

When do you know we are in deep trouble? (Part 2)

When the State loses the ability to make sound investment decisions....

In a first article published last week, I dealt with a media release of the City of Cape Town. Two days after that media release (dated 4 November 2015), BDLive published an article titled: “*Western Cape weighs use of desalination plants*”. This article stated that: “*The provincial government and its municipalities are weighing their options on how to secure the precious (water) resource. Water reclamation and seawater desalination are among the options being considered.*”

Western Cape MEC for environmental affairs Anton Bredell has said the province was planning to build desalination plants in Cape Town and the West Coast district municipality. Desalination was costly but essential for water security, Mr Bredell said.”

In my previous article I labelled the current water reclamation activities (or lack thereof) of the City of Cape Town as madness. In the same context the two desalination plants referred to above, would take madness to its extreme. I will show you why. But first, let me hasten to quote the Western Cape MEC for economic opportunities, Alan Winde from the same article: “*.... a desalination plant was not an option and the province would in stead look to use water wisely*”. At least it seems Alan Winde understands something about economics that (some of) his colleagues don't. The critical question is: will sanity prevail? We will have to wait and see but don't hold your breath.

But what is the problem with desalination of seawater? In its own right, there is nothing wrong with it, except as Anton Bredell correctly stated, it is very expensive. It is when one looks at it in the context of the City of Cape Town, which discharges massive volumes of purified effluent into the sea that the problem becomes clearly evident.

Imagine an entrepreneur who is planning to start a new and exciting business. The business that he envisages is this: he will buy a can of regular cola from his local supplier. He will then pour the contents of that can into an Olympic-sized swimming pool. Once that is done, he will use special (expensive!) equipment developed by him to extract, at great cost, the can of cola from the water in the swimming pool. Once so extracted, he will can it and then sell it in the market as: nothing else than a regular can of cola..... Does this business make any sense? Of course not, the guy is an

obvious nut case! But that is exactly what Anton Bredell, the City of Cape Town and various other proponents of desalination of seawater want to do – according to the BDLive article at least. The City of Cape Town goes to great effort and expense to collect and purify the sewage effluent to clean fresh water, just to discharge that clean fresh water into the sea and now they want to build an expensive plant that will extract at great cost that same clean fresh water from the seawater. It just does not make sense under any conditions whatsoever.

As I indicated in the previous article, the obvious solution is the indirect re-use of the purified effluent. Desalination of seawater is a last resort that should only be remotely considered once all options to reuse purified effluent have been exhausted and a suitable degree (80%+) of reuse has been achieved. A classical financial analysis of the two investment opportunities (indirect reuse versus desalination of seawater) would very quickly highlight the superiority of the first option. Just to eliminate any uncertainty, what do I mean by “classical financial analysis”? The answer is simple: discounted cash flow analysis as is typically utilised in the private sector. To be clear, there are more modern and better techniques to evaluate infrastructure projects. The fact that infrastructure projects typically offer a variety of options with regard to parameters such as timing, capacity and even technology applied makes a technique such as real option analysis highly suitable for these projects. Unfortunately, application of real option analysis is still rare in this country. So, classical discounted cash flow analysis will have to suffice and is the minimum standard one would expect. Such analysis would identify the indirect reuse option as a positive Net Present Value (NPV) project (i.e. a project that creates value) and the desalination of seawater as a (significantly!) negative NPV project (i.e. a project that destroys value). Who in his/her right mind would select the latter project for implementation?

The standard response from officials when this point is highlighted is that indirect reuse is not considered a viable choice as it would be unacceptable to the public. Rubbish! - If a fraction of the money wasted by implementing the wrong choice was utilised to properly inform the public on the environmental, economic and sustainability benefits, there would be minimal objections. Also take note that there are inland areas in this country that have for decades operated with a significant portion of purified effluent in the water source. So the principle of indirect reuse is nothing new and is well established in this country.

But this goes further than the difference between two project NPV's. This is gross wastage of a scarce, national resource. And just before you think I am hammering a

specific political party or the City of Cape Town, let me add that this situation is not unique to Cape Town or the Western Cape. Virtually every coastal city or town in South Africa is in this position where water is imported from the inland and the resulting purified return flow is (mostly) discharged to sea. So, this is a national occurrence and I firmly believe that in a dry country such as South Africa, dumping fresh, clean water into the sea borders on the criminal. How can we consistently get it so wrong? Is there not someone with the authority to stop or prevent this? Yes there is: the National Department of Water and Sanitation. (“NDWS” - this department is the regulatory body as regards the country’s water resources – the custodian of our scarce and precious resource - and an advisory and support body to the various Water Services Authorities). Yet, study after study conducted by the NDWS, planning the future water resources of the coastal regions (generally labelled Reconciliation Strategies) identifies desalination of seawater as a potential resource. To be fair, the latest update of the reconciliation strategy for the Western Cape clearly states that desalination as an option is a last resort due to its cost. But, there is a caveat: it is stated that all the other options (including water reclamation) have exceedingly long lead times whereas desalination of seawater can be implemented rapidly in an emergency. Watch this space!

Why am I so concerned about this? Well, apart from the wastage of our scarce water resource, which is an obvious concern and carries an economic cost, the seeming inability to differentiate between the right and the wrong options is to my mind widespread in government (and here I refer to all three tiers of government: local, provincial and national). I firmly believe this is symptomatic of a lack of appropriate financial analysis to ensure financial viability before investments/projects are considered. The City of Cape Town’s distribution of a small volume of purified effluent through a 230km pipe network at a price “much cheaper than potable water” and the consideration of desalination of seawater as a (emergency) water source are just two examples of this in the water sector. Sadly, I can point to a number of other examples that underline this. But rather than delving into more engineering examples, I will discuss two administrative examples that illuminate this even further.

It is common practise at municipal level that every project implemented is preceded by a feasibility study. In most cases, this feasibility study will be an engineering report outlining different implementation options, evaluating the capital costs of options, identifying key technical and construction risks and finally recommending an option to be implemented. I would typically classify this as a technical feasibility study, which would be just the first step in a more comprehensive feasibility analysis. But, in my experience, very little further (financial) analysis is conducted to inform

the decision to implement or not. In fact, the key decision driver after the technical feasibility is whether sufficient funding can be procured on the budget of the municipality for the implementation of the project. Not so long ago, I questioned a financial officer of a municipality on this lack of financial analysis and the gist of the answer was this: because the project is financed through government grants (and not through external debt/equity) which do not carry a cost for the municipality, there is no need to consider the financial feasibility of the project. Point made! It is clear that through this investment paradigm there will be a propensity to select the project option with the lowest capital cost – irrespective of the operating cost and long-term sustainability implications. There is no difference between a business that makes investment decisions on this basis and the example of our budding entrepreneur with his cola business discussed above.

Let me give another example. The NDWS uses the Unit Reference Value (“URV”) to select its preferred project options. This mechanism has no sound financial basis and consistently leads to the wrong investment choices. In fact, it was specifically developed during the sanctions years for the previous regime to select low capital cost options above higher capital cost options. (For the more technically inclined you can read more about the [URV mechanism](#) here). Application of the URV has also spread to consultants who regularly advise the NDWS with the result that many Water Services Authorities have in the past been ill-advised and made wrong investment choices.

Under the current economic climate, the role of the State to stimulate economic growth through infrastructure development is regularly highlighted. But, infrastructure development will only have the desired impact if the correct investment decisions are made. Make the wrong decisions and it could significantly worsen the situation. Making the right investment decisions starts with proper and appropriate financial analysis of the different investment options to ensure value for money, sustainability as well as financial returns that are commensurate with the investment risks. This should not be the exclusive mantra of the private sector but must also be the basis of the investment decisions of the State and all its agencies.