations to do an environmental impact assessment.

110 *Energy and the Environment*

Emergency incidents are controlled by both the National Environmental Management Act and the National Water Act 36 of 1998. This situation may give rise to problems, as industry has to report to both departments in the case of an emergency incident (e.g. a truck carrying hazardous substances, overturning). Both the National Water Act and the National Environmental Management Act contains the polluter pays principle which means that theoretically industry can be held responsible by both departments.

The National Environmental Management Act also provides for co-operation agreements between for example the energy industry, government and civil society (section 35). The chemical industry in South Africa is at present negotiating such a co-operation agreement with government and civil society. These agreements may contain an undertaking by a person or industry to improve on standards laid down by the law for the protection of the environment, a set of measurable targets for fulfilling the previous undertaking as well as provision for periodic monitoring and reporting, independent verification of reports, regular independent monitoring and inspection as well as verifiable indicators of compliance with any targets, norms and standards agreed upon (Hanks [12]).

The National Water Act 36 of 1998 and the National Water Services Act 108 of 1997 impact severely on the energy industry. Previously the energy industry was allowed to use water on their land for generation and other purposes. Since 1998 water is regarded as a natural resource that belongs to the people of South Africa and all must compete for the water resources. Industry must register their water uses (which include waste) and may also only use water provided by a water services authority. Water should also be disposed of in a prescribed manner and with permission of the water services authority. Water quality standards are prescribed in terms of Government Notice R991 of 1984. These regulations provide for a general and special standard as well as a general phosphate standard. These standards may be included as conditions in a water license (Du Plessis [1]).

Various other pieces of environmental legislation impact on the energy industry, namely the Conservation of Agricultural Resources Act 43 of 1983, the National Forest Act 84 of 1998, the National Veld and Forest Fire Act 101 of 1998, the Fertilizers, Farm Feeds and Stocks Remedies Act 36 of 1947, the Atmospheric Pollution Prevention Act 45 of 1965 and the Hazardous Substances Act 15 of 1973.

Environmental law is fragmented. Different government departments have to give authorisations sometimes for similar application sometimes for different aspects of the same activity. In many instances industries do not even know all the legislation they have to comply with or they tend to ignore them due to a lack of enforcement. The enforcement of environmental laws is a problem as skills and personnel are lacking. Legislation is not only administered by different government departments but also by different spheres of government. In some instances the approval of national government is needed while in others, the provincial government or the local authority is the correct address. This is another reason for non-compliance with environmental laws.

11 Transportation and distribution

Section 54 of the National Road Traffic Act 33 of 1996 provides that "no person shall, except as prescribed offer for transportation in a vehicle or transport goods in a vehicle or accept after transportation in on or by a vehicle any prescribed dangerous goods".

In the case of non-hazardous goods a permit has also to be obtained in terms of the Road Transportation Act 74 of 1977. This act refers to transport by both road and rail.

12 Draft Clean Air Bill

The Department of Environmental Affairs and Tourism is in the process of drafting a Clean Air Bill (the Bill itself was not available at the writing of this paper). The purpose of the Bill is to follow a new approach to air quality management in South Africa. The Atmospheric Pollution Prevention Act 45 of 1965 was based on point-source emission control, registration certificates for scheduled processes based on point-source emission guidelines, pollution abatement based on the best practical means approach, enforcement in certain areas and the regulation of dust and vehicle emissions. The new approach will include the prevention and minimisation of atmospheric emissions (pollution at source), ensure the integrity and sustained "fitness for use" of ambient air, holding the responsible parties accountable for pollution, ensure environmental justice by integrating environmental considerations with social, political and developmental needs and prosecution in the case of non-compliance with authorisations and legislation. Air pollution will be considered on a local, regional and global scale (Anon [13]).

Malodour generation and control and indoor air pollution will be regulated. The following pollution will be managed namely smoke arising from coal and fuel burning, vehicle emissions, emissions from industrial activities, greenhouse gases, waste disposal sites, incinerator emissions, acid rain and noise (Anon [13]).

The Bill will also provide for ambient air quality standards and provision will be made for the monitoring of ambient air quality as well as for compliance monitoring (Anon [13]).

13 Conclusion

The new energy legislation is fragmented and still does not address the cycle of sourcing, exploitation, generation or production, transportation, distribution and consumption. There is, however, a shift towards more environmental protection and better regulation of the energy industry. Environmental legislation is, however, also fragmented and gives rise to problems as industry does not know which legislation applies to them or ignores the legislation as enforcement of laws has been lax in the past.



112 *Energy and the Environment*

There are many new policies, plans and programmes in place. It will, however, take some time before they become operational. A lack of human and financial resources may also mean that they cannot be implemented fully.

South Africa also has not set air quality standards yet, which gave the energy industry (and other industries) a free reign to "organise" their own air quality standards by negotiation with the chief atmospheric pollution control officer.

Unless the full cycle from sourcing to consumption is addressed not much will be achieved. South African legislation needs to address the full production or life cycle in order to ensure that government can fulfil its obligation to ensure that there is an environment that is not detrimental to one's health of well-being.

South Africa is a developing country. The need for energy is high. All households depend on energy. Many people, however, cannot afford to buy energy and rely on organic material as a source of energy. Alternative and cost effective energy sources need to be found.

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