Abstract

SA Energy Reserves and the Future

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I first address the question of what is a resource. There is extensive confusion caused by concern that we are running out of resources because they are non-renewable. We need constantly to remind ourselves that there is a big difference between a resource and a reserve, that the resource is normally very large and unlikely to be used in its totality, while the reserves are constantly changing in response to price. This difference is quite clear to every geologist, but the subtlety is lost on the man in the street. I illustrate the problem by the present concern over global oil reserves.

I then turn to the present position of South African energy and the dominant role of coal. Recently the Department of Minerals and Energy re-evaluated our reserves, and found them much lower than previously thought because the very large Waterberg resource was now judged to be uneconomic. Obviously the converse is true, that if the price of coal were to increase, then this resource could be brought back into our reserves.

I turn to other energy reserves. Our liquid fuel reserves are small and seem unlikely to increase, given the relatively poor response to extensive exploration. Natural gas is likewise in short supply; the promise of coal-bed methane is still there, but it suffers from the problem of 'stranded gas' common to many such relatively small arisings – how do you develop a few tcf if the infrastructure is limited?

Renewable energies have excited a lot of interest, but there are two problems associated with them. First, as far as we can quantify the reserve, it is surprisingly small. Wind energy has a potential of some 3000MW *installed*, or about 600MW average sent-out power. South Africa being a relatively dry country, our hydropower potential is low. Solar energy would seem a natural, but photovoltaics are still very expensive, while solar thermal suffers from some technical problems that do not have obvious solutions. Probably the most exciting is wave energy, and there are some interesting developments that few have heard of.

The second problem with renewables is that the power is not necessarily there when you need it, and *vice versa*. Our existing pumped-storage systems would help, but even so it is unlikely that the renewables will ever be able to supply more than about 15% of our national demand unless consumers are happy to have unforeseen 'rolling blackouts.'