

## Purpose

The purpose of this document is to outline research that was undertaken on the eThekwini green economy utilising a Complex Adaptive Systems underpinning that is also linked to a successfully awarded Doctorate of Business Administration.

## Project Title and Author Information

Project title: Analysing the eThekwini green economy to its dynamic and complex components for identifying leverage points.

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## Research Overview

Climate change is one the greatest threats to the survival of mankind. To add insult to injury, it is widely accepted that climate change is due to anthropogenic causes. While climate change is an existential threat, it also offers some opportunities. The most notable of these opportunities is the green economy.

This specific research was predicated on the hypothesis that the eThekwini green economy is not well understood according to its complex and adaptive characteristics. Based on this lack of understanding, any initiative to stimulate the eThekwini green economy will not deliver the anticipated results. As a result, the aim of the research is to develop a framework of the eThekwini green economy to provide insight to businesses and other components on the implications of their decisions on themselves, other components and the entire system. The detailed objectives are disaggregated as follows:

1. What are the components of the eThekwini green economy and their key characteristics that affect business growth and the reduction of GHG emissions?
2. How do the components interact with other components of the eThekwini green economy and what are the leverage points?
3. Can a framework be developed to depict and set the basis for simulating the components of the eThekwini green economy and the manner in which they interact?

A variety of philosophical worldviews were considered for underpinning the research methodology. After careful consideration, Pragmatism was chosen, largely due to the ability of Pragmatism to incorporate a mixed methods approach. A concurrent mixed methods strategy was employed. Specifically, quantitative data collection was undertaken by surveys and qualitative data collection by face-to-face interviews and focus groups.

Two of the more important overarching findings include: the eThekwini green economy is in existence, however, it has come about through organic process, is still in its early growth phases and has the potential for huge growth. In addition, businesses that offer green goods and services are sometimes so focused on their product offering, that they do not realise that they are part of the eThekwini green economy.

The findings on how components operate in the eThekwini green economy are similar to components that would normally be theorised in agent-based economic models. The component is usual activated by an external stimulus, but in instances can initiate action from internal stimuli. The stimuli is then processed by a number of characteristics: such as financial, motivation and benefit, dependency on other components, people, time and strategic nature of decision making. It is important to note that each component, even those that are clustered together will have a unique set of characteristics. There are then 2 major outcomes, the component then provides 'something' to the system, that the system and other components need for survival, e.g. demand for products, or capital for investment. In addition, the component then contributes to 3 'flows' within the eThekwini green economy, these are: financial, social and environmental. Each flow is tallied, whether it is a positive or negative flow, after the a decision is taking by each component.

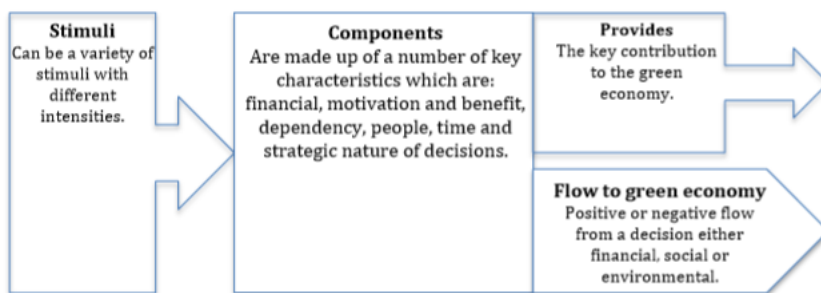


Figure 1: Structure of a component within the eThekwini green economy

Furthermore, after the analysis a total of 47 key aspects or components that make up the eThekwini green economy were identified. The components were aggregated into key sectors: communities, private sector, government, both public and private sector and cross cutting. Importantly, the eThekwini green economy is naturally framed within the largely local economy and international contexts.

The 47 highlighted components can be viewed in Figure 2.

While all 47 components are important to the functioning of the eThekwini green economy, there are a few components identified as being leverage points for the eThekwini green economy. These leverage points have the ability to catalytically improve or impede the eThekwini green economy. Ten leverage points were identified, these are highlighted with a red outline in Figure 2. However, the most important leverage point is a collection of discretionary income, gini coefficient, unemployment and per capita income. The premise of this is that even if people have full awareness and knowledge and are willing to partake in the eThekwini green economy but are unable to, then all efforts will come to nought when endeavouring to stimulate the eThekwini green economy. The inverse is likely to not hold true, do a random variable that should be included when people have the means to participate in the eThekwini green economy.

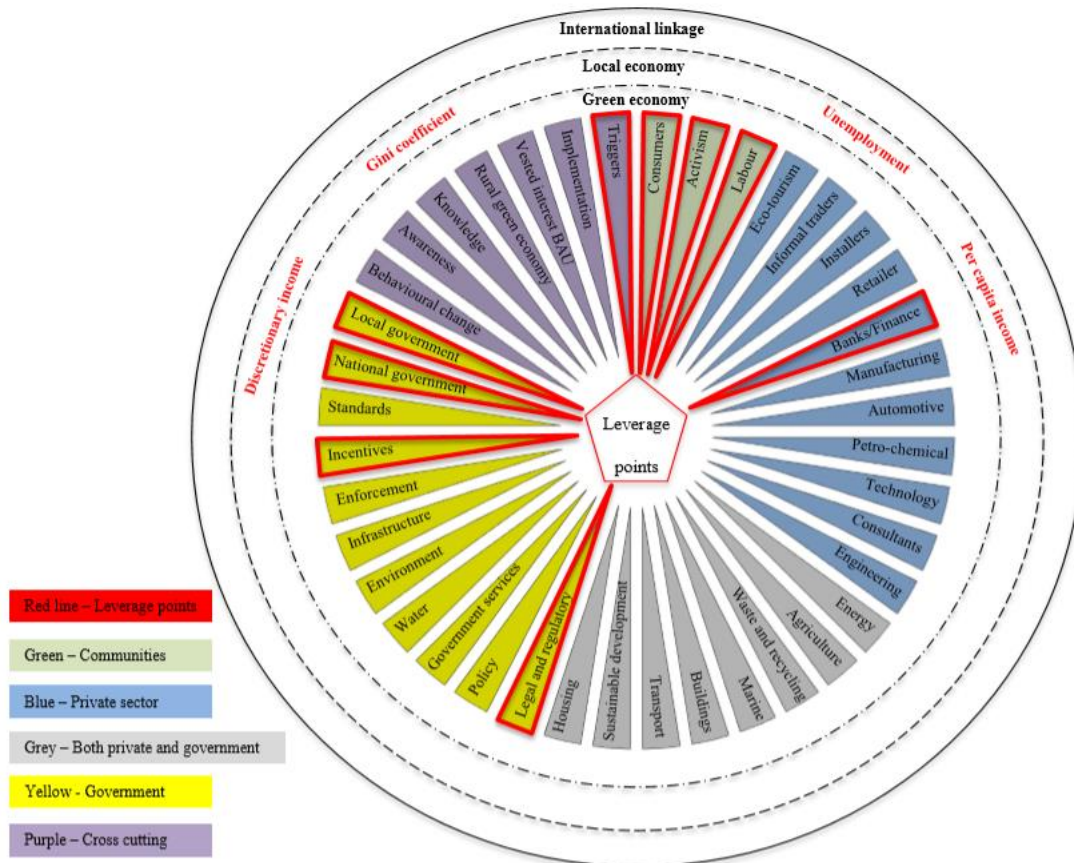


Figure 2: Components and leverage points of the eThekweni green economy

## Linkage to Sustainable Development Goals

This study can be linked to the following Sustainable Development Goals (SDG):

- SDG 7: Affordable and Clean Energy.
- SDG 8: Decent Work and Economic Growth.
- SDG 11: Sustainable Cities and Communities.
- SDG 12: Responsible Consumption and Production.
- SDG 13: Climate Action.