



## GOVERNANCE - WHY THE MUNICIPAL ENGINEERS SHOULD BE DEEPLY INVOLVED

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### ABSTRACT:

It is counter intuitive, but the fuller the world becomes the more technical, (and by implication, the less social), its management becomes. In an over-populated, resource constrained, "full world" environment, society cannot afford to build mistakes nor can it afford to waste resources by the misuse and abuse of technology. A few examples from eThekweni Municipality are used to illustrate that poor governance systems are working against the very society these systems profess to be serving. This should not be surprising considering that, in the main, our primary governance systems are centuries old and were developed for or evolved from very different environmental conditions, and further were probably designed to maintain social orders abhorrent to modern society. In the "full world" paradigm, it is questionable whether the ancient governance systems are appropriate to deal with the survival threatening environmental and social problems facing modern man. This paper argues that, as developers of technology, society's problem-solvers and stewards of the environment, engineers, and in particular Municipal Engineers, need to take responsibility for the services they provide to society, and in order to do this it means taking responsibility for the development and deployment of appropriate governance systems.

### INTRODUCTION

I laid out this paper as my "67 minutes for Madiba". The day before his birthday I had to endure the tribulations of a Tribunal Hearing concerning an appeal made by one of the country's leading retailers concerning a decision, made by the city, to turn down the developer's application to develop beyond the city's "urban development line", a line which the city had carefully chosen based on where it could reasonably service its community. At the end of the day's proceedings, when it became apparent that the retailer was not going to achieve his desired outcome, one of the directors addressed the hearing and effectively tried to blackmail the city by threatening to take his business elsewhere, which would lose jobs for the city.

The reason that the director had the confidence and was able to threaten the city was because his business makes money, and the money gives him the power and the right to interfere unreasonably with the city's business. Ever since money has been around, money has provided the power for people with it to interfere with and even rule over others. This power has sometimes been used well, but on average it has probably been used badly. Up until about a century ago, it was of little concern whether power was used well or badly as it merely affected whether people lived well or badly. In recent times there has been a major shift in paradigm: For the first time in history, man has equipment that can and does destroy the natural environment faster than the environment can recover. In this new scenario, it matters deeply whether power is used well or badly as it now determines whether mankind, along with his life-sustaining environment, is going to survive or not. Along with the shift in the mechanical paradigm there has also been a social shift and people are now far more concerned about how they live and their rights, than before.

In line with the "full world" paradigm shift, the two most pressing political problems, and therefore governance problems, facing society at present, and probably of all human history are:

- Overharvesting of the natural environment services and resources and
- Growing economic divide between "have" and "have nots", (although this is a manifestation of the real problem which is conserving resources for future generations).

These are highly complex governance problems requiring urgent attention and solution. A cursory evaluation of these two problems indicates that, while these are interrelated, one is predominantly a social one while the other is highly technical. It also implies that the social problem is not going to be resolved properly unless the technical one is resolved. A cursory evaluation of the governance structure indicates that it is filled at the top with people trained and experienced predominantly in the social fields, with very few, if any, technical people anywhere near this elevation. (If you look at the structure of eThekweni, the first level in the official ranks, (that is excluding the City's political structure and the Provincial and National political structures), is three levels from the top). This indicates that there is an inversion of the structure required to address these two major problems; a flaw with very serious potential consequences.

Not only is this structure not likely to lead to solutions to the two most serious problems, in our towns and cities, it is also leading to the inversion of function of officials. In eThekweni, socially trained people are determining the technical structure of the city, while the technical people are having to deal with the social consequences this is causing.

Probably because of the relationship between money and power, the economic system is the most dominant of the governance tools governing society. Just about every other governance system is either governed by the economy or set up to protect the economy, or is dominated by it. The inverted governance structure that is unlikely to find solutions to the two major problems is a direct result of the dominance and power of the economy. What is governing the generation of money and power is an economic system that was designed in the 1 200s, under non-critical environmental conditions, and was probably designed to maintain the social conditions and structures, prevailing at the time, which conditions and structure are abhorrent to modern society. As it now matters deeply as to whether we govern ourselves well or badly, it is imperative that we use tools that are "fit for purpose", and first among these tools has to be the economy.

Economists recognise two economies, the "financial economy" and the "real economy". In reality their "real economy" is not one, but two economies, which work very differently to one another. On the one hand, there is the "profit-based" economy, which in essence governs the private trade-based business sector and on the other hand, the "cost-based" economy which is paid through rates, taxes and tariffs. The current economy is designed around the "profit-based" sector and the "cost-based" one is virtually ignored: The economy certainly ignores the significance of the "cost-based" economy. In reality, the "cost-based" economy provides the major part of the primary services (water, electricity, roads, etc) to both society and the business sector, and as such, should be the major dominant economy, with the businesses supplying, the secondary (manufacturing, retail, etc.) and tertiary services (finance and accounting) supporting this economy. A governance structure based on this hierarchy provides the natural governance hierarchy to solve the two major problems facing society. In the current system, taxes are needed to pay for the services provided by the "cost-based" economy. These taxes are paid primarily through the business sector as a "small" portion of their profits. Because of the power of money, this has not only allowed the tax-paying businessman to believe that he "owns" the public "servant" and therefore has the right to interfere unreasonably with his business, it has also upset the natural hierarchy of governance which is interfering with the ability of the governance professionals to govern and service society properly.

Apart from the service-provision interference issues, the inversion of this natural hierarchy has a number of secondary consequences that impact on the Municipal/Civil Engineering community:

- If we remain on a tax based system, the primary-service-producing public "servants" are always going to be remunerated less than the people paying for them. This in turns means that:
  - The public "servant" will never establish the authority necessary to

govern society properly based on a money-power system.

- The public “servant” will never be paid the true value of his service relative to other services, as the true value of the secondary and tertiary services combined is probably less than the true value of the primary service.
- The Municipal/Civil Engineering community will never be able to attract the calibre candidates required to provide proper primary services and governance to society.

By far the main purpose of this paper is to show, that the economic system is not merely unfit to resolve the two major problems but is a major cause of them and by “creating jobs” we are exacerbating both these problems. But there are also a number of secondary purposes including to:

- show that money and the economy are confusing our collective thinking and problem-solving
- show that money has corrupted and is therefore interfering with the natural governance hierarchy that is best fit to address the problems
- draw attention to the need for a professional governance system, lead by properly qualified, technical people with an aptitude for problem solving and experienced in systems thinking, that is in line with the needs of the problems facing society
- determine a governance hierarchy that reflects the natural hierarchy of service that is reflected by the economic system
- provide an outline of an alternative economic system that address the two primary problems facing mankind, and thereby addresses most of the other secondary problems.

**Some Concepts to Start**

Before proceeding further a distinction needs to be made between financial value/ wealth/cost/ poverty etc. and real value/cost/wealth/poverty etc. While this is a complex topic, as far as this paper is concerned, real cost/poverty/etc. relate to the depletion of environmental resources, particularly non-renewable resources, while real value/wealth/etc. relate primarily to the provision of service and the availability of environmental resources and services, as opposed to financial value/cost/wealth/poverty which relate to the ability to command resources or service through the power of money.

**THE “UNFIT” FOR PURPOSE ECONOMY**

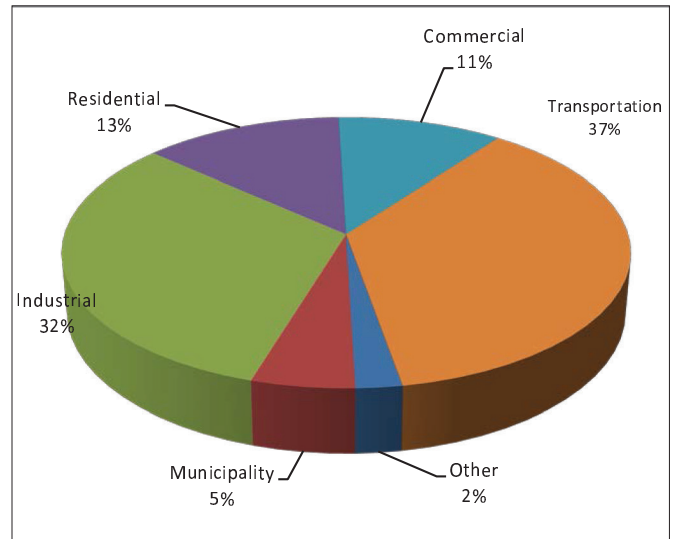
**In Regard to Sustainable Consumption of Resources**

This section is approached with reference to eThekweni Municipality’s carbon dioxide equivalent emissions (CO<sup>2</sup> emissions), as CO<sup>2</sup> emissions are an element of the two bigger primary problems. There is an ever increasing CO<sup>2</sup> emission from the city. However the pie chart shown in Figure 1, illustrating the emissions by sector, remains relatively constant. There are two outstanding features of Figure 1 which are relevant to this discussion:

- the sector making singly the highest contribution to the emissions is transport.
  - the fractionation of the emissions between those that are related to residential (presumably domestic) and those that are business (industry and commerce) related, is approximately 25% to 75% respectively. (Achieved by dividing the emissions from the transport, municipal and “other” sectors between residential and business on a pro rata basis).
- The reason that the second feature is so significant is because business certainly does not supply three times more real service to society than the municipality: It is questionable whether business even supplies as much real service to society as the Municipality.

This is not said lightly, as the municipal sector provides most of the primary and life sustaining services to society, except for agriculture, (which is the ugly stepsister to the business sector), and some mining, and, as such, should be the primary economy. In our resource-consumption stressed world it is also questionable whether most of the secondary and

tertiary services are required. The investigation into this inefficiency in the business sector plays a major part of argument of this section.



**FIGURE 1** Carbon Dioxide Equivalent emissions from eThekweni Municipality (eThekweni Energy Office 2014)

While it is not clear where all the inefficiencies lie, it is useful to take a pedantic look at the process of making money to both understand and provide the possible reason for this inefficiency and thereby provide the reason why the current economy cannot be used to cure the unsustainable consumption of resources:

- the economic “system” is based on money, (it is not based on service to society)
- money is derived from trade (and it does not matter whether that trade is associated with service to society or not)
- trade services money; business has more money than society, so business attract business trade and money generates money
- this sets up an inefficient spiral based around business trading with business, trading with business and very little business is servicing society
- there is no resistance in the process, either monetary or otherwise, that confines trade or the production of money; in fact money drives the process
- an increase in trade is synonymous with an increase in consumption of resources and there is nothing in a trade-based system to limit the consumption of environmental goods and services to within the limits of sustainable consumption
- this system is also “labour hungry”, hence part of the call that “everyone needs a job” is to fulfil this need.

This suggests, firstly, why business is consuming a large portion of society’s natural resources with very little return in social service. Clearly, this process is the cause of the unfettered overconsumption of environmental services and resources. Importantly, what is clear is that the incentives in a financial and trade based economy are totally out of line with the need to conserve resources.

The primary objective of a resource confined economy should be to service society efficiently and to use natural resources sustainably: There is nothing in the incentives or costs that even force the economy to service society, let alone efficiently, and there is no barrier in the process to limit resource consumption to a sustainable range.

There are four other major consequences, (unrelated to the argument on the preservation of resources), that are derived from the above analysis of the economy that must be mentioned:



- society is in a degenerative negative cycle in relation to business. As the wealth of businesses grows it will attract more and more service away from society
- there is no resistance in the economy, so the economy will grow until the environmental systems and/or society fails
- the current economy is becoming redundant as a service provider but continues to grow as a power-provider
- possibly related to the above point; business is deceiving society into believing that society is getting richer in financial terms by using money, whereas in reality society is getting poorer in real terms because it is being misled into consuming its resources for very little real social benefit, unless undue power to a few in business, is a benefit.

It is clear from the above that a major portion of society is working for the benefit of business rather than business working for the benefit of society. We, as society, should be objecting to this waste of resources and even more so to the social interference that this causes.

### In Regard to the Widening Wealth Gap

In regard to the growing economic divide between the rich and the poor; the Wikipedia posting for Thomas Piketty says: "Piketty specializes in economic inequality, taking a historic and statistical approach. His work looks at the rate of capital accumulation in relation to economic growth over a two hundred year spread from the nineteenth century to the present. His novel use of tax records enabled him to gather data on the very top economic elite, who had previously been understudied, and to ascertain their rate of accumulation of wealth and how this compared to the rest of society and economy. His most recent book, *Capital in the Twenty-First Century*, relies on economic data going back 250 years to show that an ever-rising concentration of wealth is not self-correcting." (Wikipedia 1014). This "ever-rising concentration of wealth is not self-correcting" should not be surprising, as there is a lot of systems based evidence that indicates that the economic system has been devised specifically to grow the gap between the rich and poor. Some familiar examples we allow to go unquestioned are:

- If one invests R100 and R10 000, both at 10% interest, the net growth of the R100 is R10 while the net growth of the R10 000 is R1 000, meaning that in terms of the actual growth, the larger rich person's investment will be growing faster than the poorer person's: This obviously widens the gap between rich and poor as opposed to narrowing it.
- The system associated with commerce where each subsequent trader in the supply chain, gets a mark-up, not only on the base value of the product but also on the mark-up of all dealers ahead of him in the supply chain. This means that the producer of the product, the farmer for instance, who usually takes most of the real risk and provides most of the real service, gets the least reward for his service, (hence the earlier remark about the ugly stepsister). If anything, if the system was fairer in terms of power, the farmer, the primary producer, should be "employing" the marketer, the secondary-service provider, to sell his produce for him rather than the marketer "employing" the farmer to produce the goods, as is currently the case: The farmer would be paying the marketer his true value rather than a value associated with the number of steps in the supply chain, and the appropriate distribution of money would maintain the power and status of the farmer to where it should be.
- In the process described above, where business service businesses, the profits generated by the business are distributed to the shareholders and senior management, not the workers who are the real service providers, which process leads to the widening of the gap between rich and poor. (This is also one of the processes which keep widening the gap between the poor and the wealthy nations).
- And then there is the deceitful practice of Preferential Shares, where large investors are usually given a higher proportional division of the profits for lower risk; the risk being lower because in the event of

liquidation they are paid out ahead of the Ordinary Shareholders, and usually get a better percentage pay-out.

These few examples and Piketty's statistical evidence provide sufficient evidence to show that the application of the current financial and economic systems are more likely to widen the gap between the "haves" and the "have-nots" than it is to narrow it.

Taking this conclusion that the current financial and economic systems is widening the wealth gap, in conjunction with the conclusion that the money and trade incentives in the economy are causing unnecessary resource consumption with very little benefit to society, means that the current economic system will not solve the two most pressing problems facing society, and worse this also shows that the current economy is the cause of these two problems. It is clear that the current, money driven trade based system is not and cannot ever be an appropriate governance system in a resource constrained world, let alone the dominant governance system. It does not take a rocket scientist to work out that one cannot use the system that is causing a problem to solve the problem. This means that we must change the economic system. Yet just about every government in the world, including our own, is busy trying to stimulate the current economy, to "create jobs" which are exacerbating the problems: The National Development Plan being the case in point.

### MONEY CONFUSING DECISION MAKING

Municipal Engineering is one of the primary businesses for society, but it is an extremely difficult business, dealing with arguably the most complex set of systems known to mankind. It is possibly counter intuitive to non-technical people, but the fuller the world gets the more technical its governance becomes. This is because society can no longer waste resources through inefficiency, or afford to make "mistakes" that will cost valuable resources to fix later.

I became an Engineer because I wanted to "make a difference". Being a compulsive problem-solver and systems freak, I had the right attributes, but I have not been able to make the differences I should, primarily because I, like most Municipal and Civil Engineers, have become third class citizens in our own domain. We are "third class citizens" because anybody, in any walk of life, including the retailer of the first paragraph, without any concern for the consequences to society and little or no aptitude, training or experience for this extremely difficult and demanding job, seems to have more right to interfere with our business, than we have, because money is driving society. The following section highlights how the pursuit of money is interfering with society's ability to think in society's best interest.

### The Problem

This section refers back to the two issues that came out of the eThekweni CO<sub>2</sub> emissions report, namely:

- the sector making singly the highest contribution to the emissions is transport
- the fractionation of the emissions between those that are domestic related and those that are business related is 25% to 75%.

To further qualify the problem, I quote with comment, some sections of the Durban, South Africa African Green City Index, which benchmarks the environmental impact for a number of services provided by major cities, posted on the Siemens' website. (It needs to be noted that the Durban posting on this website actually refers to eThekweni data).

With regards to the section on the Durban posting on the Siemens Green Cities Index on Planning: "As a result of the sprawl and the City's large administrative area, it is one of the least dense cities in the Index, with 1 500 people per square kilometre verses an overall average of 4 600." (Siemens)

With regards to Public Transport: "With an extensive bus system of 1 400 routes and some 200 operators Durban has the longest public transport



system in the Index. In total it measures 9.2 km per square kilometre, more than three times the Index average of 2.7 km". (Siemens)

If one works this back to the number of meters of route per head of population served and compare that for eThekweni to the average based on the average Indexes, one realises that eThekweni is more than ten times worse than the average for the Index (6.1 m for Durban compared to 0,6 m for the average of the Index)

When you realise that this means that not only are the capital and operational cost of infrastructure per person serviced, ten times the average for the Index but that both the travel time and probably the waiting time are both ten times more than the average. This means that in real terms, our public transport is costing the people using it, somewhere between 100 and 1 000 times more than the average for the Index.

Putting a social spin on this, it means that by providing "cheap" housing on the periphery of the city, the city is "planning" to lock the people living in these peripheral communities into the poverty cycle.

With regards to Electricity: "...electricity higher than average, 11.3 giga Joules per capita verses the Index average of 6,4 giga Joules" (Siemens)

It needs to be noted that eThekweni has a warm climate and consequently the heating required is less than other parts of the world, although there is a high usage of air-conditioning. However, air-conditioners pump heat which generally requires about one third of the energy that is required to heat through the same temperature range, implying that, had the bench-marking been rectified for climate, eThekweni's consumption would have been worse.

The eThekweni Emissions report indicates that a significant amount of electricity consumption is associated with transmission losses, which one assumes is related to the length of the transmission network, which network length, at the low densities indicated, is likely to be in the order of ten times the "network" in the Index average.

Although not noted, but based on the transport analysis above, I suggest that the street lighting is probably about ten times that for the average city on the Index.

It should be clear from the information above that, apart from the business sector, the city is incredibly inefficient in real terms:

City sprawl is a major contributor to both financial poverty and negative environmental impact: The real poverty being associated with both the consumption of non-renewable resource and the CO<sub>2</sub> emission. Urban sprawl can only be controlled by proper urban planning and governance.

As transport is the major contributor to CO<sub>2</sub> emissions, every effort should be spent on reducing the number of trips, as well as the length of these trips, (partly covered in the bullet above): The main reason for the trips, being work.

The Planning in eThekweni is done by people with primarily social and economic backgrounds, all striving to support the "profit-based" economy.

If society is serious about reducing its emissions, then it should be focussing on increasing the efficiency of service provision and reducing the number, and distance of transport trips. To do this, we should be reducing the number of jobs, not increasing them, and if society is not benefitting much from these jobs, is there any point in retaining them?

### Governments Response

All three tiers of government, Nation, Provincial and Municipal, are aware of the two most pressing problems facing society, (proof is indicated by the response referred to in the next paragraph), so it is enlightening to see how they have responded to these issues. (The Provincial Governments response will not be dealt with as in the main it is a reflection of National Governments').

Two things National government has done are, it has put out a Government Notice that has classified greenhouse gases as "Priority Air Pollutants" and secondly it has implemented the National Development Plan (NDP) to stimulate the economy.

In terms of the Government Notice, certain waste management activities have been listed as activities producing greenhouse gases and are therefore emitters of "Priority Air Pollutants". This notice, by all appearance, for these activities, only requires the administrative interference of developing a pollution prevention plan which rightly does include emission reduction targets. But, these plans apparently do not require any implementation. What is worse though, is what industrial sectors are targeted. Many of those targeted are small emitters, for instance wastewater treatment works which in the case of eThekweni only represent 6% of the municipal 5% of the total emissions (eThekweni Energy Office, 2014). Others targeted can do very little about their emissions, for instance the road transport operators, while there is no sanction on the two primary causes of the problem, which causes are the poor planning that has allowed the city to sprawl, and the creation of jobs, which the government is in fact driving.

The National Development Plan (NDP) is designed to stimulate jobs, including jobs in the highly inefficient private sector. Apart from adding to the gross inefficiency of this sector, increasing the number of jobs will also increase the need for transport which, in a sprawling city will exacerbate both the real and the financial poverty. The NDP calls for a minimum growth of 5% per annum. At 5% per annum everything doubles in 14 years, including the CO<sub>2</sub> emissions and the consumption of fossil fuel.

eThekweni Municipality's response has been even more interesting. The city has built an airport on the periphery of the city, and is now encouraging the inefficient businesses to establish themselves around it. Presumably the businesses that will take up on the offer are those that are best suited to increasing the number of flights in and out of the city, thereby increasing the CO<sub>2</sub> emissions that are already too high. Further, by establishing this business node on the periphery, it has extended the already unduly long travel routes for the workers. But that not being enough, the city has extended the "urban development line", which allows the workers to live even further out so that the workers now have to travel even further than they did before, wasting more time and scarce resources. To crown it all, the Municipality has even set up a Rural Development Service Unit, (in a city!), to consolidate and entrench these "rural developments" that cannot be serviced properly as part of the City. Presumably, this is to show just how much the city cares for the people it is busy entrenching in poverty.

### Discussion

The quality of the responses to the issues on hand indicates that there has not been an iota of the required systems and/or problem-solving thinking, brought into play. This reinforces the earlier suggestion maintaining that governance in a "full world" should be technical. This poor technical decision-making at the top of the governance structure, particularly the one to stimulate the economy rather than to change it, interferes seriously with the professional public officials' ability to provide the primary life sustaining services efficiently and to uplift a major portion of society. The cause of the poor technical decision-making at the top is, to a large degree, because the people taking them are not necessarily proficient in the technical field, because they are voted in. There are a number of very important functions that needs to be undertaken by the elected leadership, (one of which will be touched on briefly later), but the technical decision-making is not one of these functions. Further, in a "full world" there are unpopular technical decision required, which is counter-indicated to the popularity required for election. Society would not tolerate our top professional sports people being refereed and coached by amateurs, so it makes little sense to insist on people who are not technically proficient to make critical technical decisions in our life determining governance systems.

If we are going to have Professional Technical governance then we need to restructure our selves very differently to the way we are now. We need



to reverse the current structure and put the primary, secondary and tertiary services in that order and remove the tax constraints and control from the sectors that are not providing the primary services. (Tax is not required to pay for primary services if the above natural hierarchy is established). This, and the fact that the current economy is causing the two major problems, means we have to change the economic system that drives the current system.

We need to wake up and realise that the economy is manmade (certainly not God-given); this means that we can change it, and definitely should change it if it is destroying society and the life preserving environment. Why then do we remain fixated by the maintenance of an archaic bearing-less, squeaky, wooden-wheeled donkey cart of an economic system that is working against us, when we can fly to the moon and back?

### SUMMARY AND CONCLUSION

In summary the main conclusions from this are:

- The Economy is the main cause of the two major problems facing society.
- The Economy, the primary governance tool, and all the tools and structures it has spawned, are inappropriate for dealing with the two survival-threatening problems facing society.
- The “full world” paradigm means that professional technical governance has become critical to the survival of mankind and his environment.
- Our governance is poor because the power to make the required professional, governance decisions, (which should be made by the qualified, problem-solving, system-thinking, technical, professionals with governance experience), lies elsewhere.
- This state and a myriad of intertwined systemic problems are spawned and maintained by the power of an inappropriate economic system.
- This all points to the need to change that Economic system.

### SOLUTION TO THE ECONOMIC SYSTEM

In the interest of brevity an outline of the solution economy is provided with a few minor explanations and examples for clarity.

From the arguments above it is clear that the economy needs to be a service based one that is environmentally constrained, probably meaning that society will have to give up some of our material “wants”, and undoubtedly this will generate socio-political pressure for compensation. (This will be dealt with later). The objective in a modern economy then should be to provide maximum service to society at minimum environmental cost with the proviso that the consumption of environmental resources and services is limited to what can be harvested sustainably. This will constrain the system and at the same time ensure that the focus is on serving civil society. The services will need to be provided according to the hierarchy of primary, secondary, tertiary services, in the main, with only minor adjustments for instance where a lower order service is critical to provide a primary one. To manage this requires measurement on two fronts:

- **Environmental measurement of the harvestable limits.** The agricultural industry is able to measure and maximise a sustainable harvest and this needs to be extended to the natural environment. Some work on the maximisation of integrated agricultural, social and environmental services has already been done but a lot more is required. The solution economy, unlike the current economy, needs to recognise the differences in the natural recycle behaviour between different resources, for example those differences between renewable water and non-renewable oil. This implies that the solution economy will require a different “currency” for each of the critical resources, but like oil and water these currencies will not be interchangeable. (The current economy merely makes an inappropriate “human demand” based decision on an exchange rate which implies that oil is the same as water. This system

has absolutely no bearing to anything meaningful to the environment). Environmental Life-Cycle Costing, or similar, can be used for evaluating environmental cost of products and services. Most, if not all of the base technology required for this measurement and control is available, but it will still require substantial “grind” work to bring it to covering all human endeavour for implementation.

- The administration of distribution of resources can be done readily on “credit card” type technology.
- **Measurement of social service.** “Time made available to the community” (“Time”) works as a good proxy-measure of service. There are three levels of service related to “Time.” These are the services that create “Time” such as water supply, electricity, roads etc, the primary services in the main, those that use “Time”, some secondary services such as entertainment, in the main, and those that waste “Time”, such as unnecessary jobs. To use time someone has to have created it first, so generally speaking the primary services produce more “Time” than the secondary ones, and secondary one more than tertiary, thereby automatically complying with the natural hierarchy in most cases. (Subdivisions of these are required but in the main this provides the right hierarchy for remuneration).
  - “Time” is part of the real economy and also provides a real economic “feel” and thus generates a proper value comparison when making choices.
  - “Time” is also a component of both real wealth and of freedom, and this, if used properly, provides compensation for the loss of material wealth noted earlier.

Real resources will be allocated according to the needs of the natural hierarchy of primary, secondary, tertiary services such that allocation covers everyone’s primary service “needs” first, and what sustainable resources remain will be allocated to the service secondary “wants”. The allocation of “currency” will be such that everyone is allocated sufficient for their primary services, and what resources remain will be allocated to the service providers and non-working society in a ratio determined by negotiation between the service providers and society but weighted in line with the value of these services based on “Time”. Unlike the current finance, the “solution” currency will not circulate in the current fraudulent manner: As a service is consumed, along with the environmental resources, the currencies will be consumed, (thus reducing accumulation of wealth to the undeserving).

The elected leadership will need to be society’s negotiators in the negotiations between society, the service providers and the environment, represented by the environmental scientists.

The service providers and environmental scientists will need to determine the social and environmental cost of services as a “menu” and this will form the basis for negotiation as well as the political parties’ manifestos. This should help ensure that that power is distributed according to need and the ability to fulfil the need. (The control of power is beyond the scope of this paper).

No taxes are required to pay for this system, as the primary services are the primary objective of the system, and the allocation of resources is directed accordingly: Unlike the current system where primary services are the tertiary objective and the tertiary service is the primary objective. (Taxes may be used as one of the mechanisms to get the hierarchy right where there are logical anomalies).

### Ability to address the two primary problems

- Because of the capping on the harvestable capacity of the environmental goods and services is performed upfront, overharvesting should be prevented.
- Because the objective and part of the measurement of the system are social service provision based, the incentive ensures that the first allocation of material wealth is automatically directed at servicing society’s



basic needs, and because the resources are capped by the limits of harvestability, this should prevent the unfettered wealth spiral.

- There will be nothing to invest in, as there will be no capital and no growth as all the capital will be environmental capital which will be invested in the environment, by the environment, for the environment. This together with the remuneration system based on personal contribution to production of needed service will eliminate, to a large degree, people being rewarded for things that they had no part in creating on one hand, and should cap peoples' ability to earn on "un-required" services, on the other.
- The "linear" currency will eliminate one of the "get rich quick" legalised fraud schemes deployed in the financial industry, which scheme retains the financial wealth of resources that have already been consumed, and which scheme makes the financial industries huge amounts of money.

Some of the environmental-economic spin-offs of this system are:

- Many jobs will become redundant, reducing environmental impact from both the inefficiency and the transport perspectives. This will trigger a positive cycle as the fewer resources required, the fewer mining and extraction jobs are required, which in turn will reduce jobs etc., all with the associated environmental benefits.
- Rewarding people for service rendered rather than on how much they can sell, will eliminate a huge amount of "designed obsolescence": Manufacturers will be remunerated on service; while their produce is functioning and providing service, they can then sit at home and do nothing. When the product is out of order, two things happen; they stop being remunerated, and they have to go out and work to fix the problem. Getting the incentive right in this way will eliminate the incentive to drive for sales and thereby eliminate "designed obsolescence" and the like.

#### Some of the social spin-offs are:

- Less work will make more time for social activities, (jobs will be shared).
- More importantly there will be less "parent absenteeism" which in turn has social spinoffs such as the reduction of crime and gangsterism.
- Society will have more time to attend to the social fabric such as care of the aged and infirm.
- It will remove the stress and stigma of "everyone must have a job".
- There should be no beggars, as everyone will have their fair share of the resource allocated on their "currency card". If this is spent unwisely, offenders will require re-education.

#### Some professional benefits

- "No tax" will remove interference from National Treasury including Supply Chain Management.
- The primary service sector, including Engineering will be at the top of the professional and social ladder, which will attract more candidates into the profession. (If practitioners are rewarded according to this proposed hierarchy, the remuneration of Engineers relative to other professions and service providers will be appropriate).

#### WAY FORWARD

Nelson Mandela stood for freedom, in particular the freedom from dominance of one human being over another, a noble cause, and he has gone a long way to achieve this, but more needs to be done. While I accept and clearly even agree that, for the purpose of social order, it is necessary to have a social hierarchy, we need to bear in mind the purpose of that hierarchy: It is to save man from himself. Contrary to what the classic works on economics say, the current economic system is set up for one human being to dominate over another for selfish reasons, and for the same selfish reasons, the maintenance of this dominance threatens the very survival of society. Where we are failing Madiba is that we have not even recognised this selfish economic driven, dominance of one human being over another, in fact, our governance systems and government policy are

driving it. Under the "Civilution" banner, our sister Voluntary Association, the South African Association of Civil Engineers (SAICE), is trying to address some of the symptoms of the affects this dominance has on the Civil Engineering profession. This is good but it does not address the fundamental cause, and even if "Civilution" is successful, new symptoms will return. Part of Mandela's success was that he fought a noble fight: "Civilution" needs to be escalated to address the cause of the problem, not just the symptoms and in so doing it will fight for a noble cause. There is a lot to do, including raising "Civilution" to a noble cause, but in the short term, on a personal level we each need to question every decision that is made for money reasons, including "everyone needs a job". But, above all, each of us must not only recognise, but accept that we have to change the economic system, and make the effort to do so wherever possible.

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