



Early beginnings for G1000 and systemic Change

In seeking a system that facilitated a transition from the current system to one where systemic change was driven by learning organizations, our Founder, Michael Doyle presented a series of research papers to the University of Stellenbosch in which he imagined a company that facilitated this change.

The imagined company was the beginnings of the Global 1000 Schools Project.

Futures related research papers that included:

Managing for Change – an imagined company driving systemic change by learning organizations and the future influence they have in a new world.

Measuring and making the future – the processes that needed to be followed in order to ensure a thorough analysis a learning organization needed to conduct in ensuring systemic change.

Understanding the World – this research imagined a whole country and its move to the world of renewable energy. It contained an in depth look at the PESTLE (Politics, Economics, Social, Technology, Legal & Governance, and Environment).

Managing for Change

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1. Carbon Trading Concepts System

Carbon Trading Concepts (CTC), a renewable energy and carbon trading company, was founded out of the understanding that there exists a disconnect between sustainability education and the 'business as usual' scenario that primarily exists in organizations. In research conducted by the author on where this disconnect exists, it was found that very few learning organizations apply the principles of sustainability, in particular renewable energy, in their organizations (Annexure 1). Generally these organizations focus has been on education and the easier to implement programs such as recycling, composting and some degree of energy efficiency. However, the biggest impact these organizations can have on reduction of carbon emissions is through the move from fossil fuel based energy purchases to renewable energy. This move would also demonstrate to the organization's stakeholders that the requirement to move towards a sustainable future is a serious one, and one that needs immediate practical action as opposed to theoretical action due to the serious global impacts that climate change is already having on the world, and will continue to have in an ever worsening manner.

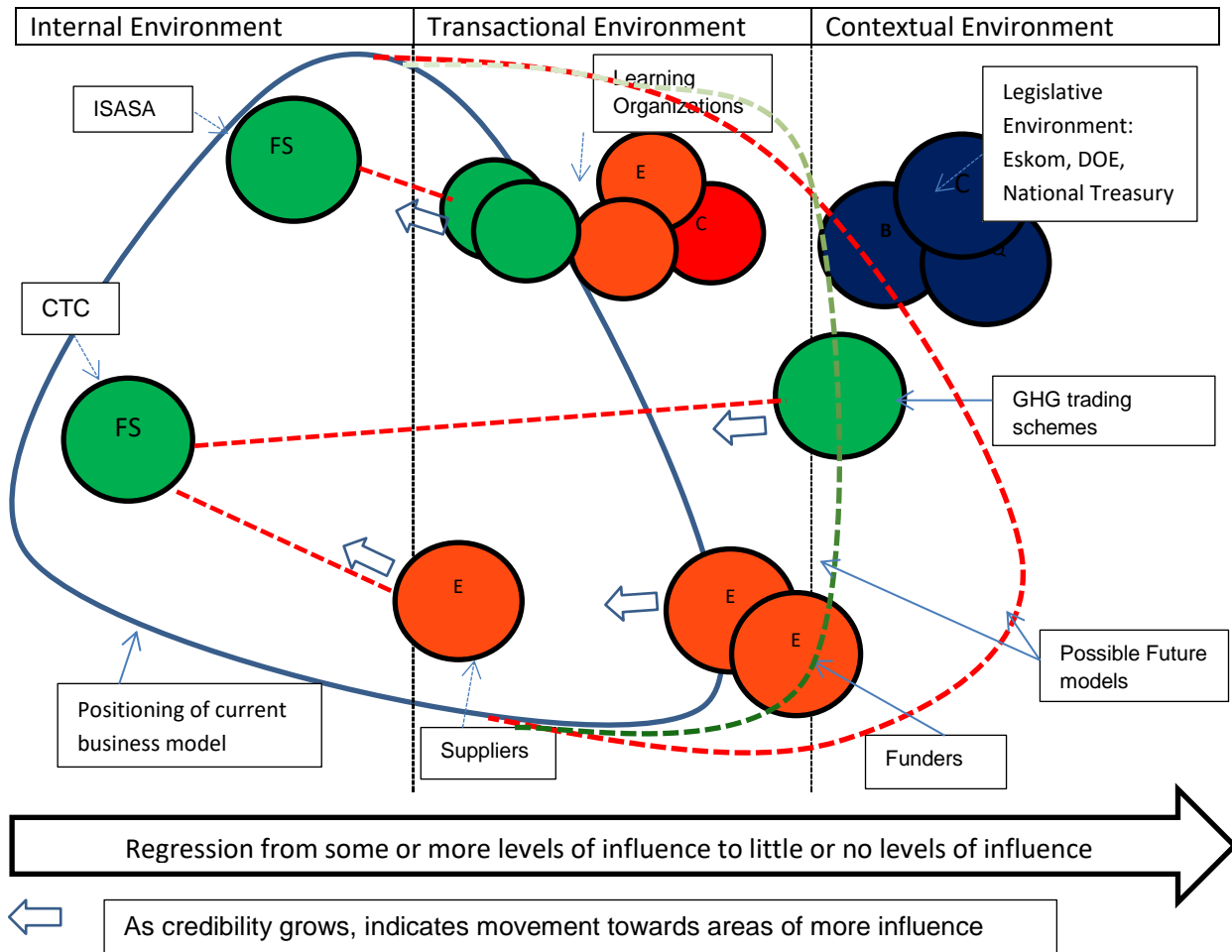
One of the primary reasons for the difficulty in this move is a financing one. While renewable energy, and especially solar photo-voltaic (solar PV) energy systems, is dropping in price, it is still seen as an expensive option given the still relatively cheap price of electricity – although each year this becomes more expensive. CTC also takes note of the fact that learning organizations primary area of focus is that of education and as such, funds are allocated firstly to the learning needs of its stakeholders. Bearing this in mind, CTC has sought to remove the burden associated with financing the investment required for such an infrastructure project.

In reconciling the disconnect between the theory and practice of renewable and sustainable energy, CTC seeks to facilitate the practical application of sustainability theory in learning organizations via a business model that allows the organization to switch to renewable energy sources as well as to contribute to a cascade effect into the broader environment through the trading of carbon credits.

CTC has chosen its target market of learning organizations for several reasons. Firstly sustainability education needs to start at a very young age in order for the concept of sustainability to become an embedded part of learner's worldviews. Secondly, learning organizations operate primarily during daylight hours, and as such they are able to take advantage of the high incidence of sunlight South Africa experiences by installing the most cost effective renewable energy – solar PV. In addition, this removes the cost of the most expensive component of solar PV, storage - the learning organization will be able to build this capacity from savings generated through their own supply. Thirdly, learning organizations generally do not operate over weekends, nor during lengthy holiday periods. This provides the opportunity to tie to the grid and sell power back to the power utility during these periods, which will provide the necessary set off required when the organization needs to draw power from the grid. As a system is scaled up, the opportunity exists to be a net provider of power to the grid.

2. Systems affecting Carbon Trading Concepts in the internal, transactional and contextual environmental spaces

Diagram 1: Environmental Canvas



Source: amended from Dr Steyn Heckroodt, PGD Futures Studies, Stellenbosch University

Internal Environment

The internal environment is made up by two very committed stakeholders who are currently the key driving forces behind the project - Carbon Trading Concepts (CTC) and the Independent Schools Association of Southern Africa (ISASA). CTC, which has the vision of carbon neutral learning organizations, partnered with ISASA as they are the co-ordinating body for independent schools. They have the ability and resources to influence their member schools. ISASA also has sustainability education as one of their core focuses.

Suppliers or Independent Power Providers (IPP) of renewable and alternative sources of energy are a rapidly growing sector in the energy market in South Africa. There is a degree of influence that CTC can exert over the suppliers, primarily due to the fact that international renewable energy companies are looking to expand their markets into Sub-Saharan Africa (SSA). Some funders already exist and are seeking to invest renewable technology in organizations on an IPP basis.

Transactional Environment

Learning organizations remain in the transactional environment due to the fact that the CTC/ISASA partnership has yet to approach them on a co-ordinated energy model. The link however exists which allows for an 'easier' management of the proposed model and influence through ISASA. Primary research has indicated that learning organizations would seek to incorporate renewable energy in order to demonstrate practical commitment.

Due to new regulations within the carbon trading market, SSA is classified as a preferred funding opportunity for Annexure 1 countries both for their expansion models and carbon emission requirements under the various trading schemes and emission target commitments such as the Clean Demand Mechanism, Gold Standard, Kyoto Protocol, etc. This allows suppliers and project developers to link with funders such as the European Union, Power Africa, etc.

Suppliers border the internal and transactional environment as they see the opportunity to invest in renewable energy projects. CTC should seek partnerships with these suppliers

Contextual Environment

In seeking to position CTC as a leader within the renewable energy sector it is necessary to understand the energy mix in South Africa. Current energy generation in South Africa is complicated, with primarily one central provider, Eskom, generally supplying energy to municipalities who then sell-on the power to their customers, or directly to larger customers. Currently severe supply constraints exist. The primary and majority of Eskom supply is fossil fuel based, coal (72%), followed by oil (22%), natural gas (3%), nuclear (3%), and renewables (less than 1%, primarily from hydropower), according to BP Statistical Review of Energy 2013. In terms of the country's future energy mix, there is a move towards renewable energy; however the current short term focus is on coal fired power stations and a possibility of a move to financially non-feasible nuclear power generation. In terms of its proposed renewable energy component, the government's commitment falls well short of the potential a solar energy rich country such as South Africa has. There has been a move during 2015 to some larger scale solar PV projects such as, Jasper, and a further 13 licences were issued to renewable energy projects. According to the Department of Energy, South Africa's installed capacity is about 45, 700 MW (coal, oil and natural gas). The precarious low margin between installed capacity and peak demand leads to load shedding and the power utility having to request large industrial users to shut down or cut back operations during peak periods. According to the Southern African Power Pool 2013 Annual Report the peak demand forecast is expected to reach 53, 900 MW by 2025.

With increasing interest in renewable energy deployment in the country, existing grid infrastructure problems have come to the forefront. In 2010, the DOE and National Treasury, in consultation with Eskom, mapped investor plans against existing Eskom infrastructure and grid planning, and indicated that there was sufficient connection capacity for REFIT IPPs until 2016. However, in 2011, Eskom did admit that it does not have the capacity to build the infrastructure needed to connect all IPPs to the grid. IPPs have, therefore, undertaken connection requirements themselves and at their own costs. Despite these commitments, existing maintenance backlogs in the country's electricity grid are putting severe constraints on the development and deployment of renewable energy. In efforts to alleviate the challenge,

Eskom has initiated a smart grid pilot project network to enable demand side management through load limiting technology.

It is the constraint in supply and grid connectivity problems, the peak demand forecast in 2025, and the planned development of renewable energy supply that opens the market opportunities for renewable energy IPP's such as CTC. The regulatory and legislative framework needs development and government primarily relies on central control. This would place this system at a DQ (blue) within the spiral dynamic framework where the entity is absolutistic, is ruled by higher authority and conforms to the status quo.

The various GHG trading schemes exist as a source of funding as well as the opportunity to have a CTC type project classed as a World Leading Project in terms of carbon emission reductions.

3. Carbon Trading Concepts business model within the environmental canvas

(Represented by blue line in diagram 1.)

Carbon Trading Concepts is very much at an embryonic stage. The founders of the company aspire to a set of values and a vision that reflect the need for the world to move towards a carbon free future. In terms of the Spiral Dynamics model of Graves, the founders' life conditions that they are encountering is very much at a FS (green) stage which reflects their beliefs that 'the habitat wherein humanity can find love and purpose through affiliation and sharing' and in terms of their brain/mind coping capacities, they 'respond to human needs, are affiliative, situational and fluid'. CTC's founders all have a business background, however they are more purpose driven to ensure that renewable energy replaces fossil fuel based energy technologies which are detrimental to the natural environment.

ISASA (and its member learning organizations), as a partner of CTC is very much the same as CTC, however would be seeking to reflect their 'life conditions' and 'coping strategies' through sustainability education.

Suppliers of renewable energy technologies lean more towards an ER (orange) representation which reflects their position to supply the necessary resources and opportunities for renewable energy to CTC. They are pragmatically driven to achieve results and will allow CTC to evaluate the various options of technologies. Suppliers are actively seeking to develop new markets, and it is intended to develop the learning organization as a market for them.

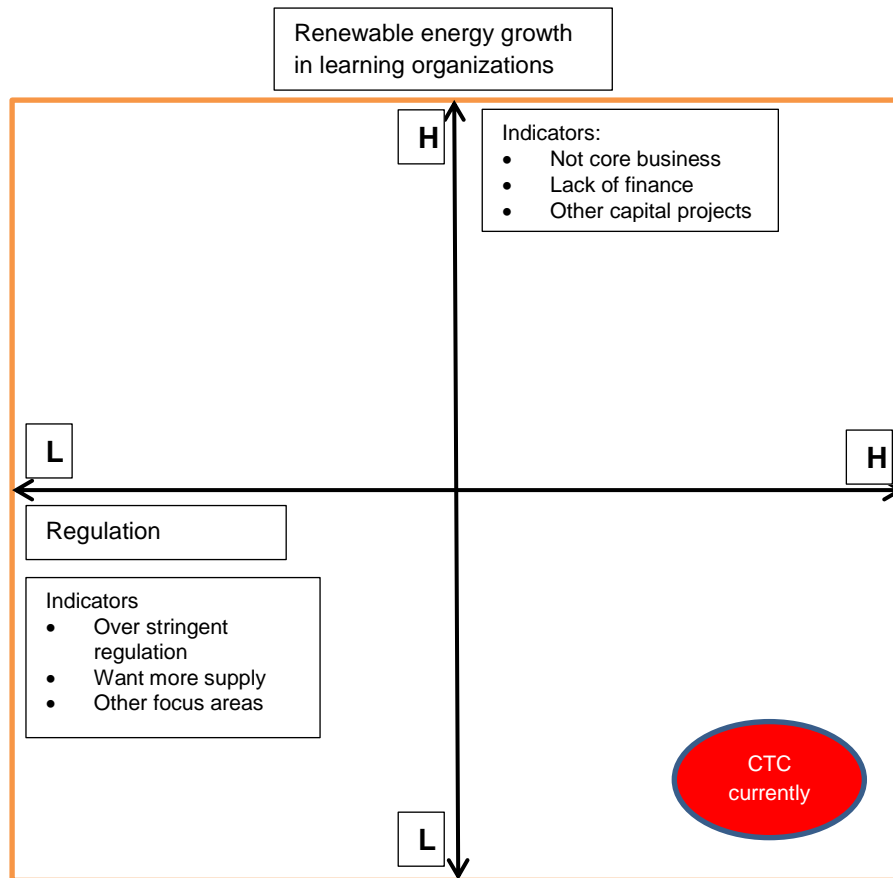
Through partnering with ISASA and suppliers the company believes that the aims of all three can be achieved.

The current state of the political and weak legislative climate in South Africa makes the connection of small scale renewable energy projects to the national grid difficult. CTC currently has no influence within this sector – something that will require attention if the CTC project is to connect its learning organizations to the grid and become net suppliers of energy.

An aspect of the current CTC model is that of Greenhouse Emissions. CTC will be seeking to bundle its organizations into one 'World Leading Project' which will allow it to take advantage of the various protocols that exist in order to access funding for upscaling of its project. Currently CTC exerts no influence and as such GHG Emissions remain in the contextual environment.

4. Carbon Trading Concepts within a current reality

Diagram 2: Positioning within a current reality



Source: amended from Dr Steyn Heckroodt, PGD Futures Studies, Stellenbosch University

The 2 key variants critical for optimum business model implementation and success

- Renewable energy growth in learning organizations
- Regulation of the renewable energy market.

Renewable energy growth in learning organizations

CTC currently finds itself positioned in a market that has very little competition in the supply of renewable energy to learning organizations. This is due to two primary reasons. Firstly, the core business of learning organizations has been traditionally that of theoretical education, but not that of theoretical sustainability education. There is a move towards the practical components of this, however this is on a small scale and includes easier implementation of projects such as recycling, energy efficiencies, etc. The second and probably the more important reason preventing move towards learning organizations renewable energy programs is that of lack of a sustainable financing model. As most organizations already have electricity supply infrastructure in place, the retrofit to take the organization off-grid is seen to be an expensive one. The capital investment required is usually large and these organizations finance departments are often not in the financial position to commit their organizations to such capital projects, particularly when other education based projects will receive priority.

Regulation of the renewable energy market

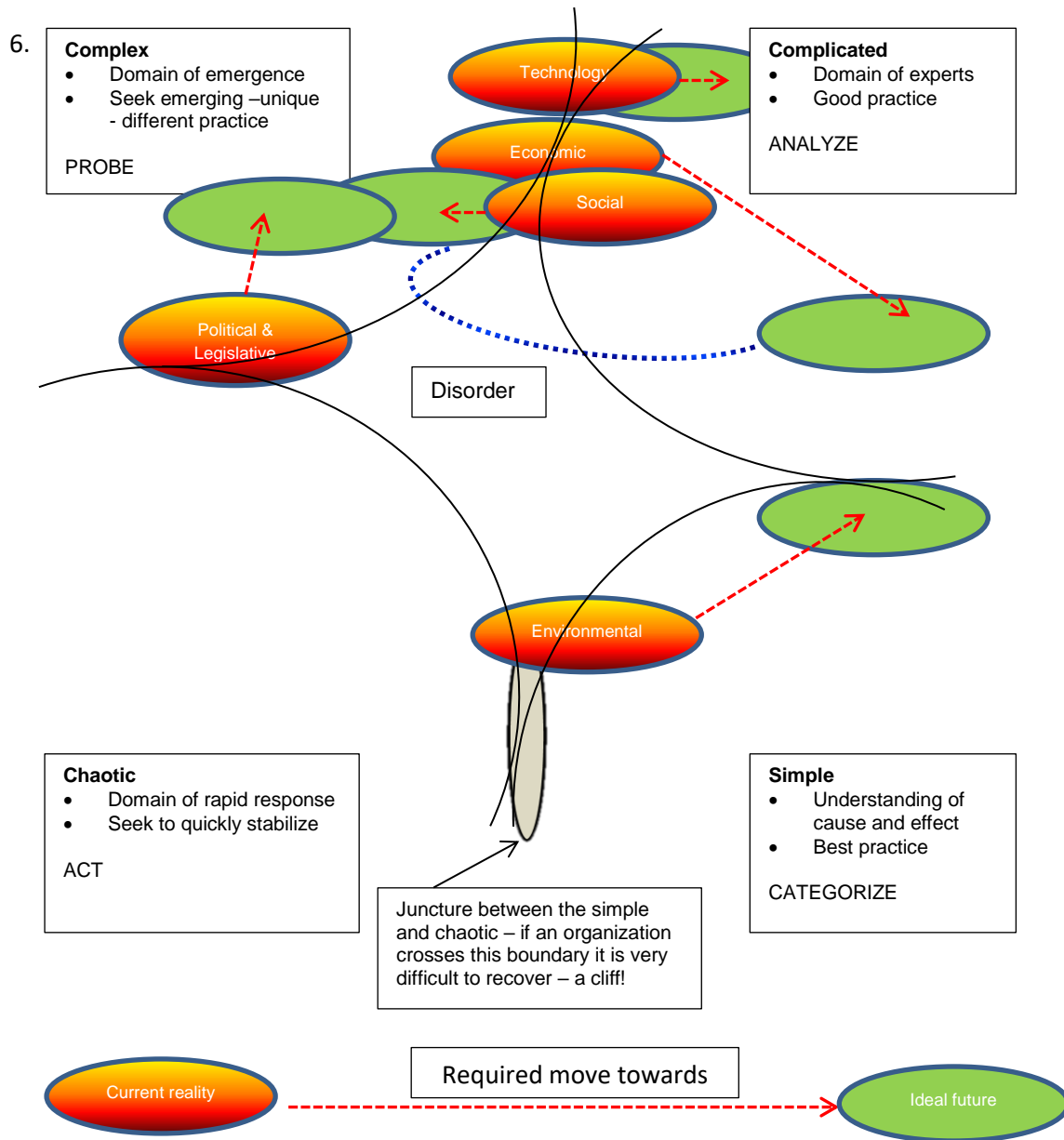
This market is highly regulated and in particular the regulatory framework is onerous for smaller organizations to enter the renewable energy market. The Department of energy is looking for substantial additional supply to the grid, however it lacks the infrastructure to allow IPP's to connect to the national grid. In addition the Department of Energy sees nuclear power and coal fired power as a more important future investment, primarily as the required base/peak load is firstly very high, and secondly the margin between the base/peak load is so small.

Currently CTC operates within the domain of a low growth in renewable energy to learning organizations due to reasons outlined as above. This does not indicate that there is not a market for renewable energy within the learning organization. It is indicative of the barrier of entry of lack of a sustainable finance model for the organization. There are many suppliers of the technology required however their current focus is one of short term profit generation, hence they still remain largely within the transactional environment within which CTC operates. A move towards the internal environment would be required on their part with a more sustainable long term partnership with the learning organization.

CTC also operates within a highly regulated energy industry, but only if it wishes to connect learning organizations to the national grid. Currently learning organizations can be suppliers of their own power if they are not tied to the grid. Grid tied operations are the ideal for the learning organization as they financial benefits are multiple and are a necessary part of the ideal future. This would entail CTC developing the necessary framework with the regulatory authorities; however, it is not a necessary condition for the CTC model to be successful.

5. An ideal future

Diagram 3: PESTLE in the Cynefin Framework



Source: amended from Cynefin Framework Complexity Model

In analysing the ideal future and various scenarios available to CTC, it is worth analysing the context within which the organization finds itself within the Cynefin Framework Complexity Model. This is a sense making model and not a categorization model. The primary aim is to establish which domain CTC currently finds itself and which domain is preferable, considering the PESTLE context (Political, Economic, Social, Technological, Legislative and Environmental).

Environmental – there is no doubt that the natural environment is under unprecedented stress which is primarily due to the fossil fuel energy driven style of economy that currently exists. Governments and business understand this well, however the required fix of moving economies to a sustainable renewable energy one is not only enormously expensive, but also

requires a change in attitudes and a systemic change of conducting business to a system where external costs are internalised. This requires political will (including the allocation of funds) which is often lacking or the governments of the day lack the necessary finance to complete this move.

Due to the nature of the natural environment, and despite the best efforts of humans to bend it to its will, the environmental feedback systems are reacting in a manner that is approaching a tipping point where the system will dominate the change. The stable climatic environment is approaching a chaotic one through the forces of climate change, pollution and uncontrolled use of natural resources. What began as a simple climatic model of natural systems and balancing feedback loops is fast approaching the 'cliff', a juncture whereby the natural systems will descend into the chaotic domain of the Cynefin Framework with resultant chaos and disorder. Short term strategies would require immediate response to deal with issues such as flooded cities, hurricanes, drought, etc. however it is the longer term strategies and mitigation and adaptation that become complex.

Political – The political nature of nations in a globalized world is highly complex. In terms of classification, more developed nations were able to take advantage of their influence and wealth in developing their economies. This has led to the problem of global carbon emissions reaching points whereby all nations and in particular less developed nations are faced with the dual problem of not only growing their economies, but also dealing with the climate change problem caused by more developed nations. Despite the best efforts of nations, NGO's and bodies such as the United Nations to address the climate change problems faced, a nation's government seeks to first address the needs of its own populace within the constraints of its finances available. Many nations are already being subject to the forces of climate change and the cascade effects. For example, the Sudan and the drought leading to lack of water, mass internal migration and the resultant conflict; Syria's prolonged drought, loss of livestock, arable land, mass internal and external displacement and conflict; California's longest historic drought, drying up of rivers, drop in available hydro-power; South Africa's reliance on coal-fired power, lack of infrastructure maintenance and development, corruption, deployment of funds to maintain the political status quo; all leading to complex political environments bordering on chaos and disorder.

Economics – the business organization is generally the bedrock on which an economy is based. It is the foundation upon which a nation's economy relies to employ the populace and generate the necessary taxes required to develop the required infrastructure to operate a nation effectively. The organizations operate within an environment which needs to be conducive to fulfilling these needs as well as to allow an expansion of the economies through profit generation. While the typical Keynesian style of economics saw its role as one of profit generation for shareholders, current thinking is moving to a more inclusive role whereby the organization has a responsibility for social development, due to the fact that it is given a licence to operate within the social environment, has an obligation to internalize external costs such as pollution, and that the intellectual capital of the organization is a core component of the organization. The organization is also required to operate within the political and legislative framework, which if chaotic, makes conducting business more difficult. Added to this is the labour component which can lead to disorder if the correct partnerships between government, business and labour are incorrect.

Social – In a social context, chaos within the environment, economic and political domains can lead to disorder which has a positive feedback loop on other entities within the contextual environment. For example; a negative economic environment can lead to lack of investment by corporations, which leads to job losses, which leads to social hardship, which leads to tighter labour laws, etc. In addition the social diversity with nations and between nations can lead to conflict due to opposing worldviews. This places the social systems within the complicated domain, bordering on the complex with some degree of disorder possible.

Technological – The available technologies to move to a renewable future do exist. The constraints that currently exist are firstly the cost of scaling up these technologies to a point that they can replace the existing fossil fuel based technologies. This would require a rapid mass change in the political will of nations to invest heavily in research and implementation of these technologies in order to ensure the environmental systems move from the edge of collapse. The second constraint is the social attitude of the populace to demand such change from government and to also be part of the solution by implementing the changes where possible without the need for meeting legislative requirements. For example, new development could install such technologies immediately. The technology required is complicated; however the necessary expertise exists to implement it. This places this system within two domains – the complicated and the complex. It can be rolled out to organizations that are prepared to invest in the long term benefits, but to see a global roll out would require entering the complex world of globalized nation states.

5.1 Contextual Ideal Future

In seeking an ideal future within which CTC would operate would require the following:

Political / Legislative system moves away from the chaotic /complex domain well into the complex domain. This would indicate that there is political stability and a favourable legislative environment, allowing CTC and its suppliers to conduct its business. At the same time it would consider the necessity of a business friendly environment and take into account the social needs of the populace.

The economic system, due to a stable and favourable political and legislative system could move away from the complex domain into a complicated domain, however would also move towards the simple domain in acknowledgement of the crucial role it has to play in developing a sustainable renewable energy sector by changing past business as usual paradigms.

The social system moves further into the complex domain as governments further take cognizance of the complexity of diversity. There is, however, a link to economics which also acknowledges its role in developing social stability. The move into this domain further indicates the social development of an essential world view that highlights the complexity of the humanity's impact on the natural environment.

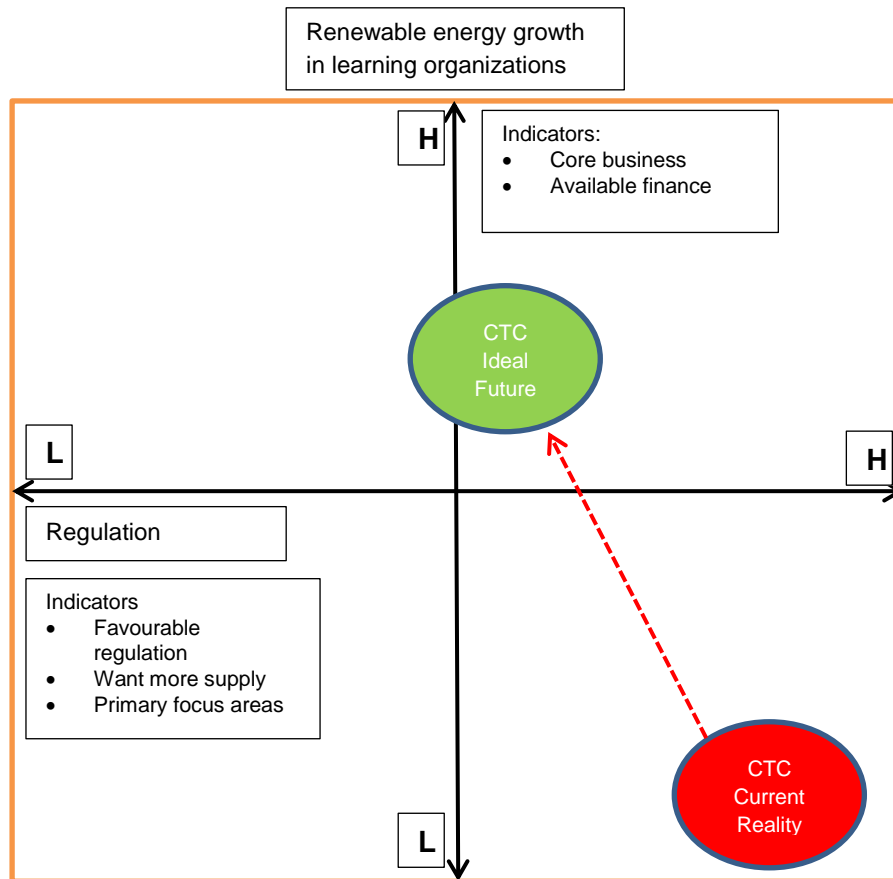
The technology moves towards a more complicated domain towards the economic system. This would indicate political will power and investment into future technologies, as well as a move towards the economic viability of these technologies.

The environmental system would move away from the 'cliff' and well into the simple domain, where it can stabilize. There, is however, acknowledgement of the current anthropogenic 'tail' that exists and that mitigation and adaptation strategies will be required. This moves this

system towards the complicated domain to acknowledge that the problems do exist and will have to be dealt with, but also that the other systems also acknowledge this and in particular the economic system is moving towards environmental sustainability.

5.2 Carbon Trading Concept's Ideal Future

Diagram 4: Positioning within an Ideal Future



Source: amended from Dr Steyn Heckroodt, PGD Futures Studies, Stellenbosch University

CTC sees itself positioned within an environment of high renewable energy growth, with itself as the primary IPP for the learning organization sector. This will be as a result of its partnership initially with ISASA and then with the Department of Education. It will also have strategic partnerships with suppliers and funders.

One of the key competitive advantages CTC will have is that of its title as a World Leading Project which will allow it to access the opportunity of trading the carbon offsets it generates and source further funding from worldwide carbon emission trading schemes. The regulatory environment will still be onerous from the World Leading Project stand point; however this is not seen as a disadvantage. Once the necessary accreditations and verifications are obtained, these will serve as a barrier to entry to other organizations, providing the necessary security for suppliers and joint funders of CTC.

The regulatory framework within South Africa will see an easing once current projects prove their feasibility, however until such time as the current Department of Energy broadens its energy mix to include renewable energy on a greater scale this will prove a complex and

frustrating paperwork requirement. CTC will have to work together with the various government departments to develop this market, however will not rely on it for its success.

6. Evaluation of Current Business model against an Ideal Future

In seeking to understand CTC's business model it needs to ensure that it moves from a methodology of robustness in which it plans against failure to one of resilience in which it understands the complexity of the system in which it operates and is able to change in order to recover from any of the components failure in the contextual environment in which it operates.

Three aspects will be crucial: resilience, adaptability and transformability (Walker et al. 2004). Resilience is "the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks" (Walker et al. 2004:4).

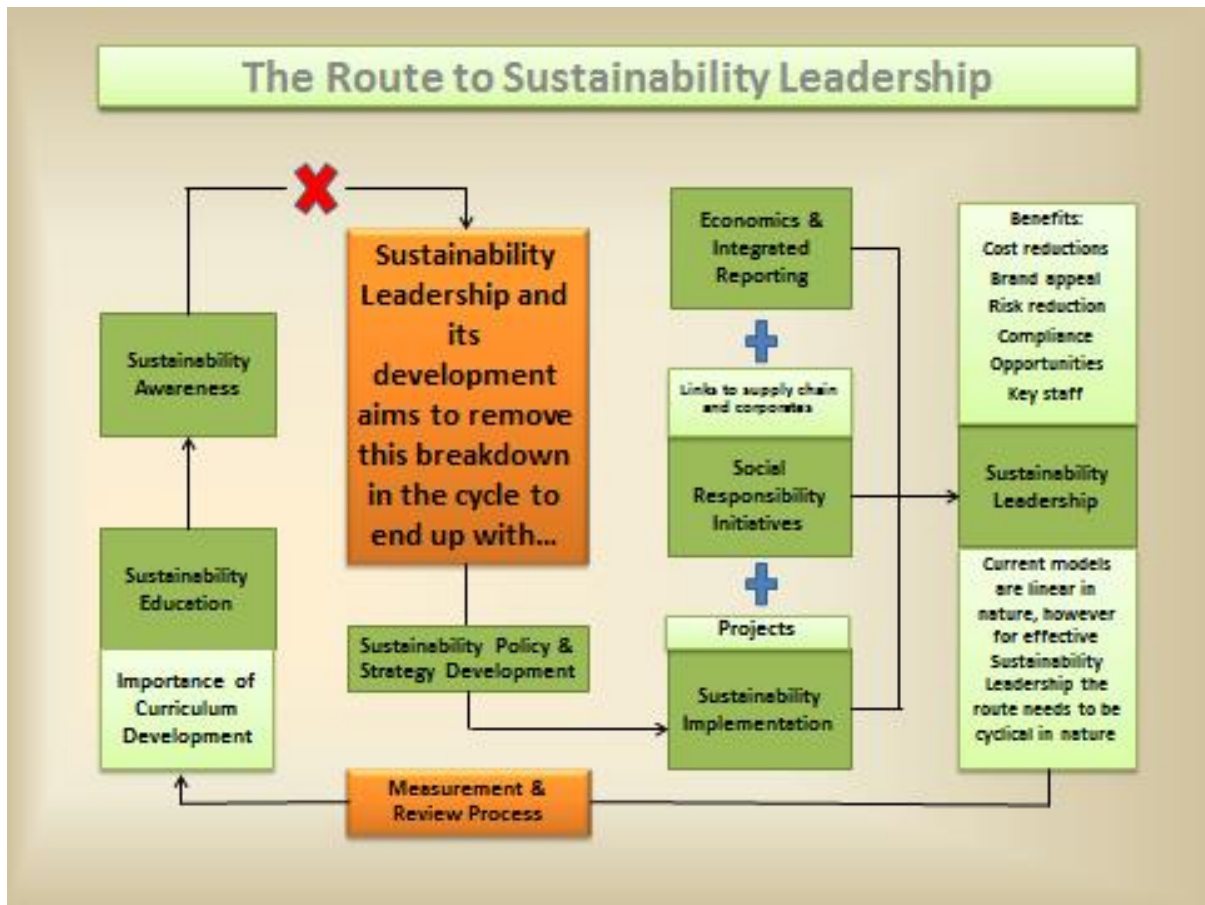
In seeking to build resilience and understand the anatomy of organizational change in developing transformability, CTC has looked to Kotter's eight critical factors for success and what CTC needs to change in its business model.

1. *Establishing a sense of urgency.* As outlined in the contextual analysis within the Cynefin Framework, the environmental component is approaching a tipping point. Resilience in this context is the capacity of the system to continually change and adapt, yet remain within critical thresholds. Scientific data backs up the evidence that the socio-ecological system is under stress. CTC will need to develop the sense of urgency of its project by effectively communicating this urgency to stakeholders, particularly the learning organizations. In order to reduce the leadership paralysis that may exist within these organizations, CTC's model needs to ensure its financial model is attractive to the learning organizations.
2. *Forming a powerful guiding coalition.* By assembling the correct stakeholders to lead the change effort and encouraging the group to work together as a partnership will lead to better resilience. CTC needs to include more learning organizations within its model, and to seek funders and suppliers who not only understand 1 above, but also buy into the vision of CTC.
3. *Creating a vision.* CTC has the necessary vision; however it will ensure that it encompasses all the stakeholders.
4. *Communicating the vision.* CTC will require development work on creating numerous strategies that would suit different needs of stakeholders. If it is able to do this, it may then begin to influence some of the components within the transactional environment. It will need to use every vehicle available to communicate the vision and new strategies.
5. *Empowering others to act on the vision.* In empowering others to act on the vision, CTC needs to remove obstacles to change, changing systems or structure that may undermine the vision, and to encourage risk taking and use of non-traditional ideas. CTC needs to ensure the financial obstacle is removed through strong financial models with its funders, and to demonstrate to learning organizations the feasibility of renewable energy sources.

6. *Planning for and creating short term wins.* One of the areas that CTC can improve on is the immediate benefits that would exist with a switch to renewable energy. This would include the immediate cost savings available. Possible affiliation to accredited international bodies that recognize this change would improve the immediate marketability of the stakeholders.
7. *Consolidating improvements and producing still more change.* CTC would seek to use its growing credibility to change organizationalised systems and structures that so often appear within the learning organizations. To this end CTC will continue its research work with academics on the development of sustainability education
8. *Organizationalizing new approaches.* CTC must articulate the connections between the renewable energy switch and the success of the organization. In other words it must show that the disconnect between sustainability education and the 'business as usual' scenario no longer exists. By demonstrating that the learning organization is now practicing what it preaches, this will enhance reputation. By organizationalizing new practices, CTC must ensure that sustainability leadership and development exists within the 'new' organization.

The changes suggested above can be represented by the green and red dotted lines in diagram 1 (environmental canvas). This does indicate that CTC is moving its business model into the contextual environment, where its influence is minimal, but represents a change in the contextual environment where nation states make the required moves to a sustainable future. Due to its growing credibility, CTC will be positioned better to guide and partake in the changes required in a globalised world. Since the ultimate vision of CTC is to move the environmental systems away from the 'cliff' as outlined in the Cynefin Framework, CTC is providing a core component for the development of resilience, a way to foster resilience of smaller more manageable systems (learning organizations), and which, when bundled together provide a sustainable model that collectively makes a large difference, not only in practical terms, but also in changing the attitudes and behavioural patterns of humans within the system.

Annexure 1:



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